I. Roll Call
(· Arlene Schmuland (· Hsing-Wen Hu (· Sam Thiru
(· Susan Garton (· Peter Olsson (· Cindy Knall
(· Greg Protasell (· Anthony Paris (· GSA Vacancy
(· Dennis Drinka (· Patricia Sandberg (· FSAL vacancy
(· Jervette Ward (· Clayton Trotter (· Scheduling & Publications

II. Approval of Agenda (pg. 1-3)

III. Approval of Meeting Summary (pg. 4-6)

Program/Course Action Request – Second Reading
Chg CIS A690 Selected Topics in Management Information Systems (3 cr)(3+0)(pg. 7-10)
Add Master of Science, Computer Engineering and Computer Science (pg. 11-15)
Chg CSCE A601 Advanced Software Engineering (3 cr)(3+0)(pg. 16-20)

IV. Program/Course Action Request - First Readings
Add CSCE A611 Advanced Artificial Intelligence (stacked with CSCE A411)(3 cr)(3+0)(pg. 21-28)
Add CSCE A612 Advanced Evolutionary Computing (stacked with CSCE A412)(3 cr)(3+0)(pg. 29-27)
Add CSCE A615 Advanced Machine Learning (stacked with CSCE A415)(3 cr)(3+0)(pg. 38-47)
Add CSCE A621 Mission Critical Systems (3 cr)(3+0)(pg. 48-53)
Add CSCE A631 Advanced Compilers (stacked with CSCE A431)(3 cr)(3+0)(pg. 53-61)
Add CSCE A632 Advanced Programming Languages (3 cr)(3+0)(pg. 62-65)
Add CSCE A646 Advanced Digital Media and Interactive Systems (Stacked with CSCE A446)
(3 cr)(3+0)(pg. 66-77)
Add CSCE A648 Advanced Computer Architecture (3 cr)(3+0)(pg. 78-81)
Add CSCE A650 Advanced Mobile Robotics (stacked with CSCE A450)(3 cr)(3+0)(pg. 82-91)
Add CSCE A652 Advanced Computational Theory and Algorithms (3 cr)(3+0)(pg. 92-96)
Add CSCE A660 Advanced Database Systems (stacked with CSCE A460)(3 cr)(3+0)(pg. 97-104)
Add CSCE A662 Advanced Data Mining (stacked with CSCE A462)(3 cr)(3+0)(pg. 105-112)
Add CSCE A665 Advanced Computer and Network Security (stacked with CSCE A465)
(3 cr)(3+0)(pg. 113-121)
Add CSCE A667 Advanced computer Network Systems (3 cr)(3+0)(pg 122-125)
Add CSCE A671 Research Methods in Computer Science and Engineering (3 cr)(3+0)(pg. 126-130)
Add CSCE A685 Advanced Computer and Machine Vision (stacked with CSCE A485)
(3 cr)(3+0)(pg. 131-140)
<p>| | | |</p>
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<tr>
<td>Add</td>
<td>CSCE A690</td>
<td>Topics in Computer Science and Computer Engineering (stacked with CSCE A490) (3 cr) (3+0) (pg. 141-148)</td>
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<td>Add</td>
<td>CSCE A698</td>
<td>Individual Research (1-3 cr) (0+3+9) (pg. 149-151)</td>
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<td>Doctor of Nursing Practice (pg. 155-162)</td>
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<td>Chg</td>
<td>NS A601</td>
<td>Advanced Pathophysiology I (1-4 cr) (1-4+0) (pg. 163-168)</td>
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<td>Chg</td>
<td>NS A602</td>
<td>Advanced Health Assessment in Primary Care (4 cr) (2+8) (pg. 169-175)</td>
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<td>Advanced Pathophysiology II (2 cr) (2+0) (pg. 176-180)</td>
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<tr>
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<td>Add</td>
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<td>Family Nurse Practitioner IV (6 cr) (2+16) (pg. 281-287)</td>
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<td>Chg</td>
<td>NS A670</td>
<td>Advanced Practice Psychiatric and Mental Health Nursing I (5 cr) (4+4) (pg. 288-292)</td>
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</table>
Chg  NS A671  Advanced Practice Psychiatric and Mental Health Nursing II (5 cr)(3+8)(pg. 293-297)
Chg  NS A672  Advanced Practice Psychiatric and Mental Health Nursing III (5 cr)(2+12)(pg. 298-303)
Chg  NS A673  Advanced Practice Psychiatric and Mental Health Nursing IV (5 cr)(1+16)(pg. 304-307)
Add  NS A683  Clinical Immersion (3 cr)(0+12)(pg. 308-311)
Add  NS A684  Clinical Concentration (4 cr)(0+16)(pg. 312-314)
Add       Master of Business Administration (pg. 315-325)
Add       BA A626  Strategic Leadership (3 cr)(3+0)(pg. 326-330)
Add       BA A649  Advanced Business Data Analysis (3 cr)(3+0)(pg. 331-334)

V.  Administrative Reports
   A.  Associate Dean of the Graduate School David Yesner
   B.  Graduate Student
   C.  University Registrar Lora Volden

VI.  Chair’s Report
   A.  GAB Chair- Arlene Schmuland
   B.  Faculty Alliance
   C.  Graduate Council

VII.  Old Business
   A.  Designation for community-Engaged Learning Courses (pg. 335-336)

VIII. New Business

IX.  Informational Items and Adjournment
**Graduate Academic Board**

**Summary**

**January 10, 2014**

**ADM 204**
**9:30 to 11:30**

I. **Roll Call**

(x) Arlene Schmuland  () Hsing-Wen Hu  (x) Sam Thiru  
(x) Susan Garton  (x) Peter Olsson  (x) Cindy Knall  
(x) Greg Protasel  (x) Anthony Paris  () GSA Vacancy  
(x) Dennis Drinka  (x) Patricia Sandberg  () FSAL vacancy  
(x) Jervette Ward  (x) Clayton Trotter  (x) Scheduling & Publications  

**Ex-Officio Members:**

(x)  Greg Protasel  (x) Anthony Paris  () GSA Vacancy  () David Yesner  
(x)  Dennis Drinka  (x) Patricia Sandberg  () FSAL vacancy  (x) Lora Volden  

II. **Approval of Agenda** (pg. 1-3)  
**Approved**

III. **Approval of Meeting Summary** (pg. 4-5)  
**Approved**

IV. **Program/Course Action Request – Second Reading**

Chg  CIS A690  Selected Topics in Management Information Systems (3 cr)(3+0)(pg. 6-9)  
Faculty initiator was not present

Add  BA A621  Change Leadership and Facilitation (3 cr)(3+0)(pg. 10-14)  
**Approved for second reading**

Add  BA A622  Performance Management and Coaching (3 cr)(3+0)(pg. 15-18)  
**Approved for second reading**

Add  BA A671  Introduction to Entrepreneurship (3 cr)(3+0)(pg. 19-22)  
**Approved for second reading**

Add  BA A672  Developing a Business Plan (3 cr)(3+0)(pg. 23-25)  
**Approved for second reading**

Add  BA A673  Creating and Managing the Entrepreneurial Venture (3 cr)(3+0)(pg. 26-29)  
**Approved for second reading**

Chg  BA A695  Graduate Internship (3 cr)(3+0)(pg. 30-33)  
**Approved for second reading**

Add  EDEN A600  Education, Culture, and Leadership Residency (4 cr)(4+0)(pg. 34-40)  
**Approved for second reading**

Add  EDEN A612  Indigenous Epistemologies in Alaska (3 cr)(3+0)(pg. 41-46)  
**Approved for second reading**

V. **Program/Course Action Request - First Readings**

Add  EDEN A601  Inquiry-Based Scholarship: Quantitative, Qualitative, Mixed-modes (6 cr)(6+0)(pg. 47-52)  
**Accepted for first reading**

Add  EDEN A602  Inquiry-Based Scholarship: Quantitative, Qualitative, Mixed-modes II (3 cr)(3+0)(pg. 53-58)  
**Accepted for first reading**

Add  Master of Science, Computer Engineering and Computer Science (pg. 59-63)  
**Accepted for first reading**

Chg  CSCE A601  Advanced Software Engineering (3 cr)(3+0)(pg.64-68)  
**Accepted for first reading**
Add CSCE A611 Advanced Artificial Intelligence (stacked with CSCE A411) (3 cr) (3+0) (pg. 69-76)
Add CSCE A612 Advanced Evolutionary Computing (stacked with CSCE A412) (3 cr) (3+0) (pg. 77-85)
Add CSCE A615 Advanced Machine Learning (stacked with CSCE A415) (3 cr) (3+0) (pg. 86-95)
Add CSCE A621 Mission Critical Systems (3 cr) (3+0) (pg. 96-101)
Add CSCE A631 Advanced Compilers (stacked with CSCE A431) (3 cr) (3+0) (pg. 102-110)
Add CSCE A632 Advanced Programming Languages (3 cr) (3+0) (pg. 111-114)
Add CSCE A646 Advanced Digital Media and Interactive Systems (Stacked with CSCE A446) (3 cr) (3+0) (pg. 115-126)
Add CSCE A648 Advanced Computer Architecture (3 cr) (3+0) (pg. 127-130)
Add CSCE A650 Advanced Mobile Robotics (stacked with CSCE A450) (3 cr) (3+0) (pg. 131-140)
Add CSCE A660 Advanced Database Systems (stacked with CSCE A460) (3 cr) (3+0) (pg. 141-148)
Add CSCE A662 Advanced Data Mining (stacked with CSCE A462) (3 cr) (3+0) (pg. 149-156)
Add CSCE A665 Advanced Computer and Network Security (stacked with CSCE A465) (3 cr) (3+0) (pg. 157-165)
Add CSCE A667 Advanced Computer Network Systems (3 cr) (3+0) (pg. 166-169)
Add CSCE A671 Research Methods in Computer Science and Engineering (3 cr) (3+0) (pg. 170-174)
Add CSCE A685 Advanced Computer and Machine Vision (stacked with CSCE A485) (3 cr) (3+0) (pg. 175-184)
Add CSCE A690 Topics in Computer Science and Computer Engineering (stacked with CSCE A490) (3 cr) (3+0) (pg. 185-192)
Add CSCE A698 Individual Research (1-3 cr) (0+3+9) (pg. 193-195)
Add CSCE A699 Thesis (1-6 cr) (0+3+18) (pg. 196-198)
Add Doctor of Nursing Practice (pg. 199-205)

NS Courses are postponed until the next meeting
Chg NS A601 Advanced Pathophysiology I (1-4 cr) (1-4+0) (pg. 206-211)
Chg NS A602 Advanced Health Assessment in Primary Care (4 cr) (2+8) (pg. 212-218)
Add NS A603 Advanced Pathophysiology II (2 cr) (2+0) (pg. 219-223)
Chg NS A610 Pharmacology for Primary Care I (1-2) (1-2+0) (pg. 224-229)
Chg NS A611 Psychopharmacology for Advanced Practice Nursing (3 cr) (3+0) (pg. 230-234)
Add NS A612 Pharmacology for Primary Care II (3 cr) (3+0) (pg. 235-239)
Add NS A613 Advanced Practice Informatics (2 cr) (2+0) (pg. 240-243)
Add NS A614 Advanced Practice Ethics and Law (2 cr) (2+0) (pg. 244-247)
Add NS A615 Health Services Organization and Finance (4 cr) (4+0) (pg. 248-251)
Chg NS A618 Advanced Nursing Roles and Leadership (2-4) (2-4+0) (pg. 252-256)
Chg NS A619 Health Policy and Economics (2-4) (2-4+0) (pg. 257-261)
Chg NS A621 Knowledge Development for Advanced Nursing Practice (3 cr) (3+0) (pg. 262-266)
Add NS A627 Practice Inquiry I: The Nature of Evidence (3 cr) (3+0) (pg. 267-271)
Add NS A628 Practice Inquiry II: Design and Methods (3 cr) (3+0) (pg. 272-275)
Add NS A629 Practice Inquiry III: Proposal Development (2 cr)(2+0)(pg. 276-279)
Add NS A630 Practice Inquiry IV: Capstone Project (2 cr)(1+4)(pg. 280-283)
Add NS A633 Statistics for Advanced Practice (3 cr)(3+0)(pg. 284-287)
Add NS A634 Epidemiology for Advanced Practice (2 cr)(2+0)(pg. 288-291)
Add NS A637L Data Analysis: Qualitative (1 cr)(0+3)(pg. 292-294)
Add NS A638L Data Analysis: Quantitative (1 cr)(0+3)(pg. 295-298)
Chg NS A660 Family Nurse Practitioner I (4 cr)(2+8)(pg. 299-307)
Chg NS A661 Family Nurse Practitioner II (5 cr)(2+12)(pg. 308-315)
Chg NS A662 Family Nurse Practitioner III (5 cr)(2+12)(pg. 316-323)
Chg NS A663 Family Nurse Practitioner IV (6 cr)(2+16)(pg. 324-330)
Chg NS A670 Advanced Practice Psychiatric and Mental Health Nursing I (5 cr)(4+4)(pg. 331-335)
Chg NS A671 Advanced Practice Psychiatric and Mental Health Nursing II (5 cr)(3+8)(pg. 336-340)
Chg NS A672 Advanced Practice Psychiatric and Mental Health Nursing III (5 cr)(2+12)(pg. 341-346)
Chg NS A673 Advanced Practice Psychiatric and Mental Health Nursing IV (5 cr)(1+16)(pg. 347-380)
Add NS A683 Clinical Immersion (3 cr)(0+12)(pg. 351-354)
Add NS A684 Clinical Concentration (4 cr)(0+16)(pg. 355-357)

VI. Administrative Reports
A. Associate Dean of the Graduate School David Yesner
   Written report is posted to the agenda website
B. Graduate Student
   Written report is posted to the agenda website
C. University Registrar Lora Volden

VII. Chair’s Report
A. GAB Chair- Arlene Schmuland
   Written report is posted to the agenda website
B. Faculty Alliance
C. Graduate Council

VIII. Old Business

IX. New Business
   A. Designation for Community-Engaged Learning Courses (pg. 358-359)
      Accepted for first reading

X. Informational Items and Adjournment
Course Action Request  
University of Alaska Anchorage  
Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
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<tbody>
<tr>
<td>CB CBPP</td>
<td>ADBP Division of Business Programs</td>
<td>CIS</td>
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<tr>
<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours</th>
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<tr>
<td>CIS</td>
<td>A690</td>
<td>N/A</td>
<td>3</td>
<td>(Lecture + Lab) (3+0)</td>
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<th>6. Complete Course Title</th>
<th>7. Type of Course</th>
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<tr>
<td>Selected Topics in Management Information Systems</td>
<td>Academic</td>
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<tr>
<td>Selected Topics in MIS</td>
<td>Preparatory/Development</td>
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<td>Non-credit</td>
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<th>13a. Impacted Courses or Programs:</th>
<th>List any programs or college requirements that require this course.</th>
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<tbody>
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<td>Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at <a href="http://www.uaa.alaska.edu/governance">www.uaa.alaska.edu/governance</a>.</td>
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<th>Chair/Coordinator Contacted</th>
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<td>10/29/2013</td>
<td>Minnie Yen</td>
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<tr>
<th>Initiator Name (typed): Bogdan Hoanca</th>
<th>Initiator Signed Initials:</th>
<th>Date:</th>
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<th>13c. Coordination with Library Liaison</th>
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<th>15. Course Description (suggested length 20 to 50 words)</th>
<th>Study of specific current issues, techniques, and trends in Management Information Systems (MIS).</th>
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<tbody>
<tr>
<td>Special note: May be repeated with change of subtitle/topic. Maximum of 9 elective credits may be used for the MBA degree.</td>
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<th>16b. Co-requisite(s) (concurrent enrollment required)</th>
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<td>Mark if course is a selected topic course</td>
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<tr>
<td>CIS A692 has been removed as a prerequisite, for two reasons. First, it was recently changed from a core course to a prerequisite for the MBA. Second, not all CIS A690 topics require CIS A692 as a prerequisites.</td>
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<table>
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<td>Bogdan Hoanca</td>
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7
I. **Date Initiated**  
October 23, 2013

II. **Course Information**

- **College/School:** College of Business and Public Policy  
- **Department:** Computer Information Systems  
- **Program:** Master of Business Administration  
- **Course Title:** Selected Topics in Management Information Systems  
- **Course Number:** CIS A690  
- **Credits:** 3  
- **Contact Hours:** 3 hr per week x 15 weeks = 45 hours for each lecture hour  
  0 lab hours  
- **Grading Basis:** A-F  
- **Course Description:** Study of specific current issues, techniques, and trends in Management Information Systems (MIS)  
  Special note: May be repeated with change of subtitle/topic. Maximum of 9 elective credits may be used for the MBA degree.  
- **Course Prerequisites:** None  
- **Registration Restrictions:** Graduate standing  
- **Fees:** Standard CBPP computer lab fee

III. **Course Activities**

Because this is a “selected topics” course, the focus of the course may vary depending on the topic addresses. However, in general, the course will involve a combination of:

A. Lecture  
B. Discussion  
C. Guest speakers

IV. **Guidelines for Evaluation**

The guidelines for evaluation will be developed by the faculty member offering the course and will vary and may include:

A. Written assignments  
B. Class presentations  
C. Case studies or term paper  
D. Exams
V. **Course Level Justification**
   This is an elective course in the Master of Business Administration (MBA) program, intended to introduce graduate students to the most recent and relevant topics in MIS. The nature of the topics and the level of the discussion will require advanced understanding of the concepts, as well as business experience beyond an undergraduate degree.

VI. **Course Outline**
   Course outline varies with topics.

   Example course (Information Security Assurance)
   
   A. Introduction to Information Security
   B. The Need for Security
   C. Legal, Ethical, and Professional Issues in Information Security
   D. Risk Management: Identifying and Assessing Risk
   E. Risk Management: Assessing and Controlling Risk
   F. Blueprint for Security
   G. Planning for Continuity
   H. Security Technology
   I. Physical Security
   J. Implementing Security
   K. Security and Personnel
   L. Information Security Maintenance

VII. **Suggested Texts**
   Textbooks vary according to topic.

   Example course (Information Security Assurance)
   

VIII. **Bibliography**
   References vary according to topic.

   Example course (Information Security Assurance)
   
   
   
   
   
### IX. Instructional Goals and Student Learning Outcomes

Instructional Goals and Student Outcomes vary according to topic. Example provided for Information Security Assurance topic

<table>
<thead>
<tr>
<th>A. Instructional Goals. The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Demonstrate the integration of security, software, people, data, and telecommunications components in Information Systems (IS).</td>
</tr>
<tr>
<td>2. Engage students in classroom debates on the implications of emerging global threats to IS data.</td>
</tr>
<tr>
<td>3. Empower students to be able to perform customer investigation of security faults and protection of IS resources.</td>
</tr>
<tr>
<td>4. Guide students in developing analysis and database tools to support quantitative decision making related to security risk assessment and use of forensic tools to solve security problems.</td>
</tr>
<tr>
<td>5. Challenge students in identifying societal and business implications of information systems security risks and protection policies.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Student Learning Outcomes. Students will be able to:</th>
<th>Assessment Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Apply the ethical legislative and regulatory issues of information security, as well as the role of public policy in shaping a global digital economy.</td>
<td>Homework, Exams, Research project</td>
</tr>
<tr>
<td>2. Investigate the role of computer forensics.</td>
<td>Homework, Exams</td>
</tr>
<tr>
<td>3. Create suitable information assurance policies for a variety of systems.</td>
<td>Homework</td>
</tr>
<tr>
<td>4. Explain the basic theories, principles, and concepts of computer security.</td>
<td>Homework, Quizzes, Exams</td>
</tr>
<tr>
<td>5. Analyze Information Security practices across a variety of business environments.</td>
<td>Homework, Quizzes</td>
</tr>
<tr>
<td>6. Describe the issues and tasks surrounding the implementation and operation of an Information Assurance program.</td>
<td>Homework, Quizzes</td>
</tr>
<tr>
<td>7. Define various information security processes and discuss their tangible and intangible benefits.</td>
<td>Homework, Quizzes, Exams</td>
</tr>
<tr>
<td>8. Describe the various security technologies including: firewalls, dial-up protection, and access control.</td>
<td>Homework, Quizzes, Exams</td>
</tr>
<tr>
<td>9. Describe the various concepts of cryptography including types of ciphers and cryptographic algorithms.</td>
<td>In-class activities, Quizzes, Exams</td>
</tr>
<tr>
<td>10. Describe and design physical security measures.</td>
<td>Homework, Exams</td>
</tr>
<tr>
<td>11. Develop an Information Assurance plan.</td>
<td>Research project</td>
</tr>
</tbody>
</table>
Memo regarding: Proposed Master of Science, Computer Engineering and Computer Science

From: Kenrick Mock, Chair, Department of Computer Science & Engineering

Curriculum Committees:

The Department of Computer Science and Engineering in the School of Engineering proposes a new Master’s Degree in Computer Engineering and Computer Science. We have received interest in a graduate program for many years. Due to the recent merger of faculty from the Computer Science and Computer Systems Engineering programs into a unified department, we now have a sufficient number of faculty members and sufficient expertise to offer a Master’s degree without the need to hire additional faculty members.

We have conducted surveys where over 40 individuals have expressed interest in the program. A draft prospectus is available upon request that describes the business case and alignment with institutional goals and objectives. Overall, the proposed program addresses state needs for technology and high-demand jobs as specified in both the UAA Strategic Plan and the UA Master Academic Plan. Additionally, Computer Science & Engineering (CS&E) faculty at UAA currently collaborate on projects with many other UAA departments, as computing needs have become ubiquitous. The graduate program in CS&E will strengthen and grow these relationships while also stimulating research and innovation.

We have designed the program with two options, a research thesis and a course option. In the thesis option, students complete a research thesis while the course option is geared toward working professionals. Both options require a core set of courses. None of the core courses are stacked. A majority of the elective courses are stacked with undergraduate courses. Our planned rotation of course offerings allows completion of the degree within two years. The curriculum has been developed in consultation with our Computer Science & Engineering Advisory Board, which consists of technology professionals in the Anchorage area.

Finally, the proposed graduate courses in this program will also support the existing Master’s in Interdisciplinary Studies. We have already held discussions with faculty members in Chemistry, Biology, and Physics/Astronomy about creating a MS plan utilizing the proposed CS&E graduate courses.

Sincerely,

Kenrick Mock
Professor of Computer Science
Chair, Department of Computer Science & Engineering
# Program/PREFIX Action Request

**University of Alaska Anchorage**

Proposal to Initiate, Add, Change, or Delete a Program of Study or Prefix

---

### 1a. School or College
EN SOENGR

### 1b. Department
Computer Science & Engineering

### 2. Complete Program Title/PREFIX
Master of Science, Computer Engineering and Computer Science

### 3. Type of Program

<table>
<thead>
<tr>
<th>Undergraduate:</th>
<th>Graduate:</th>
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</thead>
<tbody>
<tr>
<td>CHOOSE ONE</td>
<td>Master of Science</td>
</tr>
</tbody>
</table>

This program is a Gainful Employment Program:  

- [ ] Yes  
- [x] No

### 4. Type of Action:

- [x] PROGRAM  
- [ ] PREFIX

- [ ] Add  
- [ ] Change  
- [ ] Delete  
- [ ] Add  
- [ ] Change  
- [ ] Inactivate

### 5. Implementation Date (semester/year)

- **From:** Fall/2014  
- **To:** 99.9999

### 6a. Coordination with Affected Units

**Initiator Name (typed):** Kenrick Mock

**Date:**

- **Initiator Signed Initials:** ________

**Department, School, or College:** CIS/CBPP/UA; CS/CEM/UAFA

**Email submitted to Faculty Listserv:** (uaa-faculty@lists.uaa.alaska.edu)

**Date:** 11/4/2013

### 6b. Coordination Email submitted to Faculty Listserv

**Date:** 11/4/2013

### 6c. Coordination with Library Liaison

**Date:** 11/4/2013

### 7. Title and Program Description - Please attach the following:

- [x] Cover Memo  
- [ ] Catalog Copy in Word using the track changes function

### 8. Justification for Action

The proposed program addresses state needs for technology and high-demand jobs as specified in both the UAA Strategic Plan and the UA Master Academic Plan. The proposed program can be implemented with existing faculty and will stimulate both research and technological innovation.

---

**Initiator (faculty only) Date**

- [ ] Approved  
- [ ] Disapproved  

**Dean/Director of School/College Date**

- [ ] Approved  
- [ ] Disapproved  

**Undergraduate/Graduate Academic Board Chair Date**

- [ ] Approved  
- [ ] Disapproved  

**Provost or Designee Date**

- [ ] Approved  
- [ ] Disapproved
Master of Science, Computer Engineering and Computer Science

The Master of Science in Computer Engineering and Computer Science focuses on advanced computer engineering and computer science technologies. Students may tailor their degree toward software development and computer science or toward computer systems and engineering. Students may focus on research with a thesis option or expand their breadth of knowledge with a non-thesis option. Graduates will be prepared to conduct research in computing, develop new software or computer systems, and contribute to companies and organizations at an advanced technological level. The program prepares students for research or professional practice by exposing them to core concepts in computer science and computer engineering. The program includes computational theory, design, and practice in developing software and computer systems.

Program Student Learning Outcomes

At the completion of this program, students will be able to:

- Analyze, design, and develop advanced computer architectures and systems.
- Identify, formulate, and develop advanced software that solves problems.
- Utilize advanced computational theory and algorithms in the analysis and design of computer systems.
- Demonstrate focused knowledge in areas of specialization in computer engineering and computer science, including the ability to conduct research.
- Communicate and work effectively in a professional environment.

Admission Requirements

See the beginning of this chapter for Admission Requirements for Graduate Degrees and deadlines. All students must have previously earned a baccalaureate degree in computer science or computer engineering or a closely related field with a cumulative undergraduate GPA of at least 3.00. Probationary admission may be granted by the Computer Science and Engineering Department for students who do not meet the minimum GPA or do not have a baccalaureate degree in computer science or computer engineering or a closely related field but have evidence of their potential for success in graduate computer engineering and computer science studies. Probationary terms will typically call for successful completion of a pre-approved sequence of 9 credits of graduate Computer Science and Computer Engineering (CSCE) courses. Admitted students are also responsible for completion of prerequisites for CSCE courses that may not have been included in their undergraduate education.

Graduation Requirements

See the beginning of this chapter for University Requirements for Graduate Degrees.

Major Requirements

1. Complete any combination of 12 credits from Architecture and Systems and Software and Theory: 12

   Architecture and Systems
   
   - CSCE A621 Mission Critical Systems (3)
   - CSCE A648 Advanced Computer Architecture (3)
   - CSCE A667 Advanced Computer Network Systems (3)

   Software and Theory
   
   - CSCE A601 Advanced Software Engineering (3)
   - CSCE A632 Advanced Programming Languages (3)
   - CSCE A652 Advanced Computational Theory and Algorithms (3)

2. Complete the Thesis or Non-thesis Option:

   Thesis Option
   
   a. Complete the research methods course: 3
      
      - CSCE A671 Research Methods in Computer Science & Engineering (3)
b. Complete 9 credits of elective graduate courses. Elective courses may be additional courses from Major Requirement 1 (Architecture and Systems or Software and Theory) or from the following list of graduate courses:  

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<thead>
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<th>Course Title</th>
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<tbody>
<tr>
<td>CSCE A611</td>
<td>Advanced Artificial Intelligence (3)</td>
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<tr>
<td>CSCE A612</td>
<td>Advanced Evolutionary Computing (3)</td>
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<tr>
<td>CSCE A615</td>
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<tr>
<td>CSCE A631</td>
<td>Advanced Compilers (3)</td>
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<tr>
<td>CSCE A646</td>
<td>Advanced Digital Media and Interactive Systems (3)</td>
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<tr>
<td>CSCE A650</td>
<td>Advanced Mobile Robotics (3)</td>
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<td>CSCE A660</td>
<td>Advanced Database Systems (3)</td>
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<tr>
<td>CSCE A662</td>
<td>Advanced Data Mining (3)</td>
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<tr>
<td>CSCE A665</td>
<td>Advanced Computer and Network Security (3)</td>
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<tr>
<td>CSCE A685</td>
<td>Advanced Computer and Machine Vision (3)</td>
</tr>
<tr>
<td>CSCE A690</td>
<td>Topics in Computer Science and Computer Systems Engineering (3)</td>
</tr>
<tr>
<td>CSCE A698</td>
<td>Individual Research (1-3)</td>
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c. Complete 6 thesis credits:  

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<th>Course Title</th>
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<tbody>
<tr>
<td>CSCE A699</td>
<td>Thesis (1-6)</td>
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d. Students who elect for the thesis option must meet the following thesis requirements:  

1. The work must contribute to the body of knowledge in the candidate’s field of study. A literature review is required as part of the thesis to show how the work is associated with the current state of the art.
2. The advisor of the graduate committee must be a tenured or tenure-track faculty member in the department. The committee must be approved by the advisor and consist of at least three members including the advisor and one member who is external to the department. All committee members must at least have a master’s degree.
3. The thesis, as judged by the graduate committee, must be publishable in either peer-reviewed technical conference proceedings or a peer-reviewed journal.
4. The work must demonstrate command of knowledge and skills associated with the candidate’s program of graduate study.
5. The thesis proposal, submitted at least one semester prior to the thesis defense, must present evidence that the above requirements will be satisfied and will generally consist of an explicit problem statement, a literature review, and one or more sections describing the research and the analytical methods that will be applied.
6. The written thesis is to be defended by the student in an oral presentation to the student’s graduate committee and invited guests.

**Non-thesis Option**

a. Complete 18 credits of elective graduate courses. Elective courses may be additional courses from Major Requirement 1 (Architecture and Systems or Software and Theory) or from the following list of graduate courses:  

<table>
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<tbody>
<tr>
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<td>CSCE A665</td>
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</tr>
<tr>
<td>CSCE A690</td>
<td>Topics in Computer Science and Computer Systems Engineering (3)</td>
</tr>
<tr>
<td>CSCE A698</td>
<td>Individual Research (1-3)</td>
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</table>

3. A total of 30 credits is required for the degree.
FACULTY

Martin Cenek, Assistant Professor, mcenek@uaa.alaska.edu
Kenrick Mock, Professor/Chair, kjmock@uaa.alaska.edu
Frank Moore, Associate Professor, fmooore@uaa.alaska.edu
Randy Moulic, Assistant Professor, jmoulic@uaa.alaska.edu
Kirk Scott, Associate Professor, kascott@uaa.alaska.edu
Samuel Siewert, Assistant Professor, ssiewert@uaa.alaska.edu
## Course Action Request

**University of Alaska Anchorage**

**Proposal to Initiate, Add, Change, or Delete a Course**

<table>
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<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
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<td>Computer Science &amp; Engineering</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours (Lecture + Lab)</th>
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</thead>
<tbody>
<tr>
<td>CSCE</td>
<td>A601</td>
<td>CS A671</td>
<td>3</td>
<td>(3+0)</td>
</tr>
</tbody>
</table>

### 6. Complete Course Title

**Advanced Software Engineering**

**Abbreviated Title for Transcript** (30 character)

### 7. Type of Course

- [x] Academic
- [ ] Preparatory/Development
- [ ] Non-credit
- [ ] CEU
- [ ] Professional Development

### 8. Type of Action:

- [ ] Add
- [x] Change
- [ ] Delete

**If a change, mark appropriate boxes:**

- [x] Prefix
- [x] Course Number
- [x] Credits
- [x] Contact Hours
- [x] Repeat Status
- [x] Title
- [x] Cross-Listed/Stacked
- [ ] Grading Basis
- [ ] Co-requisites
- [ ] Course Description
- [ ] Course Prerequisites
- [ ] Test Score Prerequisites
- [ ] Registration Restrictions
- [ ] Automatic Restrictions
- [ ] General Education Requirement
- [ ] Class
- [ ] Level
- [ ] College
- [ ] Major
- [ ] Other Course Content Guide, Division code, Department code (please specify)

### 9. Repeat Status

- [x] No
- [ ] # of Repeats: n/a
- [x] Max Credits: n/a

### 10. Grading Basis

- [x] A-F
- [ ] P/NP
- [ ] NG

### 11. Implementation Date

- [ ] semester/year
- From: Fall/2014
- To: 99/9999

### 12. Cross Listed

- [x] with
- [ ] Stacked with
- [ ] Cross-Listed Coordination Signature

### 13a. Impacted Courses or Programs:

List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

**Impact Program/Course**

<table>
<thead>
<tr>
<th>Program/Course</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperative UAF MS in Software Engineering</td>
<td>11/5/2013</td>
<td>Jon Genetti (UAF), Kenrick Mock (UAA)</td>
</tr>
</tbody>
</table>

### 13b. Coordination Email

Date: 11/25/2013

submitted to Faculty Listserv: [uaa-faculty@lists.uaa.alaska.edu](mailto:uaa-faculty@lists.uaa.alaska.edu)

### 13c. Coordination with Library Liaison

Date: 11/25/2013

### 14. General Education Requirement

Mark appropriate box:

- [ ] Oral Communication
- [ ] Written Communication
- [ ] Quantitative Skills
- [ ] Humanities
- [ ] Fine Arts
- [ ] Social Sciences
- [ ] Natural Sciences
- [ ] Integrative Capstone

### 15. Course Description

(suggested length 20 to 50 words)

Coverage of current methodologies used to develop large software systems. Topics include requirements, specification, design, implementation, testing, project management, formal methods, maintenance, and evolution. Seminar discussion of classic and current research articles in software engineering.

### 16a. Course Prerequisite(s)

(list prefix and number or test code and score)

n/a

### 16b. Co-requisite(s)

(concurrent enrollment required)

n/a

### 16c. Automatic Restriction(s)

- [ ] College
- [ ] Major
- [ ] Class
- [x] Level

### 16d. Registration Restriction(s)

(non-codable)

Graduate standing

### 17. Mark if course has fees

Standard SOE fee

### 18. Mark if course is a selected topic course

### 19. Justification for Action

Required course in support of the proposed new Master's degree program in Computer Science & Engineering and potential offering within the existing Master's degree in Interdisciplinary Studies. This is an existing course in Computer Science that is part of the inactive MS in Software Engineering offered through UAF. A small number of sections were offered at UAA but none have been offered in the past 10 years.

---

16
<table>
<thead>
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<th>Role</th>
<th>Date</th>
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<th>Disapproved</th>
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<td></td>
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</tr>
<tr>
<td>肯里克·摩克 (Kenrick Mock)</td>
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<td></td>
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<tr>
<td>Initiator (TYPE NAME)</td>
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</tbody>
</table>
UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: Fall 2014

II. Course Information
A. College/School: School of Engineering
B. Course Title: Advanced Software Engineering
C. Course Subject/Number: CSCE A601
D. Credit Hours: 3.0 Credits
E. Contact Time: 3+0
F. Grading Information: A-F
G. Course Description: Coverage of current methodologies used to develop large software systems. Topics include requirements, specification, design, implementation, testing, project management, formal methods, maintenance, and evolution. Seminar discussion of classic and current research articles in software engineering.
H. Status of course relative to degree or certificate program: Required for MS in Computer Engineering and Computer Science.
I. Lab Fees: Yes
J. Coordination: SOE and Faculty Listserv
K. Course Prerequisites: n/a
L. Registration Restrictions: Graduate standing

III. Evaluation
Grades are based on assignments, exams, term project, seminar discussion, and presentations.

IV. Course Level Justification
This is an advanced course that requires an understanding of software engineering principles presented at the undergraduate level.

V. Outline
1. Software Lifecycle Models
2. Legal Issues and Intellectual Property
3. Current Issues in Software Engineering
   a. Integration vs. Composition
   b. Software Architectures
   c. Formal Requirements, Analysis, and Testing
   d. Static and Dynamic Testing
   e. Software Engineering Processes and Practices
   f. Reliability
   g. Security and Privacy
   h. Performance
   i. Metrics and Evaluation
4. Emerging Frameworks  
   a. Mobile Development  
   b. Cloud-based Software Engineering  
   c. Big Data  

VI. Instructional Goals and Student Learning Outcomes  
A. Instructional Goals.  

<table>
<thead>
<tr>
<th>The instructor will:</th>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe common software engineering lifecycle methodologies.</td>
<td>Exams, assignments, term project, seminar discussion, presentations</td>
</tr>
<tr>
<td>Discuss current/emerging techniques and current/emerging research in software engineering.</td>
<td>Exams, assignments, seminar discussion</td>
</tr>
<tr>
<td>Guide the development of a term project that includes a literature review, development or testing of a novel technique, analysis and evaluation, conference-style paper, and oral presentation.</td>
<td></td>
</tr>
</tbody>
</table>

B. Student Learning Outcomes:  

<table>
<thead>
<tr>
<th>Upon completion of this course, students will be able to:</th>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply current/emerging software engineering techniques to a software engineering project.</td>
<td>Exams, assignments, term project, seminar discussion, presentations</td>
</tr>
<tr>
<td>Develop an appropriate software engineering methodology.</td>
<td>Exams, assignments, seminar discussion</td>
</tr>
<tr>
<td>Conduct a literature review.</td>
<td>Seminar discussion, term project</td>
</tr>
<tr>
<td>Develop and analyze a novel software engineering technique.</td>
<td>Term project</td>
</tr>
<tr>
<td>Communicate the results of a term project.</td>
<td>Presentations, term project</td>
</tr>
</tbody>
</table>

VII. Suggested Texts  

VIII. Bibliography and Resources  


* Classic Text
# Proposal to Initiate, Add, Change, or Delete a Course

## 1a. School or College
EN SOENGR

## 1b. Division
No Division Code

## 1c. Department
Computer Science & Engineering

## 2. Course Prefix
CSCE

## 3. Course Number
A611

## 4. Previous Course Prefix & Number
n/a

## 5a. Credits/CEUs
3

## 5b. Contact Hours
(3+0)

## 6. Complete Course Title
Advanced Artificial Intelligence

## 7. Type of Course
- Academic
- Preparatory/Development
- Non-credit
- CEU
- Professional Development

## 8. Type of Action: **Add**

## 9. Repeat Status
- No
- # of Repeats
- n/a
- Max Credits
- n/a

## 10. Grading Basis
- A-F
- P/NP
- NG

## 11. Implementation Date
- From: Fall/2014
- To: 99/9999

## 12. Cross Listed with
CSCE A411

## 13a. Impacted Courses or Programs:

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

**Initiator Name (typed): Frank Moore**

## 13b. Coordination Email
Date: 11/4/2013

submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

## 13c. Coordination with Library Liaison
Date: 11/4/2013

## 14. General Education Requirement
- Oral Communication
- Written Communication
- Quantitative Skills
- Humanities
- Fine Arts
- Social Sciences
- Natural Sciences
- Integrative Capstone

## 15. Course Description (suggested length 20 to 50 words)
Coverage of Artificial Intelligence (AI). Topics include intelligent agents; heuristic, local, and adversarial search; first-order logic and knowledge representation; and machine learning. Students will review recently published artificial intelligence research, write the results of that review in a research summary paper, and present their findings in a public forum. Special Note: Not available for credit to students who have completed CSCE A411.

## 16a. Course Prerequisite(s) (list prefix and number or test code and score)
n/a

## 16b. Co-requisite(s) (concurrent enrollment required)
n/a

## 16c. Automatic Restriction(s)
- College
- Major
- Class
- Level

## 16d. Registration Restriction(s) (non-codable)
Graduate standing

## 17. Mark if course has fees Standard SOE fee

## 18. Mark if course is a selected topic course

## 19. Justification for Action
Create an elective in support of the proposed new Master’s degree program in Computer Science & Engineering and the existing Master’s degree in Interdisciplinary Studies.

**Initiator (faculty only)**

Frank Moore

Initiator (TYPE NAME)

**Initiator Signed Initials:** _______
**Date:** ______________

**Approved**

**Dean/Director of School/College**

**Date:** ______________

**Disapproved**

**Undergraduate/Graduate Academic Board Chair**

**Date:** ______________

**Approved**

**Provost or Designee**

**Date:** ______________
Course Content Guide
University of Alaska Anchorage
School of Engineering
Computer Science & Engineering Department

I. **Initiation Date**: Fall 2014

II. **Course Information**
   A. **College**: School of Engineering
   B. **Course Subject/Number**: CSCE A611
   C. **Credits**: 3
   D. **Contact Hours**: (3+0)
   E. **Course Title**: Advanced Artificial Intelligence
   F. **Repeat Status**: No
   G. **Grading Basis**: A-F
   H. **Course Description**: Coverage of Artificial Intelligence (AI). Topics include intelligent agents; heuristic, local, and adversarial search; first-order logic and knowledge representation; and machine learning. Students will review recently published artificial intelligence research, write the results of that review in a research summary paper, and present their findings in a public forum. Special Note: Not available for credit to students who have completed CSCE A411.
   I. **Course Prerequisites**: n/a
   J. **Fees**: Yes, standard SOE fee
   K. **Stacked**: Yes: CSCE A411
   L. **Registration Restrictions**: Graduate standing

III. **Course Level Justification**

This course is an elective for any graduate student who seeks knowledge in the field of creating intelligent software applications. In addition to the requirements for the stacked undergraduate course (CSCE A411), graduate students will be required to complete a literature review of recent research in an applied or theoretical area of artificial intelligence; write a research paper summarizing the results of that review; and complete a presentation of these findings in a public forum.

IV. **Instructional Goals and Student Learning Outcomes**

<table>
<thead>
<tr>
<th><strong>A. Instructional Goals</strong></th>
<th>The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Describe classic artificial intelligence topics, including search, knowledge representation, propositional logic, predicate calculus, and game playing.</td>
</tr>
<tr>
<td>2.</td>
<td>Describe modern artificial intelligence topics, including knowledge-based systems, machine learning, and genetic/evolutionary computation.</td>
</tr>
<tr>
<td>3.</td>
<td>Develop the students’ abilities to design, implement, test, debug, document, and verify the correct operation of programs that illustrate AI topics.</td>
</tr>
</tbody>
</table>
B. **Student Learning Outcomes.** Students will be able to:

<table>
<thead>
<tr>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Apply AI-based techniques, tools, and languages to solve problems.</strong> Assignments, Exams, Projects</td>
</tr>
<tr>
<td>2. <strong>Design, implement, test, debug, and verify the correct operation of AI programs.</strong> Assignments, Exams, Projects</td>
</tr>
<tr>
<td>3. <strong>Conduct a literature review, write a research summary paper, and present findings in a public forum.</strong> Research Summary Paper, Presentation</td>
</tr>
</tbody>
</table>

V. **Guidelines for Evaluation**

A. Assignments
B. Exams
C. Projects
D. Research Summary Paper
E. Presentation

VI. **Topical Course Outline**

1. Problems and Searching
   a. Problems, spaces and search
   b. Heuristic, local, and adversarial search
2. Knowledge Representation
   a. Issues
   b. Predicate calculus and propositional logic
   c. Uncertainty
   d. Statistical approaches
   e. Cognitive approaches
3. Machine Learning
   a. Bayesian approaches
   b. Nearest neighbor
   c. Neural networks
   d. Evolutionary computation
   e. Inductive learning
   f. Classifier systems
4. Application Areas
   a. Game playing
   b. Planning
   c. Natural language processing and text processing
   d. Expert systems

VII. **Suggested Texts**


VIII. Bibliography


1a. School or College
EN SOENGR

1b. Division
No Division Code

1c. Department
Computer Science & Engineering

2. Course Prefix
CSCE

3. Course Number
A411

4. Previous Course Prefix & Number
n/a

5a. Credits/CEUs
3

5b. Contact Hours
(Lecture + Lab)
(3+0)

6. Complete Course Title
Artificial Intelligence

Abbreviated Title for Transcript (30 character)

7. Type of Course
☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action:
☐ Add ☒ Change ☐ Delete

If a change, mark appropriate boxes:
☐ Prefix ☐ Course Number ☐ Credits ☐ Contact Hours ☐ Title ☐ Repeat Status ☐ Grading Basis
☐ Grade Basis ☐ Cross-Listed/Stacked ☐ Course Prerequisites ☐ Co-requisites ☐ Test Score Prerequisites
☐ Registration Restrictions ☐ Automatic Restrictions ☐ College ☐ Level ☐ Repeat Status No ☐ # of Repeats
☐ Title ☐ Credits ☐ Class ☐ Level ☐ General Education Requirement
☐ Grading Basis ☐ Cross-Listed/Stacked ☐ Course Prerequisites ☐ Co-requisites
☐ Test Score Prerequisites ☐ Registration Restrictions ☐ Credits ☐ Contact Hours
☐ Title ☐ Course Number

9. Repeat Status No ☐ # of Repeats n/a ☐ Max Credits n/a

10. Grading Basis
☒ A-F ☐ P/NP ☐ NG

11. Implementation Date
From: Fall/2014 To: 99/9999

12. ☐ Cross Listed with
☒ Stacked with CSCE A611

Cross-Listed Coordination

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
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Initiator Name (typed): Frank Moore Initiator Signed Initials: __________ Date: __________

13b. Coordination Email
Date: 11/4/2013
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 11/4/2013

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
Introduction to the basic concepts of Artificial Intelligence (AI). Topics include intelligent agents; heuristic, local, and adversarial search; first-order logic and knowledge representation; and machine learning. Special note: Not available for credit to students who have completed CSCE A611.

16a. Course Prerequisite(s) (list prefix and number or test code and score)
CSCE A311 with a minimum grade of C.

16b. Co-requisite(s) (concurrent enrollment required)
n/a

16c. Automatic Restriction(s)
☐ College ☐ Major ☐ Class ☐ Level

16d. Registration Restriction(s) (non-codable)
n/a

17. ☒ Mark if course has fees Standard SOE fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Stack with graduate course in support of proposed MS in Computer Engineering & Computer Science.

Initiator (faculty only) Date
☐ Approved ☐ Disapproved
Frank Moore
Initiator (TYPE NAME)

☐ Approved ☐ Disapproved
☐ Approved ☐ Disapproved
☐ Approved ☐ Disapproved

Dean/Director of School/College Date
Undergraduate/Graduate Academic Board Chair Date
Provost or Designee Date
Course Content Guide
University of Alaska Anchorage
School of Engineering
Computer Science & Engineering Department

I. **Initiation Date**: Fall 2014

II. **Course Information**
A. **College**: School of Engineering
B. **Course Subject/Number**: CSCE A411
C. **Credits**: 3
D. **Contact Hours**: (3+0) 45 contact lecture hours (3 contact lecture hours/week x 15 weeks = 45) plus 90 hours outside work (6 hours outside lecture/week x 15 weeks = 90) for a total of 135 hours
E. **Course Title**: Artificial Intelligence
F. **Repeat Status**: No
G. **Grading Basis**: A-F
H. **Course Description**: Introduction to the basic concepts of Artificial Intelligence (AI). Topics include intelligent agents; heuristic, local, and adversarial search; first-order logic and knowledge representation; and machine learning. Special note: Not available for credit to students who have completed CSCE A611.
I. **Course Prerequisites**: CSCE A311 with a minimum grade of C.
J. **Fees**: Yes, standard SOE fee
K. **Stacked**: Yes: CSCE A611

III. **Course Level Justification**

In this course students will use concepts covered at the 300 level to design, implement, and analyze AI programs.

IV. **Instructional Goals and Student Learning Outcomes**

<table>
<thead>
<tr>
<th>A. <strong>Instructional Goals.</strong> The instructor will:</th>
</tr>
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<tbody>
<tr>
<td>1. Introduce students to classic artificial intelligence topics, including search, knowledge representation, propositional logic, predicate calculus, and game playing.</td>
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<td>2. Introduce modern artificial intelligence topics, including knowledge-based systems, machine learning, and genetic/evolutionary computation.</td>
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<tr>
<td>3. Develop the students’ abilities to design, implement, test, debug, document, and verify the correct operation of programs that illustrate AI topics.</td>
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B. **Student Learning Outcomes.** Students will be able to:

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<tr>
<th>Assessment method</th>
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<tr>
<td>1. <strong>Apply AI-based techniques, tools, and languages to solve problems.</strong></td>
<td>Assignments, Exams, Projects</td>
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<tr>
<td>2. <strong>Design, implement, test, debug, and verify the correct operation of AI programs.</strong></td>
<td>Assignments, Exams, Projects</td>
</tr>
</tbody>
</table>

V. **Topical Course Outline**

1. Problems and Searching
   a. Problems, spaces and search
   b. Heuristic, local, and adversarial search
2. Knowledge Representation
   a. Issues
   b. Predicate calculus and propositional logic
   c. Uncertainty
   d. Statistical approaches
   e. Cognitive approaches
3. Machine Learning
   a. Bayesian approaches
   b. Nearest neighbor
   c. Neural networks
   d. Evolutionary computation
   e. Inductive learning
   f. Classifier systems
4. Application Areas
   a. Game playing
   b. Planning
   c. Natural language processing and text processing
   d. Expert systems

VI. **Suggested Texts**

VII. Bibliography


**Course Action Request**

University of Alaska Anchorage

Proposal to Initiate, Add, Change, or Delete a Course

<table>
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<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
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</thead>
<tbody>
<tr>
<td>EN SOENGR</td>
<td>No Division Code</td>
<td>Computer Science &amp; Engineering</td>
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</tbody>
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<table>
<thead>
<tr>
<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours</th>
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<tr>
<td>CSCE</td>
<td>A612</td>
<td>n/a</td>
<td>3</td>
<td>(Lecture + Lab)</td>
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6. Complete Course Title

**Advanced Evolutionary Computing**

Abbreviated Title for Transcript (30 character)

<table>
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<th>7. Type of Course</th>
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<td>Academic</td>
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<tr>
<th>8. Type of Action:</th>
<th>Add</th>
<th>Change</th>
<th>Delete</th>
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</table>

If a change, mark appropriate boxes:

- Prefix
- Title
- Course Description
- Text Score
- Grading Basis
- Co-requisites
- Contact Hours
- Cross-Listed/Stacked
- Credits
- Repeat Status
- Registration Restrictions
- Course Prerequisites
- General Education Requirement
- Class
- Major
- Other (please specify)

9. Repeat Status No | # of Repeats | Max Credits |
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<tbody>
<tr>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

10. Grading Basis

- A-F
- P/NP
- NG

11. Implementation Date

- Fall/2014
- To: 99/9999

12. Cross Listed with

- CSCE A412

Cross-Listed Coordination

<table>
<thead>
<tr>
<th>13a. Impacted Courses or Programs:</th>
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</table>

List any programs or college requirements that require this course.

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Initiator Name (typed): Frank Moore  
Initiator Signed Initials: __________  
Date: ______________

13b. Coordination Email

Date: 11/4/2013

submitted to Faculty Listserv: [uaa-faculty@lists.uaa.alaska.edu](mailto:uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison

Date: 11/4/2013

14. General Education Requirement

Mark appropriate box:

- Oral Communication
- Written Communication
- Quantitative Skills
- Humanities
- Fine Arts
- Social Sciences
- Natural Sciences
- Integrative Capstone

15. Course Description (suggested length 20 to 50 words)

Broad coverage of the field of evolutionary computing, including genetic algorithms, evolution strategies, evolutionary programming, and genetic programming. Emphasis will be on the design, implementation, testing, debugging, and verification of correct programs. Graduate students will be required to complete a literature review of recent research in evolutionary computation, write the results of that review in a research summary paper, and complete a presentation of these findings in a public forum. Special Note: Not available for credit to students who have completed CSCE A412.

16a. Course Prerequisite(s) (list prefix and number or test code and score)

n/a

16b. Co-requisite(s) (concurrent enrollment required)

n/a

16c. Automatic Restriction(s)

- College
- Major
- Class
- Level

16d. Registration Restriction(s) (non-codable)

Graduate standing

17. Mark if course has fees

Standard SOE fee

18. Mark if course is a selected topic course

n/a

19. Justification for Action

Create an elective in support of the proposed new Master's degree program in Computer Science & Engineering and the existing Master's degree in Interdisciplinary Studies.
<table>
<thead>
<tr>
<th>Role</th>
<th>Approved</th>
<th>Disapproved</th>
<th>Date</th>
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<td>Initiator (faculty only)</td>
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<td>Frank Moore</td>
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<td>Provost or Designee</td>
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</table>
Course Content Guide
University of Alaska Anchorage
School of Engineering
Computer Science & Engineering Department

I. Initiation Date: Fall 2014

II. Course Information
A. College: School of Engineering
B. Course Subject/Number: CSCE A612
C. Credits: 3
D. Contact Hours: 3+0
E. Course Title: Advanced Evolutionary Computing
F. Repeat Status: No
G. Grading Basis: A-F
H. Course Description: Broad coverage of the field of evolutionary computing, including genetic algorithms, evolution strategies, evolutionary programming, and genetic programming. Emphasis will be on the design, implementation, testing, debugging, and verification of correct programs. Graduate students will be required to complete a literature review of recent research in evolutionary computation, write the results of that review in a research summary paper, and complete a presentation of these findings in a public forum. Special Note: Not available for credit to students who have completed CSCE A412.
I. Course Prerequisites: n/a
J. Fees: Yes, standard SOE fee
K. Stacked: Yes: CSCE A412
L. Registration Restrictions: Graduate standing

III. Course Level Justification
This course is an elective for any graduate student who seeks knowledge in the field of evolutionary computing. In addition to the requirements for the stacked undergraduate course (CSCE A412), students enrolled in this course will be expected to complete additional work at a higher level than students enrolled in CSCE A412, which may include but is not limited to research projects, research summaries, presentations, assignments, or exam problems.

IV. Instructional Goals and Student Learning Outcomes

<table>
<thead>
<tr>
<th>A. Instructional Goals. The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe the theory and practice of evolutionary computation.</td>
</tr>
<tr>
<td>2. Demonstrate how evolutionary techniques can be used to solve, or approximately solve, a wide variety of difficult optimization problems that cannot be solved in a reasonable amount of computing time using traditional methodologies.</td>
</tr>
</tbody>
</table>
### B. Student Learning Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Students will be able to:</th>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Describe similarities and differences between biological evolution and evolutionary computing.</td>
<td>Exams</td>
</tr>
<tr>
<td>2.</td>
<td>Utilize a variety of evolutionary computing techniques, including genetic algorithms, evolution strategies, evolutionary programming, and genetic programming.</td>
<td>Projects</td>
</tr>
<tr>
<td>3.</td>
<td>Work with a team member to successfully implement programs that employ evolutionary computing techniques to solve classic non-deterministic polynomial (NP-hard) optimization problems.</td>
<td>Projects</td>
</tr>
<tr>
<td>4.</td>
<td>Analyze the results of several program runs for each project and effectively describe relevant conclusions in a written report.</td>
<td>Reports</td>
</tr>
<tr>
<td>5.</td>
<td>Design, implement, test, and debug a moderately complex software project.</td>
<td>Major Project</td>
</tr>
<tr>
<td>6.</td>
<td>Present project results in a public forum.</td>
<td>Presentation</td>
</tr>
<tr>
<td>7.</td>
<td>Conduct a literature review, write a research summary paper or research project, and present findings in a public forum.</td>
<td>Research Summary Paper, Research Project, Presentation</td>
</tr>
</tbody>
</table>

### V. Guidelines for Evaluation

A. Exams  
B. Major Project  
C. Projects  
D. Reports  
E. Presentations  
F. Research Summary Paper  
G. Research Project

### VI. Topical Course Outline

1. Introduction  
   a. The evolutionary computing metaphor  
   b. Inspiration from biology  
   c. Evolutionary computing: why?  
2. What is an Evolutionary Algorithm (EA)?  
   a. Components of EAs  
   b. Applications  
   c. Global optimization  
3. Genetic Algorithms (GAs)  
   a. Representation of individuals in GAs  
   b. Mutation and recombination in GAs
c. GA population models  
d. Parent and survivor selection in GAs  
e. Example applications  
f. Premature convergence and stagnation  

4. Evolution Strategies (ES)  
   a. Representation in ES  
   b. Mutation and recombination in ES  
   c. Parent and survivor selection in ES  
   d. Self-adaptation  
   e. Applications of ES  

5. Genetic Programming (GP)  
   a. Representation  
   b. Mutation and recombination in GP  
   c. Selection in GP  
   d. Bloat  
   e. Applications of GP  

6. Advanced Topics  
   a. Classifier systems  
   b. Parameter control in EAs  
   c. Theory  
      i. The schema theorem  
      ii. The no free lunch theorem  
   d. Co-evolution  

VII. Suggested Texts  


VIII. Bibliography  


1a. School or College  
EN SOENGR  

1b. Division  
No Division Code  

1c. Department  
Computer Science & Engineering  

2. Course Prefix  
CSCE  

3. Course Number  
A412  

4. Previous Course Prefix & Number  
n/a  

5a. Credits/CEUs  
3  

5b. Contact Hours  
(Lecture + Lab)  
(3+0)  

6. Complete Course Title  
Evolutionary Computing  

Abbreviated Title for Transcript (30 character)  

7. Type of Course  
☒ Academic  
☐ Preparatory/Development  
☐ Non-credit  
☐ CEU  
☐ Professional Development  

8. Type of Action:  
☐ Add  or  ☒ Change  or  ☐ Delete  

If a change, mark appropriate boxes:  
☐ Prefix  
☐ Course Number  
☐ Credits  
☐ Contact Hours  
☐ Title  
☐ Repeat Status  
☐ Grading Basis  
☐ Cross-Listed/Stacked  
☐ Course Description  
☐ Course Prerequisites  
☐ Test Score Prerequisites  
☐ Co-requisites  
☐ Automatic Restrictions  
☐ Registration Restrictions  
☐ General Education Requirement  
☐ College  
☐ Level  
☐ Other Course Content Guide (please specify)  

9. Repeat Status  
No  
# of Repeats  
n/a  
Max Credits  
n/a  

10. Grading Basis  
☒ A-F  
☐ P/NP  
☐ NG  

11. Implementation Date  
From:  Fall/2014  
To:  99/9999  

12. ☐ Cross Listed with  
Stacked with  
CSCE A612  

13a. Impacted Courses or Programs:  
List any programs or college requirements that require this course.  
Please type into fields provided in table. If more than three entries, submit a separate table.  
A template is available at www.uaa.alaska.edu/governance.  

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BS, Natural Sciences, Environmental Sciences Option</td>
<td>11/4/2013</td>
<td>Khrys Duddleston</td>
</tr>
<tr>
<td>2. BA/BS Computer Science</td>
<td>10/25/2013</td>
<td>Kenrick Mock</td>
</tr>
<tr>
<td>3. BSE Computer Systems Engineering</td>
<td>10/25/2013</td>
<td>Kenrick Mock</td>
</tr>
</tbody>
</table>

Initiator Name (typed): Frank Moore  
Initiator Signed Initials: _________  
Date: __________________  

13b. Coordination Email Date: 11/4/2013  
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)  

13c. Coordination with Library Liaison Date: 11/4/2013  

14. General Education Requirement  
Mark appropriate box:  
☐ Oral Communication  
☐ Written Communication  
☐ Quantitative Skills  
☐ Humanities  
☐ Fine Arts  
☐ Social Sciences  
☐ Natural Sciences  
☐ Integrative Capstone  

15. Course Description (suggested length 20 to 50 words)  
Introduces students to subjects in the broad field of evolutionary computing, including genetic algorithms, evolution strategies, evolutionary programming, and genetic programming. Emphasis will be on the design, implementation, testing, debugging, and verification of correct programs. Special note: Not available for credit to students who have completed CSCE A612.  

16a. Course Prerequisite(s) (list prefix and number or test code and score)  
CSCE A311 with a minimum grade of C.  

16b. Co-requisite(s) (concurrent enrollment required)  
n/a  

16c. Automatic Restriction(s)  
☒ College  
☐ Major  
☐ Class  
☐ Level  

16d. Registration Restriction(s) (non-codable)  
n/a  

17. ☒ Mark if course has fees Standard SOE fee  

18. ☐ Mark if course is a selected topic course  

19. Justification for Action  
Stack with graduate course in support of proposed MS in Computer Engineering & Computer Science.  

Initiator (faculty only)  
Frank Moore  
Initiator (TYPE NAME)  

Initiator (faculty only) Date  

Approved  
Disapproved  

Dean/Director of School/College  
Date  

Approved  
Disapproved  

Undergraduate/Graduate Academic Board Chair  
Date  

Approved  
Disapproved  

Provost or Designee  
Date  

Approved  
Disapproved  

Department Chair  
Date  

Approved  
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Approved  
Disapproved  

Provost or Designee  
Date
I. **Initiation Date:** Fall 2014

II. **Course Information**
   A. **College:** School of Engineering
   B. **Course Subject/Number:** CSCE A412
   C. **Credits:** 3
   D. **Contact Hours:** (3+0) 45 contact lecture hours (3 contact lecture hours/week x 15 weeks = 45) plus 90 hours outside work (6 hours outside lecture/week x 15 weeks = 90) for a total of 135 hours
   E. **Course Title:** Evolutionary Computing
   F. **Repeat Status:** No
   G. **Grading Basis:** A-F
   H. **Course Description:** Introduces students to subjects in the broad field of evolutionary computing, including genetic algorithms, evolution strategies, evolutionary programming, and genetic programming. Emphasis will be on the design, implementation, testing, debugging, and verification of correct programs. Special note: Not available for credit to students who have completed CSCE A612.
   I. **Course Prerequisites:** CSCE A311 with a minimum grade of C.
   J. **Fees:** Yes, standard SOE fee
   K. **Stacked:** Yes: CSCE A612

III. **Course Level Justification**

   In this course students will use concepts covered at the 300 level to design, implement, and analyze evolutionary programs.

IV. **Instructional Goals and Student Learning Outcomes**

   A. **Instructional Goals.** The instructor will:

   1. Introduce students to the theory and practice of evolutionary computation.
   2. Demonstrate how evolutionary techniques can be used to solve, or approximately solve, a wide variety of difficult optimization problems that cannot be solved in a reasonable amount of computing time using traditional methodologies.
B. **Student Learning Outcomes.** Students will be able to:

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<td>1. Describe similarities and differences between biological evolution and evolutionary computing.</td>
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<td>6. Present project results in a public forum.</td>
<td>Presentation</td>
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V. **Topical Course Outline**

1. **Introduction**
   a. The evolutionary computing metaphor
   b. Inspiration from biology
   c. Evolutionary computing: why?
2. **What is an Evolutionary Algorithm (EA)?**
   a. Components of EAs
   b. Applications
   c. Global optimization
3. **Genetic Algorithms (GAs)**
   a. Representation of individuals in GAs
   b. Mutation and recombination in GAs
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   d. Parent and survivor selection in GAs
   e. Example applications
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   e. Applications of ES
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   a. Representation
b. Mutation and recombination in GP  
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d. Bloat  
e. Applications of GP  

6. Advanced Topics  
   a. Classifier systems  
   b. Parameter control in EAs  
   c. Theory  
      i. The schema theorem  
      ii. The no free lunch theorem  
   d. Co-evolution  

VI. Suggested Texts  


VII. Bibliography  


## Course Action Request

**University of Alaska Anchorage**  
**Proposal to Initiate, Add, Change, or Delete a Course**

### 1a. School or College
EN SOENG

### 1b. Division
No Division Code

### 1c. Department
Computer Science & Engineering

### 2. Course Prefix
CSCE

### 3. Course Number
A615

### 4. Previous Course Prefix & Number
n/a

### 5a. Credits/CEUs
3

### 5b. Contact Hours
(Lecture + Lab)
(3+0)

### 6. Complete Course Title
**Advanced Machine Learning**

### Abbreviated Title for Transcript (30 character)

### 7. Type of Course
☑ Academic  ☐ Preparatory/Development  ☐ Non-credit  ☐ CEU  ☐ Professional Development

### 8. Type of Action:
☑ Add  or  ☐ Change  or  ☐ Delete

If a change, mark appropriate boxes:

- Prefix
- Credits
- Title
- Repeat Status
- Course Prerequisites
- Test Score Prerequisites
- Co-requisites
- Grading Basis
- Contact Hours
- Cross-Listed/Stacked
- Registration Restrictions
- Course Description
- General Education Requirement
- College
- Major
- Class
- Level
- Other (please specify)

### 9. Repeat Status No       # of Repeats   n/a     Max Credits  n/a

### 10. Grading Basis
☑ A-F  ☐ P/NP  ☐ NG

### 11. Implementation Date
From: Fall/2014  To: 99/9999

### 12. Cross Listed with
☐  Stacked with CSCE A415

### 13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

<table>
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<tr>
<th>Impacted Program/Course</th>
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<th>Chair/Coordinator Contacted</th>
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<td>3.</td>
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</table>

Initiator Name (typed): **Martin Cenek**  
Initiator Signed Initials: _________  Date:________________

### 13b. Coordination Email
Date: 11/4/2013  
submitted to Faculty Listserv: (uac-faculty@lists.uaa.alaska.edu)

### 13c. Coordination with Library Liaison
Date: 11/4/2013

### 14. General Education Requirement
Mark appropriate box:

- Oral Communication
- Written Communication
- Quantitative Skills
- Humanities
- Fine Arts
- Social Sciences
- Natural Sciences
- Integrative Capstone

### 15. Course Description (suggested length 20 to 50 words)

In-depth survey of basic and advanced concepts of machine learning. Topics include linear discrimination, supervised, unsupervised, semi-supervised learning, multilayer perceptron, maximum-margin methods, Monte-Carlo and reinforcement learning. Students are required to implement a research project that applies machine learning technique(s) to a unique and original data set, or to develop a technique that combines or modifies one or more machine learning algorithms. Special Note: Not available for credit to students who have completed CSCE A415.

### 16a. Course Prerequisite(s) (list prefix and number or test code and score)
n/a

### 16b. Co-requisite(s) (concurrent enrollment required)
n/a

### 16c. Automatic Restriction(s)
☐ College  ☐ Major  ☐ Class  ☐ Level

### 16d. Registration Restriction(s) (non-codable)
Graduate standing

### 17. ☑ Mark if course has fees

### 18. ☐ Mark if course is a selected topic course

### 19. Justification for Action

Create an elective in support of the proposed new Master's degree program in Computer Science & Engineering and the existing Master's degree in Interdisciplinary Studies.
<table>
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<tr>
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<td>Martin Ceneke</td>
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Course Content Guide
University of Alaska Anchorage
School of Engineering
Computer Science & Engineering Department

I. **Initiation Date**: Fall 2014

II. **Course Information**
   A. **College**: School of Engineering
   B. **Course Subject/Number**: CSCE A615
   C. **Credits**: 3
   D. **Contact Hours**: 3+0
   E. **Course Title**: Advanced Machine Learning
   F. **Repeat Status**: No
   G. **Grading Basis**: A-F
   H. **Course Description**: In-depth survey of basic and advanced concepts of machine learning. Topics include linear discrimination, supervised, unsupervised, semi-supervised learning, multilayer perceptron, maximum-margin methods, Monte-Carlo and reinforcement learning. Students are required to implement a research project that applies machine learning technique(s) to a unique and original data set, or to develop a technique that combines or modifies one or more machine learning algorithms. Special Note: Not available for credit to students who have completed CSCE A415.
   I. **Course Prerequisites**: n/a
   J. **Fees**: Yes, standard SOE fee
   K. **Stacked**: Yes: CSCE A415
   L. **Registration Restrictions**: Graduate standing

III. **Course Level Justification**

This course is a graduate level elective for students who seek in-depth understanding, knowledge, and skills of artificial intelligence and machine learning techniques for research and industrial use. In addition to the requirements for the stacked undergraduate course (CSCE A415), students will be required to complete a literature review from the latest machine learning research, report the results of their finding in an oral presentations to the rest of the class and write a technical report. In addition, graduate students will complete a research based project that requires an application of a machine learning technique(s) to a unique and original data set or to develop a technique that combines or modifies one or more machine learning algorithms.

IV. **Instructional Goals and Student Learning Outcomes**
A. **Instructional Goals.** The instructor will:

1. Introduce students to basic topics of machine learning algorithms that include linear discrimination, supervised, unsupervised, semi-supervised learning, multilayer perceptron, maximum-margin methods, Monte-Carlo and reinforcement learning.

2. Present in-depth material on selected advanced topics such as support vector machines with linear and non-linear kernels, recurrent artificial neural networks, and kernel methods.

3. Guide students through the design, implementation, training, testing, and evaluation of machine learning algorithms that illustrate covered machine learning topics.

4. Demonstrate implementation and application of several different machine learning approaches to solve problems.

B. **Student Learning Outcomes.** Upon successful completion of this course, students will be able to:

<table>
<thead>
<tr>
<th></th>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Apply machine learning algorithms to solve computational and applied problems.</td>
<td>Exams, Assignments, Project</td>
</tr>
<tr>
<td>2. Design, implement, train/test, and analyze machine learning algorithms.</td>
<td>Exams, Assignments, Project</td>
</tr>
<tr>
<td>3. Prepare oral and written presentations about machine learning.</td>
<td>Project</td>
</tr>
<tr>
<td>4. <em>Conduct a literature review, write a research summary paper, and present findings in a public forum.</em></td>
<td>Research Summary Paper, Presentation</td>
</tr>
<tr>
<td>5. <em>Research project that applies machine learning technique(s) to a unique and original data set or to develop a technique that combines or modifies multiple machine learning algorithms.</em></td>
<td>Research Project</td>
</tr>
</tbody>
</table>

V. **Guidelines for Evaluation**

A. Exams
B. Project
C. Assignments
D. *Research Summary Paper*
E. *Presentation*
F. *Research Project*

VI. **Topical Course Outline**
1. Linear Discrimination
   a. Perceptron
   b. Linear separability
2. Supervised Learning
   a. Regression
   b. Classification
3. Multi-layer Perceptrons
   a. Hierarchical Temporal Memory (HTM)
   b. Artificial neural networks
      1. Feed-forward
      2. Backward error propagation
      3. Recurrent
   c. Hierarchical Model and X (HMAX)
4. Maximum Margin Methods
   a. Maximum margin classifiers
   b. Support vector machines
      1. Weighted
      2. Fuzzy
      3. Semi-supervised
5. Decision Trees
6. Ensemble Learning
7. Probability and Learning
   a. Gaussian mixture
   b. Nearest neighbor
8. Unsupervised Learning
9. K-means
10. Self-Organizing feature Map (SOM)
11. Dimensionality Reduction
    a. Linear discriminant analysis
    b. Principal component analysis
    c. Independent component analysis
12. Evolutionary Learning
    a. Evolution
    b. Co-evolution
    c. Genetic programming
13. Optimization and Search
14. Reinforcement Learning
    a. Hidden Markov models
    b. Markov chains
15. Graphical Models
   a. Bayesian networks
   b. Markov random fields
16. Monte Carlo Methods

VII. Suggested Texts


VIII. Bibliography


1. School or College
   EN SOENGR

2. Course Prefix
   CSCE

3. Course Number
   A415

4. Previous Course Prefix & Number
   n/a

5a. Credits/CEUs
   3

5b. Contact Hours
   (Lecture + Lab)
   (3+0)

6. Complete Course Title
   Machine Learning

Abbreviated Title for Transcript (30 character)

7. Type of Course
   ☒ Academic
   ☐ Preparatory/Development
   ☐ Non-credit
   ☐ CEU
   ☐ Professional Development

8. Type of Action:
   ☐ Add
   ☐ Change
   ☐ Delete

   If a change, mark appropriate boxes:
   ☐ Prefix
   ☐ Credits
   ☐ Title
   ☐ Repeat Status
   ☐ Grading Basis
   ☒ Course Number
   ☐ Contact Hours
   ☐ Cross-Listed/Stacked
   ☐ Course Prerequisites
   ☐ Registration Restrictions
   ☐ General Education Requirement
   ☐ Class
   ☐ Major
   ☐ Level
   ☐ College
   ☐ Major
   ☐ Course Description
   ☐ Repeat Status
   ☐ Grading Basis
   ☐ Course Number
   ☐ Contact Hours
   ☐ Cross-Listed/Stacked
   ☐ Course Prerequisites
   ☐ Registration Restrictions
   ☐ General Education Requirement
   ☐ Class
   ☐ Major
   ☐ Level
   ☐ College
   ☐ Major
   ☐ Cross Listed with
   ☒ Stacked
   ☐ n/a

9. Repeat Status
   ☐ No
   # of Repeats
   n/a
   Max Credits
   n/a

10. Grading Basis
    ☒ A-F
    ☐ P/NP
    ☐ NG

11. Implementation Date
    ☐ From: Fall/2014
    ☐ To: 99/9999

12. Cross Listed with
    ☐ Stacked
    with CSCE A615
    Cross-Listed Coordination

13. Coordination:
    □ Oral Communication
    □ Written Communication
    □ Quantitative Skills
    □ Humanities
    □ Fine Arts
    □ Social Sciences
    □ Natural Sciences
    □ Integrative Capstone

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
    Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BA/BS Computer Science</td>
<td>10/26/2013</td>
<td>Kenrick Mock</td>
</tr>
<tr>
<td>2. BSE Computer Systems Engineering</td>
<td>10/26/2013</td>
<td>Kenrick Mock</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initiator Name (typed): Martin Cenek
Initiator Signed Initials: __________ Date: __________

13b. Coordination Email
    Date: 11/4/2013
    submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
    Date: 11/4/2013

14. General Education Requirement
    Mark appropiate box:
    □ Oral Communication
    □ Written Communication
    □ Quantitative Skills
    □ Humanities
    □ Fine Arts
    □ Social Sciences
    □ Natural Sciences
    □ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
    In-depth survey of basic and advanced concepts of machine learning. Topics include linear discrimination; supervised, unsupervised, and semi-supervised learning; multilayer perceptrons; maximum-margin methods; Monte Carlo methods; and reinforcement learning. Special note: Not available for credit to students who have completed CSCE A615.

16a. Course Prerequisite(s) (list prefix and number or test code and score)
    (CSCE A311 and (STAT A253 or STAT A307)) with a minimum grade of C.

16b. Co-requisite(s) (concurent enrollment required)
    n/a

16c. Automatic Restriction(s)
    □ College
    □ Major
    □ Class
    □ Level

16d. Registration Restriction(s) (non-codable)
    n/a

17. ☒ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
    Stack with graduate course in support of proposed MS in Computer Engineering & Computer Science. Added stats prerequisite based on statistical material covered in the class.

Initiator (faculty only)
Initiator Signed Initials: __________ Date: __________

Initiator (TYPE NAME)

Approved
Disapproved

Dean/Director of School/College
Date

Department Chair
Date

Undergraduate/Graduate Academic
Date

Board Chair

Provost or Designee
Date

College/School Curriculum Committee Chair
Date
I. **Initiation Date**: Fall 2014

II. **Course Information**
   A. **College**: School of Engineering
   B. **Course Subject/Number**: CSCE A415
   C. **Credits**: 3
   D. **Contact Hours**: (3+0) 45 contact lecture hours (3 contact lecture hours/week x 15 weeks = 45) plus 90 hours outside work (6 hours outside lecture/week x 15 weeks = 90) for a total of 135 hours
   E. **Course Title**: Machine Learning
   F. **Repeat Status**: No
   G. **Grading Basis**: A-F
   H. **Course Description**: In-depth survey of basic and advanced concepts of machine learning. Topics include linear discrimination; supervised, unsupervised, and semi-supervised learning; multilayer perceptrons; maximum-margin methods; Monte Carlo methods; and reinforcement learning. Special note: Not available for credit to students who have completed CSCE A615.
   I. **Course Prerequisites**: (CSCE A311 and (STAT A253 or STAT A307)) with a minimum grade of C.
   J. **Fees**: Yes, standard SOE fee
   K. **Stacked**: Yes: CSCE A615

III. **Course Level Justification**

This course builds on knowledge of data structures, algorithms, and computer programming provided at the 200-level and 300-level.

IV. **Instructional Goals and Student Learning Outcomes**

<table>
<thead>
<tr>
<th>A. Instructional Goals.</th>
<th>The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Introduce students to basic topics of machine learning algorithms that include linear discrimination, supervised, unsupervised, semi-supervised learning, multilayer perceptron, maximum-margin methods, Monte-Carlo and reinforcement learning.</td>
</tr>
<tr>
<td>2.</td>
<td>Present in-depth material on selected advanced topics such as support vector machines with linear and non-linear kernels, recurrent artificial neural networks, and kernel methods.</td>
</tr>
</tbody>
</table>
3. Guide students through the design, implementation, training, testing, and evaluation of machine learning algorithms that illustrate covered machine learning topics.

4. Demonstrate implementation and application of several different machine learning approaches to solve problems.

**B. Student Learning Outcomes.** Upon successful completion of this course, students will be able to:

| 1. Apply machine learning algorithms to solve computational and applied problems. | Exams, Assignments, Project |
| 2. Design, implement, train/test, and analyze machine learning algorithms. | Exams, Assignments, Project |
| 3. Prepare oral and written presentations about machine learning. | Project |

**V. Topical Course Outline**

1. Linear Discrimination
   a. Perceptron
   b. Linear separability
2. Supervised Learning
   a. Regression
   b. Classification
3. Multi-layer Perceptrons
   a. Hierarchical Temporal Memory (HTM)
   b. Artificial neural networks
      1. Feed-forward
      2. Backward error propagation
      3. Recurrent
   c. Hierarchical Model and X (HMAX)
4. Maximum Margin Methods
   a. Maximum margin classifiers
   b. Support vector machines
      1. Weighted
      2. Fuzzy
      3. Semi-supervised
5. Decision Trees
6. Ensemble Learning
7. Probability and Learning
   a. Gaussian mixture
b. Nearest neighbor
8. Unsupervised Learning
9. K-means
10. Self-Organizing feature Map (SOM)
11. Dimensionality Reduction
   a. Linear discriminant analysis
   b. Principal component analysis
   c. Independent component analysis
12. Evolutionary Learning
   a. Evolution
   b. Co-evolution
   c. Genetic programming
13. Optimization and Search
14. Reinforcement Learning
   a. Hidden Markov models
   b. Markov chains
15. Graphical Models
   a. Bayesian networks
   b. Markov random fields
16. Monte Carlo Methods

VI. Suggested Texts


VII. Bibliography


1a. School or College
EN SOENG

1b. Division
No Division Code

1c. Department
Computer Science & Engineering

2. Course Prefix
CSCE

3. Course Number
A621

4. Previous Course Prefix & Number
n/a

5a. Credits/CEUs
3

5b. Contact Hours
(Lecture + Lab)
(3+0)

6. Complete Course Title
Mission Critical Systems

7. Type of Course
☒ Academic  ☐ Preparatory/Development  ☐ Non-credit  ☐ CEU  ☐ Professional Development

8. Type of Action:  ☒ Add  ☐ Change  ☐ Delete

9. Repeat Status No
# of Repeats
n/a
Max Credits
n/a

10. Grading Basis
☒ A-F  ☐ P/JP  ☐ NG

11. Implementation Date
From: Fall/2014 To: 99/9999

12. ☐ Cross Listed with
☐ Stacked with
Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
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</table>

Initiator Name (typed): Sam Siewert
Initiator Signed Initials: _________ Date:________________

13b. Coordination Email
Date: 11/4/2013
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 11/4/2013

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication  ☐ Written Communication  ☐ Quantitative Skills  ☐ Humanities  ☐ Fine Arts  ☐ Social Sciences  ☐ Natural Sciences  ☐ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
Covers the timing correctness of hardware and software, including rate-monotonic analysis for software and design for fault recovery methods for hardware and software sanity monitoring. Topics include microprocessor-based predictable response and embedded systems that require the integration of sensor and actuator devices, analog to digital and digital to analog interfaces, single and multi-core microprocessors, a real-time operating system, and multi-tasking application software.

16a. Course Prerequisite(s) (list prefix and number or test code and score)
n/a

16b. Co-requisite(s) (concurrent enrollment required)
n/a

16c. Automatic Restriction(s)
☒ College  ☐ Major  ☐ Class  ☒ Level

16d. Registration Restriction(s) (non-codable)
Graduate standing

17. ☒ Mark if course has fees Standard SOE fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Required course in support of the proposed new Master's degree program in Computer Science & Engineering and potential offering within the existing Master's degree in Interdisciplinary Studies.

Initiator (faculty only)

Sam Siewert
Initiator (TYPE NAME)

[Approval/Disapproval boxes for various signatories]

Approved
Dean/Director of School/College
Date

Disapproved
Undergraduate/Graduate Academic Board Chair
Date

Approved
Provost or Designee
Date

[More approval/disapproval boxes as needed]
I. Initiation Date:  Fall 2014

II. Course Information
A. College/School:  School of Engineering
B. Course Title:  Mission Critical Systems
C. Course Subject/Number:  CSCE A621
D. Credit Hours:  3.0 Credits
E. Contact Time:  3+0
F. Grading Information:  A-F
G. Course Description:  Covers the timing correctness of hardware and software, including rate-monotonic analysis for software and design for fault recovery methods for hardware and software sanity monitoring. Topics include microprocessor-based predictable response and embedded systems that require the integration of sensor and actuator devices, analog to digital and digital to analog interfaces, single and multi-core microprocessors, a real-time operating system, and multi-tasking application software.
I. Lab Fees:  Yes
J. Coordination:  SOE and Faculty Listserv
K. Course Prerequisites:  n/a
L. Registration Restrictions:  Graduate standing

III. Evaluation
Grades are based on written examination, class assignments, and class projects.

IV. Course Level Justification
This course requires and builds upon an understanding of software development, hardware systems, and operating systems that are introduced at the undergraduate level.

V. Outline
A. Lecture
      a. Brief history
      b. Purpose
      c. Fault Tolerant System Concepts
      d. Real-Time, Near Real-Time, Best Effort
      e. Mission Critical Failures (e.g. Flight 447 Accident and Fly-by-Wire)
      f. Future Challenges
   2. Overview Process Control History
      a. Hardware Review for Embedded Systems
      b. Application Executives for Real-Time Systems
      c. RTOS tasks, Input/Output (I/O), memory and power management
      d. Basic redundancy concepts and methods
      e. SCADA (Supervisory Control and Data Acquisition)
3. Rate Monotonic Theory
   a. Comparison to traditional OS
   b. Liu and Layland Rate Monotonic and Deadline Driven Scheduling
   c. Timing Diagrams and Analysis
   e. Thread Safety and Re-entrant code
4. Rate Monotonic Least Upper Bound Derivation for Safety
   a. Hardware State Machine Review
   b. Designing Software State Machines
   c. Rate Monotonic Policy
   d. Derivation of the Least Upper Bound
5. Sensor and Actuator I/O Interfaces
   a. Device Interfaces, Drivers, Data Acquisition
   b. Proportional, Integral, Differential Controllers
   c. Actuator Interfaces
   d. I/O Buses (1553, RS485, fiber, Ethernet) for Embedded
   e. Multi-path Fault Tolerant I/O
   e. Fly by Wire, Fly by Light Avionics
6. Non-volatile Memory
   a. ECC (Error Correction Codes) for NVM Devices
   b. Embedded RAID (Redundant Array of Independent Devices) on NVM (Non-Volatile Memory)
   c. Erasure Codes and Advanced Error Detection and Correction
7. Co-Processors and Offload
   a. Interfaces to Field Programmable Gate Array State Machines
   b. Double Buffers and Register Files for Deterministic Systems
   c. Isochronal Buses
8. Fault Tolerant Computing Systems
   a. High Availability compared to High Reliability
   b. Design for Reliability
   c. Redundancy Management and Cross-Strapping
   d. Active-Active Recovery
   e. Active-Passive Recovery
   f. Fail Safe
9. Multi-Core Real Time Operating Systems
   a. AMP – Asymmetric Multi-Processing
   b. SMP - Symmetric Multi-Processing
   c. Real-Time Services Load Balancing
10. Mission Critical Applications Review
    a. Medical
    b. Aerospace
    c. Process Control and SCADA
B. Projects (Free RTOS on TI Lockstep Dual-Core Processor)
   1. Board Support Packages and Boot
   2. Task Based State Machines
   3. Rate Monotonic Scheduling in Practice
4. Sensor and Actuator Interface and Control
5. Control of 6 DOF Robotic Arm or Tracker with Free RTOS or Linux
6. PID (Proportional-Integral-Derivative) Control

VI. Instructional Goals and Student Learning Outcomes

A. Instructional Goals.

The instructor will:

- Instill and develop student understanding of the principles of mission critical systems.
- Explain purpose and policies for mission critical system design for software and hardware.
- Demonstrate RTOS principles and tools.
- Instruct students on the use and extension of a prevalent real-time operating systems, microprocessors and co-processors for mission critical systems.

B. Student Learning Outcomes:

Upon completion of this course, students will be able to:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain the operation of the building blocks of mission critical systems.</td>
<td>exams, quizzes, assignments, class projects</td>
</tr>
<tr>
<td>Demonstrate methodologies used in the design of mission critical systems.</td>
<td>exams, quizzes, assignments, class projects</td>
</tr>
<tr>
<td>Extend existing RTOS and microprocessor systems to implement at PID controller for a device.</td>
<td>exams, quizzes, assignments, class projects</td>
</tr>
<tr>
<td>Develop the necessary code to complete RTOS projects.</td>
<td>exams, quizzes, assignments, class projects</td>
</tr>
<tr>
<td>Implement RTOS projects, test their operation, and report their findings to the instructor and colleagues.</td>
<td>class projects</td>
</tr>
<tr>
<td>Demonstrate recognition of the engineering tradeoffs necessary in the design of modern operating systems.</td>
<td>exams, quizzes, assignments, class projects</td>
</tr>
</tbody>
</table>

VII. Suggested Texts


VIII. Bibliography and Resources

### Course Action Request

#### Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN SOENGR</td>
<td>No Division Code</td>
<td>Computer Science &amp; Engineering</td>
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<table>
<thead>
<tr>
<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours (Lecture + Lab)</th>
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</thead>
<tbody>
<tr>
<td>CSCE</td>
<td>A631</td>
<td>n/a</td>
<td>3</td>
<td>(3+0)</td>
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6. Complete Course Title

**Advanced Compilers**

**Abbreviated Title for Transcript (30 character)**

7. Type of Course

- [x] Academic
- [ ] Preparatory/Development
- [ ] Non-credit
- [ ] CEU
- [ ] Professional Development

8. Type of Action:

- [x] Add
- [ ] Change
- [ ] Delete

If a change, mark appropriate boxes:

- [ ] Prefix
- [ ] Credits
- [ ] Title
- [ ] Course Number
- [ ] Contact Hours
- [ ] Repeat Status
- [ ] Repeat Code
- [ ] Cross-Listed/Stacked
- [ ] Course Prerequisites
- [ ] Co-requisites
- [ ] Registration Restrictions
- [ ] General Education Requirement
- [ ] Class
- [ ] Level
- [ ] College
- [ ] Major
- [ ] Other

(please specify)

9. Repeat Status No

<table>
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<tr>
<th># of Repeats</th>
<th>Max Credits</th>
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10. Grading Basis

- [x] A-F
- [ ] P/NP
- [ ] NG

11. Implementation Date

- From: Fall/2014
- To: 99/9999

12. Cross Listed with

- [x] Stacked
- [ ] with CSCE A431

Cross-Listed Coordination

Signature:

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

- [ ] Impacted Program/Course
- [ ] Date of Coordination
- [ ] Chair/Coordinator Contacted

<table>
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<th>1.</th>
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</table>

Initiator Name (typed): **Kenrick Mock**

Initiator Signed Initials: ________

Date: __________________

13b. Coordination Email

Date: 11/4/2013

submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison

Date: 11/4/2013

14. General Education Requirement

Mark appropriate box:

- [ ] Oral Communication
- [ ] Written Communication
- [ ] Quantitative Skills
- [ ] Humanities
- [ ] Fine Arts
- [ ] Social Sciences
- [ ] Natural Sciences
- [ ] Integrative Capstone

15. Course Description (suggested length 20 to 50 words)

Programming language translation from a high-level object-oriented language to Assembly code. Covers lexical analysis, semantic analysis, code generation, finite state automata, flow graphs, directed graphs, parsers, parse trees, and regular expressions. Includes optimizations to improve runtime efficiency. Graduate students will be required to complete a literature review of recent research in compilers, write the results of that review in a research summary paper, and complete a presentation of these findings in a public forum. Special Note: Not available for credit to students who have completed CSCE A431.

16a. Course Prerequisite(s) (list prefix and number or test code and score)

n/a

16b. Co-requisite(s) (concurrent enrollment required)

n/a

16c. Automatic Restriction(s)

- [x] College
- [ ] Major
- [ ] Class
- [ ] Level

16d. Registration Restriction(s) (non-codable)

Graduate standing

17. Mark if course has fees

Standard SOE fee

18. [ ] Mark if course is a selected topic course

19. Justification for Action

Create an elective in support of the proposed new Master's degree program in Computer Science & Engineering and the existing Master's degree in Interdisciplinary Studies.
<table>
<thead>
<tr>
<th>Initiator (faculty only)</th>
<th>Date</th>
<th>Dean/Director of School/College</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenrick Mock</td>
<td></td>
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<tr>
<td>Initiator (TYPE NAME)</td>
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<tr>
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<td>Date</td>
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<tr>
<td>College/School Curriculum Committee Chair</td>
<td>Date</td>
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</tbody>
</table>
Course Content Guide
University of Alaska Anchorage
School of Engineering
Department of Computer Science and Engineering

I. Initiation Date: Fall 2014

II. Course Information
A. College: School of Engineering
B. Course Subject/Number: CSCE A631
C. Credits: 3
D. Contact Hours: (3+0)
E. Course Title: Advanced Compilers
F. Repeat Status: No
G. Grading Basis: A-F
H. Course Description: Programming language translation from a high-level object-oriented language to Assembly code. Covers lexical analysis, semantic analysis, code generation, finite state automata, flow graphs, directed graphs, parsers, parse trees, and regular expressions. Includes optimizations to improve runtime efficiency. Graduate students will be required to complete a literature review of recent research in compilers, write the results of that review in a research summary paper, and complete a presentation of these findings in a public forum. Special Note: Not available for credit to students who have completed CSCE A431.
I. Course Prerequisites: n/a
J. Fees: Yes, standard SOE fee
K. Stacked: Yes: CSCE A431
L. Registration Restrictions: Graduate standing

III. Course Level Justification

This course is an elective for any graduate student who seeks knowledge in the field of compilers. In addition to the requirements for the stacked undergraduate course (CSCE A431), graduate students will be required to complete a literature review of recent research in an applied or theoretical area of compilers, write a research summary paper that describes the results of that review, and complete a presentation of these findings in a public forum.

IV. Instructional Goals and Student Learning Outcomes
A. **Instructional Goals.** The instructor will:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Provide an understanding of lexical analysis of computer programs</td>
</tr>
<tr>
<td>2.</td>
<td>Provide an understanding of the differences between context-sensitive and context-free languages</td>
</tr>
<tr>
<td>3.</td>
<td>Provide an understanding of semantic language parsing methods</td>
</tr>
<tr>
<td>4.</td>
<td>Demonstrate the importance of optimizing programs for added efficiency of programs</td>
</tr>
</tbody>
</table>

B. **Student Learning Outcomes.** Students will be able to:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Write a lexical analyzer in a high level language that will handle a given set of language tokens</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>2.</td>
<td>Write a parser in a high level language that will generate intermediate code</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>3.</td>
<td>Write a code generator in a high level language that will produce assembly code for a given machine architecture</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>4.</td>
<td>Conduct a literature review, write a research summary paper, and present the findings in a public forum.</td>
<td>Research Summary Paper, Presentation</td>
</tr>
</tbody>
</table>

V. **Guidelines for Evaluation**

A. Assignments  
B. Exams  
C. Project  
* D. *Research Summary Paper*  
* E. *Presentation*

VI. **Topical Course Outline**

1. Introduction, Structure of a Compiler  
2. Syntax-Directed Translator  
3. Lexical Analysis  
4. Strings, Tokens, and Languages  
5. Finite Automata, Nondeterministic Finite State Automata, Deterministic Finite State Automata  
6. Regular Expressions and Grammars  
7. Syntax Analysis  
8. Parse Trees, Ambiguity, Context-Free Grammars  
9. Top-Down, Bottom-Up, Left to Right Leftmost and Rightmost Parsers  
10. Intermediate Code Generators, Three-Address Code
11. Type Checking, Control Flow
12. Run-Time Environments, Stacks, Heaps, Garbage Collection
13. Code Generator, Flow Graphs
14. Basic Blocks, Optimization of Basic Blocks
15. Machine-Independent Optimizations
16. Instruction-Level Parallelism

VII. Suggested Texts


VIII. Bibliography

1a. School or College  
EN SOENGR

1b. Division  
No Division Code

1c. Department  
Computer Science & Engineering

2. Course Prefix  
CSCE

3. Course Number  
A431

4. Previous Course Prefix & Number  
n/a

5a. Credits/CEUs  
3

5b. Contact Hours  
(Lecture + Lab) (3+0)

6. Complete Course Title  
Compilers

Abbreviated Title for Transcript (30 character)

7. Type of Course  
☒ Academic  ☐ Preparatory/Development  ☐ Non-credit  ☐ CEU  ☐ Professional Development

8. Type of Action:  
☐ Add  ☑ Change  ☐ Delete

If a change, mark appropriate boxes:

☒ Prefix  ☐ Credits  ☐ Title  ☐ Repeat Status  ☐ Grading Basis  ☐ Cross-Listed/Stacked  ☐ Course Description  ☐ Course Prerequisites  ☐ Test Score Prerequisites  ☐ Co-requisites  ☐ Automated Restrictions  ☐ Registration Restrictions  ☐ General Education Requirement  ☐ Class  ☐ Level  ☐ College  ☐ Major  ☒ Other Course Content Guide (please specify)

9. Repeat Status No  # of Repeats  n/a  Max Credits  n/a

10. Grading Basis  
☒ A-F  ☐ P/NP  ☐ NG

11. Implementation Date  
semester/year

From: Fall/2014  To: 99/9999

12.  
☐ Cross Listed with  
Stacked with  
CSCE A631  
Cross-Listed Coordination

13a. Impacted Courses or Programs:  List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

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<thead>
<tr>
<th>Impacted Program/Course</th>
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<th>Chair/Coordinator Contacted</th>
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<tr>
<td>1. BA/BS Computer Science</td>
<td>10/26/2013</td>
<td>Kenrick Mock</td>
</tr>
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<td>2. BSE Computer Systems Engineering</td>
<td>10/26/2013</td>
<td>Kenrick Mock</td>
</tr>
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<td>3.</td>
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Initiator Name (typed): Kenrick Mock  
Initiator Signed Initials:  
Date: 

13b. Coordination Email  
Date: 11/4/2013  
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison  
Date: 11/4/2013

14. General Education Requirement  
Mark appropriate box:

☐ Oral Communication  ☐ Written Communication  ☐ Quantitative Skills  ☐ Humanities  ☐ Fine Arts  ☐ Social Sciences  ☐ Natural Sciences  ☐ Integrative Capstone

15. Course Description  
(suggested length 20 to 50 words)

Programming language translation from a high-level object-oriented language to assembly code. Lexical analysis, semantic analysis, and code generation. Finite state automata, flow graphs, directed graphs, parsers, parse trees, and regular expressions. Includes optimizations to improve runtime efficiency. Special note: Not available for credit to students who have completed CSCE A631.

16a. Course Prerequisite(s)  
(list prefix and number or test code and score)

[(CSCE A331 or CSCE A351) and CSCE A248] with a minimum grade of C.

16b. Co-requisite(s)  
(concurrent enrollment required)

n/a

16c. Automatic Restriction(s)  

☒ College  ☐ Major  ☐ Class  ☐ Level

16d. Registration Restriction(s)  
(non-codable)

n/a

17. ☒ Mark if course has fees  
Standard SOE fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action  
Stack with graduate course in support of proposed MS in Computer Engineering & Computer Science.

Initiator (faculty only)  
Kenrick Mock

Initiator (TYPE NAME)

Approved  
Disapproved  
Date  
Dean/Director of School/College  
Date

Approved  
Disapproved  
Date  
Undergraduate/Graduate Academic  
Date

Approved  
Disapproved  
Date  
Board Chair  
Date

Approved  
Disapproved  
Date  
Provost or Designee  
Date
I. **Initiation Date**: Fall 2014

II. **Course Information**
   A. **College**: School of Engineering
   B. **Course Subject/Number**: CSCE A431
   C. **Credits**: 3
   D. **Contact Hours**: (3+0) 45 contact lecture hours (3 contact lecture hours/week x 15 weeks = 45) plus 90 hours outside work (6 hours outside lecture/week x 15 weeks = 90) for a total of 135 hours
   E. **Course Title**: Compilers
   F. **Repeat Status**: No
   G. **Grading Basis**: A-F
   H. **Course Description**: Programming language translation from a high-level object-oriented language to assembly code. Lexical analysis, semantic analysis, and code generation. Finite state automata, flow graphs, directed graphs, parsers, parse trees, and regular expressions. Includes optimizations to improve runtime efficiency. Special note: Not available for credit to students who have completed CSCE A631.
   I. **Course Prerequisites**: [(CSCE A331 or CSCE A351) and CSCE A248] with a minimum grade of C.
   J. **Fees**: Yes, standard SOE fee
   K. **Stacked**: Yes: CSCE A631

III. **Course Level Justification**

   In this course students will use concepts covered at the 300 level to design, implement, and analyze compilers.

IV. **Instructional Goals and Student Learning Outcomes**

   A. **Instructional Goals.** The instructor will:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Provide an understanding of lexical analysis of computer programs</td>
</tr>
<tr>
<td>2.</td>
<td>Provide an understanding of the differences between context-sensitive and context-free languages</td>
</tr>
<tr>
<td>3.</td>
<td>Provide an understanding of semantic language parsing methods</td>
</tr>
<tr>
<td>4.</td>
<td>Demonstrate the importance of optimizing programs for added efficiency of</td>
</tr>
</tbody>
</table>
B. **Student Learning Outcomes.** Students will be able to:

<table>
<thead>
<tr>
<th></th>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Write a lexical analyzer in a high level language that will handle a given set of language tokens</td>
</tr>
<tr>
<td>2.</td>
<td>Write a parser in a high level language that will generate intermediate code</td>
</tr>
<tr>
<td>3.</td>
<td>Write a code generator in a high level language that will produce assembly code for a given machine architecture</td>
</tr>
</tbody>
</table>

V. **Topical Course Outline**

1. Introduction, Structure of a Compiler
2. Syntax-Directed Translator
3. Lexical Analysis
4. Strings, Tokens, and Languages
5. Finite Automata, Nondeterministic Finite State Automata, Deterministic Finite State Automata
6. Regular Expressions and Grammars
7. Syntax Analysis
8. Parse Trees, Ambiguity, Context-Free Grammars
9. Top-Down, Bottom-Up, Left to Right Leftmost and Rightmost Parsers
10. Intermediate Code Generators, Three-Address Code
11. Type Checking, Control Flow
12. Run-Time Environments, Stacks, Heaps, Garbage Collection
13. Code Generator, Flow Graphs
14. Basic Blocks, Optimization of Basic Blocks
15. Machine-Independent Optimizations
16. Instruction-Level Parallelism
VI. **Suggested Texts**


VII. **Bibliography**

### Advanced Programming Languages

**Course Prefix:** CSCE  
**Course Number:** A632  
**Previous Course Prefix & Number:** n/a  
**Credits/CEUs:** 3  
**Contact Hours:** (Lecture + Lab) (3+0)

**Complete Course Title:** Advanced Programming Languages

**Abbreviated Title for Transcript:**

**Type of Course:**
- [x] Academic  
- [ ] Preparatory/Development  
- [ ] Non-credit  
- [ ] CEU  
- [ ] Professional Development

**Type of Action:**
- [x] Add  
- [ ] Change  
- [ ] Delete

**Repeat Status No**  
**# of Repeats** n/a  
**Max Credits** n/a

**Grading Basis:**
- [x] A-F  
- [ ] P/NP  
- [ ] NG

**Implementation Date:**  
**From:** Fall/2014  
**To:** 99/9999

**Course Prerequisite(s):** n/a

**Course Description:**
Advanced topics in the design of programming languages, including abstract syntax, denotational semantics, operational semantics, type systems, run-time behavior, program analysis, garbage collection and compilation. Programs are written in multiple programming languages to study programming paradigms.

**Course Description (suggested length 20 to 50 words)**

**General Education Requirement**
- [ ] Oral Communication  
- [ ] Written Communication  
- [ ] Quantitative Skills  
- [ ] Humanities  
- [ ] Fine Arts  
- [ ] Social Sciences  
- [ ] Natural Sciences  
- [ ] Integrative Capstone

**Course Prerequisite(s) (list prefix and number or test code and score):** n/a  
**Co-requisite(s) (concurrent enrollment required):** n/a

**Automatic Restrictions:**
- [ ] College  
- [ ] Major  
- [ ] Class  
- [x] Level

**Registration Restriction(s) (non-codable):**
- [ ] Graduate standing

**Justification for Action:**
Required course in support of the proposed new Master's degree program in Computer Science & Engineering and potential offering within the existing Master's degree in Interdisciplinary Studies.
I. **Initiation Date:** Fall 2014

II. **Course Information**
   A. **College/School:** School of Engineering
   B. **Course Title:** Advanced Programming Languages
   C. **Course Subject/Number:** CSCE A632
   D. **Credit Hours:** 3.0 Credits
   E. **Contact Time:** 3+0
   F. **Grading Information:** A-F
   G. **Course Description:**
      Advanced topics in the design of programming languages, including abstract syntax, denotational semantics, operational semantics, type systems, run-time behavior, program analysis, garbage collection and compilation. Programs are written in multiple programming languages to study programming paradigms.
   H. **Status of course relative to degree or certificate program:** Required for MS in Computer Engineering and Computer Science.
   I. **Lab Fees:** Yes
   J. **Coordination:** SOE and Faculty Listserv
   K. **Course Prerequisites:** n/a
   L. **Registration Restrictions:** Graduate standing

III. **Evaluation**
   Grades are based on written examination, assignments, and projects.

IV. **Course Level Justification**
   This is an advanced course that synthesizes concepts from undergraduate programming languages and algorithms courses to study the design, implementation, and use of programming languages within a spectrum of computational paradigms.

V. **Outline**
   1. Overview of Programming Language Issues and Models
   2. Syntax
      a. concrete syntax
      b. abstract Syntax
      c. s-expressions
      d. grammars
   3. Operational Semantics
      a. formal framework
      b. rewrite rules
      c. operational reasoning, transformations, equivalence
   4. Denotational Semantics
a. denotational reasoning, transformations
b. comparison to operational semantics

5. Fixed Points
   a. recursive definitions
   b. partial orders
   c. monotonicity and continuity

6. Dynamic Semantics
   a. lambda calculus
   b. naming
   c. state
   d. control
   e. data
   f. concurrency

7. Static Semantics
   a. simple types
   b. polymorphism and higher-order types
   c. type reconstruction
   d. modules and linking

8. Pragmatic Issues
   a. compilation
   b. garbage collection

9. Implementations of Programming Paradigms
   a. Clojure
   b. Haskell
   c. Scala
   d. Erlang
   e. Prolog
   f. Oz

VI. Instructional Goals and Student Learning Outcomes
   A. Instructional Goals.

<table>
<thead>
<tr>
<th>The instructor will:</th>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrate how syntactic formalisms define the structure and behavior of programming languages.</td>
<td>Exams, assignments, projects</td>
</tr>
<tr>
<td>Demonstrate how semantic formalisms define the structure and behavior of programming languages.</td>
<td>Exams, assignments, projects</td>
</tr>
<tr>
<td>Illustrate major programming paradigms (e.g. functional, procedural, declarative, concurrent).</td>
<td>Exams, assignments, projects</td>
</tr>
</tbody>
</table>

   B. Student Learning Outcomes:

<table>
<thead>
<tr>
<th>Upon completion of this course, students will be able to:</th>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilize formal syntax to characterize programming languages.</td>
<td>Exams, assignments, projects</td>
</tr>
<tr>
<td>Utilize formal semantics to characterize programming languages.</td>
<td>Exams, assignments, projects</td>
</tr>
<tr>
<td>Write programs in a variety of programming languages that support a particular programming paradigm.</td>
<td>Exams, assignments, projects</td>
</tr>
</tbody>
</table>
VII. Suggested Text


VIII. Bibliography and Resources


Tate, B. Seven Languages in Seven Weeks: A Pragmatic Guide to Learning Programming Languages. Pragmatic Bookshelf, 2010.


1a. School or College
EN SOENGR

1b. Division
No Division Code

1c. Department
Computer Science & Engineering

2. Course Prefix
CSCE

3. Course Number
A646

4. Previous Course Prefix & Number
n/a

5a. Credits/CEUs
3

5b. Contact Hours
(Lecture + Lab)
(3+0)

6. Complete Course Title
Advanced Digital Media and Interactive Systems
Adv Digital Media & Inter Sys

Abbreviated Title for Transcript (30 characters)

7. Type of Course
☒ Academic  ☐ Preparatory/Development  ☐ Non-credit  ☐ CEU  ☐ Professional Development

8. Type of Action:
☒ Add  ☐ Change  ☐ Delete

If a change, mark appropriate boxes:
☐ Prefix  ☐ Course Number  ☐ Contact Hours  ☐ Repeat Status  ☐ Title  ☐ Cross-Listed/Stacked  ☐ Repeat Status  ☐ Course Prerequisites  ☐ Credit Hours
☐ Grading Basis  ☐ Repeatability  ☐ General Education Requirement  ☐ Test Score Prerequisites  ☐ Course Prerequisites  ☐ Registration Restrictions
☐ Automatic Restrictions  ☐ Other (please specify)  ☐ General Education Requirement
☐ College  ☐ Major  ☐ Class  ☐ Level

9. Repeat Status No
☐ # of Repeats  ☐ n/a  ☐ Max Credits  ☐ n/a

10. Grading Basis
☒ A-F  ☐ P/NP  ☐ NG

11. Implementation Date
☐ semester/year
From: Fall/2014  To: 99/9999

12. ☐ Cross Listed with
☐ Stacked with CSCE A446

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

<table>
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Initiator Name (typed): Samuel Siewert  Initiator Signed Initials: __________  Date: __________

13b. Coordination Email
Date: 11/4/2013
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 11/4/2013

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication  ☐ Written Communication  ☐ Quantitative Skills  ☐ Humanities
☐ Fine Arts  ☐ Social Sciences  ☐ Natural Sciences  ☐ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
Introduces digital media systems for digital cinema and digital cable/Internet media creation, delivery, and interactive systems. Topics covered include digital audio and video encoding and decoding, transport, multiplexing, broadband and baseband transmission, real-time requirements, and interactive on-demand systems for video and video games. Students will be required to complete a literature review of recent research in digital media and interactive systems, write a research summary paper, and complete a presentation of their work in a public forum. Special note: Not available for credit to students who have completed CSCE A446.

16a. Course Prerequisite(s) (list prefix and number or test code and score)
n/a

16b. Co-requisite(s) (concurrent enrollment required)
n/a

16c. Automatic Restriction(s)
☐ College  ☐ Major  ☐ Class  ☐ Level

16d. Registration Restriction(s) (non-codable)
Graduate standing

17. ☒ Mark if course has fees Standard SOE fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Create an elective in support of the proposed new Master's degree program in Computer Science & Engineering and the existing Master's degree in Interdisciplinary Studies.
<table>
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<td>Samuel Siewert</td>
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UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: Fall 2014

II. Course Information
A. College/School: School of Engineering
B. Course Title: Advanced Digital Media and Interactive Systems
C. Course Subject/Number: CSCE A646
D. Credit Hours: 3.0 Credits
E. Contact Time: 3+0 Contact Time
F. Grading Information: A-F
G. Course Description: Introduces digital media systems for digital cinema and digital cable/Internet media creation, delivery, and interactive systems. Topics covered include digital audio and video encoding and decoding, transport, multiplexing, broadband and baseband transmission, real-time requirements, and interactive on-demand systems for video and video games. Students will be required to complete a literature review of recent research in digital media and interactive systems, write a research summary paper, and complete a presentation of their work in a public forum. Special note: Not available for credit to students who have completed CSCE A446.

H. Lab Fees: Yes, standard SOE fee
I. Coordination: SOE and Faculty Listserv
J. Course Prerequisites: n/a
K. Registration Restrictions: Graduate standing
L. Stacked: Yes, CSCE A446

III. Evaluation
Grades are based on written examinations, class assignments, projects, research summary paper, and presentation.

IV. Course Level Justification
In addition to the requirements for the stacked undergraduate course (CSCE A446), graduate students will be required to complete a literature review of recent research in an applied or theoretical topic in digital media and interactive systems, write the results of that review in a research summary paper, and complete a presentation of these findings in a public forum.

V. Outline
A. Lecture
   1. Analog Video and Audio Transmission
      a. Brief history
      b. Advantage of digital video
      c. Future challenges for mobile and on-demand
   2. Fundamental Digital Video and Audio Encoding
      a. Pulse Code Modulation (PCM) audio sampling
      b. Multi-channel audio
c. Pixel and still image encoding
d. Moving picture encoding concepts
e. Elementary streams
f. Program streams
g. Transport streams – single and multi-program

3. Transmission and Transport Fundamentals
   a. Baseband packet switched networks (Motion Picture Experts Group (MPEG) – in User Datagram Protocol (UDP) or Real-Time Protocol (RTP))
   b. Broadband digital cable – Quadrature Phase-Shift Keying (QPSK) and Quadrature Amplitude Modulation (QAM)
   c. Over-the-air digital transmission – Vestigial Sideband Modulation (VSB) for ATSC
   d. Digital packet switched network Quality of Service (QoS)

4. Video Encoding from Bottom Up
   a. Pixel and color encoding
   b. Frames and macro blocks
   c. Discrete Cosine Transform (DCT)
   d. Quantization
   e. Huffman and Run-Length Encoding (RLE)
   f. Motion vector quantization and change only data
   g. Intra, predictive, and bi-directional frames
   h. Packet multiplexing of audio and video elementary streams

5. Real-time Processing
   a. Dynamic priority preemptive scheduling
   b. I/O scheduling
   c. QoS networks
   d. Latency, buffering, bandwidth-delay product
   e. Performance

6. Post Production
   a. Capture form digital cameras
   b. Computer Graphic (CG) rendering of frames
   c. Editing content, color, and selection of encoding quality
   d. Bit rates, resolutions, aspect ratios
   e. Post workflows and I/O processing pipelines

7. Post Production Architecture and Performance
   a. Single Instruction, Multiple Data (SIMD) Graphics Processing Unit (GPU) software
   b. Redundant Array of Independent Disk (RAID) systems for storage and I/O scaling
   c. Clusters and networking
   d. CG and Digital Video Transformation

8. Mobile and End-User Systems
   a. Decoders
   b. Players
   c. Down-conversion and color enhancement
9. Interactive and On-Demand Systems
   a. On-demand digital video and trick play
   b. Digital video game concepts
   c. Physics and game engines
   d. Interactive graphics and animation basics
   e. Augmented reality

B. Example Projects (MPEG encoders/decoders – on Linux and/or Windows)
   1. MPEG audio and video elementary stream parsing and analysis
   2. Portable BitMap (PBM), Portable GreyMap (PGM), Portable PixMap (PPM) frames and encoding for compression
   3. Packet switched digital video streaming and performance
   4. Simple construction of a digital video encoder for compression
   5. Scheduling theory and run-time analysis of threads
   6. Work with encoders/decoders to produce short movies from digital images produced using ray tracing and RenderMan or OpenGL Optix real-time ray tracing
   7. Post production pipeline speed-up with Compute Unified Device Architecture (CUDA)/OpenCL using GPUs

VI. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. The instructor will:

1. Explain the principles of digital media encoding/decoding, transport, quality of service, and system performance
2. Explain digital media transport over-the-air, over coaxial cable, and over the Internet.
3. Demonstrate the use of MPEG tools, Linux software development for digital media processing, storage and networking applied to digital media

B. Student Learning Outcomes. Upon successful completion of this course, students will be able to:

<table>
<thead>
<tr>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams, quizzes, assignments, projects</td>
</tr>
</tbody>
</table>

1. Explain the methods of encoding and decoding digital video and audio
2. Demonstrate methodologies used in the design of digital media systems
3. Demonstrate methodologies used to transport digital media with quality of service (latency control)
4. Develop the necessary code to complete the course projects
5. Implement course projects, test their operation, and report their findings to the instructor and colleagues
6. Demonstrate recognition of the engineering tradeoffs necessary in the design of production CG
imagery and interactive 3D graphics

| 7. Review research literature, write a research summary paper, and present to an academic audience. | Research summary paper, presentation |

VII. Suggested Texts


VIII. Bibliography and Resources


### Course Action Request

#### Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
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<td>Computer Science &amp; Engineering</td>
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<th>4. Previous Course Prefix &amp; Number</th>
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<th>5b. Contact Hours</th>
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<td>(3+0)</td>
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<td>Digital Media and Interactive Systems</td>
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<td>Abbreviated Title for Transcript (30 character)</td>
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<th>7. Type of Course</th>
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<td>To: 99/9999</td>
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<th>12. Cross Listed with</th>
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<tr>
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<table>
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<tr>
<th>13a. Impacted Courses or Programs:</th>
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<tbody>
<tr>
<td>List any programs or college requirements that require this course.</td>
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<td>Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at <a href="http://www.uaa.alaska.edu/governance">www.uaa.alaska.edu/governance</a>.</td>
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<td>10/26/2013</td>
<td>Kenrick Mock</td>
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<th>Initiator Name (typed):</th>
<th>Initiator Signed Initials:</th>
<th>Date:</th>
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<tbody>
<tr>
<td>Samuel Siewert</td>
<td>_________________________</td>
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<td>submitted to Faculty Listserv: <a href="mailto:uaa-faculty@lists.uaa.alaska.edu">uaa-faculty@lists.uaa.alaska.edu</a></td>
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<th>14. General Education Requirement</th>
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<td>☐ Oral Communication</td>
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<tr>
<td>☦ Natural Sciences</td>
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<td>☦ Integrative Capstone</td>
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<tr>
<th>15. Course Description (suggested length 20 to 50 words)</th>
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<tbody>
<tr>
<td>Covers digital media systems for digital cinema and digital cable/Internet media creation, delivery, and interactive systems. Topics covered include digital audio and video encoding and decoding, transport, multiplexing, broadband and baseband transmission, real-time requirements, and interactive on-demand systems for video and video games. Also covers the historical progressions of audio and video from traditional analog to digital formats, including cable; web/mobile Internet Protocol Television (IPTV) and media; Advanced Television Systems Committee (ATSC) standards; over-the-air, interactive on-demand digital video; and digital video gaming. Special note: Not available for credit to students who have completed CSCE A646.</td>
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<tr>
<th>16a. Course Prerequisite(s) (list prefix and number or test code and score)</th>
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<tr>
<td>(CSCE A320 and CSCE A365) with a minimum grade of C.</td>
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<th>16b. Co-requisite(s) (concurrent enrollment required)</th>
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<td>☐ College</td>
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<th>16d. Registration Restriction(s) (non-codable)</th>
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<tr>
<th>17. ☒ Mark if course has fees Standard SOE fee</th>
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<tr>
<th>18. ☐ Mark if course is a selected topic course</th>
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<tr>
<th>19. Justification for Action</th>
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<tbody>
<tr>
<td>Stack with graduate course in support of proposed MS in Computer Engineering &amp; Computer Science.</td>
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<td>Initiator (faculty only)</td>
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<td>-------------------------</td>
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<td><strong>Samuel Siewert</strong></td>
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<th>Provost or Designee</th>
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I. **Initiation Date:** Fall 2014

II. **Course Information**
   A. **College/School:** School of Engineering  
   B. **Course Title:** Digital Media and Interactive Systems  
   C. **Course Subject/Number:** CSCE A446  
   D. **Credit Hours:** 3.0 Credits  
   E. **Contact Time:** 3+0 Contact Time  
   F. **Grading Information:** A-F  
   G. **Course Description:** Covers digital media systems for digital cinema and digital cable/Internet media creation, delivery, and interactive systems. Topics covered include digital audio and video encoding and decoding, transport, multiplexing, broadband and baseband transmission, real-time requirements, and interactive on-demand systems for video and video games. Also covers the historical progressions of audio and video from traditional analog to digital formats, including cable; web/mobile Internet Protocol Television (IPTV) and media; Advanced Television Systems Committee (ATSC) standards; over-the-air, interactive on-demand digital video; and digital video gaming. Special note: Not available for credit to students who have completed CSCE A646.  
   H. **Lab Fees:** Yes, standard SOE fee  
   I. **Coordination:** SOE and Faculty Listserv  
   J. **Course Prerequisites:** (CSCE A320 and CSCE A365) with a minimum grade of C.  
   K. **Registration Restrictions:** None  
   L. **Stacked:** Yes, CSCE A646

III. **Course Level Justification**  
This course allows students to apply programming skills, network, computing, and storage skills taught at the 300-level to digital media application and system development relevant to digital cable, Internet content distribution, and digital Radio Frequency (RF) transmission of media.

IV. **Outline**  
A. **Lecture**  
   1. Analog Video and Audio Transmission  
      a. Brief history  
      b. Advantage of digital video  
      c. Future challenges for mobile and on-demand  
   2. Fundamental Digital Video and Audio Encoding  
      a. Pulse Code Modulation (PCM) audio sampling  
      b. Multi-channel audio  
      c. Pixel and still image encoding  
      d. Moving picture encoding concepts
e. Elementary streams
f. Program streams
g. Transport streams – single and multi-program

3. Transmission and Transport Fundamentals
   a. Baseband packet switched networks
      1. Motion Picture Experts Group (MPEG)
      2. User Datagram Protocol (UDP)
      3. Real-Time Protocol (RTP)
   b. Broadband digital cable – Quadrature Phase-Shift Keying (QPSK) and Quadrature Amplitude Modulation (QAM)
   c. Over-the-air digital transmission – Vestigial Sideband Modulation (VSB) for ATSC
   d. Digital packet switched network Quality of Service (QoS)

4. Video Encoding from Bottom Up
   a. Pixel and color encoding
   b. Frames and macro blocks
   c. Discrete Cosine Transform (DCT)
   d. Quantization
   e. Huffman and Run-Length Encoding (RLE)
   f. Motion vector quantization and change only data
   g. Intra, predictive, and bi-directional frames
   h. Packet multiplexing of audio and video elementary streams

5. Real-time Processing
   a. Dynamic priority preemptive scheduling
   b. I/O scheduling
   c. QoS networks
   d. Latency, buffering, bandwidth-delay product
   e. Performance

6. Post Production
   a. Capture from digital cameras
   b. Computer Graphic (CG) rendering of frames
   c. Editing content, color, and selection of encoding quality
   d. Bit rates, resolutions, aspect ratios
   e. Post workflows and I/O processing pipelines

7. Post Production Architecture and Performance
   a. Single Instruction, Multiple Data (SIMD) Graphics Processing Unit (GPU) software
   b. Redundant Array of Independent Disk (RAID) systems for storage and I/O scaling
   c. Clusters and networking
   d. CG and Digital Video Transformation

8. Mobile and End-User Systems
   a. Decoders
   b. Players
   c. Down-conversion and color enhancement

9. Interactive and On-Demand Systems
a. On-demand digital video and trick play
b. Digital video game concepts
c. Physics and game engines
d. Interactive graphics and animation basics

d. Augmented reality

B. Example Projects (MPEG encoders/decoders – on Linux and/or Windows)
   1. MPEG audio and video elementary stream parsing and analysis
   2. Portable BitMap (PBM), Portable GreyMap (PGM), Portable PixMap (PPM) frames and encoding for compression
   3. Packet switched digital video streaming and performance
   4. Simple construction of a digital video encoder for compression
   5. Scheduling theory and run-time analysis of threads
   6. Work with encoders/decoders to produce short movies from digital images produced using ray tracing and RenderMan or OpenGL Optix real-time ray tracing
   7. Post production pipeline speed-up with ComputeUnified Device Architecture (CUDA)/OpenCL using GPUs

V. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. The instructor will:

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1.</td>
<td>Explain the principles of digital media encoding/decoding, transport, quality of service, and system performance.</td>
</tr>
<tr>
<td>2.</td>
<td>Explain digital media transport over-the-air, over coaxial cable, and over the Internet.</td>
</tr>
<tr>
<td>3.</td>
<td>Instruct students on the use of MPEG tools, Linux software development for digital media processing, storage and networking applied to digital media.</td>
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</table>

B. Student Learning Outcomes. Upon successful completion of this course, students will be able to:

<table>
<thead>
<tr>
<th></th>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Explain the methods of encoding and decoding digital video and audio</td>
</tr>
<tr>
<td>2.</td>
<td>Demonstrate methodologies used in the design of digital media systems</td>
</tr>
<tr>
<td>3.</td>
<td>Demonstrate methodologies used to transport digital media with quality of service (latency control)</td>
</tr>
<tr>
<td>4.</td>
<td>Develop the necessary code to complete the course projects</td>
</tr>
<tr>
<td>5.</td>
<td>Implement course projects, test their operation, and report their findings to the instructor and colleagues</td>
</tr>
<tr>
<td>6.</td>
<td>Demonstrate recognition of the engineering tradeoffs necessary in the design of production CG imagery and interactive 3D graphics</td>
</tr>
</tbody>
</table>
VI. Suggested Texts


VII. Bibliography and Resources


Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
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<tr>
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<th>4. Previous Course Prefix &amp; Number</th>
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<th>5b. Contact Hours</th>
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<td>n/a</td>
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<td>(Lecture + Lab)</td>
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6. Complete Course Title
Advanced Computer Architecture

Abbreviated Title for Transcript (30 character)

7. Type of Course
☑ Academic
☐ Preparatory/Development
☐ Non-credit
☐ CEU
☐ Professional Development

8. Type of Action:
☑ Add
☐ Change
☐ Delete

9. Repeat Status No
# of Repeats
Max Credits
n/a

10. Grading Basis
☑ A-F
☐ P/NP
☐ NG

11. Implementation Date
From: Fall/2014
To: 99/9999

12. Cross Listed with
☑
☐

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
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Initiator Name (typed): Randy Moulic
Initiator Signed Initials: __________ Date: __________

13b. Coordination Email
Date: 11/4/2013
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 11/4/2013

14. General Education Requirement
Mark appropriate box:
☑ Oral Communication
☐ Written Communication
☐ Quantitative Skills
☐ Humanities
☐ Fine Arts
☐ Social Sciences
☐ Natural Sciences
☐ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
Advanced computer architecture of VLSI (Very Large Scale Integration) digital systems. Focus will be placed on basic VLSI technologies, design automation algorithms and techniques, computer aided design tools, and design of complete integrated systems-on-a-chip. The course includes a hands-on design project utilizing design automation software tools to implement a chip design, layout, and simulation.

16a. Course Prerequisite(s) (list prefix and number or test code and score)
n/a

16b. Co-requisite(s) (concurrent enrollment required)
n/a

16c. Automatic Restriction(s)
☐ College
☐ Major
☐ Class
☑ Level

16d. Registration Restriction(s) (non-codable)
Graduate standing

17. ☑ Mark if course has fees Standard SOE fee

18. ☑ Mark if course is a selected topic course

19. Justification for Action
Required course in support of the proposed new Master's degree program in Computer Science & Engineering and potential offering within the existing Master's degree in Interdisciplinary Studies.

Initiator (faculty only)
Initiator (TYPE NAME)

☑ Approved
☐ Disapproved

Dean/Director of School/College
Date

Undergraduate/Graduate Academic
Date

Provost or Designee
Date

Department Chair
Date

Board Chair
Date

College/School Curriculum Committee Chair
Date
UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: Fall 2014

II. Course Information
A. College/School: School of Engineering
B. Course Title: Advanced Computer Architecture
C. Course Subject/Number: CSCE A648
D. Credit Hours: 3.0 Credits
E. Contact Time: 3+0
F. Grading Information: A-F
G. Course Description:
Advanced computer architecture of VLSI (Very Large Scale Integration) digital systems. Focus will be placed on basic VLSI technologies, design automation algorithms and techniques, computer aided design tools, and design of complete integrated systems-on-a-chip. The course includes a hands-on design project utilizing design automation software tools to implement a chip design, layout, and simulation.
I. Lab Fees: Yes
J. Coordination: SOE and Faculty Listserv
K. Course Prerequisites: n/a
L. Registration Restrictions: Graduate standing

III. Evaluation
Grades are based on written examination, class assignments, and class and lab projects.

IV. Course Level Justification
This is an advanced course that synthesizes concepts from the undergraduate level computer architecture, digital electronics, logic design, computer aided design and simulation tools and algorithms to design and implement an integrated VLSI integrated circuit design.

V. Outline

1. VLSI technologies
   a. Design hierarchy
   b. Integrated circuit layers
   c. Photolithography and patterning
   d. Planarization
   e. Electrical characteristics
   f. Semiconductor material characteristics

2. CMOS (Complementary Metal Oxide Semiconductor) logic and memory circuits
   a. Design ground rules
   b. MOS transistors, passives and logic circuit implementations
c. CMOS physical circuit modeling using SPICE

3. Physical design methodologies, algorithms
   a. System partitioning
   b. Logic design and schematic generation
   c. Module/macro design, placement and routing
   d. Standard cell and full custom design
   e. Cell hierarchies and libraries

4. Physical layout and floor planning
   a. Interconnections, parasitics
   b. Propagation delays and critical paths
   c. Optimization problems in module generation
   d. Modeling and circuit parameter extraction from physical layout
   e. Physical design
      i. EDA (Electronic design automation) tools
      ii. Floor planning and layout
   f. Chip level power distribution, optimization
   g. Interconnect capacitances, crosstalk

5. Logic design simulation and verification

6. Release to the integrated circuit fabrication line; MOSIS Integrated Circuit Fabrication Service

VI. Instructional Goals and Student Learning Outcomes

A. Instructional Goals.

The instructor will:

Present the principles of VLSI systems design.

Explain purpose and operation of VLSI system design software tools used in designing a very large scale integrated system-on-a-chip.

Instruct students on the design, layout, simulation and verification of a VLSI system-on-a-chip.

B. Student Learning Outcomes:

<table>
<thead>
<tr>
<th>Upon completion of this course, students will be able to:</th>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain the operation of the building blocks of VLSI integrated system design.</td>
<td>exams, quizzes, assignments, class projects</td>
</tr>
<tr>
<td>Apply methodologies used in the design of VLSI integrated systems.</td>
<td>exams, quizzes, assignments, class projects</td>
</tr>
<tr>
<td>Design, layout, simulate and test a VLSI system design.</td>
<td>exams, quizzes, assignments, class projects</td>
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<tr>
<td>Apply course material to projects, test their operation, and report their findings.</td>
<td>class projects</td>
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<td>Demonstrate recognition of the engineering tradeoffs necessary in the design of computing systems using VLSI.</td>
<td>exams, quizzes, assignments, class projects</td>
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VII. Suggested Text


VIII. Bibliography and Resources


* Classic Text
## Course Action Request

### University of Alaska Anchorage

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### 2. Course Prefix

- CSCE

### 3. Course Number

- A650

### 4. Previous Course Prefix & Number

- n/a

### 5a. Credits/CEUs

- 3

### 5b. Contact Hours

- (Lecture + Lab) (3+0)

### 6. Complete Course Title

- Advanced Mobile Robotics

### Abbreviated Title for Transcript (30 character)

### 7. Type of Course

<table>
<thead>
<tr>
<th>Academic</th>
<th>Preparatory/Development</th>
<th>Non-credit</th>
<th>CEU</th>
<th>Professional Development</th>
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</table>

### 8. Type of Action

- Add

### If a change, mark appropriate boxes:

- Prefix
- Credits
- Title
- Grading Basis
- Course Description
- Test Score Prerequisites
- Automatic Restrictions
- College
- Level
- Other (please specify)

### 9. Repeat Status

<table>
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<tr>
<th>No</th>
<th># of Repeats</th>
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<th>Max Credits</th>
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</table>

### 10. Grading Basis

<table>
<thead>
<tr>
<th>A-F</th>
<th>P/NP</th>
<th>NG</th>
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</thead>
</table>

### 11. Implementation Date

- Semester/year: Fall/2014 - 99/9999

### 12. Cross Listed with

- CSCE A450

### Cross-Listed Coordination

**Signature**

### 13a. Impacted Courses or Programs

List any programs or college requirements that require this course. Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

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<tr>
<td>3.</td>
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</tbody>
</table>

**Initiator Name (typed): Kenrick Mock**  
**Initiator Signed Initials:** ______________  
**Date:** ______________

### 13b. Coordination Email

- Date: 11/4/2013
- Submitted to Faculty Listserv: [uaa-faculty@lists.uaa.alaska.edu](mailto:uaa-faculty@lists.uaa.alaska.edu)

### 13c. Coordination with Library Liaison

- Date: 11/4/2013

### 14. General Education Requirement

**Mark appropriate box:**

- Oral Communication
- Written Communication
- Quantitative Skills
- Humanities
- Fine Arts
- Social Sciences
- Natural Sciences
- Integrative Capstone

### 15. Course Description

*Suggested length 20 to 50 words*

Introduction to robotics with embedded systems. Covers mobile robots, sensors, motors, and their control with autonomous and user-controlled operations in aerial, underwater, and land environments. Applications of real-time image processing and neural networks will be covered. Students will be required to complete a literature review of recent research in robotics, write the results of that review in a research summary paper, and complete a presentation of these findings in a public forum. Special Note: Not available for credit to students who have completed CSCE A450.

### 16a. Course Prerequisite(s) (list prefix and number or test code and score)

- n/a

### 16b. Co-requisite(s) (concurrent enrollment required)

- n/a

### 16c. Automatic Restriction(s)

- College
- Major
- Class
- Level

### 16d. Registration Restriction(s) (non-codable)

- Graduate standing

### 17. Mark if course has fees

- Standard SOE fee

### 18. Mark if course is a selected topic course

### 19. Justification for Action

Create an elective in support of the proposed new Master's degree program in Computer Science & Engineering and the existing Master's degree in Interdisciplinary Studies.
<table>
<thead>
<tr>
<th>Role</th>
<th>Approval Status</th>
<th>Date</th>
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<td></td>
<td></td>
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<tr>
<td>Kenrick Mock</td>
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</tr>
<tr>
<td>Initiator (TYPE NAME)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dean/Director of School/College</td>
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<td>Department Chair</td>
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<tr>
<td>Undergraduate/Graduate Academic Board Chair</td>
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<tr>
<td>College/School Curriculum Committee Chair</td>
<td></td>
<td></td>
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<tr>
<td>Provost or Designee</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Course Content Guide  
University of Alaska Anchorage  
School of Engineering  
Department of Computer Science and Engineering

I. **Initiation Date**: Fall 2014

II. **Course Information**
A. **College**: Engineering
B. **Course Subject/Number**: CSCE A650
C. **Credits**: 3
D. **Contact Hours**: 3+0
E. **Course Title**: Advanced Mobile Robotics
F. **Repeat Status**: No
G. **Grading Basis**: A-F
H. **Course Description**: Introduction to robotics with embedded systems. Covers mobile robots, sensors, motors, and their control with autonomous and user-controlled operations in aerial, underwater, and land environments. Applications of real-time image processing and neural networks will be covered. Students will be required to complete a literature review of recent research in robotics, write the results of that review in a research summary paper, and complete a presentation of these findings in a public forum. Special Note: Not available for credit to students who have completed CSCE A450.
I. **Course Prerequisites**: n/a
J. **Fees**: Yes, standard SOE fee
K. **Stacked**: Yes: CSCE A450
L. **Registration Restrictions**: Graduate standing

III. **Course Level Justification**

*In addition to the requirements for the stacked undergraduate course (CSCE A450), graduate students will be required to complete a literature review of recent research in an applied or theoretical area of robotics, write the results of that review in a research summary paper, and complete a presentation of these findings in a public forum.*

IV. **Instructional Goals and Student Learning Outcomes**

<table>
<thead>
<tr>
<th>A. <strong>Instructional Goals.</strong> The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Present the basic principles behind mobile robots.</td>
</tr>
<tr>
<td>2. Describe electronic sensors and what sensors are needed for different operations.</td>
</tr>
</tbody>
</table>
3. Describe the different types of autonomous robots.

4. Describe the importance of localization, navigation, and real-time processing of data to develop robotic systems.

<table>
<thead>
<tr>
<th>B. <strong>Student Learning Outcomes.</strong> Upon successful completion of this course, students will be able to:</th>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Create a robot with appropriate sensors to perform dedicated tasks.</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>2. Write code to control a robot by a user with a computer or handheld device.</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>3. Write code to allow a robot to autonomously perform tasks.</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>4. Write a program to allow a robot to learn using neural networks and artificial intelligence principles.</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>5. <em>Conduct a literature review, write a research summary paper, and present the findings in a public forum.</em></td>
<td>Research Summary Paper, Presentation</td>
</tr>
</tbody>
</table>

V. **Guidelines for Evaluation**
   A. Assignments
   B. Exams
   C. Project
   D. *Research Summary Paper*
   E. *Presentation*

VI. **Topical Course Outline**
   1. Introduction, Embedded Systems
   2. Mobile Robots, Operating Systems
   3. Analog and Digital Sensors
   4. Actuators, Motors, Servos
   5. Controllers
   6. Multitasking, Synchronization, Scheduling
   7. Wireless Communication, Remote Control
   8. Driving and Omnidirectional Robots
   9. Balanced and Walking Robots
   10. Autonomous Aerial and Underwater Vehicles
   11. Robotic Simulators
   12. Localization and Navigation
   13. Maze Exploration and Map Generation
14. Real-Time Image Processing
15. Neural Networks
16. Genetic Algorithms and Programming
17. Automotive Systems

VII. Suggested Text


VIII. Bibliography

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

| 1a. School or College          | EN SOENGR                                      |
| 1b. Division                  | No Division Code                               |
| 1c. Department                | Computer Science & Engineering                 |

| 2. Course Prefix              | CSCE                                           |
| 3. Course Number              | A450                                           |
| 4. Previous Course Prefix & Number | n/a               |
| 5a. Credits/CEUs              | 3                                              |
| 5b. Contact Hours             | (Lecture + Lab) (3+0)                           |

6. Complete Course Title Mobile Robotics

Abbreviated Title for Transcript (30 character)

<table>
<thead>
<tr>
<th>7. Type of Course</th>
<th>Academic</th>
<th>Preparatory/Development</th>
<th>Non-credit</th>
<th>CEU</th>
<th>Professional Development</th>
</tr>
</thead>
</table>

8. Type of Action: [ ] Add [ ] Change [ ] Delete

If a change, mark appropriate boxes:
- [ ] Prefix
- [ ] Credits
- [ ] Course Number
- [ ] Contact Hours
- [ ] Cross-Listed/Stacked
- [ ] Grading Basis
- [ ] Repeat Status
- [ ] Course Prerequisites
- [ ] Co-requisites
- [ ] Title
- [ ] Course Description
- [ ] Registration Restrictions
- [ ] Test Score Prerequisites
- [ ] General Education Requirement
- [ ] College
- [ ] Level
- [ ] Other Course Content Guide (please specify)

9. Repeat Status No: [ ] # of Repeats: n/a [ ] Max Credits: n/a

10. Grading Basis: [ ] A-F [ ] P/NP [ ] NG

11. Implementation Date:
   From: Fall/2014 To: 99/9999

12. [ ] Cross Listed with
    [ ] Stacked with CSCE A650
    [ ] Cross-Listed Coordination

| 13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
| Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
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<td>1. BA/BS Computer Science</td>
<td>10/26/2013</td>
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<td>Kenrick Mock</td>
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Initiator Name (typed): Kenrick Mock
Initiator Signed Initials: ___________ Date: ___________

13b. Coordination Email:
     Date: 11/4/2013
     submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
     Date: 11/4/2013

14. General Education Requirement
    Mark appropriate box:
    [ ] Oral Communication
    [ ] Written Communication
    [ ] Quantitative Skills
    [ ] Humanities
    [ ] Fine Arts
    [ ] Social Sciences
    [ ] Natural Sciences
    [ ] Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
    Introduces robotics with embedded systems. Controlling mobile robots, sensors, and motors with autonomous and user-controlled operations. Different types of robots, including aerial, underwater, and automotive robots. Real-time image processing and neural networks including genetic algorithms will be covered. Special note: Not available for credit to students who have completed CSCE A650.

16a. Course Prerequisite(s) (list prefix and number or test code and score) (CSCE A241 and CSCE A311 and CSCE A365) with a minimum grade of C.

16b. Co-requisite(s) (concurrent enrollment required)
     n/a

16c. Automatic Restriction(s)
     [ ] College [ ] Major [ ] Class [ ] Level

16d. Registration Restriction(s) (non-codable)
     n/a

17. [ ] Mark if course has fees
     Standard SOE fee

18. [ ] Mark if course is a selected topic course

19. Justification for Action
    Stack with graduate course in support of proposed MS in Computer Engineering & Computer Science. Title reflects emphasis on mobile robots.
<table>
<thead>
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<th>Dean/Director of School/College</th>
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Course Content Guide
University of Alaska Anchorage
School of Engineering
Department of Computer Science and Engineering

I. **Initiation Date:** Fall 2014

II. **Course Information**
A. **College:** Engineering  
B. **Course Subject/Number:** CSCE A450  
C. **Credits:** 3  
D. **Contact Hours:** (3+0) 45 contact lecture hours (3 contact lecture hours/week x 15 weeks = 45) plus 90 hours outside work (6 hours outside lecture/week x 15 weeks = 90) for a total of 135 hours  
E. **Course Title:** Mobile Robotics  
F. **Repeat Status:** No  
G. **Grading Basis:** A-F  
H. **Course Description:** Introduces robotics with embedded systems. Controlling mobile robots, sensors, and motors with autonomous and user-controlled operations. Different types of robots, including aerial, underwater, and automotive robots. Real-time image processing and neural networks including genetic algorithms will be covered. Special note: Not available for credit to students who have completed CSCE A650.  
I. **Course Prerequisites:** (CSCE A241 and CSCE A311 and CSCE A365) with a minimum grade of C.  
J. **Fees:** Yes, standard SOE fee  
K. **Stacked:** Yes: CSCE A650

III. **Course Level Justification**

This course builds upon concepts taught at the 200-level and 300-level to design and develop robotic systems.

IV. **Instructional Goals and Student Learning Outcomes**

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<th>A. <strong>Instructional Goals.</strong> The instructor will:</th>
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of data to develop robotic systems.

B. **Student Learning Outcomes.** Upon successful completion of this course, students will be able to:

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V. **Topical Course Outline**

1. Introduction, Embedded Systems
2. Mobile Robots, Operating Systems
3. Analog and Digital Sensors
4. Actuators, Motors, Servos
5. Controllers
6. Multitasking, Synchronization, Scheduling
7. Wireless Communication, Remote Control
8. Driving and Omnidirectional Robots
9. Balanced and Walking Robots
10. Autonomous Aerial and Underwater Vehicles
11. Robotic Simulators
12. Localization and Navigation
13. Maze Exploration and Map Generation
14. Real-Time Image Processing
15. Neural Networks
16. Genetic Algorithms and Programming
17. Automotive Systems
VI. **Suggested Texts**


VII. **Bibliography**


# Course Action Request

**Proposal to Initiate, Add, Change, or Delete a Course**

<table>
<thead>
<tr>
<th>1a. School or College</th>
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</tr>
</thead>
<tbody>
<tr>
<td>EN SOENGR</td>
<td>No Division Code</td>
<td>Computer Science &amp; Engineering</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours</th>
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<tbody>
<tr>
<td>CSCE</td>
<td>A652</td>
<td>n/a</td>
<td>3</td>
<td>(Lecture + Lab) (3+0)</td>
</tr>
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</table>

6. **Complete Course Title**

Advanced Computational Theory and Algorithms

Adj. Theory and Algorithms

**Abbreviated Title for Transcript (30 characters)**

7. **Type of Course**

- [x] Academic
- [ ] Preparatory/Development
- [ ] Non-credit
- [ ] CEU
- [ ] Professional Development

8. **Type of Action**: [x] Add or [ ] Change or [ ] Delete

If a change, mark appropriate boxes:

- [ ] Prefix
- [ ] Credits
- [ ] Title
- [ ] Grading Basis
- [ ] Course Description
- [ ] Test Score Prerequisites
- [ ] Automatic Restrictions
- [ ] Other (please specify)

9. **Repeat Status No**

# of Repeats: n/a

Max Credits: n/a

10. **Grading Basis**

- [x] A-F
- [ ] P/NP
- [ ] NG

11. **Implementation Date**

- From: Fall/2014
- To: 99/9999

12. **Cross Listed with**

- [ ] with

**Cross-Listed Coordination Signature**

13a. **Impacted Courses or Programs**: List any programs or college requirements that require this course. If more than three entries, submit a separate table. A template is available at [www.aaa.alaska.edu/governance](http://www.aaa.alaska.edu/governance).

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</table>

Initiator Name (typed): Martin Cenek

Initiator Signed Initials: ________

Date: __________

13b. **Coordination Email**

Date: 12/13/2013

submitted to Faculty Listserv: (uaa-faculty@lists.aaa.alaska.edu)

13c. **Coordination with Library Liaison**

Date: 12/13/2013

14. **General Education Requirement**

Mark appropriate box:

- [ ] Oral Communication
- [ ] Written Communication
- [ ] Quantitative Skills
- [ ] Humanities
- [ ] Fine Arts
- [ ] Social Sciences
- [ ] Natural Sciences
- [ ] Integrative Capstone

15. **Course Description** *(suggested length 20 to 50 words)*

Advanced study of the design and analysis of algorithms, computational theory, and complexity theory. The focus is on models of computation, the theory of automata, and formal languages. Topics include finite state machines, formal grammars, recursive function theory, pattern matching, linear programming, non-deterministic polynomial (NP) time problems, and NP-complete problems.

16a. **Course Prerequisite(s)** *(list prefix and number or test code and score)*

n/a

16b. **Co-requisite(s)** *(concursit enrollment required)*

n/a

16c. **Automatic Restriction(s)**

- [ ] College
- [ ] Major
- [ ] Class
- [x] Level

16d. **Registration Restriction(s)** *(non-codable)*

- [ ] Graduate standing

17. [x] Mark if course has fees

Standard SOE fee

18. [ ] Mark if course is a selected topic course

19. **Justification for Action**

Core course in support of the proposed new Master's degree program in Computer Science & Engineering and the existing Master's degree in Interdisciplinary Studies.

Initiator (faculty only): Martin Cenek

Initiator Signed Initials: ________

Date: __________

Approved

Disapproved

Dean/Director of School/College

Date: __________

Approved

Disapproved

Department Chair

Date: __________

Approved

Disapproved

Board Chair

Date: __________

Approved

Disapproved

Provost or Designee

Date: __________
I. Initiation Date: Fall 2014

II. Course Information
A. College/School: School of Engineering
B. Course Title: Advanced Computational Theory and Algorithms
C. Course Subject/Number: CSCE A652
D. Credit Hours: 3.0 Credits
E. Contact Time: 3+0
F. Grading Information: A-F
G. Course Description:
   Advanced study of the design and analysis of algorithms, computational theory, and complexity theory. The focus is on models of computation, the theory of automata, and formal languages. Topics include finite state machines, formal grammars, recursive function theory, pattern matching, linear programming, non-deterministic polynomial (NP) time problems, and NP-complete problems.
H. Lab Fees: Yes
I. Coordination: SOE and Faculty Listserv
J. Course Prerequisites: n/a
K. Registration Restrictions: Graduate standing

III. Evaluation
Grades are based on exams and assignments.

IV. Course Level Justification
This is an advanced course that provides additional depth and theoretical foundation to material covered at the undergraduate level involving automata and algorithms.

V. Outline
1. Introduction
   a) notation
   b) set theory
   c) proofs
   d) diagonalization

2. Finite State Machines

3. Regular Languages
   a) definition, closure properties, non-determinism, regular expressions
   b) equivalence of regular expressions and non-deterministic finite state automata
   c) non-regular languages, distinguishability
   d) Context Free Languages (CFL)
e) Pushdown Automata (PDA)
f) Myhill-Nerode theorem
g) Context Free Grammars (CFG)
h) equivalence of PDAs/CFGs
i) pumping lemma, applications

4. Turing Machines
   a) programming languages for CFLs
   b) Church-Turing thesis
c) decidability and Turing recognizability
d) the Halting Problem
e) multi-tape Turing machines
f) non-deterministic Turing machines
g) language problems
h) undecidable problems

5. Reduction
   a) examples of reductions
   b) computation histories
c) post correspondence problem
d) relationship to logic
e) Rice's theorem
f) primitive recursive functions

6. Recursion Theory
   a) partial recursive functions
   b) equivalence of partial recursive functions and Turing machines
c) lambda calculus
d) fixed points and recursion
e) general recursion
f) programming systems
g) pairing functions
h) $s_{mn}$ theorem
i) recursion theorem for acceptable programming systems
j) recursion theorem applications
k) recursion theorem corollaries

7. Logic
   a) formulas, terms, sentences
b) logical theories
c) truth
d) proof
e) representability
f) incompleteness
g) Gödel's theorem

8. Complexity
   a) time and space complexity
   b) the classes Polynomial (P) and Non-deterministic Polynomial (NP)
   c) P-time reduction
d) NP-completeness
e) Cook-Levin theorem

VI. Instructional Goals and Student Learning Outcomes

A. Instructional Goals:

<table>
<thead>
<tr>
<th>The instructor will:</th>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Demonstrate the correspondence between complexity classes and computing machines.</td>
<td>exams, assignments</td>
</tr>
<tr>
<td>2. Construct a variety of proofs to show how to validate program correctness.</td>
<td>exams, assignments</td>
</tr>
<tr>
<td>3. Introduce different machine constructs to solve various classes of problems along with the relevant algorithms used to solve these problems.</td>
<td>exams, assignments</td>
</tr>
<tr>
<td>4. Discuss complexity classes, computability, decidability, and complexity theory.</td>
<td>exams, assignments</td>
</tr>
<tr>
<td>5. Demonstrate how the theoretical topics such as automata or computability can be applied to practical applications such as high assurance software verification or algorithmic reduction for program optimization.</td>
<td>exams, assignments</td>
</tr>
</tbody>
</table>

B. Student Learning Outcomes:

<table>
<thead>
<tr>
<th>Upon completion of this course, students will be able to:</th>
<th>Assessment Methods</th>
</tr>
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<tbody>
<tr>
<td>1. Demonstrate basic proof techniques including induction, diagonalization, and reduction.</td>
<td>exams, assignments</td>
</tr>
<tr>
<td>2. Validate the relationship between logic and computation.</td>
<td>exams, assignments</td>
</tr>
<tr>
<td>3. Construct formal arguments about complexity classes, problem class classification, and complexity reductions.</td>
<td>exams, assignments</td>
</tr>
<tr>
<td>4. Analyze and design algorithms to solve computational problems.</td>
<td>exams, assignments</td>
</tr>
<tr>
<td>5. Describe the fundamental topics of computational theory including: computability, the halting problem, countability, determinism, and decidability.</td>
<td>exams, assignments</td>
</tr>
</tbody>
</table>
VII. Suggested Text


VIII. Bibliography and Resources


Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College
EN SOENGR

1b. Division
No Division Code

1c. Department
Computer Science & Engineering

2. Course Prefix
CSCE

3. Course Number
A660

4. Previous Course Prefix & Number
n/a

5a. Credits/CEUs
3

5b. Contact Hours
(Lecture + Lab)
(3+0)

6. Complete Course Title
Advanced Database Systems

Abbreviated Title for Transcript (30 character)

7. Type of Course
☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action:
☒ Add ☐ Change ☐ Delete

If a change, mark appropriate boxes:

- Prefix
- Credits
- Title
- Grading Basis
- Course Description
- Test Score Prerequisites
- Automatic Restrictions
- College
- Level
- Other (please specify)

9. Repeat Status No
# of Repeats
n/a
Max Credits
n/a

10. Grading Basis
☒ A-F ☐ P/NP ☐ NG

11. Implementation Date
From: Fall/2014
To: 99/9999

12. ☐ Cross Listed with

☒ Stacked with CSCE A460
Cross-Listed Coordination

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

Initiator Name (typed): Kirk Scott
Initiator Signed Initials: __________ Date: __________

13b. Coordination Email
Date: 11/4/2013
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 11/4/2013

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication
☐ Written Communication
☐ Quantitative Skills
☐ Humanities
☐ Fine Arts
☐ Social Sciences
☐ Natural Sciences
☐ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
Comprehensive treatment of relational theory, non-relational database models, transaction processing, concurrency control, and administration of databases in practice. Includes an applied project of significant scope, solving a database challenge for an outside client and formally presenting the results. Special Note: Not available for credit to students who have completed CSCE A460.

16a. Course Prerequisite(s) (list prefix and number or test code and score)
n/a

16b. Co-requisite(s) (concurrent enrollment required)
n/a

16c. Automatic Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16d. Registration Restriction(s) (non-codable)
Graduate standing

17. ☒ Mark if course has fees Standard SOE fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Create an elective in support of the proposed new Master's degree program in Computer Science & Engineering and the existing Master's degree in Interdisciplinary Studies.

Initiator (faculty only)
Kirk Scott
Initiator (TYPE NAME)

Approved
Disapproved
Dean/Director of School/College
Date

Approved
Disapproved
Undergraduate/Graduate Academic
Board Chair
Date

Approved
Disapproved
Provost or Designee
Date

Disapproved
Department Chair
Date

Disapproved
College/School Curriculum Committee Chair
Date

Approved
Disapproved
Course Content Guide
University of Alaska Anchorage
School of Engineering
Department of Computer Science and Engineering

I. Initiation Date: Fall 2014

II. Course Information
A. College: School of Engineering
B. Course Subject/Number: CSCE A660
C. Credits: 3
D. Contact Hours: 3+0
E. Course Title: Advanced Database Systems
F. Repeat Status: No
G. Grading Basis: A-F
H. Course Description: Comprehensive treatment of relational theory, non-relational database models, transaction processing, concurrency control, and administration of databases in practice. Includes an applied project of significant scope, solving a database challenge for an outside client and formally presenting the results. Special Note: Not available for credit to students who have completed CSCE A460.
I. Course Prerequisites: n/a
J. Fees: Yes, standard SOE fee
K. Stacked: Yes: CSCE A460
L. Registration Restrictions: Graduate standing

III. Course Level Justification

This course is an elective for any graduate student with an understanding of the basic concepts of database management systems. This course is stacked with CSCE A460. The prerequisite is one upper division undergraduate course in database systems. The course is principally lecture based, using a standard, advanced textbook. The course will include an applied project of significant scope. In addition to the requirements for the stacked undergraduate course (CSCE A460), graduate student projects will differ substantially from those for undergraduate student projects. Graduate students will have to find and work with an outside client with a data management challenge of sufficient size and complexity to cover all of the formal elements specified for the project. Graduate students will be expected to conceptualize this data management challenge and create a working solution for it. The results of the project will be formally presented in a public forum and to the outside client.

IV. Instructional Goals and Student Learning Outcomes

<table>
<thead>
<tr>
<th>A. Instructional Goals. The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Provide a thorough treatment of the theoretical foundations of relational database management systems.</td>
</tr>
</tbody>
</table>
2. Indicate how the theoretical foundations are applied in practice.
3. Present information on the concerns and tasks involved in administering a database.
4. Discuss database management systems that may be wholly or partially different from traditional relational systems.

B. **Student Learning Outcomes.** Upon successful completion of this course students will be able to:

<table>
<thead>
<tr>
<th></th>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Relate the theory of database management systems to the practice of database management systems.</td>
<td>Assignments, Exams, <em>Advanced Project</em></td>
</tr>
<tr>
<td>2. Install, configure, and administer a database management system.</td>
<td>Assignments, <em>Advanced Project</em></td>
</tr>
<tr>
<td>3. Design a database and write queries for it.</td>
<td>Assignments, <em>Advanced Project</em></td>
</tr>
<tr>
<td>4. Implement a system that correctly and successfully supports secure, concurrent transactions in a multi-user environment.</td>
<td><em>Advanced Project</em></td>
</tr>
<tr>
<td>5. <em>Work with a client to elicit user requirements and system specifications.</em></td>
<td><em>Advanced Project</em></td>
</tr>
<tr>
<td>6. <em>Write and present the results of their project in a public forum and to the client.</em></td>
<td><em>Advanced Project</em></td>
</tr>
</tbody>
</table>

V. **Guidelines for Evaluation**

A. Assignments
B. Exams
C. *Advanced Project*

VI. **Topical Course Outline**

1. The Relational Model
   a. Tuples and relations
   b. Relational algebra
   c. Relational calculus
2. Relational Design
   a. Functional dependencies
   b. Normalization
   c. Semantic modeling
3. Query Processing
   a. Simple queries
   b. Embedded Structured Query Language (SQL)
   c. Java Database Connectivity (JDBC)
   d. Transaction processing
4. Database Administration
   a. File systems and physical design
   b. Concurrency control
c. Transaction rollback and recovery
d. Security
e. Optimization

5. Types of Databases
   a. Spatial and temporal databases
   b. Distributed databases
   c. Web databases
   d. Extensible Markup Language (XML) and databases
   e. Logic-based databases

6. Object-Orientation and Databases
   a. Relations and classes
   b. Object databases
   c. Object-relational databases

VII. Suggested Texts

Wesley, Boston, MA, 2011.
Welling, L. and Thomson, L. PHP and MySQL Web Development, Addison Wesley,
Boston, MA, 2009.

VIII. Bibliography

1a. School or College
EN SOENG

1b. Division
No Division Code

1c. Department
Computer Science & Engineering

2. Course Prefix
CSCE

3. Course Number
A460

4. Previous Course Prefix & Number
n/a

5a. Credits/CEUs
3

5b. Contact Hours (Lecture + Lab)
(3+0)

6. Complete Course Title
Database Systems II

Abbreviated Title for Transcript (30 character)

7. Type of Course
☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action:
☐ Add or ☒ Change or ☐ Delete

If a change, mark appropriate boxes:
☐ Prefix ☐ Course Number ☒ Repeat Status ☐ Credits ☐ Contact Hours ☐ Grade Basis ☐ Cross-Listed/Stacked
☒ Title ☐ Course Prerequisites ☐ Requisites ☐ Course Description ☐ Registration Restrictions
☐ Test Score Prerequisites ☐ Co-requisites ☐ Other Course Content Guide (please specify)

9. Repeat Status No # of Repeats n/a Max Credits n/a

10. Grading Basis
☒ A-F ☐ P/NP ☐ NG

11. Implementation Date
From: Fall/2014 To: 99/9999

12. ☐ Cross Listed with
Stacked with CSCE A660

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

<table>
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<tr>
<th>Impact Program/Course</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
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</thead>
<tbody>
<tr>
<td>1. BA/BS Computer Science</td>
<td>10/26/2013</td>
<td>Kenrick Mock</td>
</tr>
<tr>
<td>2. BSE Computer Systems Engineering</td>
<td>10/26/2013</td>
<td>Kenrick Mock</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initiator Name (typed): Kirk Scott Initiator Signed Initials: __________ Date: __________

13b. Coordination Email
Date: 11/4/2013
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 11/4/2013

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
In-depth treatment of relational theory, non-relational database models, transaction processing, concurrency control, and administration of databases in practice. Course includes an applied project of significant scope. Special note: Not available for credit to students who have completed CSCE A660.

16a. Course Prerequisite(s) (list prefix and number or test code and score)
CSCE A360 with a minimum grade of C.

16b. Co-requisite(s) (concurrent enrollment required)
n/a

16c. Automatic Restriction(s)
☐ College ☐ Major ☐ Class ☐ Level

16d. Registration Restriction(s) (non-codable)
n/a

17. ☒ Mark if course has fees Standard SOE fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Stack with graduate course in support of proposed MS in Computer Engineering & Computer Science. Title changed to differentiate from the graduate level naming convention.

Initiator (faculty only) Date
Kirk Scott
Initiator (TYPE NAME)

Approved Disapproved
☐ Dean/Director of School/College Date

Approved Disapproved
☐ Undergraduate/Graduate Academic Date

Approved Disapproved
☐ Board Chair Date

Approved Disapproved
☐ Provost or Designee Date
Course Content Guide
University of Alaska Anchorage
School of Engineering
Department of Computer Science and Engineering

I. Initiation Date: Fall 2014

II. Course Information
A. College: School of Engineering
B. Course Subject/Number: CSCE A460
C. Credits: 3
D. Contact Hours: (3+0) 45 contact lecture hours (3 contact lecture hours/week x 15 weeks = 45) plus 90 hours outside work (6 hours outside lecture/week x 15 weeks = 90) for a total of 135 hours
E. Course Title: Database Systems II
F. Repeat Status: No
G. Grading Basis: A-F
H. Course Description: In-depth treatment of relational theory, non-relational database models, transaction processing, concurrency control, and administration of databases in practice. Course includes an applied project of significant scope. Special note: Not available for credit to students who have completed CSCE A660.
I. Course Prerequisites: CSCE A360 with a minimum grade of C.
J. Fees: Yes, standard SOE fee
K. Stacked: Yes: CSCE A660

III. Course Level Justification

This course is typically taught at the upper division level and depends on an understanding of the concepts of database management systems taught at the 300-level.

IV. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. The instructor will:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Provide a thorough treatment of the theoretical foundations of relational database management systems.</td>
</tr>
<tr>
<td>2.</td>
<td>Indicate how the theoretical foundations are applied in practice.</td>
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<tr>
<td>3.</td>
<td>Present information on the concerns and tasks involved in administering a database.</td>
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<tr>
<td>4.</td>
<td>Discuss database management systems that may be wholly or partially different from traditional relational systems.</td>
</tr>
</tbody>
</table>

B. Student Learning Outcomes. Upon successful completion of this course students will be able to:

<table>
<thead>
<tr>
<th></th>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Relate the theory of database management</td>
</tr>
</tbody>
</table>
systems to the practice of database management systems.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Install, configure, and administer a database management system.</td>
<td>Assignments, Project</td>
</tr>
<tr>
<td>3.</td>
<td>Design a database and write queries for it.</td>
<td>Assignments, Project</td>
</tr>
<tr>
<td>4.</td>
<td>Implement a system that correctly and successfully supports secure, concurrent transactions in a multi-user environment.</td>
<td>Project</td>
</tr>
</tbody>
</table>

V. Topical Course Outline

1. The Relational Model
   a. Tuples and relations
   b. Relational algebra
   c. Relational calculus

2. Relational Design
   a. Functional dependencies
   b. Normalization
   c. Semantic modeling

3. Query Processing
   a. Simple queries
   b. Embedded Structured Query Language (SQL)
   c. Java Database Connectivity (JDBC)
   d. Transaction processing

4. Database Administration
   a. File systems and physical design
   b. Concurrency control
   c. Transaction rollback and recovery
   d. Security
   e. Optimization

5. Types of Databases
   a. Spatial and temporal databases
   b. Distributed databases
   c. Web databases
   d. Extensible Markup Language (XML) and databases
   e. Logic-based databases

6. Object-Orientation and Databases
   a. Relations and classes
   b. Object databases
   c. Object-relational databases

VI. Suggested Texts

VII. **Bibliography**


## Course Action Request

### University of Alaska Anchorage

**Proposal to Initiate, Add, Change, or Delete a Course**

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN SOENGR</td>
<td>No Division Code</td>
<td>Computer Science &amp; Engineering</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCE</td>
<td>A662</td>
<td>n/a</td>
<td>3</td>
<td>(Lecture + Lab)</td>
</tr>
</tbody>
</table>

### 6. Complete Course Title

**Advanced Data Mining**

**Abbreviated Title for Transcript (30 character)**

### 7. Type of Course

- [ ] Academic
- [ ] Preparatory/Development
- [ ] Non-credit
- [ ] CEU
- [ ] Professional Development

### 8. Type of Action: [ ] Add or [ ] Change or [ ] Delete

**If a change, mark appropriate boxes:**

- [ ] Prefix
- [ ] Credits
- [ ] Title
- [ ] Grading Basis
- [ ] Course Description
- [ ] Test Score Prerequisites
- [ ] Automatic Restrictions
- [ ] College
- [ ] Level
- [ ] Other (please specify)

### 9. Repeat Status No # of Repeats

- [ ] n/a
- [ ] Max Credits

### 10. Grading Basis

- [ ] A-F
- [ ] P/NP
- [ ] NG

### 11. Implementation Date

- [ ] semester/year
- From: Fall/2014 To: 99/9999

### 12. Cross Listed with

- [ ] Stacked with CSCE A462

### 13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

**Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.**

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</tr>
</tbody>
</table>

Initiator Name (typed): Kirk Scott

Initiator Signed Initials: __________

Date: __________

### 14. General Education Requirement

Mark appropriate box:

- [ ] Oral Communication
- [ ] Written Communication
- [ ] Quantitative Skills
- [ ] Humanities
- [ ] Fine Arts
- [ ] Social Sciences
- [ ] Natural Sciences
- [ ] Integrative Capstone

### 15. Course Description (suggested length 20 to 50 words)

Survey and application of techniques for classification, clustering, and association rule mining. Covers rule-based, tree-based, statistical, and regression approaches. Project involving an original data set, including integration, formatting, conceptualization, hypothesis testing, analysis, evaluation, and presentation of results. Special Note: Not available for credit to students who have completed CSCE A462.

### 16a. Course Prerequisite(s) (list prefix and number or test code and score)

- [ ] n/a

### 16b. Co-requisite(s) (concurrent enrollment required)

- [ ] n/a

### 16c. Automatic Restriction(s)

- [ ] College
- [ ] Major
- [ ] Class
- [ ] Level

### 16d. Registration Restriction(s) (non-codable)

- [ ] Graduate standing

### 17. Mark if course has fees Standard SOE fee

### 18. Mark if course is a selected topic course

### 19. Justification for Action

Create an elective in support of the proposed new Master's degree program in Computer Science & Engineering and the existing Master's degree in Interdisciplinary Studies.

Initiator (faculty only) Date

Kirk Scott

Initiator (TYPE NAME)

- [ ] Approved
- [ ] Disapproved

Dean/Director of School/College Date

Undergraduate/Graduate Academic Board Chair Date

Approved

Provost or Designee Date

Disapproved
I. **Initiation Date**: Fall 2014

II. **Course Information**
   A. **College**: School of Engineering
   B. **Course Subject/Number**: CSCE A662
   C. **Credits**: 3
   D. **Contact Hours**: 3+0
   E. **Course Title**: Advanced Data Mining
   F. **Repeat Status**: No
   G. **Grading Basis**: A-F
   H. **Course Description**: Survey and application of techniques for classification, clustering, and association rule mining. Covers rule-based, tree-based, statistical, and regression approaches. Project involving an original data set, including integration, formatting, conceptualization, hypothesis testing, analysis, evaluation, and presentation of results. Special Note: Not available for credit to students who have completed CSCE A462.
   I. **Course Prerequisites**: n/a
   J. **Fees**: Yes, standard SOE fee
   K. **Stacked**: Yes: CSCE A462
   L. **Registration Restrictions**: Graduate standing

III. **Course Level Justification**

This course is an elective for any graduate student with an understanding of the basic concepts of database management systems. *This course is stacked with CSCE A462. The prerequisite is one upper division undergraduate course in database systems. The course is principally lecture based, using a standard, advanced textbook. The course will include an applied project of significant scope. In addition to the requirements for the stacked undergraduate course (CSCE A462), graduate student projects will differ substantially from those for undergraduate student projects. Graduate students will have to identify, integrate, and format an original set of data for data mining purposes. In addition to this formal, mechanical requirement, it then falls upon the student to conceptualize what relationships might realistically be found in this original data set, form and test hypotheses using data mining techniques, analyze and compare results, and ultimately, evaluate the utility and validity of the results. It should be noted that graduate students face the possibility of a "failed experiment" in which their project does not produce statistically significant results. In this case, it will be necessary to present a full analysis and explanation of what was not found, as opposed to what was found.*
IV. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. The instructor will:

1. Present an array of common, well-understood data mining algorithms with examples of their application, including classification, clustering, and association rule mining.

2. Discuss the theoretical and practical basis for the implementation of covering approaches and divide and conquer approaches that result in rule sets, trees, and other representations of knowledge.

3. Present a survey of typical approaches to evaluate the results of data mining.

4. Demonstrate the application of a data mining software package to a data set.

B. Student Learning Outcomes. Upon successful completion of this course students will be able to:

<table>
<thead>
<tr>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Answer questions and present information, both verbal and statistical, on the types of data mining algorithms, how they work, their theoretical basis, their evaluation and comparison, and practical aspects of their use.</td>
</tr>
<tr>
<td>2. Do research using library or web-based resources to find additional information on the current development and application of data mining techniques.</td>
</tr>
<tr>
<td>3. Select a data set of interest and apply an array of different data mining techniques to it, using existing implementations of the algorithms, and analyze and present the results in a public forum.</td>
</tr>
<tr>
<td>4. Integrate and format raw data for the purposes of data mining.</td>
</tr>
<tr>
<td>5. Form meaningful hypotheses about relationships in data and analyze and explain both successful and unsuccessful tests of the hypotheses using data mining techniques.</td>
</tr>
</tbody>
</table>

V. Guidelines for Evaluation

A. Applied research paper
B. Applied Project
C. Homework
D. Exams

VI. Topical Course Outline

1. Knowledge Representation
   a. Tables
   b. Linear models
   c. Trees
2. Data Mining Algorithms
   a. Decision trees
   b. Classification rules
   c. Association rules
   d. Linear models
   e. Instance based methods
   f. Numeric prediction
   g. Bayesian approaches
   h. Simple and hierarchical clustering
   i. Semi-supervised techniques
   j. Multi-instance techniques

3. Evaluating Results
   a. Training vs. testing
   b. Cross-validation and other validation techniques
   c. Comparing different data mining schemes
   d. Statistical methods
   e. Information theoretic methods
   f. Including costs and benefits in evaluation

VII. Suggested Texts


VIII. Bibliography

# Course Action Request

## University of Alaska Anchorage

### Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
<tr>
<th>1a. School or College</th>
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<td>1b. Division</td>
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<td>3. Course Number</td>
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<td>5a. Credits/CEUs</td>
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<td>5b. Contact Hours (Lecture + Lab)</td>
<td>(3+0)</td>
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<td>6. Complete Course Title</td>
<td>Data Mining</td>
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<td>7. Type of Course</td>
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<tr>
<td>9. Repeat Status No</td>
<td># of Repeats</td>
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<td>10. Grading Basis</td>
<td>A-F</td>
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<tr>
<td>11. Implementation Date</td>
<td>From: Fall/2014</td>
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<td>12. Cross Listed with</td>
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<td>List any programs or college requirements that require this course.</td>
</tr>
<tr>
<td>13b. Coordination Email</td>
<td>Date: 11/4/2013</td>
</tr>
<tr>
<td>submitted to Faculty Listserv:</td>
<td>(<a href="mailto:uaa-faculty@lists.uaa.alaska.edu">uaa-faculty@lists.uaa.alaska.edu</a>)</td>
</tr>
<tr>
<td>14. General Education Requirement</td>
<td>Mark appropriate box:</td>
</tr>
<tr>
<td>Oral Communication</td>
<td>Written Communication</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>Social Sciences</td>
</tr>
<tr>
<td>15. Course Description (suggested length 20 to 50 words)</td>
<td>Survey and application of techniques for classification, clustering, and association rule mining. Covers rule-based, tree-based, statistical, and regression approaches. Special note: Not available for credit to students who have completed CSCE A662.</td>
</tr>
<tr>
<td>16a. Course Prerequisite(s) (list prefix and number or test code and score)</td>
<td>CSCE A360 with a minimum grade of C.</td>
</tr>
<tr>
<td>16b. Co-requisite(s) (concurrent enrollment required)</td>
<td>n/a</td>
</tr>
<tr>
<td>16c. Automatic Restriction(s)</td>
<td>College</td>
</tr>
<tr>
<td>16d. Registration Restriction(s) (non-codable)</td>
<td>n/a</td>
</tr>
<tr>
<td>17. Mark if course has fees Standard SOE fee</td>
<td></td>
</tr>
<tr>
<td>18. Mark if course is a selected topic course</td>
<td></td>
</tr>
<tr>
<td>19. Justification for Action</td>
<td>Stack with graduate course in support of proposed MS in Computer Engineering &amp; Computer Science.</td>
</tr>
</tbody>
</table>

### Initiator Name (typed): Kirk Scott

| Initiator Signed Initials: | Date: |

### Justification for Action

Stack with graduate course in support of proposed MS in Computer Engineering & Computer Science.

### Initiator (faculty only) | Kirk Scott

| Approved | Disapproved |

### Dean/Director of School/College | Date

### Undergraduate/Graduate Academic Board Chair | Date

### Provost or Designee | Date
I. **Initiation Date:** Fall 2014

II. **Course Information**
   A. **College:** School of Engineering  
   B. **Course Subject/Number:** CSCE A462  
   C. **Credits:** 3  
   D. **Contact Hours:** (3+0) 45 contact lecture hours (3 contact lecture hours/week x 15 weeks = 45) plus 90 hours outside work (6 hours outside lecture/week x 15 weeks = 90) for a total of 135 hours  
   E. **Course Title:** Data Mining  
   F. **Repeat Status:** No  
   G. **Grading Basis:** A-F  
   H. **Course Description:** Survey and application of techniques for classification, clustering, and association rule mining. Covers rule-based, tree-based, statistical, and regression approaches. Special note: Not available for credit to students who have completed CSCE A662.  
   I. **Course Prerequisites:** CSCE A360 with a minimum grade of C.  
   J. **Fees:** Yes, standard SOE fee  
   K. **Stacked:** Yes: CSCE A662

III. **Course Level Justification**

This course is typically taught at the upper division level and depends on an understanding of basic concepts of data organization and algorithmic thinking provided in 300-level courses.

IV. **Instructional Goals and Student Learning Outcomes**

<table>
<thead>
<tr>
<th>A. <strong>Instructional Goals.</strong></th>
<th>The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Present an array of common, well-understood data mining algorithms with examples of their application, including classification, clustering, and association rule mining.</td>
</tr>
<tr>
<td>2.</td>
<td>Discuss the theoretical and practical basis for the implementation of covering approaches and divide and conquer approaches that result in rule sets, trees, and other representations of knowledge.</td>
</tr>
<tr>
<td>3.</td>
<td>Present a survey of typical approaches to evaluate the results of data mining.</td>
</tr>
<tr>
<td>4.</td>
<td>Demonstrate the application of a data mining software package to a data set.</td>
</tr>
</tbody>
</table>
B. **Student Learning Outcomes.** Upon successful completion of this course students will be able to:

<table>
<thead>
<tr>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe both verbally and statistically how different types of data mining algorithms work. For example, their theoretical basis, their evaluation and comparison, and practical aspects of their use.</td>
</tr>
<tr>
<td>2. Find relevant literature about data mining techniques using library or web resources and summarize the results in written form.</td>
</tr>
<tr>
<td>3. Apply multiple data mining techniques to a data set using data mining tools, analyze the results, and summarize the results in an oral presentation.</td>
</tr>
</tbody>
</table>

V. **Topical Course Outline**

1. **Knowledge Representation**
   a. Tables
   b. Linear models
   c. Trees
   d. Rules
2. **Data Mining Algorithms**
   a. Decision trees
   b. Classification rules
   c. Association rules
   d. Linear models
   e. Instance based methods
   f. Numeric prediction
   g. Bayesian approaches
   h. Simple and hierarchical clustering
   i. Semi-supervised techniques
   j. Multi-instance techniques
3. **Evaluating Results**
   a. Training vs. testing
   b. Cross-validation and other validation techniques
   c. Comparing different data mining schemes
   d. Statistical methods
   e. Information theoretic methods
   f. Including costs and benefits in evaluation

VI. **Suggested Texts**

VII. Bibliography

# Course Action Request

**University of Alaska Anchorage**

Proposal to Initiate, Add, Change, or Delete a Course

**1a. School or College**  
EN SOENGR

**1b. Division**  
No Division Code

**1c. Department**  
Computer Science & Engineering

**2. Course Prefix**  
CSCE

**3. Course Number**  
A665

**4. Previous Course Prefix & Number**  
n/a

**5a. Credits/CEUs**  
3

**5b. Contact Hours**  
(Lecture + Lab)  
(3+0)

**6. Complete Course Title**  
Advanced Computer and Network Security  
Adv Comp & Network Security

**Abbreviated Title for Transcript (30 character)**  
Adv Comp & Network Security

**7. Type of Course**  
- Academic
- Preparatory/Development
- Non-credit
- CEU
- Professional Development

**8. Type of Action:**  
- Add
- Change
- Delete

**9. Repeat Status No**  
- # of Repeats n/a
- Max Credits n/a

**10. Grading Basis**  
- A-F
- P/NP
- NG

**11. Implementation Date**  
From: Fall/2014  
To: 99/9999

**12. Cross Listed with**  
CSCE A465

**13a. Impacted Courses or Programs:** List any programs or college requirements that require this course. Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
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<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initiator Name (typed): Kenrick Mock  
Initiator Signed Initials: _________  
Date: __________________

**13b. Coordination Email**  
Date: 11/4/2013  
submitted to Faculty Listserv: [uaa-faculty@lists.uaa.alaska.edu](mailto:uaa-faculty@lists.uaa.alaska.edu)

**13c. Coordination with Library Liaison**  
Date: 11/4/2013

**14. General Education Requirement**

Mark appropriate box:  
- Oral Communication
- Written Communication
- Quantitative Skills
- Humanities
- Fine Arts
- Social Sciences
- Natural Sciences
- Integrative Capstone

**15. Course Description** (suggested length 20 to 50 words)

Analysis of computer and network attack techniques and methods to defend against them including firewalls, virtual private networks, network intrusion detection, and denial of service. Malware, packet sniffers, wireless networks, cellular networks, and wired networks are discussed. Students will be required to complete a literature review of recent research in computer and network security, write the results of that review in a research summary paper, and complete a presentation of these findings in a public forum. Special Note: Not available for credit to students who have completed CSCE A465.

**16a. Course Prerequisite(s) (list prefix and number or test code and score)**  
n/a

**16b. Co-requisite(s) (concurrent enrollment required)**  
n/a

**16c. Automatic Restriction(s)**  
- College
- Major
- Class
- Level

**16d. Registration Restriction(s) (non-codable)**  
Graduate standing

**17. Mark if course has fees Standard SOE fee**  

**18. Mark if course is a selected topic course**  

**19. Justification for Action**  
Create an elective in support of the proposed new Master's degree program in Computer Science & Engineering and the existing Master's degree in Interdisciplinary Studies.
<table>
<thead>
<tr>
<th>Role</th>
<th>Date</th>
<th>Approved</th>
<th>Disapproved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiator (faculty only)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kenrick Mock</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiator (TYPE NAME)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dean/Director of School/College</td>
<td></td>
<td></td>
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<tr>
<td>Department Chair</td>
<td></td>
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<tr>
<td>Undergraduate/Graduate Academic Board Chair</td>
<td></td>
<td></td>
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<tr>
<td>College/School Curriculum Committee Chair</td>
<td></td>
<td></td>
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<tr>
<td>Provost or Designee</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Course Content Guide
University of Alaska Anchorage
School of Engineering
Department of Computer Science and Engineering

I. Initiation Date: Fall 2014

II. Course Information
A. College: School of Engineering
B. Course Subject/Number: CSCE A665
C. Credits: 3
D. Contact Hours: 3+0
E. Course Title: Advanced Computer and Network Security
F. Repeat Status: No
G. Grading Basis: A-F
H. Course Description: Analysis of computer and network attack techniques and methods to defend against them including firewalls, virtual private networks, network intrusion detection, and denial of service. Malware, packet sniffers, wireless networks, cellular networks, and wired networks are discussed. Students will be required to complete a literature review of recent research in computer and network security, write the results of that review in a research summary paper, and complete a presentation of these findings in a public forum. Special Note: Not available for credit to students who have completed CSCE A465.

I. Course Prerequisites: n/a
J. Fees: Yes, standard SOE fee
K. Stacked: Yes: CSCE A465
L. Registration Restrictions: Graduate standing

III. Course Level Justification

This course is an elective for any graduate student who seeks knowledge in the field of computer and network security. In addition to the requirements for the stacked undergraduate course (CSCE A465), graduate students will be required to complete a literature review of recent research in an applied or theoretical area of computer security, write the results of that review in a research summary paper, and complete a presentation of these findings in a public forum.

IV. Instructional Goals and Student Learning Outcomes

<table>
<thead>
<tr>
<th>A. Instructional Goals.</th>
<th>The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe security problems encountered with computer systems and</td>
<td></td>
</tr>
</tbody>
</table>
2. Explain how to prevent computer and network security breaches.
3. Demonstrate how to trace and identify computer and network security threats.
4. Describe the importance of professionalism.

<table>
<thead>
<tr>
<th>B. Student Learning Outcomes. Students will be able to:</th>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify potential security problems with computer systems and computer network systems.</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>2. Design computer and network systems resistant to attack.</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>3. Determine the source of computer and network security threats.</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>4. Demonstrate professionalism when interacting with colleagues, faculty, and staff.</td>
<td>Assignments, Project</td>
</tr>
<tr>
<td>5. Conduct a literature review, write a research summary paper, and present the findings in a public forum.</td>
<td>Research Summary Paper, Presentation</td>
</tr>
</tbody>
</table>

V. Guidelines for Evaluation
A. Assignments
B. Exams
C. Project
D. Research Summary Paper
E. Presentation

VI. Topical Course Outline
1. Introduction, Network Security Overview
2. Professionalism in Computer and Network Security
3. Types of Security Attacks and Services
4. Symmetric and Asymmetric Encryption
5. Recent Threats and Attacks
6. Kerberos
7. X.509
8. Pretty Good Privacy (PGP)
9. Secure/Multipurpose Internet Mail Extensions (S/MIME)
10. Internet Protocol Security
11. Secure Sockets Layer (SSL)
12. Transport Layer Security (TLS)
14. Wireless and Cellular Security
15. Denial of Service and Distributed Denial of Service (DoS/DDoS)
16. Firewalls
17. Database Security
18. Intrusion Detection and Identification
19. Obfuscation
20. Computer Forensics
21. Anonymity on the Internet (Digital Fingerprints)
22. Legal Implications to Security

VII. Suggested Texts


VIII. Bibliography

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College
EN SOENGR

1b. Division
No Division Code

1c. Department
Computer Science & Engineering

2. Course Prefix
CSCE

3. Course Number
A465

4. Previous Course Prefix & Number
n/a

5a. Credits/CEUs
3

5b. Contact Hours
(Lecture + Lab) (3+0)

6. Complete Course Title
Computer and Network Security

7. Type of Course
☒ Academic
☐ Preparatory/Development
☐ Non-credit
☐ CEU
☐ Professional Development

8. Type of Action:
☐ Add
☒ Change
☐ Delete

If a change, mark appropriate boxes:
☐ Prefix
☐ Course Number
☐ Credits
☐ Contact Hours
☐ Title
☐ Repeat Status
☐ Grading Basis
☒ Cross-Listed/Stacked
☐ Course Description
☐ Course Prerequisites
☐ Test Score Prerequisites
☒ Co-requisites
☐ Automatic Restrictions
☐ Registration Restrictions
☐ General Education Requirement
☐ Class
☐ Level
☐ College
☐ Major
☒ Other Course Content Guide (please specify)

9. Repeat Status No
☐ # of Repeats n/a
☐ Max Credits n/a

10. Grading Basis
☒ A-F
☐ P/NP
☐ NG

11. Implementation Date
From: Fall/2014
To: 99/9999

12. ☐ Cross Listed with
Stacked with CSCE A665

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BA/BS Computer Science</td>
<td>10/26/2013</td>
<td>Kenrick Mock</td>
</tr>
<tr>
<td>2. BSE Computer Systems Engineering</td>
<td>10/26/2013</td>
<td>Kenrick Mock</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initiator Name (typed): Kenrick Mock
Initiator Signed Initials: _________
Date: __________

13b. Coordination Email
Date: 11/4/2013
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 11/4/2013

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication
☐ Written Communication
☐ Quantitative Skills
☐ Humanities
☐ Fine Arts
☐ Social Sciences
☐ Natural Sciences
☐ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
Analysis of computer and network attack techniques and methods to defend against them including firewalls, virtual private networks, network intrusion detection, and denial of service. Course includes coverage of malware, packet sniffers, wireless networks, cellular networks, and wired networks. Special note: Not available for credit to students who have completed CSCE A665.

16a. Course Prerequisite(s) (list prefix and number or test code and score)
CSCE A365 with a minimum grade of C.

16b. Co-requisite(s) (concurrent enrollment required)
n/a

16c. Automatic Restriction(s)
☐ College
☐ Major
☐ Class
☐ Level

16d. Registration Restriction(s) (non-codable)
n/a

17. ☒ Mark if course has fees
Stacked with Standard SOE fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Stack with graduate course in support of proposed MS in Computer Engineering & Computer Science.

Initiator (faculty only)
Kenrick Mock
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved

Dean/Director of School/College
Date

Undergraduate/Graduate Academic
Board Chair
Date

Provost or Designee
Date
Course Content Guide  
University of Alaska Anchorage  
School of Engineering  
Department of Computer Science and Engineering

I. **Initiation Date**: Fall 2014

II. **Course Information**
   A. **College**: School of Engineering  
   B. **Course Subject/Number**: CSCE A465  
   C. **Credits**: 3  
   D. **Contact Hours**: (3+0) 45 contact lecture hours (3 contact lecture hours/week x 15 weeks = 45) plus 90 hours outside work (6 hours outside lecture/week x 15 weeks = 90) for a total of 135 hours  
   E. **Course Title**: Computer and Network Security  
   F. **Repeat Status**: No  
   G. **Grading Basis**: A-F  
   H. **Course Description**: Analysis of computer and network attack techniques and methods to defend against them including firewalls, virtual private networks, network intrusion detection, and denial of service. Course includes coverage of malware, packet sniffers, wireless networks, cellular networks, and wired networks. Special note: Not available for credit to students who have completed CSCE A665.  
   I. **Course Prerequisites**: CSCE A365 with a minimum grade of C.  
   J. **Fees**: Yes, standard SOE fee  
   K. **Stacked**: Yes: CSCE A665

III. **Course Level Justification**

In this course students will use concepts covered at the 300 level to design, implement, and analyze the security of computer systems and networks.

IV. **Instructional Goals and Student Learning Outcomes**

<table>
<thead>
<tr>
<th>A. <strong>Instructional Goals</strong></th>
<th>The instructor will:</th>
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<tbody>
<tr>
<td>1.</td>
<td>Describe security problems encountered with computer systems and computer network systems.</td>
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<td>2.</td>
<td>Explain how to prevent computer and network security breaches.</td>
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<td>Demonstrate how to trace and identify computer and network security threats.</td>
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<td>4.</td>
<td>Describe the importance of professionalism.</td>
</tr>
</tbody>
</table>
B. **Student Learning Outcomes.** Students will be able to:

<table>
<thead>
<tr>
<th></th>
<th>Assessment method</th>
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</thead>
<tbody>
<tr>
<td>1. Identify potential security problems with computer systems and computer network systems.</td>
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<tr>
<td>4. Demonstrate professionalism when interacting with colleagues, faculty, and staff.</td>
<td>Assignments, Project</td>
</tr>
</tbody>
</table>

V. **Topical Course Outline**

1. Introduction, Network Security Overview
2. Professionalism in Computer and Network Security
3. Types of Security Attacks and Services
4. Symmetric and Asymmetric Encryption
5. Recent Threats and Attacks
6. Kerberos
7. X.509
8. Pretty Good Privacy (PGP)
9. Secure/Multipurpose Internet Mail Extensions (S/MIME)
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11. Secure Sockets Layer (SSL)
12. Transport Layer Security (TLS)
14. Wireless and Cellular Security
15. Denial of Service and Distributed Denial of Service (DoS/DDoS)
16. Firewalls
17. Database Security
18. Intrusion Detection and Identification
19. Obfuscation
20. Computer Forensics
21. Anonymity on the Internet (Digital Fingerprints)
22. Legal Implications to Security
VI. **Suggested Texts**


VII. **Bibliography**

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN SOENGR</td>
<td>No Division Code</td>
<td>Computer Science &amp; Engineering</td>
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<table>
<thead>
<tr>
<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours</th>
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<tbody>
<tr>
<td>CSCE</td>
<td>A667</td>
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<td>3</td>
<td>(Lecture + Lab)</td>
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<table>
<thead>
<tr>
<th>6. Complete Course Title</th>
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<tbody>
<tr>
<td>Advanced Computer Network Systems</td>
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</tbody>
</table>

Abbreviated Title for Transcript (30 character)

<table>
<thead>
<tr>
<th>7. Type of Course</th>
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</tr>
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| 8. Type of Action: | Add | Change | Delete |

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<th>If a change, mark appropriate boxes:</th>
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<td>Credits</td>
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<td>Course Description</td>
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<tr>
<td>Test Score Prerequisites</td>
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<tr>
<td>Other</td>
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<table>
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<tr>
<th>9. Repeat Status No</th>
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<th>Max Credits</th>
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<td>n/a</td>
<td>n/a</td>
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<table>
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<tr>
<th>10. Grading Basis</th>
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</thead>
<tbody>
<tr>
<td>A-F</td>
</tr>
</tbody>
</table>

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<tr>
<th>11. Implementation Date</th>
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<td>From: Fall/2014</td>
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<td>To: 99/9999</td>
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<tbody>
<tr>
<td>Stacked with</td>
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</tbody>
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Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

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<td>3.</td>
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<td></td>
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</table>

Initiator Name (typed): Kenrick Mock
Initiator Signed Initials: 
Date: 

13b. Coordination Email: Date: 11/4/2013 
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison: Date: 11/4/2013

14. General Education Requirement
Mark appropriate box:

<table>
<thead>
<tr>
<th>Oral Communication</th>
<th>Written Communication</th>
<th>Quantitative Skills</th>
<th>Humanities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine Arts</td>
<td>Social Sciences</td>
<td>Natural Sciences</td>
<td>Integrative Capstone</td>
</tr>
</tbody>
</table>

15. Course Description (suggested length 20 to 50 words)
Covers network architectures, layered protocols, internet protocols, and network service interfaces. Emphasis on design and implementation of networking hardware, including routers, bridges, switches, hubs, and repeaters. Local networks, addressing, routing, flow control, queuing, routing protocols, packet-loss.

16a. Course Prerequisite(s) (list prefix and number or test code and score)
n/a

16b. Co-requisite(s) (concurrent enrollment required)
n/a

16c. Automatic Restriction(s)
| College | Major | Class | Level |

16d. Registration Restriction(s) (non-codable)
Graduate standing

17. Mark if course has fees Standard SOE fee

18. Mark if course is a selected topic course

19. Justification for Action
Required course in support of the proposed new Master's degree program in Computer Science & Engineering and potential offering within the existing Master's degree in Interdisciplinary Studies.

Initiator (faculty only) Date

Initiator (TYPE NAME)

[Signature]

Dean/Director of School/College Date

Undergraduate/Graduate Academic Date

Board Chair

Provost or Designee Date

Department Chair Date

College/School Curriculum Committee Chair Date
Course Content Guide  
University of Alaska Anchorage  
School of Engineering  
Department of Computer Science and Engineering

I.  **Initiation Date**: Fall 2014

II. **Course Information**
   A. **College**: Engineering  
   B. **Course Subject/Number**: CSCE A667  
   C. **Credits**: 3  
   D. **Contact Hours**: 3+0  
   E. **Course Title**: Advanced Computer Network Systems  
   F. **Repeat Status**: No  
   G. **Grading Basis**: A-F  
   H. **Course Description**: Covers network architectures, layered protocols, internet protocols, and network service interfaces. Emphasis on design and implementation of networking hardware, including routers, bridges, switches, hubs, and repeaters. Local networks, addressing, routing, flow control, queuing, routing protocols, packet-loss.  
   I. **Course Prerequisites**: n/a  
   J. **Fees**: Yes  
   K. **Registration Restrictions**: Graduate standing

III. **Course Level Justification**

   This course builds upon networking concepts learned at the undergraduate level in CSCE A365.

IV. **Instructional Goals and Student Learning Outcomes**

<table>
<thead>
<tr>
<th>A. <strong>Instructional Goals.</strong> The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Compare and contrast the design and implementation of different networking architectures.</td>
</tr>
<tr>
<td>2. Demonstrate how local area network equipment is connected to the Internet backbone.</td>
</tr>
<tr>
<td>3. Demonstrate network layer protocols used in autonomous systems connected to the Internet.</td>
</tr>
<tr>
<td>4. Explain shortest path algorithm code in relation to different engineering applications.</td>
</tr>
<tr>
<td>5. Demonstrate how to write programs that implement different network</td>
</tr>
</tbody>
</table>
6. Demonstrate how to write a networked application using a variety of protocols.

B. **Student Learning Outcomes.** Students will be able to:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Design network architecture given a real-world set of requirements.</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>2.</td>
<td>Understand the technologies involved with voice and data communication.</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>3.</td>
<td>Create a program implementing layer 2 and 3 network protocols.</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>4.</td>
<td>Explain networking equipment that is used in the Internet backbone.</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>5.</td>
<td>Differentiate shortest path algorithms for use by autonomous systems.</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>6.</td>
<td>Identify protocols with highest throughput based on known network parameters.</td>
<td>Assignments, Exams, Project</td>
</tr>
</tbody>
</table>

V. **Guidelines for Evaluation**

A. Assignments
B. Exams
C. Project

VI. **Topical Course Outline**

1. Network Programming review
2. Network topologies
3. Network architectures
4. Signaling, modulation, multiplexing, synchronization
5. Layer 2 protocols
6. Error detection and control
7. Flow control mechanisms
8. Layer 3 protocols
9. Circuit, virtual circuit, and packet switching
10. Autonomous systems
11. Backbone protocols
12. Internet routing protocols (RIP, OSPF, BGP)
13. Multiple-access schemes (CSMA/CD, CSMA/CA, token passing)
14. Wireless networking
15. Networking devices – repeaters, hubs, bridges, switches, routers, gateways
16. Network layer protocols (IP, ARP, ICMP)
17. Shortest path algorithms in Internet architectures
18. TCP and UDP
19. Layer 7 protocols, including HTTP, FTP, DNS, SMTP, Telnet, DHCP
20. Network security overview

VII. Suggested Text


VIII. Bibliography

### Course Action Request

**University of Alaska Anchorage**

**Proposal to Initiate, Add, Change, or Delete a Course**

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>EN SOENGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1b. Division</td>
<td>No Division Code</td>
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<tr>
<td>1c. Department</td>
<td>Computer Science &amp; Engineering</td>
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</table>

<table>
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<tr>
<th>2. Course Prefix</th>
<th>CSCE</th>
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<tbody>
<tr>
<td>3. Course Number</td>
<td>A671</td>
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<td>4. Previous Course Prefix &amp; Number</td>
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<tr>
<td>5a. Credits/CEUs</td>
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</tr>
<tr>
<td>5b. Contact Hours</td>
<td>(Lecture + Lab) (3+0)</td>
</tr>
</tbody>
</table>

### 6. Complete Course Title

**Research Methods in Computer Science and Engineering**

**Research Methods in CS&E**

**Abbreviated Title for Transcript (30 character)**

### 7. Type of Course

- [x] Academic
- [ ] Preparatory/Development
- [ ] Non-credit
- [ ] CEU
- [ ] Professional Development

### 8. Type of Action: [x] Add

If a change, mark appropriate boxes:

- [ ] Prefix
- [ ] Course Number
- [ ] Credits
- [ ] Contact Hours
- [ ] Title
- [ ] Repeat Status
- [ ] Grading Basis
- [ ] Cross-Listed/Stacked
- [ ] Course Prerequisites
- [ ] Co-requisites
- [ ] Test Score Prerequisites
- [ ] Registration Restrictions
- [ ] Automatic Restrictions
- [ ] General Education Requirement
- [ ] Contact
- [ ] Major
- [ ] Class
- [ ] Level
- [ ] Other

### 9. Repeat Status No

# of Repeats n/a

Max Credits n/a

### 10. Grading Basis

- [x] A-F
- [ ] P/NP
- [ ] NG

### 11. Implementation Date

From: Fall/2014  To: 99/9999

### 12. [ ] Cross Listed with

Stacked with

### 13a. Impacted Courses or Programs:

List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

#### Impacted Program/Course

<table>
<thead>
<tr>
<th>Date of Coordination</th>
<th>Chair/Coordinator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date: 11/4/2013</td>
<td></td>
</tr>
</tbody>
</table>

Initiator Name (typed): Martin Cenek  Initiator Signed Initials: _________  Date:________________

### 13b. Coordination Email

Date: 11/4/2013

submitted to Faculty Listserv: [uaa-faculty@lists.uaa.alaska.edu](mailto:uaa-faculty@lists.uaa.alaska.edu)

### 13c. Coordination with Library Liaison

Date: 11/4/2013

### 14. General Education Requirement

Mark appropriate box:

- [ ] Oral Communication
- [ ] Written Communication
- [ ] Quantitative Skills
- [ ] Humanities
- [ ] Fine Arts
- [ ] Social Sciences
- [ ] Natural Sciences
- [ ] Integrative Capstone

### 15. Course Description (suggested length 20 to 50 words)

Covers skills and research methods utilized in computer science and engineering research, including empirical and theoretical research. Discusses the steps in conducting a literature review, writing research proposals and papers, writing a thesis, hypothesis testing, delivering a research presentation, and ethical conduct.

### 16a. Course Prerequisite(s) (list prefix and number or test code and score)

n/a

### 16b. Co-requisite(s) (concurrent enrollment required)

n/a

### 16c. Automatic Restriction(s)

- [ ] College
- [ ] Major
- [ ] Class
- [x] Level

### 16d. Registration Restriction(s) (non-codable)

Graduate standing

### 17. [x] Mark if course has fees Standard SOE fee

### 18. [ ] Mark if course is a selected topic course

### 19. Justification for Action

Required course in support of the proposed new Master's degree program in Computer Science & Engineering and potential offering within the existing Master's degree in Interdisciplinary Studies.

**Initiator (faculty only) Date**

Martin Cenek

Initiator (TYPE NAME) Date

Approved

Disapproved

Dean/Director of School/College Date

Approved

Disapproved

Undergraduate/Graduate Academic Date

Approved

Disapproved

Board Chair Date

Approved

Disapproved

Provost or Designee Date
Course Content Guide
University of Alaska Anchorage
School of Engineering
Department of Computer Science and Engineering

I. Initiation Date: Fall 2014

II. Course Information
A. College: School of Engineering
B. Course Subject/Number: CSCE A671
C. Credits: 3
D. Contact Hours: 3+0
E. Course Title: Research Methods in Computer Science and Engineering
F. Repeat Status: No
G. Grading Basis: A-F
H. Course Description: Covers skills and research methods utilized in computer science and engineering research, including empirical and theoretical research. Discusses the steps in conducting a literature review, writing research proposals and papers, writing a thesis, hypothesis testing, delivering a research presentation, and ethical conduct.
I. Course Prerequisites: n/a
J. Fees: Yes
K. Registration Restrictions: Graduate standing

III. Course Level Justification

This course is a required core course for MS degree-seeking students in Computer Engineering and Computer Science. It provides essential skills and knowledge to ensure student success at graduate level research. Readings, examples, and techniques utilized in the class are at the graduate level and require mastery of computing topics covered at the undergraduate level.

IV. Instructional Goals and Student Learning Outcomes

<table>
<thead>
<tr>
<th>A. Instructional Goals.</th>
<th>The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Provide an overview of strategies to become a well-rounded scholar.</td>
</tr>
<tr>
<td>2.</td>
<td>Illustrate how to author, consume, and critique media used in computing research and the computing industry.</td>
</tr>
<tr>
<td>3.</td>
<td>Demonstrate techniques to become a clear and concise writer of computing research publications. Present common writing errors and tools to effectively detect and fix them.</td>
</tr>
</tbody>
</table>
4. Demonstrate skills to be a competent presenter of 5 minute poster presentations, 15 minute short talks and 45 minute conference talks that cover advanced topics in computing.

5. Illustrate how to be an effective computing researcher by conducting bibliography research, formulating general and working hypotheses, designing experiments, analyzing and evaluating results, and planning future computing research.

6. Describe the process of writing a Master's thesis proposal, conducting the research and writing a Master's thesis, and delivering an oral thesis defense.

<table>
<thead>
<tr>
<th>B. Student Learning Outcomes</th>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prepare a conference style poster on an advanced topic in computing and present the poster in a 5 minute talk.</td>
<td>Assignments, Exams, Oral Presentation, Written Report</td>
</tr>
<tr>
<td>2. Conduct background research on an advanced topic in computing, generate a research hypothesis, design and conduct experiments, and evaluate results.</td>
<td>Assignments, Exams, Oral Presentation, Written Report</td>
</tr>
<tr>
<td>3. Write clear and concise scientific documents, including conference, journal, and white papers. Prepare figures, illustrations, plots, and bibliography for use in scientific documents.</td>
<td>Assignments, Written Report</td>
</tr>
<tr>
<td>4. Read an advanced research paper in computing, provide a paper summary, and generate an annotated bibliography.</td>
<td>Assignments, Exams, Written Report</td>
</tr>
</tbody>
</table>

V. Guidelines for Evaluation
A. Exams
B. Assignments
C. Oral Presentations
   i. 5-10 minute poster presentation
   ii. 30-45 minute conference presentation
D. Written Report
   i. Research proposal, journal paper, or conference paper

VI. Topical Course Outline
A. Doing research
   i. Experimental vs. theoretical research
   ii. Forming hypotheses: general vs. focused
iii. Asking the right questions
iv. Collecting background research
v. Formulating methodology
vi. Instrumentation and experimentation
vii. Results and analysis
viii. Conclusion and discussion
ix. Bibliographies

B. Research Resources
   i. Identifying research centers and key researchers
   ii. Library, interlibrary loans, collections, dataset warehousing
   iii. Internet searches

C. Ethics and scholarship skills
   i. Plagiarism, citing,
   ii. Data collection, data bias
   iii. Copy right vs. copy left
   iv. Authoring and reporting results

D. How to read science papers and organize material

E. Core rules of writing
   i. Mechanics: Spelling, grammar, punctuation
   ii. Math, definitions, figures, illustrations, plots
   iii. Examples, citations, call-outs
   iv. References
      1. Annotated bibliographies
      2. Thematic reference collections

F. Writing process and organization
   i. Structure of conference, journal, thesis paper
   ii. Two level outline
   iii. Figures and illustrations
   iv. Topical sentences

G. Preparing visuals
   i. Poster format, sizing, color schema
   ii. Visual organization and flow
   iii. Text vs. illustrations

H. Delivering a talk
I. Reviewing and refereeing
J. Vita and interviewing
K. How to succeed
   i. Balancing writing, research, classes
   ii. Topical breadth vs. depth first

VII. Suggested Texts

VIII. Bibliography

Press.
    Philadelphia: SIAM.
    notes number 14. The Mathematical Association of America.
<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>EN SOENGR</th>
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<th>No Division Code</th>
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</tr>
</thead>
<tbody>
<tr>
<td>2. Course Prefix</td>
<td>CSCE</td>
<td>3. Course Number</td>
<td>A685</td>
<td>4. Previous Course Prefix &amp; Number</td>
<td>n/a</td>
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<td>5a. Credits/CEUs</td>
<td>3</td>
<td>5b. Contact Hours</td>
<td>(Lecture + Lab)</td>
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<td>7. Type of Course</td>
<td>Academic</td>
<td>Preparatory/Development</td>
<td>Non-credit</td>
<td>CEU</td>
<td>Professional Development</td>
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<td>Change</td>
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<td>If a change, mark appropriate boxes:</td>
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<tr>
<td>9. Repeat Status No</td>
<td># of Repeats</td>
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<td>☒ A-F</td>
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<td>semester/year</td>
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<td>To: 99/9999</td>
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<tr>
<td>12. ☐ Cross Listed with</td>
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<td>Stacked with CSCE A485</td>
<td>Cross-Listed Coordination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13a. Impacted Courses or Programs:</td>
<td>List any programs or college requirements that require this course. Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at <a href="http://www.uaa.alaska.edu/governance">www.uaa.alaska.edu/governance</a>.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13b. Coordination Email</td>
<td>Date: 11/4/2013</td>
<td>submitted to Faculty Listserv: (<a href="mailto:uaa-faculty@lists.uaa.alaska.edu">uaa-faculty@lists.uaa.alaska.edu</a>)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>13c. Coordination with Library Liaison</td>
<td>Date: 11/4/2013</td>
<td></td>
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<td>14. General Education Requirement</td>
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</tr>
<tr>
<td>Mark appropriate box:</td>
<td>Oral Communication</td>
<td>Written Communication</td>
<td>Quantitative Skills</td>
<td>Humanities</td>
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</tr>
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<td></td>
<td>Fine Arts</td>
<td>Social Sciences</td>
<td>Natural Sciences</td>
<td>Integrative Capstone</td>
<td></td>
</tr>
<tr>
<td>15. Course Description (suggested length 20 to 50 words)</td>
<td>Introduces computer vision and machine vision. Topics covered include differences between computer and machine vision, image capture and processing, filtering, thresholding, edge detection, shape analysis, shape detection, pattern matching, digital image stabilization, stereo ranging, 3D models from images, real-time vision systems, and recognition of targets. Students will be required to complete a literature review of recent research in computer and machine vision, write a research summary paper, and complete a presentation of their work in a public forum. Special note: Not available for credit to students who have completed CSCE A485.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>16a. Course Prerequisite(s) (list prefix and number or test code and score)</td>
<td>n/a</td>
<td>16b. Co-requisite(s) (concurent enrollment required)</td>
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<td>16c. Automatic Restriction(s)</td>
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<td>16d. Registration Restriction(s) (non-codable)</td>
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<td>☐ Level</td>
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<td>17. ☒ Mark if course has fees Standard SOE fee</td>
<td></td>
<td>18. ☐ Mark if course is a selected topic course</td>
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<tr>
<td>19. Justification for Action</td>
<td>Create an elective in support of the proposed new Master's degree program in Computer Science &amp; Engineering and the existing Master's degree in Interdisciplinary Studies.</td>
<td></td>
<td></td>
<td></td>
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<tr>
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<td>Date</td>
<td>Dean/Director of School/College</td>
<td>Date</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Samuel Siewert</td>
<td></td>
<td></td>
<td></td>
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<tr>
<th>Department Chair</th>
<th>Date</th>
<th>Undergraduate/Graduate Academic Board Chair</th>
<th>Date</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>College/School Curriculum Committee Chair</th>
<th>Date</th>
<th>Provost or Designee</th>
<th>Date</th>
</tr>
</thead>
</table>

| Approved |
| Disapproved |
| Approved |
| Disapproved |
I. Initiation Date: Fall 2014

II. Course Information
A. College/School: School of Engineering
B. Course Title: Advanced Computer and Machine Vision
C. Course Subject/Number: CSCE A685
D. Credit Hours: 3.0 Credits
E. Contact Time: 3+0 Contact Time
F. Grading Information: A-F
G. Course Description: Introduces computer vision and machine vision. Topics covered include differences between computer and machine vision, image capture and processing, filtering, thresholding, edge detection, shape analysis, shape detection, pattern matching, digital image stabilization, stereo ranging, 3D models from images, real-time vision systems, and recognition of targets. Students will be required to complete a literature review of recent research in computer and machine vision, write a research summary paper, and complete a presentation of their work in a public forum. Special note: Not available for credit to students who have completed CSCE A485.
H. Lab Fees: Yes, standard SOE fee
I. Course Prerequisites: n/a
J. Registration Restrictions: Graduate standing
K. Stacked: Yes, CSCE A485

III. Evaluation
Grades are based on written examination, assignments, projects, research summary paper, and presentations.

IV. Course Level Justification
In addition to the requirements for the stacked undergraduate course (CSCE A485), graduate students will be required to complete a literature review of recent research in an applied or theoretical topic in computer and machine vision, write the results of that review in a research summary paper, and complete a presentation of these findings in a public forum.

V. Outline
A. Lecture
1. Computer and Machine Vision History
   a. Brief history
   b. Purpose of computer vision (to model human vision)
   c. Purpose of machine vision (to automate with photometers and radiometers)
   d. Differences
2. Image Capture and Processing
   a. Basic encoding
b. Convolutions and transformation  
c. Filtering  
d. Thresholds  

3. Edge Detection  
a. Differential gradient  
b. Sobel operator  
c. Canny operator  
d. Performance  

4. Shape Analysis and Detection  
a. Binary shape and boundary analysis  
b. Hough transform for line and circle detection  
c. Pattern patching  
d. Keypoint and Scale Invariant Feature Transform / Speeded Up Robust Feature (SIFT/SURF) algorithms  

5. Extracting 3D Models from Scenes  
a. 3D models  
b. Stereo and laser ranging  
c. Perspective and image transformation  

6. Real-time Pattern Recognition  
a. Pixel motion  
b. Inspection systems  
c. Surveillance  
d. Optical navigation systems  

7. Computer Vision Fundamentals  
a. Human color perception, tri-stimulus and models  
b. Human vision system basics  
c. Models for human vision system and scene perception  
d. Artificial Neural Network (ANN) models  
e. 3D perception and proprioception  
f. Challenges  

8. Interactive Applications  
a. Gesture recognition  
b. Vision prosthetics  
c. Instrumentation – photometers, hyper-spectral, radiometers  

B. Example Projects – MATLAB® and Linux Open Computer Vision (OpenCV)  
1. Basic image processing – transformations and convolution for enhancement  
2. Edge Detection  
3. Shape, Boundary Analysis and Classification  
4. Skeletal Models  
5. Target recognition and tracking  
6. Facial and other biometric recognition applications  
7. Image stabilization  

VI. Instructional Goals and Student Learning Outcomes
A. **Instructional Goals.** The instructor will:

1. Describe principles of machine and computer vision, clearly defining the differences between the two.
2. Describe the design, implementation and use of computer and machine vision algorithms.
3. Demonstrate the use of design tools such as OpenCV and MATLAB® for vision systems.

B. **Student Learning Outcomes.** Upon successful completion of this course, students will be able to:

| 1. Explain the implementation and use of machine and computer vision for automation and interaction. | Exams, quizzes, assignments, class projects |
| 2. Demonstrate methodologies used in the design of machine and computer vision systems. | Exams, quizzes, assignments, class projects |
| 3. Construct the hardware and software components for computer and machine vision systems, test their operation, and report results. | Class projects |
| 4. Demonstrate recognition of the engineering tradeoffs necessary in the design of production machine vision systems. | Exams, quizzes, assignments, class projects |
| 5. Review research literature, write a research summary paper, and present in a public forum. | Research summary paper, presentation |

VII. **Suggested Texts**


VIII. **Bibliography and Resources**

## Course Action Request

### University of Alaska Anchorage

**Proposal to Initiate, Add, Change, or Delete a Course**

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN SOENGR</td>
<td></td>
<td>Computer Science &amp; Engineering</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours</th>
</tr>
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<tbody>
<tr>
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<td>(Lecture + Lab) (3+0)</td>
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</table>

<table>
<thead>
<tr>
<th>6. Complete Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer and Machine Vision</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Abbreviated Title for Transcript (30 character)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>7. Type of Course</th>
</tr>
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<tbody>
<tr>
<td>[x] Academic</td>
</tr>
<tr>
<td>[ ] Preparatory/Development</td>
</tr>
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<td>[ ] Non-credit</td>
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<tr>
<td>[ ] CEU</td>
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<td>[ ] Professional Development</td>
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<table>
<thead>
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<th>8. Type of Action:</th>
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</thead>
<tbody>
<tr>
<td>[ ] Add</td>
</tr>
<tr>
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<td>[ ] Delete</td>
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<table>
<thead>
<tr>
<th>If a change, mark appropriate boxes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] Prefix</td>
</tr>
<tr>
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<tr>
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</tr>
<tr>
<td>[ ] Contact Hours</td>
</tr>
<tr>
<td>[ ] Title</td>
</tr>
<tr>
<td>[ ] Repeat Status</td>
</tr>
<tr>
<td>[ ] Grading Basis</td>
</tr>
<tr>
<td>[ ] Cross-Listed/Stacked</td>
</tr>
<tr>
<td>[x] Course Description</td>
</tr>
<tr>
<td>[ ] Course Prerequisites</td>
</tr>
<tr>
<td>[ ] Test Score Prerequisites</td>
</tr>
<tr>
<td>[ ] Co-requisites</td>
</tr>
<tr>
<td>[ ] Automatic Restrictions</td>
</tr>
<tr>
<td>[ ] Registration Restrictions</td>
</tr>
<tr>
<td>[ ] General Education Requirement</td>
</tr>
<tr>
<td>[ ] Class</td>
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<td>[ ] Level</td>
</tr>
<tr>
<td>[ ] College</td>
</tr>
<tr>
<td>[ ] Major</td>
</tr>
<tr>
<td>[x] Other Course Content Guide (please specify)</td>
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<table>
<thead>
<tr>
<th>9. Repeat Status No</th>
<th># of Repeats</th>
<th>Max Credits</th>
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<tbody>
<tr>
<td>n/a</td>
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<table>
<thead>
<tr>
<th>10. Grading Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>[x] A-F</td>
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<tr>
<td>[ ] P/NP</td>
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<tr>
<td>[ ] NG</td>
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</table>

<table>
<thead>
<tr>
<th>11. Implementation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>From: Fall/2014 To: 99/9999</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12. [ ] Cross Listed with</th>
</tr>
</thead>
<tbody>
<tr>
<td>[x] Stacked with CSCE A685</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13a. Impacted Courses or Programs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>List any programs or college requirements that require this course.</td>
</tr>
<tr>
<td>Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at <a href="http://www.uaa.alaska.edu/governance">www.uaa.alaska.edu/governance</a>.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BA/BS Computer Science</td>
<td>10/26/2013</td>
<td>Kenrick Mock</td>
</tr>
<tr>
<td>2. BSE Computer Systems Engineering</td>
<td>10/26/2013</td>
<td>Kenrick Mock</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>Initiator Name (typed):</th>
<th>Initiator Signed Initials:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samuel Siewert</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13b. Coordination Email</th>
<th>Date: 11/4/2013</th>
<th>13c. Coordination with Library Liaison</th>
<th>Date: 11/4/2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>submitted to Faculty Listserv: <a href="mailto:uaa-faculty@lists.uaa.alaska.edu">uaa-faculty@lists.uaa.alaska.edu</a></td>
<td></td>
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<th>14. General Education Requirement</th>
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<tr>
<td>Mark appropriate box:</td>
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<tr>
<td>[ ] Oral Communication</td>
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<tr>
<td>[ ] Written Communication</td>
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<tr>
<td>[ ] Quantitative Skills</td>
</tr>
<tr>
<td>[ ] Humanities</td>
</tr>
<tr>
<td>[ ] Fine Arts</td>
</tr>
<tr>
<td>[ ] Social Sciences</td>
</tr>
<tr>
<td>[ ] Natural Sciences</td>
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<tr>
<td>[ ] Integrative Capstone</td>
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<table>
<thead>
<tr>
<th>15. Course Description (suggested length 20 to 50 words)</th>
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<tbody>
<tr>
<td>Introduces computer vision and machine vision. Topics covered include differences between computer and machine vision, image capture and processing, filtering, thresholding, edge detection, shape analysis, shape detection, pattern matching, digital image stabilization, stereo ranging, 3D models from images, real-time vision systems, and recognition of targets. Applications include inspection, surveillance, search and rescue, and machine vision navigation. Special note: Not available for credit to students who have completed CSCE A685.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>16a. Course Prerequisite(s) (list prefix and number or test code and score)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(PHYS A124 or PHYS A212) and CSCE A320) with a minimum grade of C.</td>
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</table>

<table>
<thead>
<tr>
<th>16b. Co-requisite(s) (concurrent enrollment required)</th>
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<tbody>
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<table>
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<th>16c. Automatic Restriction(s)</th>
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<td>[ ] College</td>
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<tr>
<td>[ ] Level</td>
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<table>
<thead>
<tr>
<th>16d. Registration Restriction(s) (non-codable)</th>
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| 17. [x] Mark if course has fees Standard SOE fee |

| 18. [ ] Mark if course is a selected topic course |

<table>
<thead>
<tr>
<th>19. Justification for Action</th>
</tr>
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<tbody>
<tr>
<td>Stack with graduate course in support of proposed MS in Computer Engineering &amp; Computer Science.</td>
</tr>
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**Course Description (suggested length 20 to 50 words)**

Introduces computer vision and machine vision. Topics covered include differences between computer and machine vision, image capture and processing, filtering, thresholding, edge detection, shape analysis, shape detection, pattern matching, digital image stabilization, stereo ranging, 3D models from images, real-time vision systems, and recognition of targets. Applications include inspection, surveillance, search and rescue, and machine vision navigation. Special note: Not available for credit to students who have completed CSCE A685.
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<tr>
<th>Position</th>
<th>Approval/Disapproval</th>
<th>Date</th>
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<tbody>
<tr>
<td>Initiator (faculty only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samuel Siewert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiator (TYPE NAME)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dean/Director of School/College</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department Chair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College/School Curriculum Committee Chair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undergraduate/Graduate Academic Board Chair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provost or Designee</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
I. Initiation Date:  Fall 2014

II. Course Information
A. College/School:  School of Engineering
B. Course Title:  Computer and Machine Vision
C. Course Subject/Number:  CSCE A485
D. Credit Hours:  3.0 Credits
E. Contact Time:  3+0 Contact Time
F. Grading Information:  A-F
G. Course Description:  Introduces computer vision and machine vision. Topics covered include differences between computer and machine vision, image capture and processing, filtering, thresholding, edge detection, shape analysis, shape detection, pattern matching, digital image stabilization, stereo ranging, 3D models from images, real-time vision systems, and recognition of targets. Applications include inspection, surveillance, search and rescue, and machine vision navigation. Special note: Not available for credit to students who have completed CSCE A685.
H. Lab Fees:  Yes, standard SOE fee
I. Course Prerequisites:  {(PHYS A124 or PHYS A212) and CSCE A320} with a minimum grade of C.
J. Registration Restrictions:  None
K. Stacked:  Yes, CSCE A685

III. Course Level Justification
This course allows students to apply programming skills, mathematics, and digital signal processing and image processing skills learned at the 300-level to develop more advanced applications in computer and machine vision.

IV. Outline
A. Lecture
   1. Computer and Machine Vision History
      a. Brief history
      b. Purpose of computer vision (to model human vision)
      c. Purpose of machine vision (to automate with photometers and radiometers)
      d. Differences
   2. Image Capture and Processing
      a. Basic encoding
      b. Convolutions and transformation
      c. Filtering
      d. Thresholds
   3. Edge Detection
      a. Differential gradient
      b. Sobel operator
c. Canny operator
d. Performance

4. Shape Analysis and Detection
   a. Binary shape and boundary analysis
   b. Hough transform for line and circle detection
   c. Pattern patching
   d. Keypoint and Scale Invariant Feature Transform / Speeded Up Robust Feature (SIFT/SURF) algorithms

5. Extracting 3D Models from Scenes
   a. 3D models
   b. Stereo and laser ranging
   c. Perspective and image transformation

6. Real-time Pattern Recognition
   a. Pixel motion
   b. Inspection systems
   c. Surveillance
   d. Optical navigation systems

7. Computer Vision Fundamentals
   a. Human color perception, tri-stimulus and models
   b. Human vision system basics
   c. Models for human vision system and scene perception
   d. Artificial Neural Network (ANN) models
   e. 3D perception and proprioception
   f. Challenges

8. Interactive Applications
   a. Gesture recognition
   b. Vision prosthetics
   c. Instrumentation – photometers, hyper-spectral, radiometers

B. Example Projects – MATLAB® and Linux Open Computer Vision (OpenCV)
   1. Basic image processing – transformations and convolution for enhancement
   2. Edge Detection
   3. Shape, Boundary Analysis and Classification
   4. Skeletal Models
   5. Target recognition and tracking
   6. Facial and other biometric recognition applications
   7. Image stabilization

V. Instructional Goals and Student Learning Outcomes

<table>
<thead>
<tr>
<th><strong>A. Instructional Goals</strong></th>
<th>The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Describe principles of machine and computer vision, clearly defining the differences between the two.</td>
</tr>
<tr>
<td>2.</td>
<td>Instruct students on the design, implementation and use of computer and machine vision algorithms.</td>
</tr>
<tr>
<td>3.</td>
<td>Instruct students on the use of design tools such as OpenCV and MATLAB® for vision</td>
</tr>
</tbody>
</table>
systems.

<table>
<thead>
<tr>
<th>B. <strong>Student Learning Outcomes.</strong> Upon successful completion of this course, students will be able to:</th>
<th><strong>Assessment Methods</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Explain the implementation and use of machine and computer vision for automation and interaction.</td>
<td>Exams, quizzes, assignments, class projects</td>
</tr>
<tr>
<td>2. Demonstrate methodologies used in the design of machine and computer vision systems.</td>
<td>Exams, quizzes, assignments, class projects</td>
</tr>
<tr>
<td>3. Construct the hardware and software components for computer and machine vision systems, test their operation, and report results.</td>
<td>Class projects</td>
</tr>
<tr>
<td>4. Demonstrate recognition of the engineering tradeoffs necessary in the design of production machine vision systems.</td>
<td>Exams, quizzes, assignments, class projects</td>
</tr>
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</table>

VI. **Suggested Texts**


VII. **Bibliography and Resources**


### Course Action Request

#### University of Alaska Anchorage

**Proposal to Initiate, Add, Change, or Delete a Course**

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<th>5b. Contact Hours</th>
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<tbody>
<tr>
<td>CSCE</td>
<td>A690</td>
<td>n/a</td>
<td>3</td>
<td>(Lecture + Lab) (3+0)</td>
</tr>
</tbody>
</table>

#### Complete Course Title

**Topics in Computer Science & Computer Systems Engineering**

**Topics in CS and CSE**

**Abbreviated Title for Transcript (30 character)**

#### Type of Course

- Academic
- Preparatory/Development
- Non-credit
- CEU
- Professional Development

#### Type of Action

- Add
- Change
- Delete

#### Repeat Status

- Yes
- # of Repeats: unlimited
- Max Credits: unlimited

#### Grading Basis

- A-F
- P/NP
- NG

#### Implementation Date

- From: Fall/2014
- To: 99/9999

#### Cross Listed with

- CSCE A490

#### Mark if course has fees

- Standard SOE fee

#### Mark if course is a selected topic course

#### Justification for Action

Create an elective in support of the proposed new Master's degree program in Computer Science & Engineering and the existing Master's degree in Interdisciplinary Studies.

---

**Initiator Name (typed): Kenrick Mock**  
Initiator Signed Initials: ______  Date: __________

**13b. Coordination Email**  
Date: 11/4/2013  
submitted to Faculty Listserv: (uua-faculty@lists.uaa.alaska.edu)

**14. General Education Requirement**

- Oral Communication
- Written Communication
- Quantitative Skills
- Humanities
- Fine Arts
- Social Sciences
- Natural Sciences
- Integrative Capstone

**15. Course Description**

Advanced Topics in Computer Science and Computer Systems Engineering not taught as a permanent course. A research summary paper and research presentation is required. Special Note: May be repeated for credit with a change of subtitle/topic. Not available for credit to students who have completed CSCE A490 with the same subtitle/topic.

#### Course Description (suggested length 20 to 50 words)

Advanced Topics in Computer Science and Computer Systems Engineering not taught as a permanent course. A research summary paper and research presentation is required. Special Note: May be repeated for credit with a change of subtitle/topic. Not available for credit to students who have completed CSCE A490 with the same subtitle/topic.

---

**Initiator (faculty only) Date**

Kenrick Mock  
Initiator (TYPE NAME)

**Initiator (faculty only) Date**

Approved  
Disapproved  
Dean/Director of School/College Date

**Initiator (faculty only) Date**

Approved  
Disapproved  
Department Chair Date

**Initiator (faculty only) Date**

Approved  
Disapproved  
Board Chair Date

**Initiator (faculty only) Date**

Approved  
Disapproved  
Provost or Designee Date

---

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Course Content Guide  
University of Alaska Anchorage  
School of Engineering  
Department of Computer Science and Engineering

I. Initiation Date: Fall 2014

II. Course Information
A. College: School of Engineering
B. Course Subject/Number: CSCE A690
C. Credits: 3
D. Contact Hours: 3+0
E. Course Title: Topics in Computer Science and Computer Systems Engineering
F. Repeat Status: Yes
G. Grading Basis: A-F
H. Course Description: Advanced Topics in Computer Science and Computer Systems Engineering not taught as a permanent course. A research summary paper and research presentation is required. Special Note: May be repeated for credit with a change of subtitle/topic. Not available for credit to students who have completed CSCE A490 with the same subtitle/topic.
I. Course Prerequisites: n/a
J. Fees: Yes, standard SOE fee
K. Registration Restrictions: Graduate standing and instructor permission
L. Special Topics: Yes, standard SOE fee
M. Stacked: Yes: CSCE A490

III. Course Level Justification

This course is a graduate level elective. In addition to the requirements for the stacked undergraduate course (CSCE A490), graduate students will be required to complete a literature review of recent research in an applied or theoretical area of the selected topic, write the results of that review in a research summary paper, and complete a presentation of these findings in a public forum.

IV. Instructional Goals and Student Learning Outcomes

The instructional goals and student outcomes will vary depending upon the course taught. An example from “Computer and Machine Vision” follows.

<table>
<thead>
<tr>
<th>A. Instructional Goals.</th>
<th>The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Describe principles of machine and computer vision, clearly defining the differences between the two.</td>
</tr>
<tr>
<td>2.</td>
<td>Present the design, implementation and use of computer and machine vision algorithms.</td>
</tr>
</tbody>
</table>
### Student Learning Outcomes

Students will be able to:

<table>
<thead>
<tr>
<th>B.</th>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Conduct a literature review, write a research summary, and present the findings in a public forum.</td>
<td>Research summary paper, presentation</td>
</tr>
<tr>
<td>2. Explain the implementation and use of machine and computer vision for automation and interaction</td>
<td>Exams, quizzes, assignments, class projects</td>
</tr>
<tr>
<td>3. Demonstrate methodologies used in the design of machine vision systems</td>
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<td>4. Demonstrate methodologies used in the design of machine vision systems</td>
<td>Exams, quizzes, assignments, class projects</td>
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<tr>
<td>5. Develop the necessary code to complete the course projects</td>
<td>Exams, quizzes, assignments, class projects</td>
</tr>
<tr>
<td>6. Implement projects, test their operation, and report their findings to the client</td>
<td>Class projects</td>
</tr>
<tr>
<td>7. Demonstrate recognition of the engineering tradeoffs necessary in the design of production machine vision systems</td>
<td>Exams, quizzes, assignments, class projects</td>
</tr>
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### Guidelines for Evaluation

Because this is a selected topics course, the exact focus of the course may vary depending on the topic addressed. However, in general, the course will involve a combination of:

- A. Discussion
- B. Lecture
- C. Exams
- D. Quizzes
- E. Class Projects
- F. Homework Assignments
- G. Research Summary Paper
- H. Presentation

### Topical Course Outline

The course outline will vary with the topic. A sample from “Computer and Machine Vision” follows.

- A. Computer and Machine Vision History
- B. Image Capture and Processing
- C. Edge Detection
- D. Shape Analysis and Detection
- E. Extracting 3D Models from Scenes
- F. Real-time Pattern Recognition
- G. Computer Vision Fundamentals
H. Interactive Applications
I. MATLAB® and Open Computer Vision (OpenCV)

VII. Suggested Text

The texts will vary with the topic. A sample from “Computer Graphics and Machine Vision” follows.


VIII. Bibliography

The bibliography will vary with the topic. A sample from “Computer Graphics and Machine Vision” follows.

**Course Action Request**  
University of Alaska Anchorage  
Proposal to Initiate, Add, Change, or Delete a Course

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<tr>
<td>CSCE</td>
<td>A490</td>
<td>n/a</td>
<td>3</td>
<td>(Lecture + Lab) (3+0)</td>
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6. Complete Course Title  
**Topics in Computer Science & Computer Systems Engineering**  
**Topics in CS and CSE**  
Abbreviated Title for Transcript (30 character)

7. Type of Course  
- [x] Academic  
- [ ] Preparatory/Development  
- [ ] Non-credit  
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8. Type of Action:  
- [x] Add  
- [ ] Change  
- [ ] Delete

If a change, mark appropriate boxes:  
- [ ] Prefix  
- [x] Course Number  
- [ ] Contact Hours  
- [x] Title  
- [x] Repeat Status  
- [x] Grading Basis  
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- [x] Course Description  
- [x] Course Prerequisites  
- [x] Test Score Prerequisites  
- [x] Co-requisites  
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- [ ] College  
- [ ] Major  
- [ ] Class  
- [ ] Level  
- [x] Other Course Content Guide (please specify)

9. Repeat Status  
- [ ] Yes  
- [x] No

# of Repeats:  
- [x] unlimited

Max Credits:  
- [x] unlimited

10. Grading Basis  
- [ ] A-F  
- [x] P/NP  
- [ ] NG

11. Implementation Date  
- From: Fall/2014  
- To: 99/9999

12. Cross Listed with  
- [ ] CSCE A690

Stacked with CSCE A690  
Cross-Listed Coordination

13a. Impacted Courses or Programs:  
List any programs or college requirements that require this course.  
Please type into fields provided in table. If more than three entries, submit a separate table.  
A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

<table>
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<tr>
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<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
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<tbody>
<tr>
<td>1. BA/BS Computer Science</td>
<td>10/26/2013</td>
<td>Kenrick Mock</td>
</tr>
<tr>
<td>2. BSE Computer Systems Engineering</td>
<td>10/26/2013</td>
<td>Kenrick Mock</td>
</tr>
<tr>
<td>3.</td>
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<td></td>
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</tbody>
</table>

Initiator Name (typed): Kenrick Mock  
Initiator Signed Initials: _____  
Date: _______________

13b. Coordination Email  
Date: 11/4/2013  
submitted to Faculty Listserv: [uaa-faculty@lists.uaa.alaska.edu](mailto:uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison  
Date: 11/4/2013

14. General Education Requirement  
Mark appropriate box:  
- [ ] Oral Communication  
- [ ] Written Communication  
- [ ] Quantitative Skills  
- [ ] Humanities  
- [ ] Fine Arts  
- [ ] Social Sciences  
- [ ] Natural Sciences  
- [ ] Integrative Capstone

15. Course Description (suggested length 20 to 50 words)  
Advanced Topics in Computer Science or Computer Systems Engineering not taught in other CSCE course offerings. Special Note: May be repeated for credit with a change of subtitle/topic. Not available for credit to students who have completed CSCE A690 with the same subtitle/topic.

16a. Course Prerequisite(s) (list prefix and number or test code and score)  
n/a

16b. Co-requisite(s) (concurrent enrollment required)  
n/a

16c. Automatic Restriction(s)  
- [ ] College  
- [ ] Major  
- [ ] Class  
- [ ] Level

16d. Registration Restriction(s) (non-codable)  
Instructor permission

17. Mark if course has fees  
Standard SOE fee

18. Mark if course is a selected topic course

19. Justification for Action  
Stack with graduate course in support of proposed MS in Computer Engineering & Computer Science.

Initiator (faculty only)  
Kenrick Mock  
Initiator (TYPE NAME)

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<td>Undergraduate/Graduate Academic Board Chair</td>
<td>Date</td>
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<td>Provost or Designee</td>
<td>Date</td>
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</table>
Course Content Guide
University of Alaska Anchorage
School of Engineering
Department of Computer Science and Engineering

I. Initiation Date: Fall 2014

II. Course Information
A. College: School of Engineering
B. Course Subject/Number: CSCE A490
C. Credits: 3
D. Contact Hours: (3+0) 45 contact lecture hours (3 contact lecture hours/week x 15 weeks = 45) plus 90 hours outside work (6 hours outside work x 15 weeks = 90) for a total of 135 hours
E. Course Title: Topics in Computer Science and Computer Systems Engineering
F. Repeat Status: Yes
G. Grading Basis: A-F
H. Course Description: Advanced Topics in Computer Science and Engineering not taught in other CSCE course offerings. Special Note: May be repeated for credit with a change of subtitle/topic. Not available for credit to students who have completed CSCE A690 with the same subtitle/topic.
I. Course Prerequisites: None
J. Fees: Yes, standard SOE fee
K. Registration Restrictions: Instructor permission
L. Special Topics: Yes, standard SOE fee
M. Stacked: Yes: CSCE A690

III. Course Level Justification

The student is expected to have the appropriate expertise and background for a senior-level topics course.

IV. Instructional Goals and Student Learning Outcomes

The instructional goals, student outcomes, and assessment method will vary depending upon the course taught. An example from “Computer Graphics and Machine Vision” follows.

<table>
<thead>
<tr>
<th>A. Instructional Goals.</th>
<th>The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Describe principles of machine and computer vision, clearly defining the differences between the two.</td>
</tr>
<tr>
<td>2.</td>
<td>Instruct students on the design, implementation and use of computer and machine vision algorithms.</td>
</tr>
</tbody>
</table>
**B. Student Learning Outcomes.** Students will be able to:

<table>
<thead>
<tr>
<th></th>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Explain the implementation and use of machine and computer vision for automation and interaction</td>
<td>exams, quizzes, assignments, class projects</td>
</tr>
<tr>
<td>2. Demonstrate methodologies used in the design of machine vision systems</td>
<td>exams, quizzes, assignments, class projects</td>
</tr>
<tr>
<td>3. Demonstrate methodologies used in the design of machine vision systems</td>
<td>exams, quizzes, assignments, class projects</td>
</tr>
<tr>
<td>4. Develop the necessary code to complete the course projects</td>
<td>exams, quizzes, assignments, class projects</td>
</tr>
<tr>
<td>5. Implement course projects, test their operation, and report their findings to the instructor and colleagues</td>
<td>class projects</td>
</tr>
<tr>
<td>6. Demonstrate recognition of the engineering tradeoffs necessary in the design of production machine vision systems</td>
<td>exams, quizzes, assignments, class projects</td>
</tr>
</tbody>
</table>

**V. Topical Course Outline**

The course outline will vary with the topic. A sample from “Computer and Machine Vision” follows.

A. Computer and Machine Vision History  
B. Image Capture and Processing  
C. Edge Detection  
D. Shape Analysis and Detection  
E. Extracting 3D Models from Scenes  
F. Real-time Pattern Recognition  
G. Computer Vision Fundamentals  
H. Interactive Applications  
I. MATLAB® and Open Computer Vision (OpenCV)
VI. **Suggested Text**

The text will vary with the topic. A sample from “Computer Graphics and Machine Vision” follows.


VII. **Bibliography**

The bibliography will vary with the topic. A sample from “Computer Graphics and Machine Vision” follows.

**Course Action Request**  
University of Alaska Anchorage  
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College  
EN SOENGR

1b. Division  
No Division Code

1c. Department  
Computer Science & Engineering

2. Course Prefix  
CSCE

3. Course Number  
A698

4. Previous Course Prefix & Number  
n/a

5a. Credits/CEUs  
1-3

5b. Contact Hours  
(Lecture + Lab)  
(0+3-9)

6. Complete Course Title  
Individual Research

7. Type of Course  
☒ Academic  ☐ Preparatory/Development  ☐ Non-credit  ☐ CEU  ☐ Professional Development

8. Type of Action:  
☒ Add  ☐ Change  ☐ Delete

9. Repeat Status  Yes  # of Repeats  5  Max Credits  6

10. Grading Basis  
☒ A-F  ☐ P/NP  □ NG

11. Implementation Date  
From: Fall/2014  
To: 99/9999

12. Cross Listed with  
□ Stacked with  
Cross-Listed Coordination Signature

13a. Impacted Courses or Programs:  
List any programs or college requirements that require this course.  
Please type into fields provided in table. If more than three entries, submit a separate table.  
A template is available at www.uaa.alaska.edu/governance.

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<tbody>
<tr>
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<td>2.</td>
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<td>3.</td>
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</tbody>
</table>

Initiator Name (typed): Frank Moore  
Initiator Signed Initials: __________  Date: __________

13b. Coordination Email  
Date: 11/4/2013  
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison  
Date: 11/4/2013

14. General Education Requirement  
Mark appropriate box:

☐ Oral Communication  ☐ Written Communication  ☐ Quantitative Skills  ☐ Humanities  
☐ Fine Arts  ☐ Social Sciences  ☐ Natural Sciences  ☐ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)  
Students will engage in independent research projects under the supervision of a faculty member. The result will be a research paper prepared to publication standards with the goal of submission for publication in a refereed journal or conference. Special note: May be repeated up to a maximum of 6 credits.

16a. Course Prerequisite(s) (list prefix and number or test code and score)  
n/a

16b. Co-requisite(s) (concurrent enrollment required)  
n/a

16c. Automatic Restriction(s)  
□ College  □ Major  □ Class  ☒ Level

16d. Registration Restriction(s) (non-codable)  
Graduate standing and instructor permission

17. ☒ Mark if course has fees  
Standard SOE fee

18. □ Mark if course is a selected topic course

19. Justification for Action  
Elective course in support of the proposed new Master's degree program in Computer Engineering & Computer Science and potential offering within the existing Master's degree in Interdisciplinary Studies.

Initiator (faculty only)  
Date

Initiator (TYPE NAME)  
Frank Moore

☐ Approved  ☐ Disapproved  
Dean/Director of School/College  Date

☐ Approved  ☐ Disapproved  
Undergraduate/Graduate Academic  Date

☐ Approved  ☐ Disapproved  
Provost or Designee  Date
Course Content Guide
University of Alaska Anchorage
School of Engineering
Department of Computer Science and Engineering

I. Initiation Date: Fall 2014

II. Course Information
A. College: School of Engineering
B. Course Subject/Number: CSCE A698
C. Credits: 1-3
D. Contact Hours: (0 + 3-18)
E. Course Title: Individual Research
F. Repeat Status: Yes
G. Grading Basis: A-F
H. Course Description: Students will engage in independent research projects under the supervision of a faculty member. The result will be a research paper prepared to publication standards with the goal of submission for publication in a refereed journal or conference. Special note: May be repeated up to a maximum of 6 credits.
I. Course Prerequisites: n/a
J. Fees: Yes
K. Registration Restrictions: Graduate standing and instructor permission

III. Course Level Justification

The course requires understanding of fundamental concepts in computer science and computer engineering learned at the undergraduate level. Selected upper division courses may also be necessary depending upon the nature of the research.

IV. Instructional Goals and Student Learning Outcomes

<table>
<thead>
<tr>
<th>A. Instructional Goals. The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Present topics of current research to students.</td>
</tr>
<tr>
<td>2. Demonstrate the nature of computing research, both theoretical and applied.</td>
</tr>
<tr>
<td>3. Demonstrate scientific research methods.</td>
</tr>
<tr>
<td>4. Describe how to present research results at a conference or publish in a journal.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Student Learning Outcomes. Students will be able to:</th>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Discuss topics of current research.</td>
<td>Project Proposal, Project, Final Report</td>
</tr>
<tr>
<td>2. Utilize scientific literature and resources.</td>
<td>Project Proposal, Project, Final Report</td>
</tr>
</tbody>
</table>
3. Apply the scientific method by conducting original research in computing. | Project, Final Report
4. Utilize design, development, and analysis skills to conduct original research in computing. | Project, Final Report
5. Deliver a research presentation. | Presentation
6. Complete a research paper prepared to publication standards. | Research Paper

V. **Guidelines for Evaluation**
   A. Project Proposal
   B. Project
   C. Final Report
   D. Presentation
   E. Research Paper

VI. **Topical Course Outline**
   This course involves independent research under the direction of a faculty supervisor. Topics researched will vary.

VII. **Suggested Texts**
   None.

VIII. **Bibliography**
   The bibliography will depend upon the selected research topic.
1a. School or College
EN SOENGR

1b. Division
No Division Code

1c. Department
Computer Science & Engineering

---

2. Course Prefix
CSCE

3. Course Number
A699

4. Previous Course Prefix & Number
n/a

5a. Credits/CEUs
1-6

5b. Contact Hours
(Lecture + Lab)
(0+3-18)

---

6. Complete Course Title
Thesis

Abbreviated Title for Transcript (30 character)

7. Type of Course
☒ Academic
☐ Preparatory/Development
☐ Non-credit
☐ CEU
☐ Professional Development

8. Type of Action:
☒ Add
☐ Change
☐ Delete

If a change, mark appropriate boxes:
☐ Prefix
☐ Credits
☐ Title
☐ Grading Basis
☐ Course Number
☐ Contact Hours
☐ Repeat Status
☐ Course Description
☐ Cross-Listed/Stacked
☐ Test Score Prerequisites
☐ Course Prerequisites
☐ Co-requisites
☐ Automatic Restrictions
☐ Registration Restrictions
☐ General Education Requirement
☐ Class
☐ Level
☐ College
☐ Major
☐ Other
(please specify)

---

9. Repeat Status
Yes
# of Repeats
n/a
Max Credits
5

10. Grading Basis
☒ A-F
☐ P/NP
☐ NG

11. Implementation Date
From: Fall/2014
To: 99/9999

12. ☐ Cross Listed with
☐ Stacked with

Cross-Listed Coordination Signature

---

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

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Initiator Name (typed): Frank Moore
Initiator Signed Initials: __________
Date: __________

13b. Coordination Email
11/4/2013
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 11/4/2013

---

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication
☐ Written Communication
☐ Quantitative Skills
☐ Humanities
☐ Fine Arts
☐ Social Sciences
☐ Natural Sciences
☐ Integrative Capstone

---

15. Course Description (suggested length 20 to 50 words)
Independent research conducted under the supervision of a thesis committee. Students must investigate a state-of-the-art computer engineering or computer science research topic, write a detailed proposal, identify a thesis advisor, obtain the advisor's approval to conduct the proposed research, complete the research, and write a thesis that is approved by the committee. Special Note: A maximum of 6 credits may be applied toward the degree requirements for the MS in Computer Engineering and Computer Science.

---

16a. Course Prerequisite(s) (list prefix and number or test code and score)
n/a

16b. Co-requisite(s) (concurrent enrollment required)
n/a

16c. Automatic Restriction(s)
☐ College ☒ Major ☐ Class ☒ Level

16d. Registration Restriction(s) (non-codable)
Graduate standing and permission of thesis advisor

---

17. ☒ Mark if course has fees Standard SOE fee

18. ☐ Mark if course is a selected topic course

---

19. Justification for Action
Required course in support of the proposed new Master's degree program in Computer Science & Engineering and potential offering within the existing Master's degree in Interdisciplinary Studies.

Initiator (faculty only)

Initiator (TYPE NAME)

☑ Approved
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Initiator (TYPE NAME)

☐ Approved
☐ Disapproved
Course Content Guide  
University of Alaska Anchorage  
School of Engineering  
Department of Computer Science and Engineering

I. **Initiation Date**: Fall 2014

II. **Course Information**
   A. **College**: School of Engineering  
   B. **Course Subject/Number**: CSCE A699  
   C. **Credits**: 1-6  
   D. **Contact Hours**: 3-18  
   E. **Course Title**: Thesis  
   F. **Repeat Status**: Yes  
   G. **Grading Basis**: A-F  
   H. **Course Description**: Independent research conducted under the supervision of a thesis committee. Students must investigate a state-of-the-art computer engineering or computer science research topic, write a detailed proposal, identify a thesis advisor, obtain the advisor's approval to conduct the proposed research, complete the research, and write a thesis that is approved by the committee. Special Note: A maximum of 6 credits may be applied toward the degree requirements for the MS in Computer Engineering and Computer Science.  
   I. **Course Prerequisites**: n/a  
   J. **Fees**: Yes, standard SOE fee  
   K. **Registration Restrictions**: Graduate standing and permission of thesis advisor

III. **Course Level Justification**

This course is a graduate-level thesis course that requires the synthesis of material learned at the undergraduate and graduate levels.

IV. **Instructional Goals and Student Learning Outcomes**

<table>
<thead>
<tr>
<th>A. <strong>Instructional Goals</strong></th>
<th>The thesis advisor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Describe how to thoroughly investigate a state-of-the-art computer science or computer engineering research topic.</td>
</tr>
<tr>
<td>2.</td>
<td>Describe the process of developing, organizing, and revising a thesis proposal.</td>
</tr>
<tr>
<td>4.</td>
<td>Supervise the completion and defense of a thesis, including the design, implementation, testing, debugging, and verification of correctness of the research.</td>
</tr>
</tbody>
</table>
B. **Student Learning Outcomes.** Students will be able to:

<table>
<thead>
<tr>
<th></th>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Identify a state-of-the-art research topic and write a successful thesis proposal</td>
</tr>
<tr>
<td>2.</td>
<td>Design, implement, test, debug, and verify the correctness of a solution to the proposed research</td>
</tr>
</tbody>
</table>

V. **Guidelines for Evaluation**
A. Thesis Proposal  
B. Thesis Project  
C. Written Thesis  
D. Oral Defense

VI. **Topical Course Outline**

The course outline will vary with the topic.

VII. **Suggested Texts**

Varies with the thesis topic.

VIII. **Bibliography**

Varies with the thesis topic.
To: College of Health  
From: School of Nursing  
Date: 4/16/2012  
Re: Doctorate of Nursing Practice Proposal

The University of Alaska Anchorage School of Nursing (SON) proposes to transition its two graduate advanced practice nursing programs (the master’s level family nurse practitioner and psychiatric/mental health nurse practitioner programs) to the clinical doctorate level, the Doctor of Nursing Practice (DNP), by 2014. The American Association of Colleges of Nursing (AACN) recommends that Nurse Practitioners be prepared to practice at the doctoral level by 2015.

The DNP program builds on the existing master’s level of education, yet expands to include additional experiences with clinical immersion and residency courses. In addition, didactic content is enhanced with advanced research and methodologic evaluation, leadership and health policy advocacy, organizational and systems management, information technology, clinical prevention and population health management courses, and advanced clinical scholarship. These core curricular competencies were derived from the AACN DNP essentials (2006).

Alaska is currently experiencing one of the greatest nursing shortages in its history. Adding to this serious deficit is the increasing need for nurses with enhanced professional skills who can diagnose and prescribe using evidence-based practices for individuals and populations with emerging health care needs. Research has established a clear link between higher levels of nursing education and better patient outcomes. Health disparities, especially in minorities, older adults and the underserved, are increasing. The preparation of advanced practice nurses to meet these challenges requires leadership in developing models of care that bridge the gap between research and practice and provide access to quality care for all, especially the most vulnerable who lack advocates in the current health care system.

The American Association of Colleges of Nursing (AACN) has recommended that the practice doctorate (DNP) be the entry level graduate degree for advanced nursing practice by 2015. Changing and increasing demands of Alaska and the nation’s complex health care environment and delivery system require that nurses in advanced practice positions have the highest level of scientific knowledge and practice expertise. Doctorally prepared nurses equipped with this level of knowledge and clinical skills will provide leadership and collaboration with other health professionals to change the delivery of care through evidence-based practice achieving better health outcomes.
The DNP program emphasizes the application of research to the clinical practice setting. The goal of the program is to graduate doctorally prepared nurses who can assume roles as independent advanced practitioners and clinical leaders. Doctorally prepared nurses, equipped with advanced clinical knowledge and practice skills, will provide leadership and collaborate with health professional colleagues to improve the delivery of care and achieve better health and population outcomes through evidence-based practice.

Sincerely,

Dianne Tarrant MS, ANP, FNP
Associate Professor, School of Nursing
Program/Prefix Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Program of Study or Prefix

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH College of Health</td>
<td>ADSN Division of Nursing</td>
<td>NUR</td>
</tr>
</tbody>
</table>

2. Complete Program Title/Prefix
Doctor of Nursing Practice

3. Type of Program
Choose one from the appropriate drop down menu:
Undergraduate: CHOOSE ONE or Graduate: Doctoral Program

4. Type of Action:
- [ ] Add
- [ ] Change
- [ ] Delete

5. Implementation Date (semester/year)
From: Fall/2014 To: 9999

6a. Coordination with Affected Units
Department, School, or College:
Initiator Name (typed): Dianne Tarrant
Initiator Signed Initials: __________
Date: ____________

6b. Coordination Email submitted to Faculty Listserv (uaa-faculty@lists.uaa.alaska.edu)
Date: 01/29/13

6c. Coordination with Library Liaison
Date: 01/29/13

7. Title and Program Description - Please attach the following:
- [ ] Cover Memo
- [ ] Catalog Copy in Word using the track changes function

8. Justification for Action
The American Association of Colleges of Nursing (AACN) has recommended that the practice doctorate (DNP) be the entry level graduate degree for advanced nursing practice by 2015. Changing and increasing demands of Alaska and the nation's complex health care environment and delivery system require that nurses in advanced practice positions have the highest level of scientific knowledge and practice expertise. Doctorally prepared nurses equipped with this level of knowledge and clinical skills will provide leadership and collaboration with other health professionals to change the delivery of care through evidence-based practice achieving better health outcomes.

Initiator (faculty only) Date
[ ] Approved
[ ] Disapproved

Initiator (TYPE NAME) Date
[ ] Approved
[ ] Disapproved

Dean/Director of School/College Date
[ ] Approved
[ ] Disapproved

Undergraduate/Graduate Academic Board Chairperson Date
[ ] Approved
[ ] Disapproved

Provost or Designee Date
[ ] Approved
[ ] Disapproved

Department Chairperson Date
[ ] Approved
[ ] Disapproved

Curriculum Committee Chairperson Date
[ ] Approved
[ ] Disapproved
Doctor of Nursing Practice, Nursing Science

Graduate studies at the doctoral level place primary emphasis upon advanced professional nursing practice, theory, research, leadership roles in advancing health care delivery systems and application of research into practice. Programs will be offered for both post-baccalaureate and post-master’s students.

Post-baccalaureate students may develop a specialized practice focus as a Family Nurse Practitioner or Psychiatric-Mental Health Nurse Practitioner. Doctoral level studies provide the student with the knowledge and skills for independent practice using an evidence-based approach to advancing high quality care. In addition, this doctoral level program will prepare leaders who will improve patient outcomes and positively impact health policy. The graduates in the Family Nurse Practitioner option are eligible to write the national certification examination for advanced professional practice as a Family Nurse Practitioner. Graduates of the Psychiatric-Mental Health Nurse Practitioner Option are eligible to write the national certification for advanced practice as a Psychiatric-Mental Health Nurse Practitioner-Adult, or Psychiatric and Mental Health Nurse Practitioner-Family.

For those who currently hold an advanced practice nursing degree and wish to expand their knowledge and skills to be able to better interpret research, apply best practices and incorporate clinical knowledge to influence health care policy, the post-masters to Doctor of Nursing Practice option is available.

Student Learning Outcomes

The graduate is prepared to:
1. Enhance professional skills in advanced practice nursing using an ethical, evidence-based approach to promote healthy communities.
2. Apply clinical inquiry using a culturally sensitive, evidence-based approach to adapt practice and change health outcomes.
3. Expand leadership roles to influence local, statewide and national health care policy and delivery systems serving unique, diverse and underserved populations.

Admission Requirements

School of Nursing Admission Requirements for Post-Baccalaureate Applicants;

Students applying to the Doctor of Nursing Practice must also submit documentation of having met the following requirements:
1. Earned baccalaureate degree in nursing from a program accredited by the National League for Nursing Accrediting Commission or the Commission on Collegiate Nursing Education.
2. Undergraduate (and graduate, if applicable) GPA of at least a 3.00 on a 4.00 scale.
3. Satisfactory achievement on the Graduate Record Examination (for applicants with undergraduate GPAs of 3.0 or greater, the GRE is not required).
4. Unencumbered licensure as a registered professional nurse in the state of Alaska concurrent with enrollment in first clinical course.
5. The School of Nursing graduate admission application must be submitted directly to the School of Nursing.
6. Two letters of professional recommendation submitted directly to the School of Nursing. References may be contacted by a member of the admissions committee.
7. Professional portfolio with written goal statement.
8. Minimum of one year of clinical experience as a registered nurse.

School of Nursing Admission Requirements for Post-Master’s Applicants;

Students applying to the Doctor of Nursing Practice must also submit documentation of having met the following requirements:
1. Earned master’s degree in nursing from a program accredited by the National League for Nursing Accrediting Commission or the Commission on Collegiate Nursing Education.
2. Graduate GPA of at least a 3.00 on a 4.00 scale.
3. Unencumbered licensure as an advanced practice nurse in the state of Alaska concurrent with enrollment in first clinical course and maintained throughout the program of study.
4. The School of Nursing graduate admission application must be submitted directly to the School of Nursing.
5. Two letters of professional recommendation submitted directly to the School of Nursing. References may be contacted by a member of the admissions committee.

6. Professional portfolio with written goal statement.

7. Currently engaged in practice as an advanced practice nurse practitioner.

Applicants who meet the above criteria are considered for program admission on a competitive basis. Meeting all admission criteria does not guarantee admission, nor does prior acceptance into graduate study status guarantee admission into the clinical nursing tracks.

Special consideration may be given to candidates with portfolios that document exceptional clinical experience and a proven record of professional contributions. To the extent that there are limited seats available in the program, preference may be given to residents of the state of Alaska as defined by the university’s policy on residency for tuition purposes.

**Academic Progress**

Students enrolled in the graduate degree programs must:

- Maintain at least a 3.00 (B) GPA in all required coursework.
- Earn a grade of B or higher in all clinical courses.
- Receive no more than one 2.00 © grade in core and elective courses.
- Earn all credits, including transfer credits, within a consecutive seven-year period prior to graduation. See UAA catalog Chapter 11 for additional information.

Noncompliance with academic progress expectations will result in probation and possible dismissal from the program. See the Academic Good Standing Policy in the School of Nursing Graduate Handbook for more information.

**Part-Time/Full-Time Study**

For post-baccalaureate students, this program is designed to be completed in nine semesters of full-time study, or 14 semesters part-time study, although students can take longer. For post-master’s students, this program is designed to be completed in four semesters of full-time study, or six semesters of part-time study.

Prior to being formally admitted to graduate study, students may complete up to 9 credits of degree applicable coursework, either UAA credit (with permission of the instructor) or transfer credit. Students who are not formally admitted will be allowed to register on a space-available basis and with instructor permission.

For part-time students, admission to graduate study only is recommended, with formal admission to a specialty track being delayed until core course requirements have been completed. Enrollment in any clinical course requires formal admission to graduate study and to the specialty track.

**Additional School of Nursing Requirements**

All students enrolled in UAA nursing programs must provide:

- Documentation of continuous current certification in cardiopulmonary resuscitation (CPR) for adults, infants, and children;
- Evidence of satisfactory health status, including immunity to chicken pox, rubella, rubeola, and hepatitis A and B (by titer), documentation of Tdap (tetanus, diphtheria, pertussis) immunization within the past 10 years, annual PPD skin test or health examination indicating freedom from active tuberculosis, documentation of an annual HIV test (results not required); and
- Results of a national-level criminal background check.

- Students are required to provide their own transportation to clinical sites. They are also responsible for their portion of the cost of audio conferencing. Students must have access to a personal computer and reasonable internet connectivity. All students are expected to have basic computer and typing skills prior to entry into the nursing program, for example:
• Word processing (preferably MS Word)
• Sending and receiving e-mail with attachments
• Accessing and navigating the Internet/World Wide Web, and
• Basic understanding of hardware, software, and operating systems.

Scheduling of Courses

Graduate nursing courses are offered in an alternative scheduling format consisting of intensive classroom sessions presented in short time blocks on the UAA campus and/or periodic class meetings throughout the semester that are available via computer and/or audio conference. Thus, it is possible for students who reside outside of Anchorage to take advantage of the opportunity to pursue graduate study at UAA. In addition, all students have the opportunity to take advantage of clinical learning opportunities throughout the state, including both urban and rural settings.

Graduation Requirements

See the beginning of this chapter for University Requirements for Doctoral Degrees.

Program Requirements for Post-Baccalaureate Students

1. Complete the following required courses (56):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS A601</td>
<td>Advanced Pathophysiology I*</td>
<td>1-4*</td>
</tr>
<tr>
<td>NS A602</td>
<td>Advanced Health Assessment in Primary Care</td>
<td>4</td>
</tr>
<tr>
<td>NS A603</td>
<td>Advanced Pathophysiology II</td>
<td>2</td>
</tr>
<tr>
<td>NS A610</td>
<td>Pharmacology for Primary Care I*</td>
<td>1-2**</td>
</tr>
<tr>
<td>NS A612</td>
<td>Pharmacology for Primary Care II</td>
<td>3</td>
</tr>
<tr>
<td>NS A613</td>
<td>Advanced Practice Informatics</td>
<td>2</td>
</tr>
<tr>
<td>NS A614</td>
<td>Advanced Practice Ethics and Law</td>
<td>2</td>
</tr>
<tr>
<td>NS A615</td>
<td>Health Services Organization and Finance</td>
<td>4</td>
</tr>
<tr>
<td>NS A618</td>
<td>Advanced Practice Roles and Leadership*</td>
<td>2-4*</td>
</tr>
<tr>
<td>NS A619</td>
<td>Health Policy and Economics*</td>
<td>2-4*</td>
</tr>
<tr>
<td>NS A621</td>
<td>Knowledge Development for Advanced Nursing Practice</td>
<td>3</td>
</tr>
<tr>
<td>NS A627</td>
<td>Practice Inquiry 1: The Nature of Evidence</td>
<td>3</td>
</tr>
<tr>
<td>NS A628</td>
<td>Practice Inquiry 2: Design and Methods</td>
<td>3</td>
</tr>
<tr>
<td>NS A629</td>
<td>Practice Inquiry 3: Proposal Development</td>
<td>2</td>
</tr>
<tr>
<td>NS A630</td>
<td>Practice Inquiry 4: Capstone Project</td>
<td>2***</td>
</tr>
<tr>
<td>NS A633</td>
<td>Statistics for Advanced Practice</td>
<td>3</td>
</tr>
<tr>
<td>NS A634</td>
<td>Epidemiology for Advanced Practice</td>
<td>2</td>
</tr>
<tr>
<td>NS A637</td>
<td>Data Analysis: Qualitative</td>
<td>1</td>
</tr>
<tr>
<td>NS A638</td>
<td>Data Analysis: Quantitative</td>
<td>1</td>
</tr>
</tbody>
</table>

* = BS to DNP students take course for 4 credits
** = BS to DNP students take course for 2 credits
*** = BS to DNP students take course 3 times for a total of 6 credits

2. Complete one of the following options:

Family Nurse Practitioner Option (30 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS A660</td>
<td>Family Nurse Practitioner I</td>
<td>4</td>
</tr>
<tr>
<td>NS A661</td>
<td>Family Nurse Practitioner II</td>
<td>5</td>
</tr>
<tr>
<td>NS A662</td>
<td>Family Nurse Practitioner III</td>
<td>5</td>
</tr>
<tr>
<td>NS A663</td>
<td>Family Nurse Practitioner IV</td>
<td>6</td>
</tr>
<tr>
<td>NS A683</td>
<td>Clinical Immersion</td>
<td>3</td>
</tr>
<tr>
<td>NS A684</td>
<td>Clinical Concentration</td>
<td>4</td>
</tr>
<tr>
<td>Elective</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

Psychiatric-Mental Health Practitioner Option (30 Credits)
Program Requirements for Post-Master’s Students

1. Complete the following required courses (37):

<table>
<thead>
<tr>
<th>Course Code</th>
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</tr>
</thead>
<tbody>
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<td>Advanced Pathophysiology I*</td>
<td>1-4*</td>
</tr>
<tr>
<td>NS A610</td>
<td>Pharmacology for Primary Care I*</td>
<td>1-2*</td>
</tr>
<tr>
<td>NS A613</td>
<td>Advanced Practice Informatics</td>
<td>2</td>
</tr>
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<td>Advanced Practice Ethics and Law</td>
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<td>NS A615</td>
<td>Health Services Organization and Finance</td>
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<td>NS A618</td>
<td>Advanced Practice Roles and Leadership*</td>
<td>2-4**</td>
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<td>NS A619</td>
<td>Health Policy and Economics*</td>
<td>2-4**</td>
</tr>
<tr>
<td>NS A628</td>
<td>Practice Inquiry 2: Design and Methods</td>
<td>3</td>
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<td>Practice Inquiry 4: Capstone Project</td>
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<td>3</td>
</tr>
<tr>
<td>NS A684</td>
<td>Clinical Concentration</td>
<td>4</td>
</tr>
<tr>
<td>Elective</td>
<td>Advisor Approved</td>
<td>3</td>
</tr>
</tbody>
</table>

* - MS to DNP students take this course for 1 credit
** - MS to DNP students take this course for 2 credits
*** - MS to DNP students take this course 3 times for a total of 6 credits

Capstone: Project Dissemination

A total of 4+ credits of NS A630 Capstone: Dissemination of Project, taken over 3-4 semesters, is required for the degree. Students who are unable to complete the project after four semesters will be required to complete the graduate continuous registration procedures (at the beginning of this chapter) and pay all fees.

Students who are unable to complete the capstone project during these third and fourth semesters will be required to register for two credits of NS A630 Capstone: Dissemination of Project every semester thereafter (excluding summer sessions) until the capstone project is satisfactorily completed. In the event students want to work on the capstone project during a summer semester, utilizing faculty and UAA resources, they must get approval from their committee and register for a one-credit independent study (P/F). The independent study credit does not count towards the four required capstone project credits. There is no limit to the number of capstone project credits that may be accrued; however, no more than 13 credits of capstone project may be accrued without the student being required to take additional course work at the graduate level. Specific requirements for additional coursework will be determined by the director of the Graduate Program in Nursing, the coordinator of the specialty track, and the capstone project chair.

FACULTY

Barbara Berner, Director of the School of Nursing bjberner@uaa.alaska.edu
Bernice Carmon, Associate Professor bcarmon@uaa.alaska.edu
Thomas Hendrix, Assistant Professor thendri3@uaa.alaska.edu
Jill Janke, Professor/Graduate Program Chair jjjanke@uaa.alaska.edu
Cindy Jones, Assistant Professor cgjones2@uaa.alaska.edu
Patricia Lynes-Hayes, Assistant Professor plneshayes@uaa.alaska.edu
Mary Logan, Adjunct Professor afmol@uaa.alaska.edu
Maureen O’Malley, Associate Professor momalley@uaa.alaska.edu
Nadine Parker, Assistant Professor nparker8@uaa.alaska.edu
Elizabeth Predeger, Professor epredeger@uaa.alaska.edu
### Course Action Request

**University of Alaska Anchorage**

**Proposal to Initiate, Add, Change, or Delete a Course**

<table>
<thead>
<tr>
<th>1a. School or College</th>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td>A601</td>
<td>N/A</td>
<td>1-4</td>
<td>(Lecture + Lab)</td>
</tr>
</tbody>
</table>

#### 6. Complete Course Title

**Advanced Pathophysiology I**

*Abbreviated Title for Transcript (30 character)*

#### 7. Type of Course

- [x] Academic
- [ ] Preparatory/Development
- [ ] Non-credit
- [ ] CEU
- [ ] Professional Development

#### 8. Type of Action:

- [ ] Add
- [x] Change
- [ ] Delete

*If a change, mark appropriate boxes:*

- [ ] Prefix
- [ ] Credits
- [ ] Title
- [ ] Grading Basis
- [ ] Course Prerequisites
- [ ] Registration Restrictions
- [ ] Other Restrictions

#### 9. Repeat Status No

- [x] # of Repeats
- [ ] Max Credits

#### 10. Grading Basis

- [x] A-F
- [ ] P/NP
- [ ] NG

#### 11. Implementation Date

- [x] semester/year

*From: FALL/2014 To: /9999*

#### 12. Cross Listed

- [ ] with N/A
- [ ] Stacked with N/A
- [ ] Cross-Listed Coordination Signature

#### 13a. Impacted Courses or Programs

List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Catalog Page(s) Impacted</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. See table</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
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</tbody>
</table>

**Initiator Name (typed): Dianne Tarrant**

**Initiator Signed Initials: _________**

**Date:**

**13b. Coordination Email**

**Date: 01/29/13**

Submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

**13c. Coordination with Library Liaison**

**Date: 01/29/13**

#### 14. General Education Requirement

Mark appropriate box:

- [ ] Oral Communication
- [ ] Written Communication
- [ ] Quantitative Skills
- [ ] Social Sciences
- [ ] Natural Sciences
- [ ] Integrative Capstone

#### 15. Course Description

*(suggested length 20 to 50 words)*

- Develops expertise in abnormal physiology building upon students’ understanding of basic pathophysiology. Expands knowledge of normal physiological processes, disease processes, abnormal functioning, genetic influence on disease, and clinical manifestations of disease across the lifespan. Special note: BSN to DNP students take course for 4 credits; post masters to DNP students take course for 1 credit.

#### 16a. Course Prerequisite(s)

- [x] N/A

#### 16b. Test Score(s)

- [ ] N/A

#### 16c. Co-requisite(s)

- [ ] (concurrent enrollment required)

*Admission to graduate nursing program.*

#### 16d. Other Restriction(s)

- [ ] College
- [ ] Major
- [ ] Class
- [x] Level

#### 17. Mark if course has fees

- [ ]

#### 18. Mark if course is a selected topic course

- [ ]

#### 19. Justification for Action

Course revised and enhanced for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

<table>
<thead>
<tr>
<th>Initiator (faculty only)</th>
<th>Date</th>
<th>Approved</th>
<th>Disapproved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dianne Tarrant</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Initiator (TYPE NAME)</th>
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<tbody>
<tr>
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<table>
<thead>
<tr>
<th>Dean/Director of School/College</th>
<th>Date</th>
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<table>
<thead>
<tr>
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<table>
<thead>
<tr>
<th>Board Chairperson</th>
<th>Date</th>
</tr>
</thead>
<tbody>
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</table>

<table>
<thead>
<tr>
<th>Provost or Designee</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

163
<table>
<thead>
<tr>
<th><strong>Course Being Changed:</strong></th>
<th><strong>Impacted Program or Course</strong></th>
<th><strong>Catalog Page</strong></th>
<th><strong>Date of Coordination</strong></th>
<th><strong>Chair/Coordinator Contacted</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NS A601</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. &quot;MS, Nursing Science&quot;</td>
<td>306-370</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
<td></td>
</tr>
<tr>
<td>2. Graduate Certificate, Nursing Education</td>
<td>308</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
<td></td>
</tr>
<tr>
<td>3. NS A610, Pharmacology for Primary Care</td>
<td>461</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
<td></td>
</tr>
<tr>
<td>4. NS A647 Teaching Practicum in Nursing</td>
<td>463</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. NS A660 Family Nurse Practitioner I</td>
<td>463</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
<td></td>
</tr>
<tr>
<td>6. NS A670 Advanced Psychiatric/Mental Health Nursing I</td>
<td>463</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
<td></td>
</tr>
<tr>
<td>7. NS S674 Advanced Psychiatric/Mental Health Nursing IV</td>
<td>464</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
<td></td>
</tr>
</tbody>
</table>
Course Content Guide  
School of Nursing  
Doctor of Nursing Practice (DNP) Program

I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing  
Course Prefix: NS  
Course Number: A601  
Title: Advanced Pathophysiology I  
Credits: 1-4 (1 OR 4 + 0)  
Grading Basis: A-F  
Implementation Date: Fall 2014  
Course Description: Develops expertise in abnormal physiology building upon students’ understanding of basic pathophysiology. Expands knowledge of normal physiological processes, disease processes, abnormal functioning, genetic influence on disease, and clinical manifestations of disease across the lifespan. Special note: BSN to DNP students take course for 4 credits; post masters to DNP students take course for 1 credit.

Course Prerequisite(s): N/A  
Corequisite(s): N/A  
Other Restriction(s): Level  
Registration Restriction(s): Admission to graduate nursing program.  
Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Outcomes, and Assessment Measures
A. Instructional Goals  
The instructor will:
1. Identify the application of pathophysiologic concepts and influencing factors on abnormal health states across the lifespan.
2. Distinguish an evidence-based approach to the understanding of interactions among human regulatory and compensatory processes of commonly occurring diseases.
3. Translate the application of pathophysiologic processes in the formulation of management plans for common diseases.
4. Validate appropriate evidence-based and primary literature resources to promote scholarly review and writing.
5. Emphasize the association of genetic and genomic influences on pathophysiologic processes.
B. **Student Learning Outcomes/Assessment Measures**

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Apply pathophysiologic concepts to advanced practice nursing care of individuals across the lifespan</td>
<td>Quizzes, discussion board, case studies, peer reviews</td>
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<tr>
<td>2. Evaluate the influences of genetics and genomics on disease processes including identification of common clinical features of genetic syndromes</td>
<td>Quizzes, discussion board, case studies, peer reviews</td>
</tr>
<tr>
<td>3. Analyze the effects of environment, gender, age, lifestyle, and behavior on disease process</td>
<td>Quizzes, discussion board, case studies, peer reviews</td>
</tr>
<tr>
<td>4. Incorporate evidence based research on disease processes to predict clinical manifestations in pathophysiologic conditions</td>
<td>Quizzes, discussion board, case studies, peer reviews</td>
</tr>
<tr>
<td>5. Integrate evidence based research and pathophysiology to assess and manage commonly occurring diseases</td>
<td>Quizzes, discussion board, case studies, peer reviews</td>
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<td>6. Analyze health determinants and health disparities in relation to pathophysiologic processes common to specific populations</td>
<td>Quizzes, discussion board, case studies, peer reviews</td>
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<tr>
<td>7. Associate interactions among human regulatory and compensatory processes and disease processes of commonly occurring diseases</td>
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</tbody>
</table>

**IV. Course Level Justification**

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

**V. Course Outline**

1. Introduction to advanced pathophysiology
   1.1. Integrate evidence-based research throughout the course
   1.2. Altered cellular and tissue etiology
   1.3. Normal versus pathological across the lifespan
1.4. Stress and disease with their resulting clinical manifestations

2. Physiologic imbalances
   2.1. Fluid and electrolytes
   2.2. Acid-base
   2.3. Immunologic processes
   2.4. Immune dysfunction
   2.5. Inflammation
   2.6. Infection
   2.7. Autoimmune dysfunction
   2.8. Special populations

3. Genetics and genomics
   3.1. Influence on disease
   3.2. Inheritance patterns
   3.3. Genetic mutations
   3.4. Special populations

4. Cancer
   4.1. Tumor invasion
   4.2. Metastasis
   4.3. Immune function
   4.4. Genetic influences
   4.5. Special populations

5. Reproductive
   5.1. Male
   5.2. Female
   5.3. Sexually transmitted infections
   5.4. Special populations

6. Endocrine
   6.1. Diabetes
   6.2. Thyroid/parathyroid
   6.3. Adrenal
   6.4. Other hormone imbalances
   6.5. Special populations

7. Cardiac
   7.1. Hypertension
   7.2. Diseases of the arteries and veins
   7.3. Shock and multi-organ dysfunction
   7.4. Myocardial infarction
   7.5. Heart failure
   7.6. Dysrhythmias
   7.7. Special populations
8. Hematology
   8.1. Blood dyscrasias
   8.2. Leukemias
   8.3. Anemias
   8.4. Special populations

9. Respiratory
   9.1. Altered respiratory patterns
   9.2. Hypoxia
   9.3. Pulmonary edema
   9.4. Infectious respiratory disease
   9.5. Asthma
   9.6. Chronic obstructive pulmonary disease
   9.7. Special populations

10. Complex Case Studies

VI. Suggested Texts

VII. Bibliography & Suggested Readings
    Genetics Links to Primers
    - http://learn.genetics.utah.edu/content/begin/tour/
### Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>CH College of Health</th>
<th>1b. Division</th>
<th>ADSN Division of Nursing</th>
<th>1c. Department</th>
<th>NUR</th>
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</thead>
<tbody>
<tr>
<td>2. Course Prefix</td>
<td>NS</td>
<td>3. Course Number</td>
<td>A602</td>
<td>4. Previous Course Prefix &amp; Number</td>
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<td>5a. Credits/CEUs</td>
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<td>5b. Contact Hours</td>
<td>(Lecture + Lab)</td>
<td>(2+8)</td>
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<tr>
<td>6. Complete Course Title</td>
<td>Advanced Health Assessment in Primary Care</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Abbreviated Title for Transcript (30 character)</td>
<td>Adv Health Assessment</td>
<td></td>
<td></td>
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<tr>
<td>7. Type of Course</td>
<td>☒ Academic</td>
<td>☐ Preparatory/Development</td>
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<td>☐ CEU</td>
<td>☐ Professional Development</td>
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<td>8. Type of Action:</td>
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If a change, mark appropriate boxes:

- Prefix
- Credits
- Title
- Grading Basis
- Course Description
- Test Score Prerequisites
- Other Restrictions
- Class
- Level
- College
- Major
- Repeat Status
- Cross-Listed/Stacked
- Course Prerequisites
- Co-requisites
- Registration Restrictions

9. Repeat Status No

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<th># of Repeats</th>
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</table>

10. Grading Basis

- ☒ A-F
- ☐ P/NP
- ☐ NG

11. Implementation Date

- From: FALL/2014
- To: 9999

12. ☐ Cross Listed with N/A

- Stacked with N/A

Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Catalog Page(s) Impacted</th>
<th>Date of Coordination</th>
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<tr>
<td>1. See table</td>
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</tbody>
</table>

Initiator Name (typed): Dianne Tarrant

Initiator Signed Initials: ___________________________ Date: __________________

13b. Coordination Email

Date: 01/29/13

submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison

Date: 01/29/13

14. General Education Requirement

Mark appropriate box:

- Oral Communication
- Written Communication
- Quantitative Skills
- Humanities
- Fine Arts
- Social Sciences
- Natural Sciences
- Integrative Capstone

15. Course Description (suggested length 20 to 50 words)

Provides a systematic approach to advanced physical assessment and differential diagnoses. Develops advanced skills building on basic assessment knowledge and documentation. Incorporates individual, psychological, sociocultural, developmental, spiritual, and genetic components of health.

16a. Course Prerequisite(s) (list prefix and number)

N/A

16b. Test Score(s)

N/A

16c. Co-requisite(s) (concurrent enrollment required)

N/A

16d. Other Restriction(s)

- ☒ College
- ☐ Major
- ☐ Class
- ☒ Level

16e. Registration Restriction(s) (non-codable)

Admission to graduate nursing program.

17. ☒ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action

Course revised and enhanced for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

<table>
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<td>Dianne Tarrant</td>
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<td>Dean/Director of School/College</td>
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<th>Department Chairperson</th>
<th>Date</th>
<th>Curriculum Committee Chairperson</th>
<th>Date</th>
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<td>9/11</td>
<td>Dianne Tarrant</td>
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<td>NS A610, Pharmacology for Primary Care</td>
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<td>NS A647 Teaching Practicum in Nursing</td>
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<td>464</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
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</table>
I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A602
Title: Advanced Health Assessment in Primary Care
Credits: 4 (2 + 8)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Provides a systematic approach to advanced physical assessment and differential diagnoses. Develops advanced skills building on basic assessment knowledge and documentation. Incorporates individual, psychological, sociocultural, developmental, spiritual, and genetic components of health.

Course Prerequisite(s): N/A
Corequisite(s): N/A
Other Restriction(s): Level
Registration Restriction(s): Admission to graduate nursing program.
Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals
The instructor will:
1. Demonstrate physical assessment skills for individuals across the lifespan.
2. Discuss appropriate history taking, physical assessment, and documentation incorporating individual, psychological, socio-cultural, developmental, spiritual, and genetic components of health.
3. Translate knowledge of each body system to provide the basis of the physical assessment techniques necessary to comprehensively evaluate each system.
4. Distinguish normal, variations of normal and abnormal findings on a physical exam to familiarize the student with subtle physical assessment findings.
5. Identify various diagnostic tests and their usefulness in developing a diagnosis.
6. Discuss appropriate development of differential diagnoses.
7. Evaluate students’ abilities to perform a comprehensive physical.

<table>
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<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
</tr>
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<tbody>
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<td><strong>Upon successful completion of the course, the student will be able to:</strong></td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Formulate a holistic client assessment to include psychological, physiological, socio-cultural, developmental, and spiritual variables</td>
<td>Quizzes, interactive role playing, physical assessment check-offs, complete health history, Subjective Objective Assessment Plan (SOAP) assignments</td>
</tr>
<tr>
<td>2. Obtain and evaluate a genetic health history that includes a three generation pedigree</td>
<td>Quizzes, interactive role playing, complete health history, SOAP assignments, pedigree assignment</td>
</tr>
<tr>
<td>3. Integrate advanced written and verbal communication skills while obtaining and documenting an in-depth and episodic health history of clients across the lifespan</td>
<td>Interactive role playing, complete health history, SOAP assignments</td>
</tr>
<tr>
<td>4. Perform and document a complete physical assessment of each body system for clients across the lifespan</td>
<td>Interactive role playing, physical assessment check-offs, SOAP assignments, final exam</td>
</tr>
<tr>
<td>5. Integrate lab findings with the client’s assessment</td>
<td>SOAP assignments</td>
</tr>
<tr>
<td>6. Discriminate between the obvious and subtle client abnormalities to formulate accurate differential diagnoses based on assessment findings</td>
<td>Quizzes, interactive role playing, physical assessment check-offs, SOAP assignments, advanced specialized testing check-off, final exam</td>
</tr>
<tr>
<td>7. Discriminate variations that may occur in subjective and objective client data due to influences of age, ethnicity, pregnancy, and gender</td>
<td>Quizzes, interactive role playing, physical assessment check-offs, complete health history, SOAP assignments, pedigree assignment, advanced specialized testing check-off, final exam</td>
</tr>
<tr>
<td>8. Distinguish developmental levels of clients utilizing a screening assessment</td>
<td>Quizzes, interactive role playing</td>
</tr>
<tr>
<td>9. Recognize normal, variations of normal and abnormal findings on a physical exam</td>
<td>Quizzes, interactive role playing, physical assessment check-offs, SOAP assignments, advanced specialized testing check-off, final exam</td>
</tr>
<tr>
<td>10. Summarize history and physical findings in a concise manner using SOAP format</td>
<td>SOAP assignments, final exam</td>
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IV. Course Level Justification
This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

V. Course Outline
1. History and physical process
   1.1. Complete health history
   1.2. Generational pedigree
   1.3. Differential diagnoses
   1.4. SOAP notes
2. Constitutional
   2.1. Age, race, gender, level of conscience, appearance, body shape
3. Skin, hair nails
4. HEENT (head, eyes, ears, nose, throat)
   4.1 Exam
   4.2 Utilization of specialized equipment
      4.2.1 Ophthalmoscope
      4.2.2 Otoscopic
5. Breast
   5.1. Exam using Mammacare system
   5.2. Breast masses
6. Respiratory
   6.1. Radiology (chest x-ray interpretation)
   6.2. Specialized respiratory testing
7. Cardiovascular and peripheral vascular
   7.1. Heart sounds
   7.2. Electrocardiogram (EKG)
   7.3. Specialized cardiovascular test
8. Gastrointestinal
   8.1. Physical exam
   8.2. Specialized testing
9. Genital-Urinary (GU)
   9.1. Exam
   9.2. Male
   9.3. Female
   9.4. Sexually transmitted infections
10. Musculoskeletal
   10.1. Physical Exams
      10.1.1. Joints
      10.1.2. Posture
      10.1.3. Extremities
      10.1.4. Strength testing
10.2. Specialized testing/maneuvers

11. Psychiatric
   11.1. Anxiety
   11.2. Depression
   11.3. Bipolar
   11.4. Specialized screening instruments

12. Neurologic
   12.1. Physical exams
   12.2. Cranial nerves (motor/sensory)
   12.3. Balance/gait
   12.4. Deep tendon reflexes
   12.5. Specialized neurologic testing

13. Hematologic

14. Endocrine
   14.1. Physical exams findings for endocrine disorders
   14.2. Labs

15. Pediatrics
   15.1. Developmental screening
   15.2. Enhanced Bruckner’s exam
   15.3. Developmental approach to children
   15.4. Sports physicals

16. Geriatrics
   16.1. Mini-mental
   16.2. Normal aging
   16.3. Pathological findings

17. Pregnancy
   17.1. Variations in physical findings
   17.2. Labs

VI. Suggested Texts


VII. Bibliography & Suggested Readings


1a. School or College  
CH College of Health  
1b. Division  
ADSN Division of Nursing  
1c. Department  
NUR

2. Course Prefix  
NS  
3. Course Number  
A603  
4. Previous Course Prefix & Number  
N/A  
5a. Credits/CEUs  
2  
5b. Contact Hours  
(Lecture + Lab)  
(2+0)

6. Complete Course Title  
Advanced Pathophysiology II

Abbreviated Title for Transcript (30 character)  

7. Type of Course  
☐ Academic  ☐ Preparatory/Development  ☐ Non-credit  ☐ CEU  ☐ Professional Development

8. Type of Action:  ☒ Add  ☐ Change  ☐ Delete

If a change, mark appropriate boxes:

☐ Prefix  ☐ Credit  ☐ Course Number  ☐ Contact Hours  ☐ Repeat Status  ☐ Grading Basis  ☐ Cross-Listed/Stacked  ☐ Course Prerequisites  ☐ Co-requisites  ☐ Registration Restrictions  ☐ Other Restrictions  ☐ Class  ☐ Level  ☐ College  ☐ Major

9. Repeat Status No  # of Repeats  Max Credits

10. Grading Basis  ☒ A-F  ☐ P/NP  ☐ NG

11. Implementation Date  semester/year  From: FALL/2014  To: 9999

12. ☐ Cross Listed with  N/A  ☐ Stacked with  N/A  Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

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Initiator Name (typed):  
Initiator Signed Initials:  
Date:  

13b. Coordination Email  Date: 01/29/13  
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison  Date: 01/29/13

14. General Education Requirement  
Mark appropriate box:

☐ Oral Communication  ☐ Written Communication  ☐ Quantitative Skills  ☐ Humanities  
☐ Fine Arts  ☐ Social Sciences  ☐ Natural Sciences  ☐ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)  
Increases expertise in abnormal physiology building upon an understanding of basic pathophysiology. Expands knowledge of normal physiological and disease processes, abnormal functioning, and clinical manifestations of disease across the lifespan.

16a. Course Prerequisite(s) (list prefix and number)  
NS A601 with minimum grade of B

16b. Test Score(s)  
N/A

16c. Co-requisite(s) (concurrent enrollment required)  
N/A

16d. Other Restriction(s)  
☐ College  ☐ Major  ☐ Class  ☒ Level

16e. Registration Restriction(s) (non-codable)  
Admission to graduate nursing program.

17. ☒ Mark if course has fees  

18. ☐ Mark if course is a selected topic course

19. Justification for Action  
Course developed for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

Initiator (faculty only)  Date

Dianne Tarrant  
Initiator (TYPE NAME)

Initiator Signed Initials:  
Date:  

Approved  Disapproved

Dean/Director of School/College  Date

Undergraduate/Graduate Academic  Date

Board Chairperson

Approved  Disapproved

Provost or Designee  Date

Approved  Disapproved

Department Chairperson  Date

Approved

Curriculum Committee Chairperson  Date

Disapproved
Course Content Guide  
School of Nursing  
Doctor of Nursing Practice (DNP) Program

I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A603
Title: Advanced Pathophysiology II
Credits: 2 (2 + 0)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Increases expertise in abnormal physiology building upon an understanding of basic pathophysiology. Expands knowledge of normal physiological and disease processes, abnormal functioning, and clinical manifestations of disease across the lifespan.
Course Prerequisite(s): NS A601 with minimum grade of B
Corequisite(s): N/A
Other Restriction(s): Level
Registration Restriction(s): Admission to graduate nursing program.
Course Fee: ☑ Yes ☐ No

III. Instructional Goals, Student Outcomes, and Assessment Measures
A. Instructional Goals
The instructor will:
1. Identify the application of pathophysiologic concepts and influencing factors on abnormal health states across the lifespan.
2. Present an evidence-based approach to the understanding of interactions among human regulatory and compensatory processes of commonly occurring diseases.
3. Translate the application of pathophysiologic processes in the formulation of management plans for common diseases.
4. Validate appropriate evidence-based and primary literature resources to promote scholarly review and writing.
5. Associate genetic and genomic influences on pathophysiologic processes.
B. **Student Learning Outcomes/Assessment Measures**

<table>
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<th>Assessment Measures</th>
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<td>1. Apply pathophysiologic concepts to advanced practice nursing care of individuals across the lifespan</td>
<td>Quizzes, discussion board, case studies, peer reviews</td>
</tr>
<tr>
<td>2. Evaluate the influences of genetics and genomics on disease processes, including identification of common clinical features of genetic syndromes</td>
<td>Quizzes, discussion board, case studies, peer reviews</td>
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<tr>
<td>3. Analyze the effects of environment, gender, age, lifestyle, and behavior on disease process</td>
<td>Quizzes, discussion board, case studies, peer reviews</td>
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<td>4. Incorporate evidence based research to assess and manage commonly occurring diseases</td>
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IV. **Course Level Justification**

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

V. **Course Outline**

1. Continuation of advanced pathophysiology
   1.1. Integrate evidence-based research throughout the course
   1.2. Normal versus pathological processes across the lifespan
   1.3. Stress and disease with their resulting clinical manifestations
2. Neurology
   2.1. Head injuries
   2.2. Seizure disorders
   2.3. Spinal cord injuries
   2.4. Brain attack
   2.5. Central Nervous System (CNS) tumors
   2.6. Neuropathic disorder
   2.7. Sensory organ dysfunction
2.8. Movement disorders
2.9. Alzheimer's disease
2.10. Special populations

3. Mental health
3.1. Schizophrenia
3.2. Depression
3.3. Bipolar disorder
3.4. Anxiety/panic disorders
3.5. Obsessive-compulsive disorders
3.6. Borderline personality disorders
3.7. Antisocial personality disorder
3.8. Special populations

4. Musculoskeletal
4.1. Fractures
4.2. Dislocations and subluxations
4.3. Sprains & strains
4.4. Rhabdomyolysis
4.5. Low back pain
4.6. Osteoporosis
4.7. Rheumatoid arthritis
4.8. Osteoarthritis
4.9. Secondary muscle dysfunction
4.10. Special populations

5. Renal
5.1. Regulation (auto, neural, hormonal)
5.2. Prerenal, intrarenal, postrenal dysfunction
5.3. Renal cancers
5.4. Obstructions
5.5. Infections
5.6. Glomerulophritis
5.7. Nephrotic syndrome
5.8. Acute & chronic renal failure
5.9. Special populations

6. Gastrointestinal
6.1. Motility disorders
6.2. Gastroesophageal Reflux Disease (GERD)/hiatal hernia
6.3. Obstruction
6.4. Diverticulosis
6.5. Inflammatory bowel disease
6.6. Upper Gastrointestinal (GI) ulcers
6.7. Related eating disorders
6.8. Liver disorders
6.9. Gallbladder dysfunction
6.10. Pancreatic dysfunction
6.11. Special populations

7. Dermatology
7.1. Sun exposure
7.2. Inflammatory skin disorders
7.3. Infections
7.4. Skin cancer
7.5. Frostbite
7.6. Special populations

8. Complex case studies

VI. Suggested Texts

VII. Bibliography & Suggested Readings
Genetics Links to Primers
http://learn.genetics.utah.edu/content/begin/tour/
Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
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<tbody>
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<td>Pharmacology for Primary Care I</td>
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<tr>
<td>Pharmacology Primary Care I</td>
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<td>Abbreviated Title for Transcript (30 characters)</td>
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<th>8. Type of Action:</th>
<th>9. Repeat Status No</th>
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<td>Max Credits</td>
<td>P/NP</td>
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| 12. | Cross Listed with | N/A |
|     | Stacked           | N/A |

Cross-Listed Coordination Signature

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<td>List any programs or college requirements that require this course.</td>
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<th>Impacted Program/Course</th>
<th>Catalog Page(s) Impacted</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
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<td>307</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
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<td>2. Graduate Certificate, Nursing Education</td>
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<td>Dianne Tarrant</td>
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<td>3. NS A674 Advanced Psychiatric/Mental Health Nursing IV</td>
<td>464</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
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Initiator Name (typed): Dianne Tarrant
Initiator Signed Initials: ________________________
Date: ________________________

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<td>Date: 01/29/13</td>
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submitted to Faculty Listserv: [uaa-faculty@lists.uaa.alaska.edu](mailto:uaa-faculty@lists.uaa.alaska.edu)

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<th>14. General Education Requirement</th>
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<td>Mark appropriate box:</td>
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<td>Oral Communication</td>
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<td>Fine Arts</td>
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<th>15. Course Description (suggested length 20 to 50 words)</th>
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<tr>
<td>Develops expertise in applied pharmacology, preparing providers to select, prescribe and monitor pharmaceutical agents used in primary and psychiatric care settings to include women’s health and pediatrics. Explores pharmacogenetics and pharmacogenomics influences on drug selection. Special note: BSN to DNP students take course for 2 credits; post-masters to DNP students take course for 1 credit.</td>
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<th>16a. Course Prerequisite(s) (list prefix and number)</th>
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<th>16c. Co-requisite(s) (concurrent enrollment required)</th>
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<td>NS A662 or NS A672</td>
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<tr>
<th>16e. Registration Restriction(s) (non-codable)</th>
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<tr>
<td>Admission to graduate nursing program</td>
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| 17. | Mark if course has fees |
|     | 18. | Mark if course is a selected topic course |

<table>
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<th>19. Justification for Action</th>
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<tr>
<td>Course revised and enhanced for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.</td>
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<td>Dianne Tarrant</td>
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Initiator (TYPE NAME) |

| Date |
| Approved |
| Disapproved |

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<th>Provost or Designee</th>
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<tr>
<td>Date</td>
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Course Content Guide
School of Nursing
Doctor of Nursing Practice (DNP) Program

I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A610
Title: Pharmacology for Primary Care I
Credits: 1-2 (1 or 2 + 0)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Develops expertise in applied pharmacology, preparing providers to select, prescribe, and monitor pharmaceutical agents used in primary and psychiatric care settings to include women’s health and pediatrics. Explores pharmacogenetics and pharmacogenomics influences on drug selection.
Special note: BSN to DNP students take course for 2 credits; post-masters to DNP students take course for 1 credit.

Course Prerequisite(s): N/A
Corequisite(s): NS A662 or NS A672
Other Restriction(s): Level
Registration Restriction(s): Admission to graduate nursing program
Course Fee: ☑ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals
   The instructor will:
   1. Describe the principles of pharmacokinetics, pharmacodynamics, and pharmacogenomics to foster basic understanding of foundations underlying drug therapies.
   2. Discuss basic concepts that contribute to pharmacologic decision making such as economic concerns, ethical and legal scope of practice, lifespan considerations, cultural responses, and adherence.
   3. Summarize information regarding drug effects, adverse reactions, dosing, scheduling, and contraindications in specific drug categories.
   4. Cite examples of specifics and general prescribing guidelines.
## B. Student Learning Outcomes/Assessment Measures

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Recognize pharmacokinetic principles as a guide in selecting appropriate agents, prescribing appropriate dosing schedules and administration routes, and establishing effective monitoring systems</td>
<td>Quizzes, case studies, peer reviews, topic/medication specific assignments, final exam</td>
</tr>
<tr>
<td>2. Given a clinical situation, assess information about the client and knowledge about the underlying pathophysiology and available pharmacologic agents to prescribe or recommend appropriate pharmacologic interventions</td>
<td>Discussion, case studies, peer reviews, topic/medication specific assignments, final exam</td>
</tr>
<tr>
<td>3. Translate principles of teaching/learning and understanding of theories of compliance, including sociocultural and community aspects of adherence, to assist the client in taking prescribed and recommended drugs safely and effectively</td>
<td>Quizzes, discussion, case studies, peer reviews</td>
</tr>
<tr>
<td>4. Generate ideas to facilitate clients’ abilities to take prescribed and recommended agents in a manner that will maximize therapeutic effect and minimize the development of adverse drug reactions</td>
<td>Discussion, case studies, peer reviews</td>
</tr>
<tr>
<td>5. Predict potential for adverse drug reactions based on drug-drug, drug-diet, drug-disease, drug-environment including herbal and dietary supplement interactions and integrate that recognition into clinical practice</td>
<td>Discussion, case studies, peer reviews</td>
</tr>
<tr>
<td>6. Determine the mechanism of action, rationale, dosing, common side effects, and counter indications on each medication prescribed along with lifestyle and behavioral considerations.</td>
<td>Quizzes, discussion, case studies, peer reviews, prescription assignments, topic/medication specific assignments, final exam</td>
</tr>
<tr>
<td></td>
<td>Manage the dosing needs of prescribed and recommended drugs to meet the specific needs of patients with developmental, genetic, and/or sociocultural variables</td>
</tr>
<tr>
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</tr>
<tr>
<td>8.</td>
<td>Determine collaboration sources to manage difficult cases with pharmacologic challenges</td>
</tr>
<tr>
<td>9.</td>
<td>Assess genetic and genomic factors that influence pharmacologic decision making in order to provide optimal drug therapy</td>
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</table>

### IV. Course Level Justification

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

### V. Course Outline

1. Overview of prescribing
   1.1. Principles of medical management
   1.2. Scope of practice
   1.3. Ethical and legal considerations
   1.4. Evidence based pharmacology guidelines
   1.5. Writing prescriptions
   1.6. E-Prescribing
   1.7. Drug nomenclature
   1.8. Adverse drug reactions
   1.9. Maintenance of clinical competency
   1.10. Patient education

2. Pharmacokinetics and pharmacodynamic principles
   2.1. Absorption
   2.2. Distribution
   2.3. Metabolism
   2.4. Elimination
   2.5. Mechanism of action
   2.6. Interactions

3. Pharmacogenetics and pharmacognomics
   3.1. Genetic testing
   3.2. Specific medications
   3.3. Teratogenesis
   3.4. Limits and ethical issues
3.5. Drug metabolism
3.6. Cytochrome P 450 enzymes

4. Special populations
   4.1. Pediatric
   4.2. Pregnant
   4.3. Breastfeeding
   4.4. Geriatrics
   4.5. Psychiatric

5. Health promotion
   5.1. Immunizations
   5.2. Vitamins, minerals, and supplements
   5.3. Alternative therapies
   5.4. Smoking cessation
   5.5. Obesity
   5.6. Diet
   5.7. Exercise
   5.8. Sleep hygiene
   5.9. Healthy relationships

6. Anti-infectives
   6.1. Principles for prescribing
   6.2. Antibiotics by category
   6.3. Miscellaneous anti-infectives
   6.4. Anti-fungals
   6.5. Anti-virals
   6.6. Anti/protozoals
   6.7. TB medications
   6.8. Sexually-transmitted infections

7. Respiratory agents
   7.1. Upper respiratory medications
   7.2. Asthma
   7.3. Chronic Obstructive Pulmonary Disease (COPD)
   7.4. Allergy

8. Pain management
   8.1. Principles of pain management
   8.2. Aspirin, acetaminophen and non-steroidal anti-inflammatory drugs
   8.3. Opioids
   8.4. Specific conditions
      8.4.1. Headache
      8.4.2. Neuropathic pain

9. Female specific medications
9.1. Contraceptives
9.2. Breast cancer agents

10. Psychotropic medications
10.1. Attention deficit disorder
10.2. Attention deficit hyperactivity disorder
10.3. Mood disorders
10.4. Anxiety
10.5. Depression
10.6. Sleep promotion

11. Dermatology agents
11.1. Oral
11.2. Topical

12. Eye, ear, throat and mouth agents
12.1. Glaucoma
12.2. Allergy

VI. Suggested Text

VII. Bibliography and Suggested Readings
Prescribers Letter
<table>
<thead>
<tr>
<th>1a. School or College</th>
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<th>4. Previous Course Prefix &amp; Number</th>
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6. Complete Course Title
Psychopharmacology for Advanced Practice Nursing
Psychopharm for Adv Nsg

7. Type of Course
- Academic
- Preparatory/Development
- Non-credit
- CEU
- Professional Development

8. Type of Action:  
- Add
- Change
- Delete

If a change, mark appropriate boxes:
- Prefix
- Credits
- Title
- Grading Basis
- Course Description
- Test Score Prerequisites
- Other Restrictions
- Registration Restrictions
- Class
- Level
- College
- Major

9. Repeat Status No  # of Repeats  Max Credits

10. Grading Basis
- A-F
- P/NP
- NG

11. Implementation Datesemester/year
- From: FALL/2014
- To: /9999

12. Cross Listed with
- N/A

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

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<td>Shirley Valek- Wilson</td>
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13b. Coordination Email
- Date: 01/29/13
- submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
- Date: 01/29/13

14. General Education Requirement
Mark appropriate box:
- Oral Communication
- Written Communication
- Quantitative Skills
- Social Sciences
- Humanities
- Fine Arts
- Natural Sciences
- Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
Develops expertise in applied psychopharmacology, preparing providers to select, prescribe and monitor pharmaceutical agents used in primary and psychiatric care settings.

16a. Course Prerequisite(s) (list prefix and number)
NS A610 with a minimum grade of B

16b. Test Score(s)
N/A

16c. Co-requisite(s) (concurrent enrollment required)
N/A

16d. Other Restriction(s)
- College
- Major
- Class
- Level

16e. Registration Restriction(s) (non-codable)
- Admission to graduate nursing program.

17. Mark if course has fees

18. Mark if course is a selected topic course

19. Justification for Action
Course revised and enhanced for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

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<th>Initiator Signed Initials: _________</th>
<th>Date: __________</th>
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Initiator (faculty only)  
Dianne Tarrant  
Initiator (TYPE NAME)

Approved
Disapproved

Dean/Director of School/College  
Date

Approved
Disapproved

Undergraduate/Graduate Academic  
Date

Approved
Disapproved

Board Chairperson  
Date

Approved
Disapproved

Provost or Designee  
Date
Course Content Guide  
School of Nursing  
Doctor of Nursing Practice (DNP) Program

I. Date of Initiation: Fall 2011

II. Course Information  
College/School: College of Health/School of Nursing  
Course Prefix: NS  
Course Number: A611  
Title: Psychopharmacology for Advanced Practice Nursing  
Credits: 3 (3 + 0)  
Grading Basis: A-F  
Implementation Date: Fall 2014  
Course Description: Develops expertise in applied psychopharmacology, preparing providers to select, prescribe and monitor pharmaceutical agents used in primary and psychiatric care settings.

Course Prerequisite(s): NS A610 with a minimum grade of B  
Corequisite(s): N/A  
Other Restriction(s): Level  
Registration Restriction(s): Admission to graduate nursing program.  
Course Fee: ☑ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures  
A. Instructional Goals  
The instructor will:  
1. Present the principles of pharmacokinetics, pharmacogenomics, and pharmacodynamics to foster basic understanding of foundations underlying psychopharmaceuticals.  
2. Promote basic concepts that contribute to psychopharmacologic decision making such as economic concerns, ethical and legal scope of practice, lifespan considerations, cultural responses, and adherence.  
3. Summarize information regarding psychopharmaceutical effects, adverse reactions, dosing, scheduling, and contraindications.  
4. Promote application of specific and general prescribing guidelines in practice.
<table>
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<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
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<td><strong>Upon successful completion of the course, the student will be able to:</strong></td>
<td><strong>This outcome will be assessed by one or more of the following:</strong></td>
</tr>
<tr>
<td>1. Integrate pharmacokinetic, pharmacogenomic, and pharmacodynamic principles as a guide in selecting appropriate agents, prescribing appropriate dosing schedules and administration routes, and establishing effective monitoring systems for psychopharmaceuticals</td>
<td>Quizzes, case studies, peer reviews, topic/medication specific assignments, final exam</td>
</tr>
<tr>
<td>2. Assess information about client and knowledge of underlying pathophysiology and available psychopharmacologic agents to prescribe or recommend appropriate pharmacologic interventions</td>
<td>Discussion, case studies, peer reviews, topic/medication specific assignments, final exam</td>
</tr>
<tr>
<td>3. Translate principles of teaching/learning and adherence, including mental health, sociocultural and community</td>
<td>Quizzes, discussion, case studies, peer reviews</td>
</tr>
<tr>
<td>4. Facilitate clients’ abilities to take prescribed and recommended agents to maximize therapeutic effect to minimize the development of adverse drug reactions</td>
<td>Discussion, case studies, peer reviews</td>
</tr>
<tr>
<td>5. Predict potential for adverse psychopharmacologic drug reactions based on drug-disease, drug-environment, drug-drug, drug-diet, drug-herbal and drug-dietary supplement interactions and integrate into clinical practice</td>
<td>Discussion, case studies, peer reviews</td>
</tr>
<tr>
<td>6. Appraise drugs commonly used in psychiatric mental health settings for:</td>
<td>Quizzes, discussion, case studies, peer reviews, prescription assignments, topic/medication specific assignments, final exam</td>
</tr>
<tr>
<td>• Physiologic effect (mechanism of action)</td>
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<tr>
<td>• Rationale for use in particular situations (critical decision making)</td>
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<tr>
<td>• Common adverse effects</td>
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<td>• Usual dosage and scheduling</td>
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<td>• Laboratory monitoring</td>
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<td>• Route of administration</td>
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Contraindications
• Cognitive behavioral interventions
• Life style considerations
• Compliance issues

7. Manage prescribed and recommended psychopharmaceuticals to meet specific needs of patients with developmental, genetic, and/or sociocultural variables

Quizzes, discussion, case studies, peer reviews, topic/medication specific assignments

8. Determine collaboration sources to manage difficult cases with pharmacologic challenges

Discussion, case studies, peer reviews

IV. Course Level Justification
This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

V. Course Outline
1. Principles of psychopharmacology
   1.1. Neuroanatomy
   1.2. Neurobiology
   1.3. Pharmacokinetics, pharmacogenomics, and pharmacodynamics
   1.4. Ethical and cultural concerns
2. Medication management for major disorders
   2.1. Schizophrenia and psychotic disorders
   2.2. Anxiety
   2.3. Mood disorders
   2.4. Attention deficit disorders
   2.5. Dementia
   2.6. Substance abuse
3. Medication management in special populations
   3.1. Pediatrics
   3.2. Geriatrics
   3.3. Pregnant and breastfeeding women
4. Individualizing medication management
   4.1. Essentials of the prescriptive interview
   4.2. Follow-up and monitoring strategies
   4.3. Psychotherapeutic and psychopharmacologic interventions
   4.4. Psychoeducation and therapeutic support
4.5. Special issues in adherence
5. Ethical and legal considerations in psychopharmacology
  5.1. Scope of practice and state/federal laws
  5.2. Prescription writing and record keeping
  5.3. Ethical prescribing practices
6. Maintaining clinical competency
  6.1. Consultation and peer support
  6.2. Evidence-based practice guidelines and protocols
  6.3. Professional organizations

VI. Suggested Text

VII. Bibliography and Suggested Readings
Prescribers Letter
# Course Action Request

University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

<table>
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Initiator Name (typed): [Initiator Signed Initials: ______________________ Date: ____________]

13b. Coordination Email: Submitted 01/29/13 to Faculty Listserv: [uaa-faculty@lists.uaa.alaska.edu]

13c. Coordination with Library Liaison: Date: 01/29/13

14. General Education Requirement

Mark appropriate box:
- Oral Communication
- Written Communication
- Quantitative Skills
- Social Sciences
- Natural Sciences
- Humanities
- Integrative Capstone

15. Course Description (suggested length 20 to 50 words)

Increases expertise in applied pharmacology, preparing providers to select, prescribe and monitor pharmaceutical agents used in primary and psychiatric care settings with emphasis on adults.

16a. Course Prerequisite(s) (list prefix and number)

NS A610 with a minimum grade of B

16b. Test Score(s)

N/A

16c. Co-requisite(s) (concurrent enrollment required)

NS A662 or NS A672

16d. Other Restriction(s)

- College
- Major
- Class
- Level

16e. Registration Restriction(s) (non-codable)

Admission to graduate nursing program

17. Mark if course has fees

18. Mark if course is a selected topic course

19. Justification for Action

Course developed for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

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192
I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A612
Title: Pharmacology for Primary Care II
Credits: 3 (3 + 0)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Increases expertise in applied pharmacology, preparing providers to select, prescribe and monitor pharmaceutical agents used in primary and psychiatric care settings with emphasis on adults.

Course Prerequisite(s): NS A610 with a minimum grade of B
Corequisite(s): NS A662 or NS A672
Other Restriction(s): Level
Registration Restriction(s): Admission to graduate nursing program
Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Outcomes, and Assessment Measures
A. Instructional Goals
The instructor will:
1. Describe the principles of pharmacokinetics and pharmacodynamics to foster basic understanding of foundations underlying drug therapies.
2. Discuss basic concepts that contribute to pharmacologic decision making such as economic concerns, ethical and legal scope of practice, lifespan considerations, cultural responses, and adherence.
3. Summarize information regarding drug effects, adverse reactions, dosing, scheduling, and contraindications in specific drug categories.
4. Cite examples of specifics and general prescribing guidelines.
### B. Student Learning Outcomes/Assessment Measures

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<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
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<td><strong>Upon successful completion of the course, the student will be able to:</strong></td>
<td><strong>This outcome will be assessed by one or more of the following:</strong></td>
</tr>
<tr>
<td><strong>1.</strong> Recognize pharmacokinetic principles as a guide in selecting appropriate agents, prescribing appropriate dosing schedules and administration routes, and establishing effective monitoring systems</td>
<td>Quizzes, case studies, peer reviews, topic/medication specific assignments, final exam</td>
</tr>
<tr>
<td><strong>2.</strong> Assess information about the client and apply knowledge about the underlying pathophysiology and available pharmacologic agents to prescribe or recommend appropriate pharmacologic interventions in a given clinical situation</td>
<td>Discussion, case studies, peer reviews, topic/medication specific assignments, final exam</td>
</tr>
<tr>
<td><strong>3.</strong> Translate principles of teaching/learning and understanding of theories of compliance, including sociocultural and community aspects of adherence, to assist the client in taking prescribed and recommended drugs safely and effectively</td>
<td>Quizzes, discussion, case studies, peer reviews</td>
</tr>
<tr>
<td><strong>4.</strong> Generate ideas to facilitate clients’ abilities to take prescribed and recommended agents in a manner that will maximize therapeutic effect and minimize the development of adverse drug reactions</td>
<td>Discussion, case studies, peer reviews</td>
</tr>
<tr>
<td><strong>5.</strong> Predict potential for adverse drug reactions based on drug-drug, drug-diet, drug-disease, drug-environment including herbal and dietary supplement interactions and integrate that recognition into clinical practice</td>
<td>Discussion, case studies, peer reviews</td>
</tr>
<tr>
<td><strong>6.</strong> Determine the mechanism of action, rationale, dosing, common side effects, and counter indications on each medication prescribed along with lifestyle and behavioral considerations</td>
<td>Quizzes, discussion, case studies, peer reviews, prescription assignments, topic/medication specific assignments, final exam</td>
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<tr>
<td>7.</td>
<td>Manage the dosing needs of prescribed and recommended drugs to meet the specific needs of patients with developmental, genetic, and/or sociocultural variables</td>
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<tr>
<td>8.</td>
<td>Determine collaboration sources to manage difficult cases with pharmacologic challenges</td>
</tr>
<tr>
<td>9.</td>
<td>Assess factors that influence pharmacologic decision making in order to provide optimal drug therapy</td>
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### IV. Course Level Justification

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

### V. Course Outline

1. Course introduction
2. Cardiovascular agents
   2.1. Anti-hypertensives by category
   2.2. Heart failures medications
   2.3. Anti-arrythmic agents
   2.4. Agents that act on the blood
   2.5. Coronary artery disease medications
   2.6. Anti-anginal agents
   2.7. Lipid lowering agents
3. Endocrine agents
   3.1. Metabolic syndrome
   3.2. Diabetes agents
   3.3. Glucocorticoids
   3.4. Thyroid medications
   3.5. Hormones – male and female
4. Gastrointestinal agents
   4.1. Gastroesophageal reflux disease (GERD) medications
   4.2. Anti-diarrheals
   4.3. Antiemetics
   4.4. Laxatives
4.5. Irritable bowel syndrome medications
4.6. Other gastrointestinal (GI) medications

5. Renal/genitourinary agents
5.1. Diuretics
5.2. Male genital urinary (GU) agents
5.3. Urinary incontinence and urinary analgesia

6. Musculoskeletal agents
6.1. Disease-modifying anti-rheumatic drugs
6.2. Gout medications
6.3. Muscle relaxants
6.4. Osteoporosis

7. Neurological agents
7.1. Alzheimer's and dementia medications
7.2. Anti-parkinson agents
7.3. Anti-convulsants
7.4. Anti-insomnia agents

8. Psychotropic agents
8.1. Anti-psychotics
8.2. Mood stabilizers
8.3. Substance abuse

9. Complex pharmacology case studies

VI. Suggested Texts

VII. Bibliography & Suggested Readings
Prescribers Letter
### Course Action Request

**University of Alaska Anchorage**

**Proposal to Initiate, Add, Change, or Delete a Course**

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<th>5b. Contact Hours (Lecture + Lab)</th>
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<td>Provides an evidence-based foundation in informatics and technology for advanced practice. Emphasizes evolving technologies, health communications, and clinical information systems. Evaluates impact of technology on safety, access to care, and quality healthcare outcomes.</td>
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| 17. ☒ Mark if course has fees |
| 18. ☐ Mark if course is a selected topic course |

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<td>Course developed for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.</td>
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197
Course Content Guide  
School of Nursing  
Doctor of Nursing Practice (DNP) Program

I. Date of Initiation: Fall 2011

II. Course Information  
College/School: College of Health/School of Nursing  
Course Prefix: NS  
Course Number: A613  
Title: Advanced Practice Informatics  
Credits: 2 (2 + 0)  
Grading Basis: A-F  
Implementation Date: Fall 2014  
Course Description: Provides an evidence-based foundation in informatics and technology for advanced practice. Emphasizes evolving technologies, health communications, and clinical information systems. Evaluates impact of technology on safety, access to care, and quality healthcare outcomes.

Course Prerequisite(s): N/A  
Corequisite(s): N/A  
Other Restriction(s): Level  
Registration Restriction(s): Admission to graduate nursing program  
Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Outcomes, and Assessment Measures
A. Instructional Goals  
The instructor will:
1. Facilitate analysis of health information and communication technologies to improve the quality, safety and efficiency of healthcare outcomes.
2. Discuss impact of emerging technology to enhance the delivery of healthcare across diverse populations and environments.
3. Evaluate critical elements necessary for selection and implementation of clinical information systems.
B. Student Learning Outcomes/Assessment Measures

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
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<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
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<tr>
<td>1. Describe the relationships between acquiring and manipulating data and applying information for clinical decision making</td>
<td>Compare, contrast and critique available patient databases utilizing team approach and classroom presentation</td>
</tr>
<tr>
<td>2. Analyze emerging technologies that are used to enhance access to healthcare for diverse patient populations</td>
<td>Guided discussion, literature review paper</td>
</tr>
<tr>
<td>3. Utilize a variety of electronically accessible and credible resources applicable for evidence-based practice</td>
<td>Classroom presentation, literature review paper</td>
</tr>
<tr>
<td>4. Analyze and communicate the clinician role in developing the design of and critical elements necessary for the selection, implementation, and evaluation of clinical systems</td>
<td>Guided discussion board, case study analysis</td>
</tr>
<tr>
<td>5. Discuss implications for data security, sharing of information, and access to electronic medical records</td>
<td>Guided discussion board, case study analysis</td>
</tr>
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IV. Course Level Justification
This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

V. Course Outline
1. Overview of history of computers and nursing
2. Computer systems
   2.1. Hardware, software, and systems
   2.2. Open source and free software
   2.3. Internet and intranet
   2.4. Emerging technologies
3. Informatics
   3.1. Theories, models and frameworks
   3.2. Issues in informatics
      3.2.1. Healthcare policies
      3.2.2. Data standards
      3.2.3. Minimum Data Set Systems
      3.2.4. Data security
4. Informatics applications for quality, safety, efficiency, and security
   4.1. Informatics in practice settings
   4.2. Role of the clinician
   4.3. Research applications
   4.4. Consumer and patient use
   4.5. Educational applications
5. Administration applications for evidence-based decision-making
   5.1. Informatics for nursing management
   5.2. Translation of evidence into practice
   5.3. Data mining and knowledge
   5.4. Internet tools for advanced nursing practice

VI. Suggested Texts

VII. Bibliography & Suggested Readings
## Course Action Request

**University of Alaska Anchorage**  
Proposal to Initiate, Add, Change, or Delete a Course

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<td>N/A</td>
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<td>(Lecture + Lab) (2+0)</td>
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### 6. Complete Course Title

**Advanced Practice Ethics and Law**  
Adv Practice Ethics and Law

Abbreviated Title for Transcript (30 character)

### 7. Type of Course

- Academic
- Preparatory/Development
- Non-credit
- CEU
- Professional Development

### 8. Type of Action:

- Add
- Change
- Delete

If a change, mark appropriate boxes:

- Prefix
- Credits
- Title
- Grading Basis
- Course Description
- Test Score Prerequisites
- Other Restrictions
- Class
- Level
- College
- Major
- Other (please specify)

### 9. Repeat Status No

- # of Repeats
- Max Credits

### 10. Grading Basis

- A-F
- P/NP
- NG

### 11. Implementation Date

- semester/year

- From: FALL/2014  
- To: /9999

### 12. Cross Listed with

- N/A

### 13a. Impacted Courses or Programs:

List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

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</table>

**Initiator Name (typed):**

**Initiator Signed Initials:**

**Date:**

### 13b. Coordination Email

Date: 01/29/13

Submitted to Faculty Listserv: [uaa-faculty@lists.uaa.alaska.edu](mailto:uaa-faculty@lists.uaa.alaska.edu)

### 13c. Coordination with Library Liaison

Date: 01/29/13

### 15. Course Description (suggested length 20 to 50 words)

Provides a foundation in ethics and law for advanced practice. Analyzes ethical theories and principles and their application to decision-making in practice. Explores the interface between ethical decision-making, legal and regulatory requirements, and their effects on the conduct of research, the influence of technology, and access to care.

### 16a. Course Prerequisite(s) (list prefix and number)

N/A

### 16b. Test Score(s)

N/A

### 16c. Co-requisite(s) (concurrent enrollment required)

N/A

### 16d. Other Restriction(s)

- College
- Major
- Class
- Level

### 16e. Registration Restriction(s) (non-codable)

Admission to graduate nursing program

### 17. Mark if course has fees

### 18. Mark if course is a selected topic course

### 19. Justification for Action

Course developed for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

## Approval Details

**Initiator (faculty only)**  
Dianne Tarrant  
Initiator (TYPE NAME)

- Approved  
- Disapproved

**Dean/Director of School/College**  
Date

- Approved  
- Disapproved

**Undergraduate/Graduate Academic**  
Board Chairperson  
Date

- Approved  
- Disapproved

**Provost or Designee**  
Date

---

201
I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A614
Title: Advanced Practice Ethics and Law
Credits: 2 (2 + 0)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Provides a foundation in ethics and law for advanced practice. Analyzes ethical theories and principles and their application to decision-making in practice. Explores the interface between ethical decision-making, legal and regulatory requirements, and their effects on the conduct of research, the influence of technology, and access to care.

Course Prerequisite(s): N/A
Corequisite(s): N/A
Other Restriction(s): Level
Registration Restriction(s): Admission to graduate nursing program
Course Fee: ☑ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals
The instructor will:
1. Facilitate exploration of ethical theories and principles and their application to decision-making in practice.
2. Assist with analysis of legal, regulatory and ethical structures governing healthcare practice and access to care.
3. Provide opportunities to explore ethical problems related to emerging technology including biomedical research, information technology and telemedicine.
4. Develop landmark historical and current ethical case studies for student analysis.
### B. Student Learning Outcomes/Assessment Measures

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Examine personal ethical and moral belief systems and their impact on practice</td>
<td>On-line peer discussion and self-reflection activity</td>
</tr>
<tr>
<td>2. Describe ethical theories and principles and analyze their relationship to advanced practice</td>
<td>On-line peer discussion and case study analysis</td>
</tr>
<tr>
<td>3. Analyze the legal, regulatory and ethical structures governing healthcare practice, research and access to care</td>
<td>Case study analysis</td>
</tr>
<tr>
<td>4. Critique ethical relationships between risk management, quality assurance and resource allocation</td>
<td>Case study analysis</td>
</tr>
<tr>
<td>5. Discuss ethical and legal issues and procedures governing biomedical research, information technology and telemedicine</td>
<td>Case study analysis</td>
</tr>
<tr>
<td>Analyze and solve historical and current ethical dilemmas in healthcare</td>
<td>Case study analysis</td>
</tr>
</tbody>
</table>

### IV. Course Level Justification

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

### V. Course Outline

1. Building an ethical framework
   1.1. Defining ethics in healthcare
   1.2. Personal belief systems
2. Introduction to ethical principles and theory
   2.1. Ethics and ethical theories
   2.2. Four major principles of biomedical ethics
3. Applied ethics
   3.1. Quality improvement
   3.2. Risk management
   3.3. Resource allocation
4. The ethical, regulatory and legal environment
   4.1. Licensure, credentialing, and accreditation
   4.2. Negligence, malpractice, and medical errors
   4.3. Emerging and information technologies
   4.4. Confidentiality
   4.5. Research
      4.5.1. The Institutional Review Board
      4.5.2. Case studies

VI. Suggested Texts

VII. Bibliography & Suggested Readings
# Course Action Request

## University of Alaska Anchorage

Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
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<tr>
<td>CH College of Health</td>
<td>ADSN Division of Nursing</td>
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<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours (Lecture + Lab)</th>
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<td>A615</td>
<td>N/A</td>
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<td>(4+0)</td>
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</table>

## Complete Course Title

Health Services Organization and Finance

## Abbreviated Title for Transcript (30 character)

Health Organization & Finance

### 2. Course Prefix
NS

### 3. Course Number
A615

### 4. Previous Course Prefix & Number
N/A

### 5a. Credits/CEUs
4

### 5b. Contact Hours (Lecture + Lab)
(4+0)

### 6. Complete Course Title
Health Services Organization and Finance

Health Organization & Finance

### 7. Type of Course
☒ Academic  ☐ Preparatory/Development  ☐ Non-credit  ☐ CEU  ☐ Professional Development

### 8. Type of Action:
☒ Add  ☐ Change  ☐ Delete

If a change, mark appropriate boxes:

- Prefix
- Credits
- Title
- Grading Basis
- Course Description
- Test Score Prerequisites
- Other Restrictions
- Class
- College
- Major
- Level
- Other

### 9. Repeat Status No  # of Repeats  Max Credits

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<th>10. Grading Basis</th>
<th>A-F</th>
<th>P/NP</th>
<th>NG</th>
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### 11. Implementation Date  semester/year  From: FALL/2014  To: 9999

### 12. ☐ Cross Listed with  N/A

Stacked with  N/A  Cross-Listed Coordination Signature

### 13a. Impacted Courses or Programs:
List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

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Initiator Name (typed):  
Initiator Signed Initials:  
Date:  

### 13b. Coordination Email  Date: 01/29/13

submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

### 13c. Coordination with Library Liaison  Date: 01/29/13

### 14. General Education Requirement

Mark appropriate box:

- Oral Communication
- Written Communication
- Quantitative Skills
- Social Sciences
- Humanities
- Fine Arts
- Natural Sciences
- Integrative Capstone

### 15. Course Description

(suggested length 20 to 50 words)

Synthesizes organizational theories in the healthcare context. Develops advanced practice role in complex healthcare organizations. Plans the design, implementation and evaluation of quality healthcare practices applying principles of finance, quality outcomes and cost analysis. Implements strategic findings for organizational change, system change and positive population health outcomes.

### 16a. Course Prerequisite(s) (list prefix and number)
N/A

### 16b. Test Score(s)
N/A

### 16c. Co-requisite(s) (concurrent enrollment required)
N/A

### 16d. Other Restriction(s)
- ☒ College  - ☐ Major  - ☐ Class  - ☒ Level

### 16e. Registration Restriction(s) (non-codable)

Admission to graduate nursing program

### 17. ☒ Mark if course has fees

### 18. ☐ Mark if course is a selected topic course

### 19. Justification for Action

Course developed for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

|--------------------------|-----------------------------|

Initiator (faculty only)  
Initiator (TYPE NAME)

Initiator Signed Initials:  
Date:  

Approved  
Disapproved  
Dean/Director of School/College  
Date:

Approved  
Disapproved  
Undergraduate/Graduate Academic  
Date:

Approved  
Disapproved  
Board Chairperson  
Date:

Approved  
Disapproved  
Provost or Designee  
Date:

Dianne Tarrant

Initiator (TYPE NAME)

Disapproved  
Department Chairperson  
Date:

Disapproved  
Curriculum Committee Chairperson  
Date:

[Template available at www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance)
I. Date of Initiation  
Fall 2011

II. Course Information  
College/School: College of Health/School of Nursing  
Course Prefix: NS  
Course Number: A615  
Title: Health Services Organization and Finance  
Credits: 4 (4 + 0)  
Grading Basis: A-F  
Implementation Date: Fall 2014  
Course Description: Synthesizes organizational theories in the healthcare context. Develops advanced practice role in complex healthcare organizations. Plans the design, implementation and evaluation of quality healthcare. Implements strategic findings for organizational change, system change and positive population health outcomes.

Course Prerequisite(s): N/A  
Corequisite(s): N/A  
Other Restriction(s): Level  
Registration Restriction(s): Admission to graduate nursing program  
Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures  
A. Instructional Goals  
The instructor will:  
1. Promote analysis of literature and perspectives on organizational theories in the context of healthcare.  
2. Foster development of conceptual framework for the advanced practice role in complex healthcare organizations.  
3. Facilitate analysis of healthcare services delivery using principles of finance and cost analysis.  
4. Differentiate healthcare evaluation methods to improve function, design, and implementation of quality service.  
5. Assist students to implement findings to change healthcare organizations and promote positive population health outcomes.
### B. Student Learning Outcomes/Assessment Measures

<table>
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<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
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<tbody>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Synthesize organizational theories in the context of healthcare</td>
<td>Literature review</td>
</tr>
<tr>
<td>2. Develop advanced practice conceptual framework and role in complex healthcare organizations</td>
<td>Guided peer group discussion in online discussion board</td>
</tr>
<tr>
<td>3. Design, and evaluate quality healthcare practices</td>
<td>Practice guideline, cost/benefit analysis</td>
</tr>
<tr>
<td>4. Implement findings for systems change and population health outcomes</td>
<td>Program evaluation/policy analysis</td>
</tr>
<tr>
<td>5. Evaluate organizational finances</td>
<td>Finance paper</td>
</tr>
</tbody>
</table>

### IV. Course Level Justification

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

### V. Course Outline

1. Organizational theory
   1.1. History and current general theory
   1.2. Application of healthcare setting
2. Leadership in complex healthcare systems
3. The business of healthcare
   3.1. Financing systems
   3.2. Reimbursement
   3.3. Coding and accounting
   3.4. Cost analysis
4. Health services evaluation
   4.1. Design and evaluate research outcomes
   4.2. Develop practice guidelines and protocols
5. Systems change
   5.1. Quality program evaluation
   5.2. Population health policy analysis
VI. Suggested Texts

VII. Bibliography and Suggested Readings
Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College
CH College of Health
1b. Division
ADSN Division of Nursing
1c. Department
NUR

2. Course Prefix
NS
3. Course Number
A618
4. Previous Course Prefix & Number
N/A
5a. Credits/CEUs
2 or 4
5b. Contact Hours
(Lecture + Lab)
(2 or 4+0)

6. Complete Course Title
Advanced Nursing Roles and Leadership
Advising Nurses and Leadership

7. Type of Course
☐ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action:
☐ Add  ☐ Change  ☐ Delete

9. Repeat Status No
☐ # of Repeats ☐ Max Credits

10. Grading Basis
☐ A-F ☐ P/NP ☐ NG

11. Implementation Date
semester/year
From: FALL/2014 To: /9999

12. ☐ Cross Listed with N/A
☐ Stacked with N/A

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

13b. Coordination Email
Date: 01/29/13

13c. Coordination with Library Liaison
Date: 01/29/13

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Social Sciences ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
Appraises evolution of advanced nursing roles. Enhances leadership skills to improve healthcare. Develops collaborative knowledge and practice improvement with an emphasis on population health management. Special note: BSN to DNP students take course for 4 credits; post masters to DNP students take course for 2 credits with focus on leadership.

16a. Course Prerequisite(s) (list prefix and number)
N/A
16b. Test Score(s)
N/A
16c. Co-requisite(s) (concurrent enrollment required)
N/A

16d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☐ Level

16e. Registration Restriction(s) (non-codable)
Admission to graduate nursing program

17. ☐ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Course revised and enhanced for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

Initiator Name (typed): Dianne Tarrant
Initiator Signed Initials: _________
Date:

Initiator (faculty only)
Dianne Tarrant
Initiator (TYPE NAME)

☐ Approved ☐ Disapproved
Dean/Director of School/College
Date

☐ Approved ☐ Disapproved
Undergraduate/Graduate Academic
Date

☐ Approved ☐ Disapproved
Board Chairperson
Date

☐ Approved ☐ Disapproved
Provost or Designee
Date
### Course Being Changed:

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<td>9/11</td>
<td>Dianne Tarrant</td>
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<td>NS A696 Individual Project</td>
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<td>NS A699 Thesis</td>
<td>464</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
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Course Content Guide  
School of Nursing  
Doctor of Nursing Practice (DNP) Program

I. Date of Initiation: Fall 2011

II. Course Information

College/School: College of Health/School of Nursing  
Course Prefix: NS  
Course Number: A618  
Title: Advanced Nursing Roles and Leadership  
Credits: 2 or 4 (2 or 4 + 0)  
Grading Basis: A-F  
Implementation Date: Fall 2014  
Course Description: Appraises evolution of advanced nursing roles. Enhances leadership skills to improve healthcare. Develops collaborative knowledge and practice improvement with an emphasis on population health management. Special note: BSN to DNP students take course for 4 credits; post masters to DNP students take course for 2 credits with focus on leadership.

Course Prerequisite(s): N/A  
Corequisite(s): N/A  
Other Restriction(s): Level  
Registration Restriction(s): Admission to graduate nursing program  
Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures

A. Instructional Goals

The instructor will:

1. Discuss historical, political, and social underpinnings of the health professions and the evolution of advanced nursing roles.
2. Foster acquisition of leadership skills to affect healthcare policy and institutional change.
3. Facilitate acquisition of skills for collaborative knowledge and practice improvement.
4. Encourage critical analysis of advanced nursing role in population health management.
### B. Student Learning Outcomes/Assessment Measures

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<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Evaluate the advanced nursing role in historical, political, and social context</td>
<td>Critical analyses using literature review and peer discussion</td>
</tr>
<tr>
<td>2. Demonstrate leadership skills to affect healthcare policy and effect institutional change</td>
<td>Change analysis activity with peer discussion</td>
</tr>
<tr>
<td>3. Apply leadership principles for professional collaboration</td>
<td>Leadership paper</td>
</tr>
<tr>
<td>4. Explore roles for advanced nursing in population health management</td>
<td>Clinical process improvement with role analysis</td>
</tr>
</tbody>
</table>

### IV. Course Level Justification

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

### V. Course Outline

1. Professionalism in healthcare
   1.1. History, social, regulatory and political context
   1.2. Advanced nursing roles
2. Leadership principles and tools for advanced nursing roles
3. Leadership for systems change
   3.1. Population health, policy and advocacy
   3.2. Assess, implement and evaluate system change
4. Leadership for healthcare quality, safety and equity
   4.1. Quality improvement
   4.2. To err is human: the environment of safety
VI. Suggested Texts


VII. Bibliography and Suggested Readings


Proposal to Initiate, Add, Change, or Delete a Course

Initiator Name (typed): Dianne Tarrant

Initiator Signed Initials:__________ Date:__________

Proposal to Initiate, Add, Change, or Delete a Course

Initiator Name (typed): Dianne Tarrant

Initiator Signed Initials:__________ Date:__________

1. School or College
   CH College of Health

2. Course Prefix
   NS

3. Course Number
   A619

4. Previous Course Prefix & Number
   N/A

5a. Credits/CEUs
   2 or 4

5b. Contact Hours
   (Lecture + Lab)
   (2 OR 4+0)

6. Complete Course Title
   Health Policy and Economics

7. Type of Course
   ☒ Academic
   ☐ Preparatory/Development
   ☐ Non-credit
   ☐ CEU
   ☐ Professional Development

8. Type of Action: ☐ Add or ☒ Change or ☐ Delete

If a change, mark appropriate boxes:

☐ Prefix
☐ Credits
☐ Title
☐ Grading Basis
☐ Course Description
☐ Test Score Prerequisites
☐ Other Restrictions
☐ Class
☐ Level
☐ College
☐ Major
☐ Other

(please specify)

9. Repeat Status No
   # of Repeats
   Max Credits

10. Grading Basis
    ☒ A-F
    ☐ P/NP
    ☐ NG

11. Implementation Date
    Semester/Year
    From: FALL/2014 To: /9999

12. ☐ Cross Listed with N/A
    ☐ Stacked with N/A
    Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

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Initiator Name (typed): Dianne Tarrant

Initiator Signed Initials:__________ Date:__________

13b. Coordination Email

Date: 01/29/13

submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison

Date: 01/29/13

14. General Education Requirement

Mark appropriate box:

☐ Oral Communication
☐ Written Communication
☐ Quantitative Skills
☐ Social Sciences
☐ Natural Sciences
☐ Humanities
☐ Fine Arts
☐ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)

Course Description: Critically appraises policy process. Evaluates current and proposed policies. Compares health system economics with health outcomes. Applies advocacy and leadership strategies to analyze and implement policies to promote positive societal and economic outcomes. Special note: BSN to DNP students take course for 4 credits; post masters to DNP students take course for 2 credits with a focus on economics.

16a. Course Prerequisite(s) (list prefix and number)

N/A

16b. Test Score(s)

N/A

16c. Co-requisite(s) (concurrent enrollment required)

N/A

16d. Other Restriction(s)

☐ College
☐ Major
☐ Class
☒ Level

16e. Registration Restriction(s) (non-codable)

Admission to graduate nursing program

17. ☒ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action

Course revised and enhanced for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

Initiator (faculty only)

Dianne Tarrant

Initiator (TYPE NAME)

☐ Approved
☐ Disapproved

Dean/Director of School/College

Date

Disapproved

☐ Approved
☐ Disapproved

Undergraduate/Graduate Academic

Date

Disapproved

☐ Approved

Board Chairperson

Date

Disapproved

Provost or Designee

Date
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<td>Dianne Tarrant</td>
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<td>NS A699 Thesis</td>
<td>464</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
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I. Date of Initiation: Fall 2011

II. Course Information

College/School: College of Health/School of Nursing  
Course Prefix: NS  
Course Number: A619  
Title: Health Policy and Economics  
Credits: 2 or 4 (2 or 4 + 0)  
Grading Basis: A-F  
Implementation Date: Fall 2014  
Course Description: Critically appraises policy process. Evaluates current and proposed policies. Compares health system economics with health outcomes. Applies advocacy and leadership strategies to analyze and implement policies to promote positive societal and economic outcomes. Special note: BSN to DNP students take course for 4 credits; post masters to DNP students take course for 2 credits with a focus on economics.

Course Prerequisite(s): N/A  
Corequisite(s): N/A  
Other Restriction(s): Level  
Registration Restriction(s): Admission to graduate nursing program.  
Course Fee: Yes ☑️ No ☐

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures

A. Instructional Goals

The instructor will:

1. Facilitate examination, appraisal and application of health policy process and economics.
2. Foster critical and evidence-based analysis of health policy. Employing population health, structural determinants, and economic frameworks.
3. Promote evaluation of health systems outcomes.
4. Facilitate population health advocacy.
### B. Student Learning Outcomes/Assessment Measures

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
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<tbody>
<tr>
<td><strong>Upon successful completion of the course, the student will be able to:</strong></td>
<td>This outcome will be assessed by one or more of the following:</td>
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<tr>
<td>1. Examine and appraise the policy process</td>
<td>Guided discussion and written analysis</td>
</tr>
<tr>
<td>2. Critically analyze cost, quality and access consequences of health policies</td>
<td>Written policy analysis, formal issue brief</td>
</tr>
<tr>
<td>3. Explore the impact of health policies on society using health economics tools</td>
<td>Guided discussion, formal policy analysis and formal issue brief</td>
</tr>
<tr>
<td>4. Evaluate health system design and compare outcomes</td>
<td>Written comparative analysis and guided discussion</td>
</tr>
<tr>
<td>5. Identify the impact of health policy on health care systems, delivery of care, and population health determinants</td>
<td>Literature review and guided discussion</td>
</tr>
<tr>
<td>6. Advocate for healthy population health policy</td>
<td>Formal issue brief, persuasion paper, community advocacy</td>
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</table>

### IV. Course Level Justification

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

### V. Course Outline

1. The policy process
2. Policy analysis methods
3. Healthcare economics (post masters students will only do this section)
   3.1. Economics of healthcare
   3.2. Economics of health
   3.3. Health systems comparisons
   3.4. Health outcomes comparisons
4. Healthcare reform
5. Population health policy
   5.1. Structural determinants of health
   5.2. Population health advocacy
VI. **Suggested Text**


VII. **Bibliography and Suggested Readings**


*Classic text
### Course Action Request

**University of Alaska Anchorage**  
Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
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<tbody>
<tr>
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<td>ADSN Division of Nursing</td>
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<th>3. Course Number</th>
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<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours (Lecture + Lab)</th>
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#### Complete Course Title

Knowledge Development for Advanced Nursing Practice  
Knowledge Development for ANP  
Abbreviated Title for Transcript (30 character)

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<th>7. Type of Course</th>
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<td>Add</td>
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#### Credits/CEUs

- 3 Credits/CEUs

#### Contact Hours

- (3 Lecture + Lab)

#### Complete Course Title

Knowledge Development for Advanced Nursing Practice  
Knowledge Development for ANP

#### Type of Course

- Academic  
- Preparatory/Development  
- Non-credit  
- CEU  
- Professional Development

#### Course Description

Integrates theory and clinical evidence from nursing and other disciplines to explain and predict human responses to health and illness. Explores multiple paradigms of knowledge development. Critically analyzes and explores translation of theory into knowledge to improve practice, clinical decision-making and health.

#### Course Prerequisite(s)

N/A

#### Test Score(s)

N/A

#### Co-requisite(s)

N/A

#### Other Restriction(s)

- College  
- Major  
- Class  
- Level

#### Registration Restrictions

- Cross-listed with N/A
- Stacked with N/A

#### General Education Requirement

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<th>Oral Communication</th>
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#### Course Prerequisite(s) (list prefix and number)

N/A

#### Test Score(s)

N/A

#### Co-requisite(s) (concurrent enrollment required)

N/A

#### Registration Restriction(s) (non-codable)

Admission to graduate nursing program

#### Mark if course has fees

- ☑

#### Mark if course is a selected topic course

- ☑

#### Justification for Action

Course revised and enhanced for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

Initiator (faculty only)  
Dianne Tarrant  
Initiator Signed Initials: _________

Initiator Name (typed):  
Initiator Signed Initials: _________

Initiator (TYPE NAME)  
Initiator (faculty only)  
Dianne Tarrant  
Initiator Signed Initials: _________

Approved  
Disapproved  
Dean/Director of School/College  
Date

Approved  
Disapproved  
Undergraduate/Graduate Academic  
Date

Approved  
Disapproved  
Board Chairperson  
Date

Approved  
Disapproved  
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<td>NS A640 Teaching and Learning</td>
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<td>NS A699 Thesis</td>
<td>466</td>
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<td>Dianne Tarrant</td>
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</table>
Course Content Guide
School of Nursing
Doctor of Nursing Practice Program

I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A621
Title: Knowledge Development for Advanced Nursing Practice
Credits: 3 (3 + 0)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Integrates theory and clinical evidence from nursing and other disciplines to explain and predict human responses to health and illness. Explores multiple paradigms of knowledge development. Critically analyzes and explores translation of theory into knowledge to improve practice, clinical decision-making and health.

Course Prerequisite(s): N/A
Course Corequisite(s): N/A
Other Restriction(s): Level
Registration
Restriction(s): Admission to graduate nursing program
Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals
The instructor will:
1. Facilitate integration of theory and evidence to understand human responses to health and illness.
2. Assist with development of insight into the scientific paradigm of knowledge development.
3. Foster critical analysis of theories and their conceptualization, measurement, and application.
4. Encourage recognition and application of theories of health to individuals, families, and populations.
5. Facilitate translation of theory and clinical evidence into knowledge to improve practice.
B. Student Learning Outcomes/Assessment Measures

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
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<tbody>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
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<tr>
<td>1. Integrate theory and clinical evidence from nursing and other disciplines to explain and understand human responses to health and illness</td>
<td>Comparative literature review</td>
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<tr>
<td>2. Develop insight into evolution of epistemology and belief systems</td>
<td>Peer group discussion</td>
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<tr>
<td>3. Critically analyze theories for adequacy of conceptualization, measurement, and application</td>
<td>Conceptual framework analysis</td>
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<td>4. Apply theories of health to individuals, families and populations</td>
<td>Conceptual framework draft</td>
</tr>
<tr>
<td>5. Translate theory into knowledge to improve practice</td>
<td>Theory-based practice guideline</td>
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</table>

IV. Course Level Justification
This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

V. Course Outline
1. Overview of knowledge development and theory
   1.1. Philosophical development
   1.2. Doctoral nursing roles in knowledge generation
2. Scientific methods and analysis of theory
   2.1. Conceptualization, measurement and application
   2.2. Epistemology, ontology and justification
3. Theories of health and illness
   3.1. Anthropologic theories
   3.2. Health promotion theories
   3.3. Systems models
   3.4. Population health theories
4. Influences on theory development
   4.1. Paradigm shifts
   4.2. The biomedical model
5. Theory/practice link
   5.1. Matching theory to populations
   5.2. Process of evaluation for implementation
   5.3. Measuring results of change against theoretical models
VI. **Suggested Text**

VII. **Bibliography and Suggested Readings**
<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>CH College of Health</th>
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<th>ADSN Division of Nursing</th>
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<td>15. Course Description</td>
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<td>Explores the nature of evidence and appraises scholarly evidence-based projects focusing on problems of practice within specific healthcare populations. Employs research critiques, evidence tables and integrative evidence reviews.</td>
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<td>Course developed for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.</td>
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Course Content Guide  
School of Nursing  
Doctor of Nursing Practice Program

I. Date of Initiation: Fall 2011

II. Course Information

College/School: College of Health/School of Nursing  
Course Prefix: NS  
Course Number: A627  
Title: Practice Inquiry I: The Nature of Evidence  
Credits: 3 (3+0)  
Grading Basis: A-F  
Implementation Date: Fall 2014  
Course Description: Explores the nature of evidence and appraises scholarly evidence-based projects focusing on problems of practice within specific health care populations. Employs research critiques, evidence tables and integrative evidence reviews.

Course Prerequisite(s): NS A613 and NS A621 with minimum grade of B  
Co-requisite(s): N/A  
Other Restriction(s): Level  
Registration Restriction(s): Graduate standing or instructor permission; grade C or better in undergraduate research/statistics course within the past 5 years.

Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures

A. Instructional Goals

The instructor will:
1. Identify national databases of priority health issues.
2. Foster analysis of evidence designed to improve clinical outcomes.
3. Engage in evaluation of quantitative and qualitative studies related to the student’s topic of interest.
4. Assist with critical appraisal of the data related to the student’s topic of interest within the student’s area of specialization.
5. Facilitate evaluation of the strength of evidence underlying clinical practice guidelines.
6. Promote integration of evidence-based individual decision-making in the Doctorate of Nursing Practice role.
### B. Student Learning Outcomes/Assessment Measures

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
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<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
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<tr>
<td>1. Locate primary research and theories from nursing and other disciplines applicable to</td>
<td>Research evidence table assignment</td>
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<td>student’s topic of interest</td>
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<tr>
<td>2. Appraise quantitative and qualitative studies related to student’s topic of interest</td>
<td>Qualitative and quantitative research critiques</td>
</tr>
<tr>
<td>3. Synthesize nursing research into selection of sources supporting best practices for</td>
<td>Integrative review of evidence paper with recommendations for practice</td>
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<td>potential DNP evidence-based practice project</td>
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<tr>
<td>4. Explore and compare multiple sources of aggregated client data including national</td>
<td>Research questions developed from clinical experiences (discussion)</td>
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<td>databases for identification of priority health issues</td>
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<tr>
<td>5. Integrate evidence-based individual clinical decision-making in the DNP role</td>
<td>Discussion, linkages with clinical experiences</td>
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</table>

### IV. Course Level Justification

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been developed to address essential requirements of the Doctorate of Nursing Practice. It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

### V. Course Outline

1. The nature of evidence
   1.1. Historical perspective of nursing research
   1.2. Evidence-based practice (EBP)
   1.3. Asking compelling clinical questions
2. Methods of evaluating the evidence
   2.1. Critically appraising knowledge
   2.2. Literature searches
   2.3. Quantitative and qualitative research critiques
   2.4. Evidence tables
   2.5. Evidence-based practice guidelines
   2.6. Literature synthesis, integrative systematic reviews, meta-analysis
3. Quantitative research
   3.1. Quantitative designs
   3.2. Quantitative measurement
   3.3. Reliability and validity
   3.4. Quantitative collection methods
4. Qualitative research
   4.1. Qualitative designs
   4.2. Qualitative measurement
5. Patient concerns, choices, and clinical judgment in EBP
6. Creating, evaluating and sustaining change
   6.1. Evidence to guide best practice
   6.2. Evaluation methods
       6.2.1. Benchmarking
       6.2.2. Types of outcomes
       6.2.3. Process
       6.2.4. Outcomes
       6.2.5. Impact
       6.2.6. Cost-benefit
7. Feedback loops
   7.1. Disseminating findings to key stakeholders and decision makers
   7.2. Publication and other routes of dissemination

VI. Suggested Texts

VII. Bibliography and Suggested Readings


Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College
CH College of Health

1b. Division
ADSN Division of Nursing

1c. Department
NUR

2. Course Prefix
NS

3. Course Number
A628

4. Previous Course Prefix & Number
N/A

5a. Credits/CEUs
3

5b. Contact Hours
(Lecture + Lab)
(3+0)

6. Complete Course Title
Practice Inquiry II: Design and Methods
Practice Inquiry II

7. Type of Course
✓ Academic
☐ Preparatory/Development
☐ Non-credit
☐ CEU
☐ Professional Development

8. Type of Action:
✓ Add
☐ Change
☐ Delete

If a change, mark appropriate boxes:
☐ Prefix
☐ Credits
☐ Title
☐ Grading Basis
☐ Course Description
☐ Test Score Prerequisites
☐ Contact Hours
☐ Repeat Status
☐ Co-requisites
☐ Registration Restrictions
☐ Class
☐ College
☐ Major
☐ Level
☐ Other
☐ (please specify)

9. Repeat Status
☐ # of Repeats
☐ Max Credits

10. Grading Basis
☐ A-F
☐ P/NP
☐ NG

11. Implementation Date
semester/year
From: FALL/2014 To: /9999

12. Cross Listed with
☐ N/A

Stacked with
☐ N/A

Cross-Listed/Stacked Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Impacted Program/Course: Catalog Page(s) Impacted: Date of Coordination: Chair/Coordinator Contacted:

1. __________
2. __________
3. __________

Initiator Name (typed): __________
Initiator Signed Initials: __________
Date: __________

13b. Coordination Email
Date: 01/29/13
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 01/29/13

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication
☐ Written Communication
☐ Fine Arts
☐ Social Sciences
☐ Quantitative Skills
☐ Natural Sciences
☐ Humanities
☐ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
Explores the advanced research design and methods. Develops acquisition of knowledge and skills appropriate to an advanced evidence-based clinical inquiry project, including conceptual, design, and methodologic critique.

16a. Course Prerequisite(s) (list prefix and number)
NS A627 with minimum grade of B

16b. Test Score(s)
N/A

16c. Co-requisite(s) (concurrent enrollment required)
N/A

16d. Other Restriction(s)
☐ College
☐ Major
☐ Class
☐ Level

16e. Registration Restriction(s) (non-codable)
Graduate standing or instructor permission

17. Mark if course has fees

18. Mark if course is a selected topic course

19. Justification for Action
Course developed for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

Initiator (faculty only)
Dianne Tarrant
Initiator (TYPE NAME)

Initiator Signed Initials
Date

Initiator (faculty only)
Dianne Tarrant
Initiator (TYPE NAME)

Approved
Date
Disapproved
Dean/Director of School/College
Date

Approved
Date
Disapproved
Undergraduate/Graduate Academic
Date

Approved
Date
Disapproved
Board Chairperson

Approved
Date
Disapproved
Provost or Designee

Date
Course Content Guide
School of Nursing
Doctor of Nursing Practice (DNP) Program

I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health
Course Prefix: NS
Course Number: A628
Title: Practice Inquiry II: Design and Methods
Credits: 3 (3+0)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Explores the advanced research design and methods. Develops acquisition of knowledge and skills appropriate to an advanced evidence-based clinical inquiry project, including conceptual, design, and methodologic critique.

Course Prerequisite(s): NS A627 with minimum grade of B
Co-requisite(s): N/A
Other Restriction(s): Level
Registration Restriction(s): Graduate standing or instructor permission
Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals.
The instructor will:
1. Facilitate analysis of the design and methods of successful evidence-based projects in the literature.
2. Review concepts, techniques, and methodologies underlying qualitative and quantitative nursing research process appropriate to development of a clinical inquiry project.
3. Foster an understanding and critique of approaches used to shape clinical practice, nursing education, public policy, and/or healthcare delivery.
B. **Student Learning Outcomes/Assessment Measures**

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Evaluate the link between theory, research, and advanced nursing practice</td>
<td>Critical analysis of research questions, and methods via peer reviewed discussion board activities</td>
</tr>
<tr>
<td>2. Differentiate and explore qualitative and quantitative research paradigms, designs, and methods</td>
<td>Explains and defends methods and approaches for clinical inquiry projects via papers and Peer-reviewed discussion board activities</td>
</tr>
<tr>
<td>3. Critique, synthesize and summarize the existing knowledge on various methods and approaches in the conduct of a clinical inquiry project</td>
<td>Critical appraisal of existing clinical inquiry projects</td>
</tr>
<tr>
<td>4. Apply ethical principles to nursing research methods and approaches involving human participants, considering the cultural context</td>
<td>UAA –Institutional Review Board approved course Peer-reviewed discussion board activities</td>
</tr>
</tbody>
</table>

IV. **Course Level Justification**

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

V. **Course Outline**

1. Moving from evidence to action – approaches to improve practice
   1.1. Meta-analyses
   1.2. Meta-synthesis
   1.3. Clinical guidelines
   1.4. Systematic reviews
2. Qualitative approaches
   2.1. Narratives
   2.2. Focus groups
   2.3. Interviews, participatory action research
3. Frameworks and tools
4. Quantitative approaches
   4.1. Population to sample
     4.1.1. Generalized to varies populations
     4.1.2. Recruitment
   4.2. Instrument development
   4.3. Survey methods, survey assessment: reliability and validity
5. The role of outcomes: measures and instruments

7. Matching approach to question
   7.1. Refine study question
   7.2. Prepare for clinical inquiry
   7.3. Legal issues and research ethics

VI. Suggested Texts


VII. Bibliography and Suggested Readings


1a. School or College  
CH College of Health

1b. Division  
ADSN Division of Nursing

1c. Department  
NUR

2. Course Prefix  
NS

3. Course Number  
A629

4. Previous Course Prefix & Number  
N/A

5a. Credits/CEUs  
2

5b. Contact Hours  
(Lecture + Lab) (2+0)

6. Complete Course Title  
Practice Inquiry III: Proposal Development

7. Type of Course  
☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action:  
☒ Add ☐ Change ☐ Delete

If a change, mark appropriate boxes:

- Prefix
- Credits
- Title
- Grading Basis
- Course Description
- Test Score Prerequisites
- Other Restrictions
- Class
- College
- Major
- Level
- Other (please specify)

9. Repeat Status No  
# of Repeats  
Max Credits

10. Grading Basis  
☒ A-F ☐ P/NP ☐ NG

11. Implementation Date  
semester/year  
From: FALL/2014 To: /9999

12. Cross Listed with  
N/A

Stacked with  
N/A

Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Catalog Page(s) Impacted</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
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<tbody>
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<td>2.</td>
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Initiator Name (typed): ___________________________ Initiator Signed Initials: __________________Date: __________________

13b. Coordination Email  
Date: 01/29/13  
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison  
Date: 01/29/13

14. General Education Requirement  
Mark appropriate box:

- Oral Communication
- Written Communication
- Fine Arts
- Social Sciences
- Quantitative Skills
- Natural Sciences
- Humanities
- Integrative Capstone

15. Course Description (suggested length 20 to 50 words)  
Operationalizes clinical evidence-based practice project. Refines project to incorporate appropriate conceptual frameworks, designs and methods. Prepares written project proposal to address significant clinical, health policy, leadership, or advanced nursing practice problem relevant to stakeholders.

16a. Course Prerequisite(s) (list prefix and number)  
NS A628 with minimum grade of B

16b. Test Score(s)  
N/A

16c. Co-requisite(s) (concurrent enrollment required)  
N/A

16d. Other Restriction(s)  
☒ College ☐ Major ☐ Class ☒ Level

16e. Registration Restriction(s) (non-codable)  
Admission to graduate nursing program.

17. ☒ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action  
Course developed for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

Initiator (faculty only)  
Dianne Tarrant

Initiator (TYPE NAME)  
☐ Approved ☐ Disapproved

Dean/Director of School/College  
Date

Undergraduate/Graduate Academic  
Date

Board Chairperson  
Date

Provost or Designee  
Date
Course Content Guide  
School of Nursing  
Doctor of Nursing Practice (DNP) Program

I. Date of Initiation:  Fall 2011

II. Course Information  
College/School: College of Health/School of Nursing  
Course Prefix: NS  
Course Number: A629  
Title: Practice Inquiry III: Proposal Development  
Credits: 2 (2 + 0)  
Grading Basis: A-F  
Implementation Date: FALL 2014  
Course Description: Operationalizes clinical evidence-based practice project. Refines project to incorporate appropriate conceptual frameworks, designs and methods. Prepares written project proposal to address significant clinical, health policy, leadership, or advanced nursing practice problem relevant to stakeholders.

Course Prerequisite(s): NS A628 with minimum grade of B  
Corequisite(s): N/A  
Other Restriction(s): Level  
Registration Restriction(s): Admission to graduate nursing program  
Course Fee: ☑ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures  
A. Instructional Goals  
The instructor will:
1. Formalize the protocol and project management strategies for the evidence-based practice project.  
2. Facilitate a critical dialogue of stakeholders’ roles in assessing and supporting an evidence-based practice project.  
3. Guide students in development and completion of an evidence-based practice project proposal.  
4. Guide and support students through the institutional review board (IRB) review process.
### B. Student Learning Outcomes/Assessment Measures

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Critique the project protocol and project management strategies for the evidence-based practice project</td>
<td>Critical reflection exercise with development of a Practice, evidence, translation (PET) chart</td>
</tr>
<tr>
<td>2. Analyze stakeholder perspective and organizational environment in the development and management of the evidence-based practice project</td>
<td>Discussion board and peer exchange appraising stakeholder perspective, potential benefits, and barriers</td>
</tr>
<tr>
<td>3. Synthesize and expound the planned methods and approaches for the evidence-based practice project</td>
<td>Draft, submit and defend evidence-based practice project proposal</td>
</tr>
<tr>
<td>4. Identify the steps for completing the institutional review board (IRB) submission</td>
<td>Complete and submit IRB submission for evidence</td>
</tr>
</tbody>
</table>

### IV. Course Level Justification
This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

### V. Course Outline
1. Environment for change
   1.1. Project background and significance
   1.2. Stakeholders: benefits and barriers
   1.3. Developing meaningful and sustainable projects
   1.4. Clinical assessment and evaluation
2. Function of a proposal
   2.1. Communication
   2.2. Plan
   2.3. Contract
3. Foundations for application
   3.1. Format
   3.2. Definitions
   3.3. Protocol development
   3.4. Plan of action
   3.5. Protection of human subjects
4. Synthesis
   4.1. Project management
   4.2. Timelines for completion
   4.3. Proposal defense
VI. **Suggested Texts**


VII. **Bibliography and Suggested Readings**


Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>CH College of Health</th>
<th>1b. Division</th>
<th>ADSN Division of Nursing</th>
<th>1c. Department</th>
<th>NUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Course Prefix</td>
<td>NS</td>
<td>3. Course Number</td>
<td>A630</td>
<td>4. Previous Course Prefix &amp; Number</td>
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<td>5a. Credits/CEUs</td>
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<td></td>
<td>5b. Contact Hours</td>
<td>(Lecture + Lab)</td>
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<td>6. Complete Course Title</td>
<td>Practice Inquiry IV: Capstone Project</td>
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<td>Abbreviated Title for Transcript (30 character)</td>
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<td>7. Type of Course</td>
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<td>Preparatory/Development</td>
<td>Non-credit</td>
<td>CEU</td>
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<td>8. Type of Action:</td>
<td>□ Add or □ Change or □ Delete</td>
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<td>If a change, mark appropriate boxes:</td>
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<td>□ Course Number</td>
<td>□ Contact Hours</td>
<td>□ Repeat Status</td>
<td>□ Grading Basis</td>
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<tr>
<td>9. Repeat Status</td>
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<td># of Repeats</td>
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<td>Max Credits</td>
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<td>Semester/year</td>
<td>From: FALL/2014</td>
<td>To: /9999</td>
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<td>Initiator Name (typed):</td>
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<td>Initiator Signed Initials:</td>
<td>Date:</td>
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<td>14. General Education Requirement</td>
<td>Mark appropriate box:</td>
<td>Oral Communication</td>
<td>Written Communication</td>
<td>Social Sciences</td>
<td>Quantitative Skills</td>
</tr>
<tr>
<td>15. Course Description (suggested length 20 to 50 words)</td>
<td>Implements evidence-based practice project in a clinical setting reflecting a topic of current concern within the specialty. Collects and analyzes data to generate findings and conclusions relating to clinical practice. Special note: must be taken three times for credit.</td>
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<tr>
<td>16a. Course Prerequisite(s) (list prefix and number)</td>
<td>NS A629 with minimum grade of B</td>
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<td>16b. Test Score(s)</td>
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<td>16c. Co-requisite(s) (concurrent enrollment required)</td>
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<td>16d. Other Restriction(s)</td>
<td>College</td>
<td>Major</td>
<td>Class</td>
<td>Level</td>
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<td>16e. Registration Restriction(s) (non-codable)</td>
<td>Admission to graduate nursing program.</td>
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<tr>
<td>17. □ Mark if course has fees</td>
<td>18. □ Mark if course is a selected topic course</td>
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<tr>
<td>19. Justification for Action</td>
<td>Course developed for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.</td>
<td></td>
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</table>

Initiator (faculty only) | Date | Dean/Director of School/College | Date |
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Dianne Tarrant</td>
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</tr>
<tr>
<td>Initiator (TYPE NAME)</td>
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Approved | Disapproved
Approved | Disapproved
Approved | Disapproved
Approved | Disapproved
Approved | Disapproved
Approved | Disapproved
Course Content Guide  
School of Nursing  
Doctor of Nursing Practice (DNP) Program

I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A630
Title: Practice Inquiry IV: Capstone Project
Credits: 2 (1 + 4)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Implements evidence-based practice project in a clinical setting reflecting a topic of current concern within the specialty. Collects and analyzes data to generate findings and conclusions relating to clinical practice. Special note: must be taken three times for credit.

Course Prerequisite(s): NS A629 with minimum grade of B
Corequisite(s): N/A
Other Restriction(s): Level
Registration Restriction(s): Admission to graduate nursing program.
Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals
   The instructor will:
   1. Implement and continually appraise the project methods to maximize accuracy and applicability of findings.
   2. Guide student data collection and compilation for the evidence-based practice project.
   3. Facilitate generation of findings and implications for practice.
   4. Support dissemination of findings orally and in writing.
### B. Student Learning Outcomes/Assessment Measures

<table>
<thead>
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<tbody>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Implement and evaluate the methodological approach for the evidence-based practice project</td>
<td>Implementation/action phase of evidence-based practice project, discussion and peer review</td>
</tr>
<tr>
<td>2. Collect and manage data: create data files or data analysis frameworks as appropriate</td>
<td>Formulate a summary of project results, peer review</td>
</tr>
<tr>
<td>3. Analyze data: generate findings and implications for clinical practice</td>
<td>Revisit project conceptual underpinnings, literature and practice environment to develop findings; peer review</td>
</tr>
<tr>
<td>4. Communicate evidence-based practice project verbally and in writing in a manner adapted to the level of the intended audience</td>
<td>Project committee approved manuscript for dissemination/publication</td>
</tr>
</tbody>
</table>

### IV. Course Level Justification

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

### V. Course Outline

1. Class overview: research utilization in practice
   1.1. Implementation/action
   1.2. Data collection
   1.3. Generation of findings/outcome evaluation
   1.4. Translation to practice
2. Writing for dissemination: resources for writing
3. From idea to publication
   3.1. Targeting the audience
   3.2. Selecting the journal/author guidelines
4. Communicating findings
   4.1. Practice dissemination
   4.2. Facilitating change
VI. Suggested texts

VII. Bibliography and Suggested Readings
Course Action Request  
University of Alaska Anchorage  
Proposal to Initiate, Add, Change, or Delete a Course

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<table>
<thead>
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<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours (Lecture + Lab)</th>
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<tr>
<td>NS</td>
<td>A633</td>
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<td>3</td>
<td>(3+0)</td>
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6. Complete Course Title  
Statistics for Advanced Practice  
Statistics for Adv Practice  
Abbreviated Title for Transcript (30 character)

7. Type of Course  
☑ Academic  
☐ Preparatory/Development  
☐ Non-credit  
☐ CEU  
☐ Professional Development

8. Type of Action: ☑ Add  
☐ Change  
☐ Delete

If a change, mark appropriate boxes:
- Prefix  
- Credits  
- Title  
- Grading Basis  
- Course Description  
- Test Score Prerequisites  
- Other Restrictions  
  - Class 
  - Level
  - College 
  - Major
- (please specify)  
- Course Number  
- Contact Hours  
- Repeat Status  
- Cross-Listed/Stacked  
- Course Prerequisites  
- Co-requisites  
- Registration Restrictions

9. Repeat Status No  
☐ # of Repeats  
☐ Max Credits

10. Grading Basis  
☐ A-F  
☐ P/NP  
☐ NG

11. Implementation Date  
semester/year  
From: FALL/2014  
To: /9999

12. ☐ Cross Listed with  
☐ N/A  
☐ Stacked with  
☐ N/A  
☐ Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Catalog Page(s) Impacted</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
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<tbody>
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Initiator Name (typed): ___________________________  
Initiator Signed Initials: ________________________

Date: __________________

13b. Coordination Email  
Date: 01/29/13

submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison  
Date: 01/29/13

14. General Education Requirement  
Mark appropriate box:
- Oral Communication  
- Written Communication  
- Social Sciences  
- Quantitative Skills  
- Fine Arts  
- Humanities  
- Natural Sciences  
- Integrative Capstone

15. Course Description (suggested length 20 to 50 words)  
Explores bio-statistical methods used in nursing and health care research for clinical decision making, evidence-based practice, and program and policy evaluations. Emphasizes selection of appropriate statistical tests and interpretation and critique of data related to clinical practice and program assessment. Focuses on conceptual understanding rather than mathematical computation.

16a. Course Prerequisite(s) (list prefix and number)  
N/A

16b. Test Score(s)  
N/A

16c. Co-requisite(s) (concurrent enrollment required)  
N/A

16d. Other Restriction(s)  
☐ College  
☐ Major  
☐ Class  ☑ Level

16e. Registration Restriction(s) (non-codable)  
Admission to graduate nursing program

17. ☑ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action  
Course developed for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

Initiator (faculty only)  
Dianne Tarrant  
Initiator (TYPE NAME)

☑ Approved  
☐ Disapproved  
Dean/Director of School/College  
Date

☐ Approved  
☐ Disapproved  
Department Chairperson  
Date

☐ Approved  
☐ Disapproved  
Undergraduate/Graduate Academic  
Date

☐ Approved  
☐ Disapproved  
Board Chairperson

☐ Approved  
☐ Disapproved  
Curriculum Committee Chairperson  
Date

☐ Approved  
☐ Disapproved  
Provost or Designee  
Date
Course Content Guide  
School of Nursing  
Doctor of Nursing Practice (DNP) Program

I. Date of Initiation: Fall 2011

II. Course Information  
College/School: College of Health/School of Nursing  
Course Prefix: NS  
Course Number: A633  
Title: Statistics for Advanced Practice  
Credits: 3 (3 + 0)  
Grading Basis: A-F  
Implementation Date: Fall 2014  
Course Description: Explores bio-statistical methods used in nursing and health care research for clinical decision making, evidence-based practice, and program and policy evaluations. Emphasizes selection of appropriate statistical tests and interpretation and critique of data related to clinical practice and program assessment. Focuses on conceptual understanding rather than mathematical computation.

Course Prerequisite(s): N/A  
Corequisite(s): N/A  
Other Restriction(s): Level  
Registration  
Restriction(s): Admission to graduate nursing program.  
Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures  
A. Instructional Goals  
The instructor will:  
1. Foster critical thinking skills in order to select an appropriate statistical test for a given research question and data set.  
2. Facilitate interpretation and critique of the numerical organization and summary of data, statistical output, and its applicability to practice.  
3. Describe alternative approaches to data analysis when test assumptions are violated.  
4. Review statistical tests appropriate for non-normal distributions and small samples.  
5. Impart an understanding of the conceptual underpinnings of statistical theory.
### B. Student Learning Outcomes/Assessment Measures

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Select appropriate statistical tests based on measurement level of variable(s), research questions and/or hypotheses, sample size, and whether the data meets the test assumptions</td>
<td>Weekly homework assignment addressing unit content, midterm and final exams</td>
</tr>
<tr>
<td>2. Interpret and critique numerical summaries of data</td>
<td>Weekly homework assignment addressing unit content, midterm and final exams</td>
</tr>
<tr>
<td>3. Determine alternate approaches to data analysis when test assumptions are violated</td>
<td>Weekly homework assignment addressing unit content, midterm and final exams</td>
</tr>
<tr>
<td>4. Interpret computer generated statistical output</td>
<td>Weekly homework assignment addressing unit content, midterm and final exams</td>
</tr>
<tr>
<td>5. Judge clinical relevance of statistical findings</td>
<td>Weekly homework assignment addressing unit content, midterm and final exams</td>
</tr>
<tr>
<td>6. Utilize statistical methods as a foundation for developing, implementing, and evaluating policies and programs integral for the health care of identified populations</td>
<td>Midterm and final exams</td>
</tr>
</tbody>
</table>

### IV. Course Level Justification

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

### V. Course Outline

2. Types of statistics
   2.1. Descriptive versus inferential
   2.2. Parametric versus non-parametric
   2.3. Univariate versus multivariate
   2.4. Tests to determine differences, associations, prediction
3. Selection of appropriate statistical tests
   3.1. Research question
   3.2. Sample size
   3.3. Sample type (dependent versus independent)
   3.4. Measurement level of variables
   3.5. Assumptions of various tests
3.6. Alternative approaches when test assumptions not met

4. Interpretation of statistical results
   4.1. Statistical significance
   4.2. Confidence intervals
   4.3. Effect size
   4.4. Practical versus statistical significance

5. Statistical tests
   5.1. Descriptive
   5.2. Inferential
      5.2.1. Tests of mean differences
      5.2.2. Correlation (parametric and non-parametric)
      5.2.3. Simple linear regression, multiple regression, logistic regression, proportional hazards regression
      5.2.4. Survival analysis
      5.2.5. Nonparametric tests for small sample and non-normal data
      5.2.6. Scaling procedures and reliability
      5.2.7. Power analysis

VI. Suggested Texts

VII. Bibliography and Suggested Readings
Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College
CH College of Health

1b. Division
ADSN Division of Nursing

1c. Department
NUR

2. Course Prefix
NS

3. Course Number
A634

4. Previous Course Prefix & Number
N/A

5a. Credits/CEUs
2

5b. Contact Hours (Lecture + Lab)
(2+0)

6. Complete Course Title
Epidemiology for Advanced Practice
Epidemiology for Adv Practice

Abbreviated Title for Transcript (30 character)
Epidemiology for Advanced Practice

7. Type of Course
☑ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action:
☒ Add ☐ Change ☐ Delete

If a change, mark appropriate boxes:
☐ Prefix ☐ Credits ☐ Title ☐ Grading Basis ☐ Course Description ☐ Test Score Prerequisites ☐ Other Restrictions ☐ Class ☐ Level ☐ College ☐ Major ☐ Other

(please specify)

9. Repeat Status No
☐ Yes ☐ No

# of Repeats

Max Credits

10. Grading Basis
☒ A-F ☐ P/NP ☐ NG

11. Implementation Date
From: FALL/2014 To: /9999

12. ☐ Cross Listed with N/A

Stacked with N/A

Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

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Initiator Name (typed): Dianne Tarrant
Initiator Signed Initials: _________ Date: ____________

13b. Coordination Email
Date: 01/29/13

submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 01/29/13

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Social Sciences ☐ Natural Sciences
☐ Fine Arts ☐ Quantitative Skills ☐ Humanities ☐ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)

16a. Course Prerequisite(s) (list prefix and number)
NS A633 with minimum grade of B

16b. Test Score(s)
N/A

16c. Co-requisite(s) (concurrent enrollment required)
N/A

16d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☑ Level

16e. Registration Restriction(s) (non-codable)
Admission to graduate nursing program.

17. ☑ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Course developed for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

Initiator (faculty only) Dianne Tarrant
Initiator (TYPE NAME) ____________________________

☐ Approved ☐ Disapproved

Dean/Director of School/College Date

Undergraduate/Graduate Academic ☐ Approved ☐ Disapproved
Board Chairperson Date

Provost or Designee ☐ Approved ☐ Disapproved
Date

245
Course Content Guide  
School of Nursing  
Doctor of Nursing Practice (DNP) Program

I. Date of Initiation: Fall 2011

II. Course Information  
   College/School: College of Health/School of Nursing  
   Course Prefix: NS  
   Course Number: A634  
   Title: Epidemiology for Advanced Practice  
   Credits: 2 (2 + 0)  
   Grading Basis: A-F  
   Implementation Date: Fall 2014  

   Course Prerequisite(s): NS A633 with minimum grade of B  
   Corequisite(s): N/A  
   Other Restriction(s): Level  
   Registration Restriction(s): Admission to graduate nursing program  
   Course Fee: Yes ☒ No ☐

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures  
A. Instructional Goals  
   The instructor will:  
   1. Facilitate acquisition of terminology for and interpretation of epidemiologic principles and studies.  
   2. Assist with methods and techniques for analysis of clinical data sets.  
   3. Encourage interpretation of causality, risk, and clinical testing.  
   4. Facilitate application of epidemiologic principles to program, practice, and population health evaluation.
B. Student Learning Outcomes/Assessment Measures

<table>
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<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
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<tbody>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Critique epidemiologic studies and apply to clinical practice</td>
<td>Participate in on-line small group case-study analysis</td>
</tr>
<tr>
<td>2. Analyze clinical data sets for clinical decision-making</td>
<td>Critical peer group case study discussion and analysis</td>
</tr>
<tr>
<td>3. Assess causality and risk in clinical situations</td>
<td>Critical case-study analysis</td>
</tr>
<tr>
<td>4. Analyze screening, testing, and interpretation in clinical practice</td>
<td>Critical case-study analysis</td>
</tr>
<tr>
<td>5. Evaluate clinical practice using epidemiologic methods and statistical process controls to improve patient outcomes</td>
<td>Clinical process improvement project</td>
</tr>
<tr>
<td>6. Analyze population health outcomes and health evaluation services research</td>
<td>Literature review and comparative analysis</td>
</tr>
</tbody>
</table>

IV. Course Level Justification
This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

V. Course Outline
1. Observational data
   1.1. Introductory exercise: preliminary data analysis
   1.2. Hypothesis generation
2. Clinical epidemiology basic case studies
   2.1. Incidence, prevalence, rates
   2.2. Bias, confounding, effect size
3. Study design
   3.1. Cohort, case-control studies
   3.2. Observational designs and “natural” experiments
4. Causation/risk assessments
   4.1. Causality
   4.2. Odds ratio, relative risk, confidence intervals
5. Screening and prevention
   5.1. Sensitivity, specificity, predictive value
   5.2. Consequences of false positives
6. Quality control
   6.1. Statistical process controls
6.2. Continuous quality improvement case study

7. Practical program evaluation case studies
   7.1. Evaluation with limited data, time and budget
   7.2. Practice guidelines for quality

8. Population health analysis
   8.1. Using large data sets
   8.2. Comparative assessments

VI. Suggested Texts


VII. Bibliography and Suggested Readings


- Classic text
Course Action Request  
University of Alaska Anchorage  
Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
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<th>1b. Division</th>
<th>1c. Department</th>
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<td>ADSN Division of Nursing</td>
<td>NUR</td>
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<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours (Lecture + Lab)</th>
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<tr>
<td>NS</td>
<td>A637L</td>
<td>N/A</td>
<td>1</td>
<td>(0+3)</td>
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<th>6. Complete Course Title</th>
<th>7. Type of Course</th>
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<tr>
<td>Data Analysis: Qualitative</td>
<td>Academic</td>
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<th>9. Repeat Status No</th>
<th># of Repeats</th>
<th>Max Credits</th>
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If a change, mark appropriate boxes:
- Prefix
- Credits
- Title
- Grading Basis
- Course Description
- Test Score Prerequisites
- Co-requisites
- Registration Restrictions
- Class
- Level
- College
- Major
- Other

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<th>10. Grading Basis</th>
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<td>Oral Communication</td>
<td>Emphasizes qualitative research principles and methods of analysis. Applies qualitative analytic methods to clinical data sets. Focuses on ensuring validity, credibility, and dependability. Facilitates interpretation and dissemination of qualitative research study findings.</td>
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<td>Written Communication</td>
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<td>Social Sciences</td>
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<td>Quantitative Skills</td>
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<td>Integrative Capstone</td>
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<th>16c. Co-requisite(s) (concurrent enrollment required)</th>
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<td></td>
<td>Admission to graduate nursing program.</td>
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<th>17. Mark if course has fees</th>
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<th>19. Justification for Action</th>
<th>20. Initiation (faculty only)</th>
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<tr>
<td>Curriculum Committee Chairperson</td>
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</table>
I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A637L
Title: Data Analysis: Qualitative
Credits: 1 (0 + 3)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Emphasizes qualitative research principles and methods of analysis. Applies qualitative analytic methods to clinical data sets. Focuses on ensuring validity, credibility, and dependability. Facilitates interpretation and dissemination of qualitative research study findings.

Course Prerequisite(s): NS A628 with minimum grade of B
Corequisite(s): N/A
Other Restriction(s): Level
Registration
Restriction(s): Admission to graduate nursing program.
Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals
The instructor will:
1. Develop qualitative data set examples.
2. Foster application of qualitative research principles and methods.
3. Assist with interpretation of qualitative data.
4. Facilitate dissemination of analysis findings for clinical practice.
B. **Student Learning Outcomes/Assessment Measures**

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<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1 Synthesize qualitative research principles with methods of analysis</td>
<td>On-line case study discussion</td>
</tr>
<tr>
<td>2 Apply analytic methods to qualitative research data sets</td>
<td>On-line peer group discussion</td>
</tr>
<tr>
<td>3 Articulate methods of ensuring validity, credibility, and dependability</td>
<td>Brief written qualitative case-study analysis.</td>
</tr>
<tr>
<td>4 Generate and disseminate qualitative research study findings</td>
<td>Brief written qualitative case-study analyses</td>
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</table>

IV. **Course Level Justification**

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

V. **Course Outline**

1. Survey research review
2. Semi-structured interview review
3. Focus groups review
4. Participant observation
5. Field studies
6. Community-based participatory research (action research)
7. Interpreting and communicating qualitative data for the public

VI. **Suggested Texts**


VII. **Bibliography and Suggested Readings**


### 1. School or College
- CH College of Health

### 1b. Division
- ADSN Division of Nursing

### 1c. Department
- NUR

### 2. Course Prefix
- NS

### 3. Course Number
- A638L

### 4. Previous Course Prefix & Number
- 

### 5a. Credits/CEUs
- 1

### 5b. Contact Hours
- (Lecture + Lab) (0+3)

### 6. Complete Course Title
- Data Analysis: Quantitative

### 7. Type of Course
- Academic

### 8. Type of Action:
- Add

### 9. Repeat Status No
- # of Repeats
- Max Credits

### 10. Grading Basis
- A-F

### 11. Implementation Date
- From: FALL/2014
- To: /9999

### 12. Cross Listed with
- N/A

### 13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

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### 13b. Coordination Email
- Date: 01/29/13
- submitted to Faculty Listserv: [uaa-faculty@lists.uaa.alaska.edu](mailto:uaa-faculty@lists.uaa.alaska.edu)

### 13c. Coordination with Library Liaison
- Date: 01/29/13

### 14. General Education Requirement

Mark appropriate box:
- Oral Communication
- Written Communication
- Fine Arts
- Social Sciences
- Quantitative Skills
- Natural Sciences
- Humanities
- Integrative Capstone

### 15. Course Description (suggested length 20 to 50 words)
Introduces quantitative data analysis using the Statistical Package for the Social Sciences (SPSS) computer program. Focuses on creating a database, evaluating data for entry errors, exploring data for statistical test assumptions, and computing descriptive and inferential statistics.

### 16a. Course Prerequisite(s) (list prefix and number)
- NS A628 with minimum grade of B

### 16b. Test Score(s)
- N/A

### 16c. Co-requisite(s) (concurrent enrollment required)
- N/A

### 16d. Other Restriction(s)
- College
- Major
- Class
- Level

### 16e. Registration Restriction(s) (non-codable)
Admission to graduate nursing program.

### 17. Mark if course has fees

### 18. Mark if course is a selected topic course

### 19. Justification for Action
Course developed for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

**Initiator (faculty only)**

Dianne Tarrant

Initiator (TYPE NAME)

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### 20. Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

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252
I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A638L
Title: Data Analysis: Quantitative
Credits: 1 (0 + 3)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Introduces quantitative data analysis using the Statistical Package for the Social Sciences (SPSS) computer program. Focuses on creating a database, evaluating data for entry errors, exploring data for statistical test assumptions, and computing descriptive and inferential statistics.

Course Prerequisite(s): NS A628 with minimum grade of B
Corequisite(s): N/A
Other Restriction(s): Level
Registration Restriction(s): Admission to graduate nursing program.
Course Fee: ☑ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals
The instructor will:
1. Review methods to create a database, explore data, and check test assumptions.
2. Illustrate commands for obtaining descriptive and inferential statistics.
### B. Student Learning Outcomes/Assessment Measures

<table>
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<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
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<tbody>
<tr>
<td>Upon successful completion of the course, the student will be able:</td>
<td>This outcome will be assessed by one or more of the following:</td>
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<tr>
<td>1. Demonstrate the ability to create a database in statistical package of the social sciences (SPSS)</td>
<td>Define an error free data base and enter data</td>
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<td>2. Utilize SPSS to explore the data for entry errors and test assumptions</td>
<td>Data exploration exercises.</td>
</tr>
<tr>
<td>3. Utilize SPSS to obtain descriptive and inferential statistics</td>
<td>Data analysis exercises</td>
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<tr>
<td>4. Implement findings for systems change and population health outcomes</td>
<td>Chart and output table modification exercises</td>
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### IV. Course Level Justification

Course developed and enhanced for use in doctorate of nursing practice program based on accreditation standards.

### V. Course Outline

1. Introduction to SPSS (Statistical Package for Social Science)
2. Data entry
   - 2.1. Defining variables
   - 2.2. Entering data
   - 2.3. Transforming variables
   - 2.4. File manipulation
   - 2.5. Importing data from other program
   - 2.6. Looking for data entry errors
3. Descriptive statistical commands
   - 3.1. Descriptive statistics and frequencies
   - 3.2. Explore
   - 3.3. Crosstabs
   - 3.4. Graphs
4. Inferential statistical commands
   - 4.1. Non-parametric statistics
   - 4.2. Parametric statistics
   - 4.3. Advanced multivariate statistics
5. Reliability analysis and scaling procedures
VI. **Suggested Text**


VII. **Bibliography and Suggested Readings**

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

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<th>1c. Department</th>
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<th>4. Previous Course Prefix &amp; Number</th>
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<th>5b. Contact Hours (Lecture + Lab)</th>
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6. Complete Course Title
Family Nurse Practitioner I

Abbreviated Title for Transcript (30 character)

7. Type of Course
☐ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action:
☐ Add or ☐ Change or ☐ Delete

If a change, mark appropriate boxes:
- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
- ☐ Class
- ☐ Level
- ☐ Major (please specify)

9. Repeat Status No
☐ # of Repeats ☐ Max Credits

10. Grading Basis
☐ A-F ☐ P/NP ☐ NG

11. Implementation Date
 Semester/year
From: FALL/2014 To: /9999

12. ☐ Cross Listed with N/A
☐ Stacked with N/A Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

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Initiator Name (typed): Dianne Tarrant
Initiator Signed Initials: _________ Date: __________________

13b. Coordination Email
Date: 01/29/13
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 01/29/13

14. General Education Requirement
Mark appropriate box:
- ☐ Oral Communication
- ☐ Written Communication
- ☐ Social Sciences
- ☐ Natural Sciences
- ☐ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
Develops advanced skills needed in primary care of pediatric patients and developing families, including advanced history and physical assessment skills for all pediatric age groups. Focuses on acquisition of skills and diagnostic evaluation methods required for management of pediatric patients and families. Explores influence of genetics and genomics on health status.

16a. Course Prerequisite(s) (list prefix and number)
(NS A602 and NS A603) with minimum grade of B

16b. Test Score(s)
N/A

16c. Co-requisite(s) (concurrent enrollment required)
NS A610

16d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☐ Level

16e. Registration Restriction(s) (non-codable)
Current acceptance into the FNP track of the DNP program.

17. ☐ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Course revised and enhanced for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

Initiator (faculty only) Date
☐ Approved
☐ Disapproved

Dianne Tarrant
Initiator (TYPE NAME)

Initiator (faculty only) Date
☐ Approved
☐ Disapproved

Dean/Director of School/College Date
☐ Approved
☐ Disapproved

Department Chairperson Date
☐ Approved
☐ Disapproved

Undergraduate/Graduate Academic Date
☐ Approved
☐ Disapproved

Board Chairperson

Provost or Designee Date
☐ Approved
☐ Disapproved
## Course Being Changed:

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<td>Dianne Tarrant</td>
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Course Content Guide
School of Nursing
Doctor of Nursing Practice (DNP) Program

I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A660
Title: Family Nurse Practitioner 1
Credits: 4 (2 + 8)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Develops advanced skills needed in primary care of pediatric patients and developing families, including advanced history and physical assessment skills for all pediatric age groups. Focuses on acquisition of skills and diagnostic evaluation methods required for management of pediatric patients and families. Explores influence of genetics and genomics on health status.

Course Prerequisite(s): NS A602 and NS A603 with minimum grade of B
Corequisite(s): NS A610
Other Restriction(s): Level
Registration Restriction(s): Current acceptance into the FNP track of the DNP program.
Course Fee: Yes No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals
The instructor will:
1. Present pediatric information as it relates to prevention, assessment of normal and complex abnormal function, anticipatory guidance, and evidence-based approach.
2. Facilitate significant hands-on exposure to complex primary care of pediatric patients and the developing family in a clinical setting through preceptorship experiences.
3. Implement assignments in which students develop critical thinking skills in the area of history taking, physical exam, differential diagnoses, and management plans appropriate to the care of complex pediatric patients and their developing families.
4. Foster discussion of clinical cases in promoting research, evidence-based practice, and student self-reflection.
5. Differentiate legal aspects of the family nurse practitioner role allowing students to understand and grow in the role of independent practice.

6. Support students in appropriate use of professional resources to make clinical and ethical judgments in caring for pediatric patients.

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<th>B.</th>
<th>Student Learning Outcomes/Assessment Measures</th>
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<td><strong>Assessment Measures</strong></td>
</tr>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td><strong>1. Translate the role of the nurse practitioner within a family based scope of practice</strong></td>
<td>Clinical site visits, clinical evaluation tools, discussion board, clinical logs, Subjective Objective Assessment Plan (SOAP)s, and student case studies</td>
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<tr>
<td><strong>2. Integrate knowledge of the developing family unit as a whole and as a member of a specific community with consideration for cultural diversity, health beliefs, and parenting issues in assessing and developing comprehensive management plans for adaptive and maladaptive behaviors</strong></td>
<td>Clinical site visits, clinical evaluation tools, discussion board, clinical logs, SOAPs, student case studies, common complaint assignments, management guides, and exams</td>
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<td><strong>3. Assess and document the health status of neonates, infants, toddlers, pre-school and school aged children and adolescents using problem oriented data collection, advanced history taking and communication skills, physical examination, and developmental screening appropriate to the age of the patient showing the ability to differentiate normal from abnormal findings</strong></td>
<td>Clinical site visits, clinical evaluation tools, discussion board, clinical logs, SOAPs, and student case studies</td>
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<td><strong>4. Integrate knowledge of theory and evidence-based research to devise and implement plans of care for pediatric patients and families with emphasis on health maintenance, wellness, and health promotion</strong></td>
<td>Clinical site visits, clinical evaluation tools, discussion board, clinical logs, SOAPs, student case studies, common complaint assignments, management guides, and exams</td>
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<td><strong>5. Integrate knowledge of theory and evidence-based research to devise and implement plans of care for pediatric patients and families with emphasis on disease processes common to pediatrics</strong></td>
<td>Clinical site visits, clinical evaluation tools, discussion board, clinical logs, SOAPs, student case studies, common complaint assignments, management guides, and exams</td>
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<td>6.</td>
<td>Evaluate the need to collaborate and refer patients for additional screening and/or diagnostic work as may be indicated by health history or physical assessment findings</td>
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<td>7.</td>
<td>Develop management plans that reflect diagnostic, therapeutic and educational/preventive strategies based on the history and physical examination, health status, stage of growth and development, anticipatory guidance needs and known sociocultural and economic factors</td>
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<td>8.</td>
<td>Discuss legal aspects and scope of practice related to the role of the advanced nurse practitioner</td>
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<td>9.</td>
<td>Communicate professionally with patients/clients, other students, preceptors, instructors, and other health care professionals in the community to enhance the care provided to pediatric patients and their families</td>
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<td>10.</td>
<td>Integrate knowledge of genetics and genomics in relation to assessment and care of pediatric patients and their families</td>
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### IV. Course Level Justification

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.
V. Course Outline

1. Advanced principles of pediatric care
   1.1. Assessment and management in health and illness
   1.2. Application of evidence-based research to care
   1.3. Incorporate legal aspects of the nurse practitioner role to patient care
   1.4. Utilize national standards of care
   1.5. Clinical decision making
   1.6. Differential diagnoses
   1.7. Incorporate family, community, and culture into decision making
   1.8. Collaboration
   1.9. Evidence-based approach

2. Health promotion
   2.1. Screening
   2.2. Education and counseling
   2.3. Disease prevention for travelers
   2.4. Obesity
   2.5. Exercise
   2.6. Safety
   2.7. Developmental stages
   2.8. Immunizations

3. Care of the well child
   3.1. Newborn
   3.2. Circumcision
   3.3. Toddler
   3.4. School age child
   3.5. Adolescent

4. Immunizations
   4.1. Overview and recommended immunizations
   4.2. Recommended schedule
   4.3. Catch-up schedule

5. Nutrition
   5.1. Normal growth
   5.2. Breastfeeding
   5.3. Eating disorders

6. Development
   6.1. Developmental issues
   6.2. Tanner staging
   6.3. Precocious puberty
   6.4. Gynecomastia

7. Parenting
   7.1. Interventional strategies for common childhood behavioral issues
   7.2. Child abuse and reporting
   7.3. Discipline
   7.4. Safety

8. Exercise
8.1. Sports physicals
8.2. Injury prevention
8.3. Recommendations
8.4. Childhood obesity

9. Sexuality
9.1. Sexual development
9.2. Contraception
9.3. Sexually transmitted infections
9.4. Risks
9.5. Relationships

10. Genetics and genomics
10.1. Considerations in the pediatric population
10.2. Common genetic conditions
10.3. Use of a 3 generation pedigree
10.4. Genetic testing
10.5. Consultation and referrals

11. Fever
11.1. Unknown etiology
11.2. Febrile seizure

12. Head, eyes, ears, nose, throat
12.1. Strabismus
12.2. Conjunctivitis
12.3. Otitis
12.4. Sinusitis
12.5. Pharyngitis
12.6. Lymphadenopathy
12.7. Allergies
12.8. Viral illness

13. Respiratory
13.1. Asthma
13.2. Pneumonia
13.3. Respiratory syncytial virus bronchiolitis, croup
13.4. Foreign body aspiration
13.5. Cystic fibrosis
13.6. Sudden infant death
13.7. Tuberculosis

14. Cardiovascular
14.1. Murmurs
14.2. Hypertension
14.3. Dyslipidemias
14.4. Dysrhythmias
14.5. Kawasaki’s disease

15. Gastrointestinal
15.1. Abdominal pain
15.2. Constipation and diarrhea
15.3. Colic
15.4. Nausea and vomiting
15.5. Hirschsprung’s disease
15.6. Pyloric stenosis
15.7. Intussusception
15.8. Pinworms

16. Urinary and renal
16.1. Bladder and urethral abnormalities
16.2. Urinary tract infections
16.3. Enuresis and encopresis
16.4. Proteinuria
16.5. Nephrology disorders
16.6. Wilm’s Tumor

17. Musculoskeletal
17.1. Injuries
17.2. Scoliosis
17.3. Leg and hip deformities
17.4. Gait disturbances
17.5. Osgood-Schlatters disease
17.6. Rheumatologic disorders

18. Neurology
18.1. Developmental delays
18.2. Seizure disorders
18.3. Headaches
18.4. Sleep disturbances
18.5. Fetal alcohol syndrome

19. Dermatology
19.1. Rashes
19.2. Infections and infestations
19.3. Birth marks
19.4. Acne
19.5. Atopic disease
19.6. Other lesions

20. Mental Health
20.1. Attention deficit disorder
20.2. Depression and anxiety
20.3. Bipolar disorder
20.4. Substance abuse
20.5. Suicidal ideation

21. Endocrine
21.1. Diabetes
21.2. Thyroid dysfunction

22. Childhood cancers
22.1. Leukemias
22.2. Other cancers

23. Hematology
23.1. Anemias
23.2. Lead toxicity
23.3. Sickle cell

VI. Suggested Text
Dickey, R., & Tyrer, L. (2010). Managing contraceptive pill patients (14th ed.). Dallas, TX: EMIS.

VII. Bibliography and Suggested Readings
**Course Action Request**

University of Alaska Anchorage

Proposal to Initiate, Add, Change, or Delete a Course

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<th>10. Grading Basis</th>
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<tbody>
<tr>
<td>A-F</td>
</tr>
<tr>
<td>P/NP</td>
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<td>From: FALL/2014</td>
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<td>To: /9999</td>
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<thead>
<tr>
<th>13a. Impacted Courses or Programs:</th>
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<tr>
<td>List any programs or college requirements that require this course.</td>
</tr>
<tr>
<td>Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at <a href="http://www.uaa.alaska.edu/governance">www.uaa.alaska.edu/governance</a>.</td>
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<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
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<tr>
<td>MS, Nursing Science</td>
<td>307</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
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<tr>
<td>Graduate Certificate, Nursing Education</td>
<td>308</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
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<tr>
<td>NS A662 Family Nurse Practitioner III</td>
<td>463</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
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<th>13b. Coordination Email</th>
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<td>Date: 01/29/13</td>
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<tr>
<td>Submitted to Faculty Listserv (<a href="mailto:uaa-faculty@lists.uaa.alaska.edu">uaa-faculty@lists.uaa.alaska.edu</a>)</td>
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<th>13c. Coordination with Library Liaison</th>
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<td>Oral Communication</td>
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<td>Written Communication</td>
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<td>Quantitative Skills</td>
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<td>Humanities</td>
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<td>Fine Arts</td>
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<tr>
<td>Social Sciences</td>
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<tr>
<td>Natural Sciences</td>
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<td>Integrative Capstone</td>
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<tr>
<th>15. Course Description (suggested length 20 to 50 words)</th>
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<tr>
<td>Develops advanced skills needed in primary care of female patients and their families, including advanced history and physical assessment skills for women's health throughout the lifespan. Clinical focus and experience include acquisition of skills and diagnostic evaluation methods required for management of women's health and obstetric patients. Explores influence of genetics and genomics on women's health status.</td>
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<thead>
<tr>
<th>16a. Course Prerequisite(s) (list prefix and number)</th>
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<tbody>
<tr>
<td>(NS A610 and NS A660) with minimum grade of B</td>
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<tr>
<th>16c. Co-requisite(s) (concurrent enrollment required)</th>
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<th>16d. Other Restriction(s)</th>
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<td>Major</td>
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<th>16e. Registration Restriction(s) (non-codable)</th>
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<tbody>
<tr>
<td>Current acceptance into the FNP track of the DNP program.</td>
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<tr>
<th>17. Mark if course has fees</th>
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<td>Yes</td>
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<tr>
<th>18. Mark if course is a selected topic course</th>
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<td>Yes</td>
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<thead>
<tr>
<th>19. Justification for Action</th>
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<tbody>
<tr>
<td>Course revised and enhanced for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.</td>
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<table>
<thead>
<tr>
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<tr>
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<table>
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<th>Provost or Designee</th>
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265
Course Content Guide
School of Nursing
Doctor of Nursing Practice (DNP) Program

I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A611
Title: Family Nurse Practitioner II
Credits: 5 (2 + 12)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Develops advanced skills needed in primary care of female patients and their families, including advanced history and physical assessment skills for women’s health throughout the lifespan. Clinical focus and experience include acquisition of skills and diagnostic evaluation methods required for management of women’s health and obstetric patients. Explores influence of genetics and genomics on women’s health status.

Course Prerequisite(s): NS A610 or NS A660 with minimum grade of B
Corequisite(s): N/A
Other Restriction(s): Level
Registration Restriction(s): Current acceptance into the Family Nurse Practitioner track of the Doctor Nursing Practice program.
Course Fee: ☑ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals
   The instructor will:
   1. Identify women’s health and obstetric information as it relates to prevention, wellness, assessment of normal and complex abnormal function, anticipatory guidance, and evidence-based approach.
   2. Facilitate significant hands-on exposure to complex primary care of women’s health and obstetric patients in a clinical setting through preceptorship experiences.
   3. Develop assignments in which students develop critical thinking skills in the area of history taking, physical exam, differential diagnoses, and management plans appropriate to the care of complex women’s health and obstetric patients.
   4. Discuss clinical cases promoting research, evidence-based practice, and student self-reflection.
5. Differentiate legal aspects of the family nurse practitioner role allowing students to understand and grow in the role of independent practice. Supports students to appropriately make use of professional resources to make clinical and ethical judgments in caring for female patients.

<table>
<thead>
<tr>
<th>B.</th>
<th>Student Learning Outcomes/Assessment Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Student Learning Outcomes</strong></td>
</tr>
<tr>
<td><strong>Upon successful completion of the course, the student will be able to:</strong></td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1.</td>
<td>Translate the role of the nurse practitioner within a family based scope of practice</td>
</tr>
<tr>
<td>2.</td>
<td>Integrate knowledge of women’s health and obstetrics with consideration of cultural diversity and health beliefs in assessing and developing management plans for adaptive and maladaptive behaviors</td>
</tr>
<tr>
<td>3.</td>
<td>Assess and document the health status of women across the lifespan using problem oriented data collection, advanced history taking and communications skills, physical examination showing the ability to differentiate normal from abnormal findings</td>
</tr>
<tr>
<td>4.</td>
<td>Assimilate knowledge of theory and evidence-based research to devise and implement plans of care for women’s health and obstetric patients with emphasis on health maintenance, wellness, and health promotion</td>
</tr>
<tr>
<td></td>
<td>Integrate knowledge of theory and evidence-based research to devise and implement plans of care for women's health and obstetric patients with emphasis on disease processes</td>
</tr>
<tr>
<td>---</td>
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<tr>
<td>6.</td>
<td>Incorporate knowledge of stages, common complaints, and abnormalities in pregnancy to develop comprehensive management plans</td>
</tr>
<tr>
<td>7.</td>
<td>Evaluate the need to collaborate and refer patients for additional screening and/or diagnostic work as may be indicated by health history or physical assessment findings</td>
</tr>
<tr>
<td>8.</td>
<td>Develop management plans that reflect diagnostic, therapeutic, and educational/preventive strategies based on the history and physical examination, health status, anticipatory guidance needs, known socio-cultural and economic factors</td>
</tr>
<tr>
<td>9.</td>
<td>Discuss legal aspects and scope of practice related to the role of the advanced nurse practitioner in Alaska and nationwide</td>
</tr>
<tr>
<td>10.</td>
<td>Communicate professionally with patients/clients, other students, preceptors, instructors, and other health care professionals in the community to enhance the care provided to women’s health and obstetric patients</td>
</tr>
<tr>
<td>11.</td>
<td>Integrate knowledge of genetics and genomics in the assessment and care of women’s health and obstetric patients</td>
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</table>
IV. **Course Level Justification**
This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

V. **Course Outline**
1. **Introduction to evidenced based principles of women’s health care**
   1.1. Assessment and management of women of all ages
   1.2. Apply evidenced based research to care
   1.3. Incorporate legal aspects of the nurse practitioner role to care
   1.4. Assessment and management of acute and chronic health problems in women
   1.5. Clinical decision making
   1.6. Differential diagnoses
   1.7. Approach to the female patient
   1.8. Health and development through the life cycle
   1.9. Focused history and exam
   1.10. Consideration of social and cultural issues
   1.11. Intervention strategies for common women’s health problems
   1.12. Role of family and community in women’s health
2. **Health promotion**
   2.1. Screening
   2.2. Education and counseling
   2.3. Obesity
   2.4. Diet and exercise
   2.5. Safety
   2.6. Substance abuse
3. **Reproductive age women**
   3.1. Menstrual cycle
   3.2. Contraception
   3.3. Sexually transmitted infections
   3.4. Domestic violence
   3.5. Cervical health
   3.6. Sexuality
   3.7. Periodic screening tests
   3.8. Common vaginal infections
   3.9. Abnormal uterine bleeding
   3.10. Benign pelvic disorders
   3.11. Sexual assault
4. **Breast health**
   4.1. Mammograms
4.2. Fibrocystic breast disease
4.3. Self breast exams
5. Menstrual problems
  5.1. Polycystic ovaries
  5.2. Endometriosis
  5.3. Amenorrhea
  5.4. Dysmenorrhea
6. Pelvic disorders
  6.1. Dyspareunia
  6.2. Leiomyomas
  6.3. Ovarian tumors
  6.4. Chronic pelvic pain
  6.5. Pelvic relaxation syndrome
  6.6. Abnormal papanicolaou (pap) test
  6.7. Pelvic infections
7. Infertility
  7.1. Endocrine disorder
  7.2. Hypothalmic disorders
  7.3. Ovarian disorders
  7.4. Uterine disorders
  7.5. Male infertility
  7.6. Fertility treatments
8. Pregnant patient
  8.1. Preconceptual counseling
  8.2. Assessment of fetal wellbeing
  8.3. Promoting healthy pregnancy
  8.4. Initial prenatal exam
  8.5. Focused history and exam during prenatal period
  8.6. Common discomforts during pregnancy
  8.7. Immunizations
  8.8. Screening tests
  8.9. Unintended pregnancy
9. Complications of pregnancy
  9.1. Infections
  9.2. Bleeding
  9.3. Anemias
  9.4. Pregnancy induced hypertension
  9.5. Gestational diabetes
  9.6. Preterm labor
  9.7. Substance abuse
  9.8. Multiple gestation
  9.9. Placental problems
  9.10. Delivery problems/c-sections
  9.11. Rhesus blood group (Rh factor) incompatibility
  9.12. Ectopics
  9.13. Hyperemesis
9.15. Post term labor

10. Postpartum period
10.1. Postpartum history and exam
10.2. Hemorrhage
10.3. Uterine sub-involution
10.4. Infections
10.5. Mastitis
10.6. Postpartum depression
10.7. Breastfeeding

11. The older woman
11.1. Breast health
11.2. Cervical health
11.3. Menopause
11.4. Health promotion in the aging female
11.5. Immunizations
11.6. Periodic screening tests
11.7. Sexuality
11.8. Urinary incontinence

12. Female cancers
12.1. Vulvar cancers
12.2. Cervical cancer
12.3. Endometrial cancer
12.4. Ovarian cancer
12.5. Breast cancer

13. Genetics and genomics in women’s health
13.1. Influence on common women’s health concerns
13.2. Three generational pedigree
13.3. Risk assessment
13.4. Consultation/referral

VI. Suggested Texts
VII. Bibliography and Suggested Readings


Initiator Name (typed): Dianne Tarrant  

Initiator (faculty only)  
Dianne Tarrant  
Initiator (TYPE NAME)  

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<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>CH College of Health</th>
<th>1b. Division</th>
<th>ADSN Division of Nursing</th>
<th>1c. Department</th>
<th>NUR</th>
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<th>4. Previous Course Prefix &amp; Number</th>
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<th>5b. Contact Hours (Lecture + Lab)</th>
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<td>(2+12)</td>
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Abbreviated Title for Transcript (30 character)  

| 7. Type of Course |  
|------------------|------------------|
| Academic         | Preparatory/Development |

| 8. Type of Action: | Add ☐ | Change ☑ | Delete ☐ |

If a change, mark appropriate boxes:  
Prefix ☐ | Credits ☐ | Title ☐ | Grading Basis ☐ | Course Description ☐ | Cross-Listed/Stacked ☐ | Contact Hours ☐ | Repeat Status ☐ | Test Score Prerequisites ☐ | Course Prerequisites ☐ | Co-requisites ☐ | Registration Restrictions ☐ | Class ☐ Level ☐ | College ☐ Major ☐ | Other ☐ | Other Restrictions ☐ |

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<th># of Repeats</th>
<th>Max Credits</th>
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| 10. Grading Basis | A-F ☑ | P/NP ☐ | NG ☐ |

| 11. Implementation Date |  
|--------------------------|------------------|
| semester/year | From: FALL/2014 | To: 9/11 |

| 12. | Cross Listed with N/A | Stacked with N/A | Cross-Listed Coordination Signature |

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.  

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.  

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<th>Impacted Program/Course</th>
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<th>Date of Coordination</th>
<th>Chair/Coordinator Contact</th>
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<tbody>
<tr>
<td>1. MS, Nursing Science</td>
<td>307</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
<td></td>
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<tr>
<td>2. Graduate Certificate, Nursing Education</td>
<td>308</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
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<tr>
<td>3. NS A663 Family Nurse Practitioner IV</td>
<td>463</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
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Initiator Name (typed): Dianne Tarrant  
Initiator Signed Initials: _________ Date: __________ |

13b. Coordination Email: Date: 01/29/13  
submitted to Faculty Listserv: uae-faculty@lists.uaa.alaska.edu  

13c. Coordination with Library Liaison: Date: 01/29/13  

14. General Education Requirement  
Mark appropriate box:  
Oral Communication ☐ | Written Communication ☐ | Quantitative Skills ☐ | Humanities ☐ |  
Fine Arts ☐ | Social Sciences ☐ | Natural Sciences ☐ | Integrative Capstone ☐ |

15. Course Description (suggested length 20 to 50 words)  
Continues preparation for advanced nursing practice. Concentrates on assessment, diagnosis, evidence-based management or the referral of adult and geriatric clients. Focuses on acute and chronic illnesses in adults but may include care of clients throughout the life span. Incorporates influence of genetics and genomics on health status.  

16a. Course Prerequisite(s) (list prefix and number)  
(NS A610 and NS A661) with minimum grade of B  

16b. Test Score(s)  
N/A  

16c. Co-requisite(s) (concurrent enrollment required)  
(NS A612)  

16d. Other Restriction(s)  
College ☐ | Major ☐ | Class ☐ | Level ☐ |  

16e. Registration Restriction(s) (non-codable)  
Current acceptance into the Family Nurse Practitioner track of the Doctor Nursing Practice program.  

17. ☑ Mark if course has fees  
18. ☐ Mark if course is a selected topic course  

19. Justification for Action  
Course revised and enhanced for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.  

Initiator (faculty only)  
Dianne Tarrant  
Initiator (TYPE NAME)  

|  
| ☐ Approved | ☑ Disapproved | Dean/Director of School/College | Date |
| ☑ Approved | ☐ Disapproved | Undergraduate/Graduate Academic | Date |
| ☑ Approved | ☐ Disapproved | Board Chairperson | Date |
| ☐ Approved | ☑ Disapproved | Provost or Designee | Date |
Course Content Guide
School of Nursing
Doctor of Nursing Practice (DNP) Program

I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A662
Title: Family Nurse Practitioner III
Credits: 5 (2 + 12)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Continues preparation for advanced nursing practice. Concentrates on assessment, diagnosis, evidence-based management or the referral of adult and geriatric clients. Focuses on acute and chronic illnesses in adults but may include care of clients throughout the life span. Incorporates influence of genetics and genomics on health status.

Course Prerequisite(s): NS A610 and NS A661 with minimum grade of B
Corequisite(s): NS A612
Other Restriction(s): Level
Registration Restriction(s): Current acceptance into the Family Nurse Practitioner track of the Doctor Nursing Practice program.
Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals
The instructor will:
1. Identify adult and geriatric focused health information as it relates to prevention, wellness, assessment of normal and complex abnormal function, anticipatory guidance, and evidence-based care.
2. Facilitate significant hands-on exposure to complex primary care problems of adult and geriatric patients in a clinical setting through preceptorship experiences.
3. Implement assignments in which students develop critical thinking skills in the area of history taking, physical exam, differential diagnoses, and management plans appropriate to the care of complex acute and chronic health problems of adult and geriatric patients.
4. Discuss clinical cases of geriatric and adult patients; promoting research, evidence-based practice, and student self-reflection.
5. Differentiate legal aspects of the family nurse practitioner role allowing students to understand and grow in the role of independent practice.
6. Support students to appropriately use professional resources to make clinical and ethical judgments in the care of adult and geriatric patients.

<table>
<thead>
<tr>
<th>B</th>
<th>Student Learning Outcomes/Assessment Measures</th>
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<tbody>
<tr>
<td><strong>Student Learning Outcomes</strong></td>
<td><strong>Assessment Measures</strong></td>
</tr>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Synthesize advanced practice knowledge/skills including medical therapeutics utilized in clinical practice for care of adult and geriatric clients</td>
<td>Clinical evaluation tool, clinical site visit, exams, Subjective Objective Assessment Plan (SOAP)s and logs, common complaint assignments, discussion, student case studies, management guidelines</td>
</tr>
<tr>
<td>2. Assess, diagnose and treat individual patients and families with a focus on acute and chronic health disruptions in adult and geriatric patients</td>
<td>Clinical evaluation tool, clinical site visit, exams, SOAPs and logs, common complaint assignments, discussion, student case studies, management guidelines</td>
</tr>
<tr>
<td>3. Evaluate the need to collaborate and refer patients whose condition cannot be safely managed within the scope of practice of the nurse practitioner</td>
<td>Clinical evaluation tool, clinical site visit, SOAPs and logs, discussion, student case studies, management guidelines</td>
</tr>
<tr>
<td>4. Integrate concepts of growth and development, pathophysiology, pharmacology and nutrition in the assessment, plan, implementation, and evaluation of primary care needs related to acute and chronic disease across the life span</td>
<td>Clinical evaluation tool, clinical site visit, exams, SOAPs and logs, common complaint assignments, discussion, student case studies, management guidelines</td>
</tr>
<tr>
<td>5. Assess the need for additional screening and/or diagnostic work as may be indicated by health assessment or physical findings</td>
<td>Clinical evaluation tool, clinical site visit, exams, SOAPs and logs, common complaint assignments, discussion, student case studies, management guidelines</td>
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<td>6. Discuss goals of health promotion, prevention and protection with patients</td>
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IV. Course Level Justification
This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

V. Course Outline
1. Introduction to advanced principles of adult and geriatric acute and chronic care
   1.1. Approach to the adult and geriatric patient
   1.2. Approach to the patient with a chronic condition
   1.3. Change theory
   1.4. Application of evidence-based research into all aspects of management
   1.5. Collaboration and consultation with an interdisciplinary team
   1.6. Incorporate an understanding a legal and ethical aspects into primary care
   1.7. Utilize national standards of care
2. Professional issues
   2.1. Active participation in professional organizations
   2.2. Ethical dilemmas
   2.3. Legal Issues
   2.4. Privacy and confidentiality
   2.5. Patient self-determination
   2.6. Nurse practitioners in private practice
   2.7. Nurse practitioner in group practices
   2.8. Coding
3. Health promotion
   3.1. Screening
   3.2. Education and counseling
   3.3. Disease prevention for travelers
   3.4. Obesity
   3.5. Diet and exercise
   3.6. Safety
   3.7. Tobacco cessation strategies
4. Genetics and genomics
   4.1. Considerations in the adult and geriatric population
   4.2. Common genetic conditions
   4.3. Use of a three generation pedigree
   4.4. Genetic testing
   4.5. Consultation and referrals
5. Labs and diagnostic testing
   5.1. Lab assessment per diagnosis
   5.2. Recommended screenings
   5.3. Diagnostics and imaging
6. Geriatrics
   6.1. Normal aging
   6.2. Common pathology and management in geriatrics
   6.3. Immunizations
   6.4. Alzheimer’s disease and dementia
   6.5. Polypharmacy and medication adjustments
   6.6. Palliative care
   6.7. Substance abuse
   6.8. Cataracts
   6.9. Hearing impairment

7. Ophthalmic disease
   7.1. Foreign bodies and corneal abrasions
   7.2. Conjunctivitis
   7.3. Glaucoma
   7.4. Chalazion and blepharitis

8. Respiratory system
   8.1. Chronic obstructive pulmonary disease
   8.2. Asthma
   8.3. Pneumonia
   8.4. Cough
   8.5. Pulmonary emboli
   8.6. Chest x-ray interpretation
   8.7. Allergic rhinitis
   8.8. Tuberculosis
   8.9. Pertussis
   8.10. Other infections

9. Cardiovascular system
   9.1. Heart sounds
   9.2. Murmurs
   9.3. Twelve lead electrocardiogram (EKG)
   9.4. Coronary artery disease
   9.5. Angina
   9.6. Heart failure
   9.7. Dysrhythmias
   9.8. Hypertension
   9.9. Chest pain
   9.10. Peripheral vascular disease
   9.11. Peripheral edema
   9.12. Women and heart disease
   9.13. Dyslipidemias
   9.15. Abdominal aortic aneurysm

10. Endocrine system
    10.1. Diabetes
    10.2. Thyroid disorders
    10.3. Adrenocortical disease
11. Hematologic system
   11.1. Anemias
   11.2. Leukemias
   11.3. Porphyria
   11.4. Glucose-six-phosphate dehydrogenase deficiency

12. Neurological system
   12.1. Headaches
   12.2. Trigeminal neuralgia
   12.3. Syncope
   12.4. Parkinson’s disease
   12.5. Bell’s Palsy
   12.6. Transient ischemic attacks
   12.7. Brain attack
   12.8. Dizziness and vertigo
   12.9. Multiple sclerosis

13. Gastrointestinal system
   13.1. Gastroesophageal reflux disease
   13.2. Ulcers
   13.3. Abdominal pain
   13.4. Constipation and diarrhea
   13.5. Diverticulosis
   13.6. Hepatitis A, B, and C
   13.7. Fatty liver disease
   13.8. Cholecystitis
   13.9. Pancreatitis
   13.10. Gastrointestinal bleed
   13.11. Anal/rectal problems
   13.12. Celiac disease
   13.13. Irritable bowel syndrome

VI. Suggested Texts

VII. Bibliography and Suggested Readings
Gilbert, D. N., Moellering, R. C., Eliopoulos, G. M., Chambers, H. F., & Saag, M. S. (Eds.). (2009). Sanford guide to antimicrobial therapy (39th ed.). Sperryville,
VA: Antimicrobial Therapy.
Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

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<th>1c. Department</th>
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13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

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13b. Coordination Email Date: 01/29/13

13c. Coordination with Library Liaison Date: 01/29/13

14. General Education Requirement
Mark appropriate box:
- Oral Communication
- Written Communication
- Quantitative Skills
- Social Sciences
- Natural Sciences
- Humanities
- Integrative Capstone

15. Course Description (suggested length 20 to 50 words)

Capstone course in preparation for family nurse practitioner role. Intensive clinical practicum incorporates professional and practice principles into primary care role. Focus includes common procedures and diagnostics, as well as the influence of genetics and genomics on health status of clients throughout the lifespan.

16a. Course Prerequisite(s) (list prefix and number) NS A662 with minimum grade of B

16b. Test Score(s) N/A

16c. Co-requisite(s) (concurrent enrollment required) N/A

16d. Other Restriction(s)

- College
- Major
- Class
- Level

16e. Registration Restriction(s) (non-codable)

Current acceptance into the FNP track of the DNP program.

17. Mark if course has fees

18. Mark if course is a selected topic course

19. Justification for Action

Course revised and enhanced for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

Initiator (faculty only) Date

Dianne Tarrant

Initiator (TYPE NAME)

Approved

Disapproved

Dean/Director of School/College Date

Approved

Disapproved

Undergraduate/Graduate Academic Date

Approved

Disapproved

Board Chairperson

Approved

Disapproved

Provost or Designee Date
I. Date of Initiation: Fall 2011

II. Course Information

College/School: College of Health/School of Nursing  
Course Prefix: NS  
Course Number: A663  
Title: Family Nurse Practitioner IV  
Credits: 6 (2 + 16)  
Grading Basis: A-F  
Implementation Date: Fall 2014  
Course Description: Capstone course in preparation for family nurse practitioner role. Intensive clinical practicum incorporates professional and practice principles into primary care role. Focus includes common procedures and diagnostics, as well as the influence of genetics and genomics on health status of clients throughout the lifespan.

Course Prerequisite(s): NS A662 with minimum grade of B  
Corequisite(s): N/A  
Other Restriction(s): Level  
Registration Restriction(s): Current acceptance into the FNP track of the DNP program.  
Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures

A. Instructional Goals

The instructor will:

1. Identify health information as it relates to prevention, wellness, assessment of normal and complex abnormal function, anticipatory guidance, and evidence-based approach to all patients.

2. Facilitate significant hands-on exposure to complex primary care of acute and chronic patients across the lifespan in a clinical setting through preceptorship experiences.

3. Implement assignments in which students develop critical thinking skills in the area of history taking, physical exam, differential diagnoses, and management plans appropriate to the care of complex acute and chronic health problems for patients across the lifespan.

4. Discuss clinical cases of patients across the lifespan promoting research, evidence-based practice, and student self-reflection.

5. Differentiate legal aspects of the family nurse practitioner role allowing students to understand and grow in the role of independent practice.

6. Support students to appropriately make use of professional resources to
make clinical and ethical judgments in care for patients across the lifespan with a focus on acute and chronic disease.

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<thead>
<tr>
<th>B</th>
<th>Student Learning Outcomes/Assessment Measures</th>
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<tr>
<td><strong>Student Learning Outcomes</strong></td>
<td><strong>Assessment Measures</strong></td>
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</tr>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
<td></td>
</tr>
<tr>
<td>1. Synthesize advanced practice knowledge/skills including medical therapeutics utilized in clinical practice</td>
<td>Clinical evaluation tool, clinical site visit, exams, Subjective Objective Assessment Plan (SOAP)s and logs, common complaint assignments, discussion, student case studies, management guidelines</td>
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<td>2. Assess, diagnose, and treat individual patients and families with a focus on acute and chronic health disruptions</td>
<td>Clinical evaluation tool, Clinical site visit, exams, SOAPs and logs, common complaint assignments, discussion, student case studies, management guidelines</td>
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<td>3. Evaluate the need to collaborate and refer patients whose condition cannot be safely managed within the scope of practice of the nurse practitioner</td>
<td>Clinical evaluation tool, clinical site visit, SOAPs and logs, discussion, student case studies, management guidelines</td>
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<td>4. Integrate concepts of growth and development, pathophysiology, pharmacology and nutrition in the assessment, plan, implementation, and evaluation of primary care needs related to acute and chronic disease across the life span</td>
<td>Clinical evaluation tool, clinical site visit, exams, SOAPs and logs, common complaint assignments, discussion, student case studies, management guidelines</td>
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**IV. Course Level Justification**

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.
V. Course Outline

1. Introduction to advanced principles of adult acute and chronic care
   1.1. Approach to the adult patient
   1.2. Approach to the patient with a chronic condition
   1.3. Application of evidence-based research into all aspects of management
   1.4. Collaboration and consultation with an interdisciplinary team
   1.5. Incorporate an understanding a legal and ethical aspects into primary care
   1.6. Utilize national standards of care

2. Professional issues
   2.1. Third party payers
   2.2. First year of practice
   2.3. Lifelong learning
   2.4. Licensure and certification

3. Genetics and genomics
   3.1. Considerations in the adult population
   3.2. Considerations in the geriatric population
   3.3. Common genetic conditions
   3.4. Use of a third generation pedigree
   3.5. Genetic testing
   3.6. Consultation and referrals

4. Labs and diagnostic testing
   4.1. Lab assessment per diagnosis
   4.2. Recommended screenings
   4.3. Diagnostics and imaging

5. Procedures
   5.1. Suturing, skin closures
   5.2. Elliptical cyst removal
   5.3. Incision and drainage
   5.4. Punch biopsy
   5.5. Wart treatments
   5.6. Toenail removal
   5.7. Anesthesia

6. Sleep disorder
   6.1. Insomnia
   6.2. Sleep apnea
   6.3. Excessive daytime somnolence
   6.4. Restless leg syndrome

7. Mental health
   7.1. Depression
   7.2. Anxiety
   7.3. Bipolar disease
   7.4. Referral sources
   7.5. Post traumatic stress syndrome
7.6. Substance abuse and drug seeking behavior
7.7. The angry patient
7.8. The aggressive patient

8. Renal system
8.1. Chronic kidney disease
8.2. Acute renal disease
8.3. Dialysis
8.4. Renal calculi

9. Genito-urinary systems
9.1. Prostatitis
9.2. Prostate cancer
9.3. Urinary tract infections
9.4. Interstitial cystitis
9.5. Cervical cancer
9.6. Breast cancer
9.7. Ovarian cancer
9.8. Incontinence

10. Musculoskeletal
10.1. Fractures, sprains, and splinting
10.2. Osteoarthritis
10.3. Rheumatoid arthritis
10.4. Low back pain
10.5. Comprehensive joint evaluation
10.6. Osteoporosis
10.7. Carpel tunnel syndrome
10.8. Gout
10.9. Bursitis
10.10. Rotator cuff syndrome
10.11. Plantar fasciitis

11. Dermatology
11.1. Common rashes
11.2. Skin infections
11.3. Bites and stings
11.4. Psoriasis
11.5. Skin cancers
11.6. Acnes

12. Human Immunodeficiency Virus
12.1. Diagnosis
12.2. Management
12.3. Medications
12.4. Prevention strategies

VI. Suggested Texts

VII. Bibliography and Suggested Readings

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

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Initiator Signed Initials: _________ Date: ____________

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submitted to Faculty Listserv: [uaa-faculty@lists.uaa.alaska.edu](mailto:uaa-faculty@lists.uaa.alaska.edu)

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(suggested length 20 to 50 words)

Develops advanced skills needed for the Psychiatric Mental Health Nurse Practitioner role. Focuses on acquisition of knowledge related to assessment, diagnosis, treatment, and evaluation. Emphasizes management of individuals across the lifespan at risk of/or experiencing mental health problems.

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<table>
<thead>
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<th>16c. Co-requisite(s) (concurrent enrollment required)</th>
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<th>16e. Registration Restriction(s) (non-codable)</th>
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<tr>
<td>Graduate standing with current acceptance into DNP program.</td>
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<th>17. ☑ Mark if course has fees</th>
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<th>18. ☑ Mark if course is a selected topic course</th>
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<tr>
<th>19. Justification for Action</th>
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Course revised and enhanced for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

Initiator (faculty only): Dianne Tarrant
Initiator (TYPE NAME): ____________ Date: ____________

Approved: Dear/Dean/Director of School/College

Disapproved: Undergraduate/Graduate Academic Board Chairperson

Approved: Provost or Designee

Disapproved: __________________________ Date: ____________
I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A670
Title: Advanced Practice Psychiatric and Mental Health Nursing I
Credits: 5 (4 + 4)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Develops advanced skills needed for the Psychiatric Mental Health Nurse Practitioner role. Focuses on acquisition of knowledge related to assessment, diagnosis, treatment, and evaluation. Emphasizes management of individuals across the lifespan at risk of/or experiencing mental health problems.

Course Prerequisite(s): (NS A602 and NS A603) with minimum grade of B
Corequisite(s): NS A611
Other Restriction(s): Level Registration Restrictions: Graduate standing with current acceptance into DNP program.
Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals
The instructor will:
1. Facilitate role development and knowledge of entry-level competencies for DNP Psychiatric Mental Health Nursing.
2. Promote attainment of clinical knowledge for assessment, diagnosis and management of mental health problem and psychiatric disorders throughout the lifespan focusing on individuals.
3. Foster development of therapeutic alliances by providing clinical experiences with individuals throughout the lifespan.
4. Facilitate identification of genetic and cultural variables that promote mental and functional well-being.
Student Learning Outcomes/Assessment Measures

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Integrate knowledge of professional role with scope of practice for advanced psychiatric mental health nursing</td>
<td>Reflection paper, self assessments and clinical practicum</td>
</tr>
<tr>
<td>2. Assess mental health functioning. Diagnose psychiatric disorders and determine psychotherapeutic, pharmacological and complementary modalities for treatment</td>
<td>Case formulation and presentation, psychiatric history, mental status interview</td>
</tr>
<tr>
<td>3. Demonstrate caring behaviors and interpersonal communication skills that facilitate development and maintenance of a therapeutic alliance</td>
<td>Interpersonal process analysis; video-taped simulations; clinical practicum logs and journals; preceptor and faculty supervision evaluations; self-evaluations</td>
</tr>
<tr>
<td>4. Application of therapeutic interventions that promote mental and functional well-being in individuals at risk of, or experiencing mental health problems or psychiatric disorders</td>
<td>Role play, clinical practicum logs and journals; preceptor and faculty supervision evaluations; self-evaluations</td>
</tr>
</tbody>
</table>

IV. Course Level Justification
This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

V. Course Outline
1. Perspectives of mental health and illness
   1.1. Mental health
   1.2. Mental health problems
   1.3. Mental illness and psychiatric disorders
   1.4. Etiology
   1.5. Neurobiological
   1.6. Genetic
1. Psychological
1.8. Bio-psychosocial
1.9. Socio-cultural manifestations
2. Advanced practice psychiatric mental health nursing role
   2.1. Historical development
   2.2. Scope and practice
   2.3. Mental health promotion
   2.4. Primary prevention
   2.5. Secondary prevention
   2.6. Tertiary prevention
3. Interpersonal competencies
   3.1. Caring in a multicultural context
   3.2. Therapeutic alliance
   3.3. Psychiatric interview/ intake assessment
   3.4. Mental status evaluation
   3.5. Psychotherapy and counseling skills
   3.6. Evaluation and application of research findings
4. Clinical decision making competencies
   4.1. Assessment
   4.2. Diagnosis
   4.3. Outcome identification and evaluation
   4.4. Evaluation and application of research findings
5. Psychotherapy and counseling
   5.1. Principles of psychotherapy and counseling
   5.2. Theoretical foundations for psychotherapeutic approaches
   5.3. Psychotherapeutic interventions
6. Epidemiology, assessment, diagnosis and interventions across the lifespan
   6.1. Schizophrenia and other psychotic disorders
   6.2. Mood disorders
   6.3. Anxiety disorders
   6.4. Post-traumatic stress and dissociative disorders
   6.5. Personality disorders

VI. Suggested Texts
VII. Bibliography and Suggested Readings


Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College
CH College of Health

1b. Division
ADSN Division of Nursing

2. Course Prefix
NS

3. Course Number
A671

4. Previous Course Prefix & Number
N/A

5a. Credits/CEUs
5

5b. Contact Hours (Lecture + Lab)
(3+8)

6. Complete Course Title
Advanced Practice Psychiatric and Mental Health Nursing II
Advanced Practice PMHN II

Abbreviated Title for Transcript (30 character)
Advanced Practice Psychiatric and Mental Health Nursing II

7. Type of Course
☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☒ Professional Development

8. Type of Action:
☐ Add ☒ Change ☐ Delete

If a change, mark appropriate boxes:
☐ Prefix ☐ Credits ☒ Title ☒ Course Number ☒ Contact Hours ☐ Repeat Status ☐ Grading Basis ☒ Cross-Listed/Stacked ☒ Course Prerequisites ☐ Test Score(s) ☒ Other Restrictions
☐ Class ☒ Level ☐ College ☒ Major ☐ (please specify)

9. Repeat Status No

☐ # of Repeats ☐ Max Credits

10. Grading Basis
☒ A-F ☒ P/NP ☐ NG

11. Implementation Date

From: FALL/2014 To: /9999

12. ☐ Cross Listed with N/A

☒ Stacked with N/A

Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Impacted Program/Course | Catalog Page(s) Impacted | Date of Coordination | Chair/Coordinator Contacted
------------------------|-------------------------|----------------------|-----------------------------
1. MS, Nursing Science | 307 | 9/11 | Dianne Tarrant
2. Graduate Certificate, Nursing Education | 308 | 9/11 | Dianne Tarrant
3. NS A672 Advanced Psychiatric/Mental Health Nursing III | 463 | 9/11 | Dianne Tarrant

Initiator Name (typed): Dianne Tarrant
Initiator Signed Initials: __________ Date: __________

13b. Coordination Email
Date: 01/29/13
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 01/29/13

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☛ Written Communication ☛ Quantitative Skills ☒ Social Sciences ☛ Natural Sciences ☒ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
Develops, applies, and adapts advanced skills for practice as a psychiatric mental health nurse practitioner caring for families and groups. Focuses on acquisition of clinical knowledge and skills for evidence-based practice and promotion of mental health.

16a. Course Prerequisite(s) (list prefix and number) (non-codable)
(NS A610 and NS A670) with a minimum grade of B

16b. Test Score(s)
N/A

16c. Co-requisite(s) (concurrent enrollment required)
N/A

16d. Other Restriction(s) (non-codable)
Graduate standing with current acceptance into Doctor Nursing Practice Program.

Mark if course has fees

17. ☒ Mark if course is a selected topic course

18. ☐ Mark if course has fees

19. Justification for Action
Course revised and enhanced for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

Initiator (faculty only)
Dianne Tarrant
Initiator (TYPE NAME)

Approved ☐ Disapproved ☒
Dean/Director of School/College Date

Approved ☐ Disapproved ☒
Undergraduate/Graduate Academic Date

Approved ☐ Disapproved ☒
Board Chairperson Date

Approved ☐ Disapproved ☒
Provost or Designee Date
Course Content Guide  
School of Nursing  
Doctor of Nursing Practice (DNP) Program

I. Date of Initiation: Fall 2011

II. Course Information  
   College/School: College of Health/School of Nursing  
   Course Prefix: NS  
   Course Number: A671  
   Title: Advanced Practice Psychiatric and Mental Health Nursing II  
   Credits: 5 (3 + 8)  
   Grading Basis: A-F  
   Implementation Date: Fall 2014  
   Course Description: Develops, applies, and adapts advanced skills for practice as a psychiatric mental health nurse practitioner caring for families and groups. Focuses on acquisition of clinical knowledge and skills for evidence-based practice and promotion of mental health.  
   Course Prerequisite(s): NS A610 and NS A670 with a minimum grade of B  
   Corequisite(s): N/A  
   Other Restriction(s): Level  
   Registration: Graduate standing with current acceptance into Doctor Nursing Practice Program.  
   Course Fee: ☒ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures  
A. Instructional Goals  
   The instructor will:  
   1. Facilitate analysis of perspectives of family and group advanced nursing practice, including genomics, ethics and socio-cultural factors.  
   2. Discuss family development and selected health problems that impact family mental and functional well-being.  
   3. Identify interventions needed to promote optimum mental and functional well-being of family and groups.  
   4. Promote application of knowledge of group dynamics, process, development, and facilitation skills to families and groups.  
   5. Guide students in evidence-based assessment, diagnosis, treatment and outcome evaluation of mental health conditions within families and groups.
B. Student Learning Outcomes/Assessment Measures

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
</tr>
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<tbody>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Analyze perspectives of family and group advanced nursing practice</td>
<td>Literature reviews, discussion</td>
</tr>
<tr>
<td>2. Apply genomics while working with families</td>
<td>Discussion, literature reviews, family genogram paper</td>
</tr>
<tr>
<td>3. Assess socio-cultural factors, family development, and selected health problems that impact family mental and functional well-being</td>
<td>Case studies, peer reviews</td>
</tr>
<tr>
<td>4. Analyze group dynamics, process, and development</td>
<td>Discussion</td>
</tr>
<tr>
<td>5. Demonstrate group facilitation skills and identify therapeutic factors expressed in group therapy</td>
<td>Facilitate a group. Evaluate group work with attention to therapeutic factors, peer evaluation</td>
</tr>
<tr>
<td>6. Analyze ethical and professional issues and challenges encountered in group and family therapy</td>
<td>Discussion, case studies, practicum journals and case notes, preceptor and faculty supervision and evaluation, theory paper and presentation</td>
</tr>
<tr>
<td>7. Assess, diagnose, intervene and evaluate families and groups to promote optimum mental health and well-being with the use evidence-based practice</td>
<td>Discussion, case studies, practicum journals, preceptor and faculty supervision and evaluation</td>
</tr>
</tbody>
</table>

IV. Course Level Justification

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

V. Course Outline

1. Course introduction
   1.1. Conceptualizations of family
   1.2. Conceptualizations of groups
2. Theoretical perspectives for advanced family nursing practice
   2.1. Family systems theory
2.2. Ecological framework
2.3. Resiliency model of family stress adjustment and adaptation

3. Promoting mental and functional well-being in families
   3.1. Primary prevention
   3.2. Secondary prevention
   3.3. Tertiary prevention

4. Impacts of mental illness on the family
   4.1. Family strengths
   4.2. Family deficits

5. Assessment and diagnosis of families
   5.1. Addiction problem
   5.2. Chronically ill family member
   5.3. Abuse and neglect
   5.4. Violence
   5.5. Loss

6. Interventions for families
   6.1. Genogram
   6.2. Psychoeducation
   6.3. Family therapy

7. Ethical and professional issues in work with families

8. Theoretical perspectives for advanced group nursing practice
   8.1. Definitions
   8.2. Group theory

9. Types of groups
   9.1. Therapy
   9.2. Support
   9.3. Activity
   9.4. Education

10. Group dynamics
    10.1. Membership
    10.2. Environment
    10.3. Roles
    10.4. Development
    10.5. Outcomes

11. Group facilitation and intervention techniques
    11.1. Theory
    11.2. Practice
    11.3. Age-related considerations
    11.4. Cultural considerations

12. Ethical and professional issues in work with groups
VI. Suggested Texts

VII. Bibliography and Suggested Readings

*Classic text
Course Action Request  
University of Alaska Anchorage  
Proposal to Initiate, Add, Change, or Delete a Course

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<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
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<td>CH College of Health</td>
<td>ADSN Division of Nursing</td>
<td>NUR</td>
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<th>2. Course Prefix</th>
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<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours</th>
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6. Complete Course Title
Advanced Practice Psychiatric and Mental Health Nursing III
Advanced Practice PMHN III
Abbreviated Title for Transcript (30 character)

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<td>or ☑ Change</td>
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<td>or ☑ Delete</td>
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9. Repeat Status No # of Repeats Max Credits

10. Grading Basis
☐ A-F ☑ P/NP ☑ NG

11. Implementation Date
semester/year
From: FALL/2014 To: /9999

12. ☐ Cross Listed with N/A

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Catalog Page(s) Impacted</th>
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Initiator Name (typed): Dianne Tarrant
Initiator Signed Initials: _________
Date:________________

13b. Coordination Email
Date: 01/29/13
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 01/29/13

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☑ Written Communication ☐ Quantitative Skills ☑ Humanities
☐ Fine Arts ☑ Social Sciences ☑ Natural Sciences ☑ Integrative Capstone

15. Course Description
(suggested length 20 to 50 words)
Introduces the consultant/liaison role in organizational settings. Analyzes organizational approaches to plan, implement and evaluate population focused mental health services. Identifies and evaluates fiscal and social policies, community resources, and research findings.

16a. Course Prerequisite(s) (list prefix and number) (NS A612 and NS A671) with minimum grade of B

16b. Test Score(s)
N/A

16c. Co-requisite(s) (concurrent enrollment required)
NS A612

16d. Other Restriction(s) (concurrent enrollment required)
☐ College ☑ Major ☑ Class ☑ Level

16e. Registration Restriction(s) (non-codable)
Graduate standing with current acceptance into DNP Program.

17. ☑ Mark if course has fees

18. ☑ Mark if course is a selected topic course

19. Justification for Action
Course revised and enhanced for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

Initiator (faculty only) Dianne Tarrant
Initiator (TYPE NAME)

Approved Disapproved

Dean/Director of School/College

Undergraduate/Graduate Academic
Board Chairperson

Approved Disapproved

Provost or Designee

298
<table>
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<th>Impacted Program or Course</th>
<th>Catalog Page</th>
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<th>Chair/Coordinator Contacted</th>
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<td>307</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
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<tr>
<td>2. Graduate Certificate, Nursing Education</td>
<td>308</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
</tr>
<tr>
<td>3. NS A672 Advanced Psychiatric/Mental Health Nursing III</td>
<td>463</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
</tr>
<tr>
<td>4. NS A674 Advanced Psychiatric/Mental Health Nursing IV</td>
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<td>9/11</td>
<td>Dianne Tarrant</td>
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</table>
I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A672
Title: Advanced Practice Psychiatric and Mental Health Nursing III
Credits: 5 (2 + 12)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Introduces the consultant/liaison role in organizational settings. Analyzes organizational approaches to plan, implement and evaluate population focused mental health services. Identifies and evaluates fiscal and social policies, community resources, and research findings.

Course Prerequisite(s): NS A671 with minimum grade of B
Corequisite(s): NS A612
Other Restriction(s): Level
Registration Restriction(s): Graduate standing with current acceptance into DNP Program.

Course Fee: Yes No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals
   The instructor will:
   1. Facilitate analysis of current perspectives, theoretical foundations and empirical data related to consultation/liaison role for advanced psychiatric mental health nursing practice.
   2. Promote discussion and critical analysis of fiscal trends, social policies, and community resources that impact the mental and functional well-being of vulnerable populations.
   3. Encourage recognition of ethical and professional issues and challenges encountered in consultation/liaison work with organizations.
   4. Stimulate understanding of collaborative strategies to work with consumer/advocacy organizations.
   5. Provide opportunities for application of consultation/liaison role within an organization providing mental health services to a vulnerable population.
   6. Supervise continued skill development in assessment, diagnosis, outcome identification, therapeutic interventions and evaluation of psychiatric mental
health clients throughout the life span, and professional development in collaboration with other mental health professionals.

<table>
<thead>
<tr>
<th>Student Learning Outcomes/Assessment Measures</th>
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</thead>
<tbody>
<tr>
<td><strong>Student Learning Outcomes</strong></td>
</tr>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
</tr>
<tr>
<td>1. Analyze current perspectives of consultation/liaison role for advanced psychiatric mental health nursing practice</td>
</tr>
<tr>
<td>2. Identify fiscal trends, social policies, community resources and public and mental health policy that impact the mental and functional well-being of vulnerable populations</td>
</tr>
<tr>
<td>3. Compare and contrast theoretical foundations and identify empirical data related to consultation with organizations providing mental health services to vulnerable populations</td>
</tr>
<tr>
<td>4. Report ethical and professional issues and challenges encountered in consultation/liaison work with organizations</td>
</tr>
<tr>
<td>5. Demonstrate collaborative strategies needed to work with consumer/advocacy organizations</td>
</tr>
<tr>
<td>6. Actively engage in consultation/liaison role with an organization that provides mental health services to a vulnerable population</td>
</tr>
<tr>
<td>7. Practice assessment, diagnosis, outcome identification, therapeutic interventions and evaluation of psychiatric mental health clients throughout the life span, and expand professional development skills</td>
</tr>
</tbody>
</table>
IV. Course Level Justification
This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

V. Course Outline
1. Course introduction
   1.1. Consultation and liaison role
   1.2. Mental health psychiatric consultant/liaison
2. Theoretical perspectives
   2.1. Mental health and behavioral consultation
   2.2. Organizational consultation
3. Consultant skills
   3.1. Process focused
   3.2. Content focused
4. Modes of consultation
   4.1. Provisional
   4.2. Prescriptive
   4.3. Collaborative
   4.4. Mediational
5. Multidimensional approaches to consultation
   5.1. Client focused
   5.2. System focused
6. Skills and knowledge for effective consultation
   6.1. Stages of consultation
   6.2. Communication/relationship building
   6.3. Collaboration
   6.4. Nature of organization
7. Ethical, professional and legal issues
   7.1. Technology, information and data management
   7.2. Cultural diversity and sensitivity
8. Burden of mental illness
   8.1. Global
   8.2. National/state/cities/communities
9. Structure of mental health system in the United States
   9.1. Historical perspective
   9.2. Contemporary overview
10. Mental health policy
    10.1. Health promotion and prevention
    10.2. Fiscal and social policies that impact mental health care delivery
11. Financing and managing mental health care
    11.1. Traditional insurance programs
11.2. Managed behavioral health care
11.3. Access to treatment and social and political will
11.4. Accountability, quality and outcomes
12. Vulnerable populations/issues and considerations
12.1. Chronically, seriously mentally ill and terminally ill
12.2. Victims of domestic violence and criminal behavior
12.3. Children, adolescents and elderly
12.4. Alaska Native and other marginalized cultures

VI. Suggested Texts

VII. Bibliography and Suggested Readings
**Course Action Request**  
**University of Alaska Anchorage**
**Proposal to Initiate, Add, Change, or Delete a Course**

<table>
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<th>5b. Contact Hours (Lecture + Lab)</th>
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</thead>
<tbody>
<tr>
<td>NS</td>
<td>A673</td>
<td>NS A674</td>
<td>5</td>
<td>(1+16)</td>
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<table>
<thead>
<tr>
<th>6. Complete Course Title</th>
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</thead>
<tbody>
<tr>
<td>Advanced Practice Psychiatric and Mental Health Nursing IV</td>
</tr>
<tr>
<td>Advanced Practice PMHN IV</td>
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<tr>
<th>7. Type of Course</th>
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</thead>
<tbody>
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<td>☒ Academic</td>
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<tr>
<td>☐ Preparatory/Development</td>
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<tr>
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<tr>
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<td>☐ Change</td>
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**If a change, mark appropriate boxes:**
- Prefix
- Credits
- Title
- Grading Basis
- Course Description
- Test Score Prerequisites
- Other Restrictions
  - Class
  - College
  - Major
  - Level
- Other (please specify)

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<td>☐ P/NP</td>
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<th>13a. Impacted Courses or Programs:</th>
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<td>List any programs or college requirements that require this course.</td>
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**Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).**

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<th>Chair/Coordinator Contacted</th>
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<tr>
<td>1. Ms. Nursing Science</td>
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<td>9/11</td>
<td>Dianne Tarrant</td>
</tr>
<tr>
<td>2. Graduate Certificate, Nursing Education</td>
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<td>☒</td>
<td>9/11</td>
<td>Dianne Tarrant</td>
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<td>3.</td>
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**Initiator Name (typed):** ________________  
**Initiator Signed Initials:** _________  
**Date:** ________________

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<td>(<a href="mailto:uaa-faculty@lists.uaa.alaska.edu">uaa-faculty@lists.uaa.alaska.edu</a>)</td>
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<td>☐ Oral Communication</td>
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<td>☐ Written Communication</td>
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<td>☐ Social Sciences</td>
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<table>
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<tr>
<th>15. Course Description (suggested length 20 to 50 words)</th>
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<tbody>
<tr>
<td>Capstone course in preparation for psychiatric mental health practitioner role. Intensive clinical practicum provides context for integration, synthesis, and application of theory, research and clinical findings to facilitate mental and functional well-being in individuals, families and groups throughout the lifespan. Includes seminar to explore advance practice issues.</td>
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<td>NS A672 with minimum grade of B</td>
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<td>Graduate standing with current acceptance into DNP program.</td>
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| 17. ☒ Mark if course is a selected topic course |

| 18. ☐ Mark if course is a selected topic course |

<table>
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<th>19. Justification for Action</th>
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<tr>
<td>This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.</td>
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**Initiator (faculty only):** 
**Initiator (TYPE NAME):** 
**Date:** ________________
I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing  
Course Prefix: NS  
Course Number: A673  
Title: Advanced Psychiatric Mental Health Nursing IV  
Credits: 5 (1 + 16)  
Grading Basis: A-F  
Implementation Date: Fall 2014  
Course Description: Capstone course in preparation for psychiatric mental health practitioner role. Intensive clinical practicum provides context for integration, synthesis, and application of theory, research and clinical findings to facilitate mental and functional well-being in individuals, families and groups throughout the lifespan. Includes seminar to explore advance practice issues.

Course Prerequisite(s): NS A672 with minimum grade of B  
Corequisite(s): N/A  
Other Restriction(s): Level  
Registration Restriction(s): Graduate standing with current acceptance into DNP program.  
Course Fee: Yes  

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals:
The instructor will:
1. Promote reflective practice with ongoing emphasis on development of interpersonal and counseling skills needed for therapeutic alliances to promote mental and functional well-being of individuals, families, and groups throughout the lifespan.
2. Facilitate skillful use of diverse, evidence-based techniques in assessment, diagnosis, outcome identification, therapeutic interventions, and evaluation of individuals, families and groups throughout the lifespan.
3. Assign clinical experience for development of a collaborative practice with other health care professionals.
4. Foster evaluation of ethical, legal and professional issues in a multidisciplinary practice.
### Student Learning Outcomes

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
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</thead>
<tbody>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Engage in self-reflection in process of evaluating interpersonal and counseling skills needed to sustain therapeutic alliance</td>
<td>Reflective journal; preceptor, faculty and peer supervision</td>
</tr>
<tr>
<td>2. Demonstrate competency in diagnosing, intervening, and managing common and recurrent psychiatric symptoms</td>
<td>Case study; preceptor, faculty and peer supervision</td>
</tr>
<tr>
<td>3. Conduct practice in accordance with recognized standards of clinical excellence</td>
<td>Case study; preceptor, faculty and peer supervision</td>
</tr>
<tr>
<td>4. Practice the use of diverse, evidence-based interventions to promote mental and functional well-being of individuals, families and groups throughout the lifespan</td>
<td>Case study; preceptor, faculty and peer supervision; case notes and reflective journaling</td>
</tr>
<tr>
<td>5. Collaborate effectively with clinical colleagues and multidisciplinary professionals to promote optimal treatment outcomes</td>
<td>Reflective journal; preceptor, faculty and peer supervision</td>
</tr>
<tr>
<td>6. 1. Address ethical, legal and professional issues</td>
<td>Case study; preceptor faculty and peer supervision</td>
</tr>
</tbody>
</table>

### IV. Course Level Justification

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been revised and enhanced to address essential requirements of the Doctorate of Nursing Practice (DNP). It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

### V. Course Outline

1. Supervision of clinical practice
   1.1 Collaboration
   1.2 Multidisciplinary treatment planning
   1.3 Standards of clinical excellence
   1.4 Diagnosing, intervening, and managing common and recurrent psychiatric symptoms/conditions
1.5 Diverse, evidence based interventions to promote mental and functional well-being throughout lifespan

1.6 Ethical and legal issues

2. Seminar topics
   2.1 Regulatory issues
   2.2 Reimbursement issues
   2.3 Risk management
   2.4 Liability
   2.5 Practice ownership
   2.6 Advancing and promoting the profession

VI. Suggested Texts

VII. Bibliography and Suggested Readings
### Course Action Request

**University of Alaska Anchorage**

Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
<tr>
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<td>1c. Department</td>
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<td>(Lecture + Lab) (0+12)</td>
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| Abbreviated Title for Transcript (30 character) |

| 7. Type of Course | Academic |

| 8. Type of Action: | Add |

| If a change, mark appropriate boxes: |

| Prefix | Course Number | Credits | Contact Hours | Grading Basis | Repeat Status | Course Description | Course Prerequisites | Test Score Prerequisites | Co-requisites | Registration Restrictions | Class | Level | College | Major (please specify) | Other |

| 9. Repeat Status No | # of Repeats | Max Credits |

| 10. Grading Basis | A-F |

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| Cross-Listed Coordination Signature |

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Initiator Name (typed): Dianne Tarrant

Initiator Signed Initials: _________

Date: __________________

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<th>13b. Coordination Email</th>
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submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

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<td>Written Communication</td>
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<td>Fine Arts</td>
<td>Integrative Capstone</td>
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<tr>
<td>Quantitative Skills</td>
<td>Humanities</td>
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<table>
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<tr>
<th>15. Course Description (suggested length 20 to 50 words)</th>
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Emphasizes care of unique, diverse, and/or underserved populations. Analyzes socio-cultural factors that influence health, illness, and health-related behaviors. The influence of genetics and genomics on health status is considered in chosen populations. May include focused project implementation.

<table>
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<th>16a. Course Prerequisite(s) (list prefix and number)</th>
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<tr>
<td>16e. Registration Restriction(s) (non-codable)</td>
<td>Current acceptance into the DNP program.</td>
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| 17. Mark if course has fees | 18. Mark if course is a selected topic course |

| 18. Mark if course is a selected topic course |

<table>
<thead>
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<th>19. Justification for Action</th>
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Course developed for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

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<td>Dianne Tarrant</td>
<td></td>
<td></td>
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<tr>
<td>Undergraduate/Graduate Academic</td>
<td>Date</td>
</tr>
<tr>
<td>Board Chairperson</td>
<td></td>
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<td>Provost or Designee</td>
<td>Date</td>
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</table>
I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A683
Title: Clinical Immersion
Credits: 3 (0 + 12)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Emphasizes care of unique, diverse, and/or underserved populations. Analyzes socio-cultural factors that influence health, illness, and health-related behaviors. The influence of genetics and genomics on health status is considered in chosen populations. May include focused project implementation.

Course Prerequisite(s): NS A663 or NS A673 with minimum grade of B
Corequisite(s): N/A
Other Restriction(s): Level
Registration Restriction(s): Current acceptance into the DNP program.
Course Fee: ☑ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals:
The instructor will:
1. Support student led seminars highlighting experiences with unique, diverse, and/or underserved populations.
2. Translate theoretical foundations of culturally competent care to specific practice environments with diverse health care systems and technology.
3. Facilitate focused project implementation.
4. Present strategies to promote self awareness about attitudes, beliefs, biases, and behaviors that influence clinical practice with emphasis on future goals for lifelong learning.
### B. Student Learning Outcomes/Assessment Measures

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<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
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<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Manage patient care of underserved populations with simple to complex diagnoses with increasing independence</td>
<td>Clinical log, self-reflective journaling, clinical evaluation</td>
</tr>
<tr>
<td>2. Integrate care emphasizing cultural diversity, values, and beliefs in collaboration with the patient to make health care decisions</td>
<td>Clinical log, self-reflective journaling, clinical evaluation, discussion</td>
</tr>
<tr>
<td>3. Assess health care environment and advocate for improved access, quality, and cost-effective health care within the identified population</td>
<td>Clinical log, self-reflective journaling, clinical evaluation, discussion, student designed case study</td>
</tr>
<tr>
<td>4. Analyze the interdependence among health care policy, complex delivery systems and practice with diverse populations</td>
<td>Self-reflective journaling, clinical evaluation, discussion, culturally competent care modules, student designed case study</td>
</tr>
<tr>
<td>5. Evaluate the ethical consequences of decision-making in underserved groups</td>
<td>Clinical log, self-reflective journaling, clinical evaluation, discussion, culturally competent care modules, student designed case study</td>
</tr>
<tr>
<td>6. Integrate knowledge of genetics and genomics to optimize patient care in underserved populations</td>
<td>Clinical log, clinical evaluation, discussion, student designed case study</td>
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</tbody>
</table>

### IV. Course Level Justification

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It has been developed to address essential requirements of the Doctorate of Nursing Practice. It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.
V. Course Outline

1. Overview of culturally competent care
   1.1. National standards on culturally and linguistically appropriate services
   1.2. Barriers to care
   1.3. Ethical decision-making with underserved populations

2. Development of cultural competence
   2.1. Goals of culturally competent care in complex health care systems
   2.2. Pathways to competent care

3. Effective communication
   3.1. Barriers to communication
   3.2. Language access services

4. Patient centered care in diverse populations
   4.1. Barriers to care
   4.2. Customized care
   4.3. Integration of genetics and genomics

5. Influence of environment and climate

6. Community partnerships
   6.1. Community assessment and demographics
   6.2. Access to care
   6.3. Strengthening community partnerships

VI. Suggested Texts


VII Bibliography and Suggested Readings


### Course Action Request

**University of Alaska Anchorage**

Proposal to Initiate, Add, Change, or Delete a Course

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<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours (Lecture + Lab)</th>
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**6. Complete Course Title**

Clinical Concentration

**Abbreviated Title for Transcript (30 character)**

**7. Type of Course**

- ☒ Academic
- ☐ Preparatory/Development
- ☐ Non-credit
- ☐ CEU
- ☐ Professional Development

**8. Type of Action:**

- ☒ Add or ☐ Change or ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
- ☐ Level
- ☐ College
- ☐ Major
- ☐ Other

(please specify)

<table>
<thead>
<tr>
<th>9. Repeat Status No</th>
<th># of Repeats</th>
<th>Max Credits</th>
</tr>
</thead>
</table>

| 10. Grading Basis | A-F | ☒ P/NP | ☐ NG |

| 11. Implementation Date | semester/year | From: FALL/2014 | To: /9999 |

| 12. | ☐ Cross Listed with | N/A |

| ☐ Stacked with | N/A | Cross-Listed Coordination Signature |

**13a. Impacted Courses or Programs:** List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

<table>
<thead>
<tr>
<th>Impact Program/Course</th>
<th>Catalog Page(s) Impacted</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
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<tr>
<td>2.</td>
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<tr>
<td>3.</td>
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</tr>
</tbody>
</table>

**Initiator Name (typed):**

Initiator Signed Initials: __________

Date: __________

**13b. Coordination Email**

Date: 01/29/13

submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

**13c. Coordination with Library Liaison**

Date: 01/29/13

**14. General Education Requirement**

Mark appropriate box:

- ☐ Oral Communication
- ☐ Written Communication
- ☐ Social Sciences
- ☐ Natural Sciences
- ☐ Humanities
- ☐ Fine Arts
- ☐ Quantitative Skills
- ☐ Integrative Capstone

**15. Course Description** *(suggested length 20 to 50 words)*

Provides final integration of advanced practice skills and evidence-based knowledge in a practice environment of interest to the student. May include focused project implementation.

**16a. Course Prerequisite(s) (list prefix and number)** (NS A663 or NS A673) with minimum grade of B

**16b. Test Score(s)**

N/A

**16c. Co-requisite(s) (concurrent enrollment required)**

N/A

**16d. Other Restriction(s)**

- ☐ College
- ☐ Major
- ☐ Class
- ☒ Level

**16e. Registration Restriction(s) (non-codable)**

Current acceptance into the Doctor Nursing Practice program.

**17. Mark if course has fees**

- ☐ Mark if course is a selected topic course

**18. Mark if course is a selected topic course**

**19. Justification for Action**

Course developed for use in Doctorate of Nursing Practice (DNP) Program based on accreditation standards. DNP is the entry level into advanced nursing practice according to national standards.

**Initiator (faculty only)***

Dianne Tarrant

Initiator (TYPE NAME)

<table>
<thead>
<tr>
<th>☐ Approved</th>
<th>Disapproved</th>
</tr>
</thead>
</table>

<table>
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</thead>
</table>

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<thead>
<tr>
<th>☐ Approved</th>
<th>Disapproved</th>
</tr>
</thead>
</table>

**20. Initiation:**

Initiator Signed Initials: __________

Date: __________

**21. Dean/Director of School/College**

Date: __________

<table>
<thead>
<tr>
<th>☐ Approved</th>
<th>Disapproved</th>
</tr>
</thead>
</table>

**22. Department Chairperson**

Date: __________

<table>
<thead>
<tr>
<th>☐ Approved</th>
<th>Disapproved</th>
</tr>
</thead>
</table>

**23. Undergraduate/Graduate Academic Board Chairperson**

Date: __________

<table>
<thead>
<tr>
<th>☐ Approved</th>
<th>Disapproved</th>
</tr>
</thead>
</table>

**24. Provost or Designee**

Date: __________

<table>
<thead>
<tr>
<th>☐ Approved</th>
<th>Disapproved</th>
</tr>
</thead>
</table>
I. Date of Initiation: Fall 2011

II. Course Information
College/School: College of Health/School of Nursing
Course Prefix: NS
Course Number: A684
Title: Clinical Concentration
Credits: 4 (0 + 16)
Grading Basis: A-F
Implementation Date: Fall 2014
Course Description: Provides final integration of advanced practice skills and evidence-based knowledge in a practice environment of interest to the student. May include focused project implementation.

Course Prerequisite(s): NS A663 or NS A673 with minimum grade of B
Corequisite(s): N/A
Other Restriction(s): Level
Registration Restrictions: Current acceptance into the Doctor Nursing Practice program.
Course Fee: ☑ Yes ☐ No

III. Instructional Goals, Student Learning Outcomes, and Assessment Measures
A. Instructional Goals:
The instructor will:
1. Facilitate student led seminars highlighting areas of practice/project interest.
2. Coordinate integration of evidence-based practice and skill acquisition.
### Student Learning Outcomes/Assessment Measures

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upon successful completion of the course, the student will be able to:</td>
<td>This outcome will be assessed by one or more of the following:</td>
</tr>
<tr>
<td>1. Synthesize and apply advanced practice preparation to improve health outcomes in the focused practice environment using a collaborative, evidence-based approach</td>
<td>Clinical log, self-reflective journaling, clinical evaluation, discussion, practice focused assignment, project completion</td>
</tr>
<tr>
<td>2. Promote a culture of excellence in clinical practice</td>
<td>Peer critique</td>
</tr>
<tr>
<td>3. Analyze organizational practice, policies and systems that affect the focused clinical environment</td>
<td>Self-reflective journaling, discussion, practice focused assignment</td>
</tr>
</tbody>
</table>

### IV. Course Level Justification

This course builds upon basic knowledge and skills acquired through baccalaureate-level nursing preparation. It requires self-direction, independent thinking and extensive use of analytical skills to achieve student outcomes.

### V. Course Outline

1. Clinical residency in student chosen clinical environment
2. Seminar group discussions with peer critiques
   2.1 Challenges and ethical issues encountered in practice
   2.2 Health and systems policies encountered in the clinical concentration
   2.3 Sharing of clinical expertise from focused practice environment

### VI. Suggested Texts

Chosen by the student and related to focused practice environment.

### VII. Bibliography and Suggested Readings

Chosen by the student and related to focused practice environment.
October 23, 2013

To Whom It May Concern:

Several changes are being proposed for the Master of Business Administration program. We are adding several emphasis areas that are most relevant for MBA students (Leadership, Entrepreneurship and Marketing). The emphasis areas are all based on existing courses or on courses that had been taught as experimental or independent study and that are now made permanent. As a new strategic direction, the College of Business and Public Policy is also introducing two new courses in Leadership, to support the new Leadership emphasis area.

Bogdan Hoanca, Ph.D.
Professor of Management Information Systems
Director of Graduate Programs
College of Business and Public Policy
University of Alaska Anchorage
3211 Providence Dr, Room RH 308A
Anchorage AK 99508
Ph: 907-786-4140
Fax: 907-786-4115
Email: bhoanca@uaa.alaska.edu
Program/Prefix Action Request  
University of Alaska Anchorage  
Proposal to Initiate, Add, Change, or Delete a Program of Study or Prefix

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB CBPP</td>
<td>ADBP Division of Business Programs</td>
<td>BA</td>
</tr>
</tbody>
</table>

2. Complete Program Title/Prefix  
Master of Business Administration

3. Type of Program
Choose one from the appropriate drop down menu:  
Undergraduate: or Graduate:  
CHOOSE ONE  Master of Business Administration

4. Type of Action:  
PROGRAM  
 PREFIX
☐ Add  
☒ Change  
☐ Delete  
☐ Add  
☐ Change  
☐ Inactivate

5. Implementation Date (semester/year)  
From: Fall/2014  
To: 9999

6a. Coordination with Affected Units  
Department, School, or College:  
Initiator Name (typed): Bogdan Hoanca  
Initiator Signed Initials: __________  
Date: __________

6b. Coordination Email submitted to Faculty Listserv (uaa-faculty@lists.uaa.alaska.edu)  
Date: 10/23/13

6c. Coordination with Library Liaison  
Date: 10/25/2013

7. Title and Program Description - Please attach the following:  
☒ Cover Memo  
☐ Catalog Copy in Word using the track changes function

8. Justification for Action
Add several emphasis areas that are relevant for MBA students (Leadership, Entrepreneurship, Marketing). Several courses that have been taught as experimental or independent study are now made permanent.

Initiator (faculty only)  
Bogdan Hoanca  
Initiator (TYPE NAME)  
Date

☐ Approved  
☐ Disapproved  
Dean/Director of School/College  
Date

☐ Approved  
☐ Disapproved  
Department Chairperson  
Date

☐ Approved  
☐ Disapproved  
Undergraduate/Graduate Academic  
Board Chairperson  
Date

☐ Approved  
☐ Disapproved  
Provost or Designee  
Date

☐ Approved  
☐ Disapproved  
Curriculum Committee Chairperson  
Date
COLLEGE OF BUSINESS
AND PUBLIC POLICY

The College of Business and Public Policy (CBPP) offers three graduate degrees: Master of Business Administration, General Management; Master of Science, Global Supply Chain Management; and Master of Public Administration. These degree programs prepare students to function as effective leaders and managers in for-profit and not-for-profit organizations. Because of the related nature of the three CBPP degrees, students interested in pursuing two degrees simultaneously or in pursuing a second graduate degree may be able to complete the second degree with a significantly reduced number of credit hours, in accordance with the Graduate School’s policies on Additional Master’s Degrees in this catalog.

BUSINESS ADMINISTRATION

Edward & Cathryn Rasmuson Hall (RH), Room 304, (907) 786-4171
www.ualaska.edu/cbpp

The College of Business and Public Policy offers the Master of Business Administration (MBA) degree in General Management. The MBA program is accredited by the Association to Advance Collegiate Schools of Business (AACSB International).

Program Policies and Administration

Students must maintain a minimum 3.00 GPA in all coursework in the MBA program. Although minimally acceptable, a grade of C in a graduate course may be offset with an A grade in another graduate course. Students with a GPA below 3.00 will be placed on probation and may be dropped from the program if the GPA is not brought up to 3.00 within one academic year. All MBA course requirements must be completed within seven calendar years.

The faculty reserves the right, where warranted by evaluation of a student’s progress and apparent knowledge, to require additional coursework or other preparation to ensure the degree candidate possesses adequate professional skills and capabilities. This includes the ability to reason and communicate effectively, both verbally and quantitatively.

The MBA program is the responsibility of CBPP’s graduate faculty, which acts as a policy-setting body and as an appeals board. Contact the CBPP Graduate Programs Office for full program information, including application forms and procedures.

Graduate Programs Office
UAA College of Business and Public Policy
University of Alaska Anchorage
3211 Providence Drive, Anchorage, AK 99508, U.S.A.
Telephone: (907) 786-4171
Facsimile: (907) 786-4115

Master of Business Administration, General Management

The MBA in General Management provides students with perspectives and skills to prepare them for increasingly significant managerial and leadership roles.

The focus of the program is management practice, recognizing that sound practice requires a thorough understanding of underlying management principles and techniques. The MBA graduate should be thoroughly grounded in state-of-the-art management theory and practice, aware of the complex global environment in which modern organizations operate, adaptive to change, articulate, and ethical.
The program serves full- and part-time students, and classes are generally scheduled on evenings or Saturdays. Most courses are offered in fall and/or spring, and a limited number in summer. Although many students are from the greater Anchorage area, the program also attracts students from throughout the United States and from foreign countries, particularly those on the Pacific Rim.

**Admission Requirements**

Applicants must meet both the Admission Requirements for Graduate Degrees and the College of Business and Public Policy requirements outlined here.

Admission to the MBA program is limited to students who have earned a baccalaureate degree from an AACSB or regionally accredited university, or foreign equivalent. Undergraduate GPA on a 4.00 scale and the Graduate Management Admission Test (GMAT) score must satisfy the following formula:

\[
\text{Undergraduate GPA} \times 200 + \text{GMAT} > 1150
\]

GMAT waivers may be considered for applicants meeting any of the following criteria:

1. Hold another master’s degree from an accredited university.
2. Have a professional designation beyond the baccalaureate (such as CPA, CFA).
3. Have an undergraduate GPA of 3.50 or higher.

Additional indicators for predicting success in individual cases may be provided through evidence of creativity and leadership; or a sustained record of accomplishment in business or other professional activity.

Each applicant must submit the following to the UAA Office of Admissions as part of their application materials:

- A statement of purpose.
- A resume, including the names and contact information of three references.
- All transcripts from prior college/university studies.

Applicants whose native language is not English must score at least 80 (Internet based exam scale) on the TOEFL examination, or otherwise demonstrate competency in English. Students may apply to enter the program at the beginning of either the fall or spring semester. There currently is no specific application deadline, but students should apply before the start of their first semester.

**MBA Student Learning Outcomes**

Upon graduation, MBA program graduates will possess or show ability in the following areas as defined by these MBA student learning outcomes:

1. Develop an understanding of the organization as a complex goal-seeking system interacting with and adapting to the dynamics of its external environment.
2. Demonstrate an understanding of the key elements and tools of business performance management.
3. Demonstrate effective communication skills utilizing a variety of tools and media suited to specific situations.
4. Provide leadership in settings ranging from the organization-wide level to the team.
5. Demonstrate professionalism through the maintenance of high standards of personal performance, teamwork, professional development and ethical behavior.

**General Management Program Structure**

Requirements consist of two parts: foundation courses and advanced courses in business or accounting. The foundation courses are:

- **ACCT A601** Accounting Foundations for Executives 3
- **BA A603** Fundamentals of Finance 3
- **ECON A602** Introduction to Economics for Managers 3
All students must complete the three foundation courses. Advisors may, however, waive one or more of the foundation courses if the student has completed disciplinary equivalent coursework within five years preceding their admission.

Entering students are expected to have basic mathematical, computer, and communication skills. Students lacking these fundamental skills will be required to improve by means of independent study, noncredit courses, undergraduate coursework, or seminars and workshops.

The main body of the MBA curriculum consists of seven core courses (21 credits) and 15 credits of curricular options, for a total of 36 credits of advanced coursework:

**Core Courses (21 credits):**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT A650</td>
<td>Seminar in Executive Uses of Accounting</td>
<td>3</td>
</tr>
<tr>
<td>BA A610</td>
<td>Business Intelligence and Analytics</td>
<td>3</td>
</tr>
<tr>
<td>BA A613</td>
<td>Applied Leadership</td>
<td>3</td>
</tr>
<tr>
<td>BA A632</td>
<td>Organizational Behavior and Foundations</td>
<td>3</td>
</tr>
<tr>
<td>BA A635</td>
<td>Current Marketing Issues Seminar</td>
<td>3</td>
</tr>
<tr>
<td>BA A636</td>
<td>Financial Decision Making</td>
<td>3</td>
</tr>
<tr>
<td>BA A655</td>
<td>Strategic Management Seminar</td>
<td>3</td>
</tr>
</tbody>
</table>

In certain cases, where warranted by previous education or experience, students may petition to substitute an elective instead.

**Curricular Options (15 credits):**

a. **Executive Focus (3 credits):** Select at least one course from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA A628</td>
<td>Executive Leadership</td>
<td>3</td>
</tr>
<tr>
<td>BA A629</td>
<td>Negotiation and Conflict Management</td>
<td>3</td>
</tr>
<tr>
<td>BA A631</td>
<td>Business Environment Analysis</td>
<td>3</td>
</tr>
<tr>
<td>BA A634</td>
<td>Organizational Design and Development</td>
<td>3</td>
</tr>
</tbody>
</table>

b. **Elective Coursework (9 credits):**

Students may design an area of concentration from CBPP courses that focus on management theory and practice, marketing, finance, international business and global economics, management information systems, logistics and supply chain management, or public administration. In addition, with the advisor’s approval, elective coursework can be selected from graduate courses offered by other colleges, disciplines, or graduate courses offered by other accredited universities.

c. **Capstone course requirement (3 credits):**

Capstone courses provide the opportunities to integrate acquired knowledge of business administration. Select one course based on preferred nature of experience (practical or academic) and application (applied or theoretical):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA A626</td>
<td>Strategic Leadership</td>
<td>3</td>
</tr>
<tr>
<td>BA A656</td>
<td>Management Project</td>
<td>3</td>
</tr>
<tr>
<td>BA A686</td>
<td>Management Simulation</td>
<td>3</td>
</tr>
<tr>
<td>BA A698</td>
<td>MBA Individual Research</td>
<td>3</td>
</tr>
</tbody>
</table>

**Thesis Option:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA A699</td>
<td>Thesis</td>
<td>6</td>
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</tbody>
</table>

Students (especially those who are considering pursuing a PhD degree) may elect to complete a master’s thesis.

**MBA with an Emphasis in Business Intelligence and Business Analytics**

MBA degree candidates will receive a degree with an emphasis in Business Intelligence and Business Analytics by completing the following sequence of elective courses as a part of their degree program:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA A633</td>
<td>Problem Formulation and Decision Analysis</td>
<td>3</td>
</tr>
<tr>
<td>BA A648</td>
<td>Business Intelligence and Data Mining</td>
<td>3</td>
</tr>
</tbody>
</table>
MBA with an Emphasis in Entrepreneurship

MBA degree candidates will receive a degree with an emphasis in Entrepreneurship by completing the following sequence of elective courses as a part of their degree program:

- BA A671 Introduction to Entrepreneurship 3
- BA A672 Developing a Business Plan 3
- BA A673 Entrepreneurship - Creating the Venture 3

MBA with an Emphasis in Leadership

MBA degree candidates will receive a degree with an emphasis in Leadership by completing the following sequence of elective courses as a part of their degree program:

- BA A621 Change Leadership and Facilitation 3
- BA A622 Leading Performance and Coaching 3
- BA A631 Business Environment Analysis 3

MBA with an Emphasis in Marketing

MBA degree candidates will receive a degree with an emphasis in Marketing by completing the following sequence of elective courses as a part of their degree program:

- BA A640 Global Marketing 3
- BA A641 Advanced Consumer Behavior 3
- BA A680 Social Media Strategies 3

FACULTY

Nalinaksha Bhattacharyya, Professor, AFNB@uaa.alaska.edu
Yong Cao, Professor, AFYC@uaa.alaska.edu
Alpana Desai, Professor, alpana@uaa.alaska.edu
Ted Eschenbach, Professor Emeritus, AFTGE@uaa.alaska.edu
Edward Forrest, Professor, AFEJF1@uaa.alaska.edu
George Geistauts, Professor, AFGAG@uaa.alaska.edu
Bogdan Hoanca, Professor/Director of CBPP Graduate Programs, AFBH@uaa.alaska.edu
Lee Huskey, Professor, AFLH@uaa.alaska.edu
Frank Jeffries, Professor, AFFLJ@uaa.alaska.edu
Yonggang Lu, Assistant Professor, AFYL@uaa.alaska.edu
Terry Nelson, Assistant Professor,
Rashmi Prasad, Professor/Dean CBPP, AFRP2@uaa.alaska.edu
Darren Prokop, Professor, AFDJP1@uaa.alaska.edu
Larry Ross, Professor, AFRLL@uaa.alaska.edu
The College of Business and Public Policy (CBPP) offers three graduate degrees: Master of Business Administration, General Management; Master of Science, Global Supply Chain Management; and Master of Public Administration. These degree programs prepare students to function as effective leaders and managers in for-profit and not-for-profit organizations. Because of the related nature of the three CBPP degrees, students interested in pursuing two degrees simultaneously or in pursuing a second graduate degree may be able to complete the second degree with a significantly reduced number of credit hours, in accordance with the Graduate School’s policies on Additional Master’s Degrees in this catalog.

BUSINESS ADMINISTRATION

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www.uaa.alaska.edu/cbpp

The College of Business and Public Policy offers the Master of Business Administration (MBA) degree in General Management. The MBA program is accredited by the Association to Advance Collegiate Schools of Business (AACSB International).

Program Policies and Administration

Students must maintain a minimum 3.00 GPA in all coursework in the MBA program. Although minimally acceptable, a grade of C in a graduate course may be offset with an A grade in another graduate course. Students with a GPA below 3.00 will be placed on probation and may be dropped from the program if the GPA is not brought up to 3.00 within one academic year. All advanced MBA course requirements (core plus electives) must be completed within seven calendar years.

The faculty reserves the right, where warranted by evaluation of a student's progress and apparent knowledge, to require additional coursework or other preparation to ensure the degree candidate possesses adequate professional skills and capabilities. This includes the ability to reason and communicate effectively, both verbally and quantitatively.

The MBA program is the responsibility of CBPP's graduate faculty, which acts as a policy-setting body and as an appeals board. The complete MBA program policies, requirements, and procedures may be obtained from the CBPP Graduate Programs Office. Students are expected to be familiar with, and adhere to, both the MBA program requirements and procedures, and the general UAA requirements for graduate degrees.

Contact the CBPP Graduate Programs Office for full program information, including application forms and procedures.

Graduate Programs Office
UAA College of Business and Public Policy
University of Alaska Anchorage
3211 Providence Drive, Anchorage, AK 99508, U.S.A.
Telephone: (907) 786-4171
Facsimile: (907) 786-4115

Master of Business Administration, General Management

The MBA in General Management provides students with perspectives and skills to prepare them for increasingly significant managerial and leadership roles.

The focus of the program is management practice, recognizing that sound practice requires a thorough understanding of underlying management principles and techniques. The MBA graduate should be thoroughly grounded in state-of-the-art management theory.
and practice, aware of the complex global environment in which modern organizations operate, adaptive to change, articulate, and ethical.

The program serves full- and part-time students, and classes are generally scheduled on evenings or Saturdays. Most courses are offered in fall and/or spring, and a limited number in summer. Although many students are from the greater Anchorage area, the program also attracts students from throughout the United States and from foreign countries, particularly those on the Pacific Rim.

Students may enter the program in either fall or spring semester. A limited number of courses are also offered during the summer. Current application deadlines, as well as other detailed program information, may be obtained by contacting the CBPP Graduate Programs Office.

**Admission Requirements**

Applicants must meet both the Admission Requirements for Graduate Degrees and the College of Business and Public Policy requirements outlined here.

Admission to the MBA program is limited to students who have earned a baccalaureate degree from an AACSB or regionally accredited university, or foreign equivalent. Undergraduate GPA on a 4.00 scale and the Graduate Management Admission Test (GMAT) score must satisfy the following formula:

$$ \text{Undergraduate GPA} \times 200 + \text{GMAT} > 1150 $$

GMAT waivers may be considered for applicants meeting any of the following criteria:

1. Hold another master’s degree from an accredited university.
2. Have a professional designation beyond the baccalaureate (such as CPA, CFA).
3. Have an undergraduate GPA of 3.50 or higher.

If an applicant is not eligible for a GMAT waiver, admission will be deferred until he or she submits an examination score.

Additional indicators for predicting success in individual cases may be provided through documented performance in extracurricular activities, evidence of creativity and leadership; or a sustained record of accomplishment in business or other professional activity.

Each applicant must submit the following to the UAA Office of Admissions as part of their application materials:

- A statement of purpose.
- A resume, including the names and contact information of three references.
- All transcripts from prior college/university studies.

Applicants whose native language is not English must score at least 80 (Internet based exam scale) on the TOEFL examination, or otherwise demonstrate competency in English. Students may apply to enter the program at the beginning of either the fall or spring semester. There currently is no specific application deadline, but students should apply before the start of their first semester. In some cases students may be admitted conditionally while their paperwork is completed.

**MBA Student Learning Outcomes**

Upon graduation, MBA program graduates will possess or show ability in the following areas as defined by these MBA student learning outcomes:

1. Develop an understanding of the organization as a complex goal-seeking system interacting with and adapting to the dynamics of its external environment.
2. Demonstrate an understanding of the key elements and tools of business performance management.
3. Demonstrate effective communication skills utilizing a variety of tools and media suited to specific situations.
4. Provide leadership in settings ranging from the organization-wide level to the team.
5. Demonstrate professionalism through the maintenance of high standards of personal performance, teamwork, professional development and ethical behavior.
General Management Program Structure

Requirements consist of two parts: foundation courses and advanced courses in business or accounting or relevant experience and expertise. In key functional areas of business, additional foundational coursework may be required. These foundation courses are:

- ACCT A601 Accounting Foundations for Executives 3
- BA A603 Fundamentals of Finance 3
- ECON A602 Introduction to Economics for Managers 3

All students must complete the three foundation courses. Advisors may, however, waive one or more of the foundation courses if the student has completed disciplinary equivalent coursework within five years preceding their admission.

Entering students are expected to have basic mathematical, computer, and communication skills. Students lacking these fundamental skills will be required to improve by means of independent study, noncredit courses, undergraduate coursework, or seminars and workshops.

The main body of the MBA curriculum consists of seven core courses (21 credits) and 15 credits of curricular options, for a total of 36 credits of advanced coursework:

Core Courses (21 credits):
- ACCT A650 Seminar in Executive Uses of Accounting 3
- BA A610 Business Intelligence and Analytics 3
- BA A613 Applied Leadership 3
- BA A632 Organizational Behavior and Foundations of Behavioral Science 3
- BA A635 Current Marketing Issues Seminar 3
- BA A636 Financial Decision Making 3
- BA A655 Strategic Management Seminar 3

In certain cases, where warranted by previous education or experience, students may petition to substitute an elective instead.

Curricular Options (15 credits):

a. Executive Focus (3 credits): Select at least one course from the following:
   - BA A628 Executive Leadership 3
   - BA A629 Negotiation and Conflict Management 3
   - BA A631 Business Environment Analysis 3
   - BA A634 Organizational Design and Development 3

b. Elective Coursework (9 credits)

   Students may design an area of concentration from CBPP courses that focus on management theory and practice, marketing, finance, international business and global economics, management information systems, logistics and supply chain management, or public administration. In addition, with the advisor’s approval, elective coursework can be selected from graduate courses offered by other colleges, disciplines, or graduate courses offered by other accredited universities.

c. Capstone course requirement (3 credits)

   Capstone courses provide the opportunities to integrate acquired knowledge of business administration. Select one course based on preferred nature of experience (practical or academic) and application (applied or theoretical):
   - BA A626 Strategic Leadership 3
   - BA A656 Management Project 3
   - BA A686 Management Simulation 3
   - BA A698 MBA Individual Research 3
Thesis Option:

BA A699 Thesis 6

Students (especially those who are considering pursuing a PhD degree) may elect to complete a master’s thesis.

MBA with an Emphasis in Business Intelligence and Business Analytics

MBA degree candidates will receive a degree with an emphasis in Business Intelligence and Business Analytics by completing the following sequence of elective courses as a part of their degree program:

BA A633 Problem Formulation and Decision Analysis 3
BA A648 Business Intelligence and Data Mining 3
BA A690, A649 Advanced Business Statistics and Data Analysis (or Advanced Topics in Business) 3

or

CIS A670 Data Warehouses and Business Intelligence (3)

*Recommended Advanced Topics in Business courses include business statistics and data analysis.

MBA with an Emphasis in Entrepreneurship

MBA degree candidates will receive a degree with an emphasis in Entrepreneurship by completing the following sequence of elective courses as a part of their degree program:

BA A671 Introduction to Entrepreneurship 3
BA A672 Developing a Business Plan 3
BA A673 Entrepreneurship - Creating the Venture 3

MBA with an Emphasis in Leadership

MBA degree candidates will receive a degree with an emphasis in Leadership by completing the following sequence of elective courses as a part of their degree program:

BA A621 Change Leadership and Facilitation 3
BA A622 Leading Performance and Coaching 3
BA A631 Business Environment Analysis 3

MBA with an Emphasis in Marketing

MBA degree candidates will receive a degree with an emphasis in Marketing by completing the following sequence of elective courses as a part of their degree program:

BA A640 Global Marketing 3
BA A641 Advanced Consumer Behavior 3
BA A680 Social Media Strategies 3

FACULTY

Carlos Alsua, Associate Professor, AFCJ@uaa.alaska.edu
Nalinaksha Bhattacharyya, Professor, AFNB@uaa.alaska.edu
Yong Cao, Associate Professor, AFYC@uaa.alaska.edu
Alpana Desai, Associate Professor, alpana@uaa.alaska.edu
Kevin Dow, Associate Professor, afkd2@uaa.alaska.edu
Ted Eschenbach, Professor Emeritus, AFTGE@uaa.alaska.edu
Edward Forrest, Professor, AFEJF1@uaa.alaska.edu
Course Action Request  
University of Alaska Anchorage  
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College  
CB CBPP

1b. Division  
ADBP Division of Business Programs

1c. Department  
BA

2. Course Prefix  
BA

3. Course Number  
A626

4. Previous Course Prefix & Number  
N/A

5a. Credits/CEUs  
3

5b. Contact Hours  
(Lecture + Lab) (3+0)

6. Complete Course Title  
Strategic Leadership

Abbreviated Title for Transcript (30 character)  

7. Type of Course  
☒ Academic  ☐ Preparatory/Development  ☐ Non-credit  ☒ CEU  ☐ Professional Development

8. Type of Action:  
☒ Add  ☐ Change  ☐ Delete

If a change, mark appropriate boxes:

☒ Prefix  ☐ Course Number  ☐ Credit Hours  ☐ Repeat Status

☐ Title  ☐ Grading Basis  ☐ Course Description  ☐ Cross-Listed/Stacked

☐ Test Score Prerequisites  ☐ Course Prerequisites  ☐ Co-requisites  ☐ Registration Restrictions

☐ Automatic Restrictions  ☐ General Education Requirement

☐ Class  ☐ Level  ☐ College  ☐ Other  ☐ (please specify)

9. Repeat Status No  
# of Repeats  
Max Credits

10. Grading Basis  
☒ A-F  ☐ P/NC  ☐ NG

11. Implementation Date  
From: Fall/2014  
To: 9999

12. ☐ Cross Listed with  
Stacked with  
Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Courtesy Coordination</td>
<td>11/20/2013</td>
<td>Ed Forrest</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initiator Name (typed):  
Terry Nelson

Initiator Signed Initials:  

Date:

13b. Coordination Email  
Date: 12/06/2013  
submitted to Faculty Listserv: [uaa-faculty@lists.uaa.alaska.edu](mailto:uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison  
Date: 12/06/2013

14. General Education Requirement  
Mark appropriate box:

☐ Oral Communication  ☐ Written Communication  ☐ Quantitative Skills  ☐ Humanities

☐ Fine Arts  ☐ Social Sciences  ☐ Natural Sciences  ☐ Integrative Capstone

15. Course Description  
(suggested length 20 to 50 words)

Integrates and synergizes the concepts and principles learned in the MBA core and leadership concentration courses. Student teams will partner with a local organization to develop recommendations to solve a critical organizational problem, or to develop a strategic plan.

16a. Course Prerequisite(s)  
(list prefix and number or test code and score)

BA A621 and BA A622

16b. Co-requisite(s)  
(concurrent enrollment required)

N/A

16c. Automatic Restriction(s)  

☐ College  ☐ Major  ☐ Class  ☒ Level

16d. Registration Restriction(s)  
(non-cordable)

Graduate standing

17. ☒ Mark if course has fees  
Standard CBPP computer lab fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action  
This course was added based on requests from the MBA students and from the business community to address the need of additional training in leadership.

Initiator (faculty only)  
Terry Nelson

Initiator (TYPE NAME)  

☐ Approved  ☐ Disapproved  Dean/Director of School/College  Date

☐ Approved  ☐ Disapproved  Undergraduate/Graduate Academic  Date

☐ Approved  ☐ Disapproved  Board Chair  Date

☐ Approved  ☐ Disapproved  Provost or Designee  Date

326
I. Date Initiated

II. Course Information

College/School: College of Business and Public Policy
Department: Business Administration
Program: Master of Business Administration
Course Title: Strategic Leadership
Course Number: BA A626
Credits: 3
Contact Hours: 3 hours per week x 15 weeks = 45 hours
Grading Basis: A – F

Course Description: Integrates and synergizes the concepts and principles learned in the MBA core and leadership concentration courses. Student teams will partner with a local organization to develop recommendations to solve a critical organizational problem, or to develop a strategic plan.

Course Prerequisites: BA A621 and BA A622
Registration Restrictions: Graduate standing
Fees: Standard CBPP computer lab fee

III. Course Activities

A. Lectures
B. Discussions
C. Experiential activities
D. Case studies
E. Group presentations
F. Team project

IV. Course Level Justification

This advanced 600-level course requires prerequisites that demonstrate accomplishment in specific courses in the MBA leadership emphasis. The nature of the topics and the level of the discussion will require advanced understanding of the concepts, as well as business experience beyond an undergraduate degree.
V. **Outline**

A. Introduction and Student Team Formulation

B. Leadership and the Strategic Management Process
   1. Initiating strategic initiatives
      a. Assessing organizational and external climate
      b. Building internal support
   2. Formulating strategic initiatives
      a. Assessing organizational competency, i.e. culture, design, human capital, finance
      b. Identifying stakeholders for successful implementation
      c. Articulating and presenting strategic initiatives across multiple levels of organizations
   3. Implementing strategic initiatives
      a. Executing change
      b. Monitoring and reporting

C. Team Project
   1. Introducing teams to an organizational partner from the community
   2. Collaborating with organizational partner to determine strategic needs or problem to address and produce an agreement defining deliverables for the strategic plan
   3. Formulating strategy to address the needs of the client organization along with an implementation plan.
   4. Presenting and defending the strategy and implementation plan for the client organization.

VI. **Instructional Goals and Student Learning Outcomes**

<table>
<thead>
<tr>
<th>A. Instructional Goals.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The instructor will:</td>
</tr>
<tr>
<td>1. Provide a comprehensive explanation and demonstration of the essential components and process of strategic planning and leadership</td>
</tr>
<tr>
<td>2. Facilitate case discussion demonstrating successful application of strategic leadership</td>
</tr>
<tr>
<td>3. Discuss and demonstrate the logic and importance of functional integration with competitive strategy</td>
</tr>
<tr>
<td>4. Explain strategic performance assessment techniques and criteria</td>
</tr>
<tr>
<td>5. Facilitate and manage students interaction with organizational partner</td>
</tr>
</tbody>
</table>
B. Student Learning Outcomes.  
**Students will be able to:**

<table>
<thead>
<tr>
<th></th>
<th>Assessment Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Exercise leadership in the development and implementation of strategy</td>
<td>Written assignments In-class exercises</td>
</tr>
<tr>
<td>2. Lead and manage the strategy-making process that can enhance organizational performance</td>
<td>Written assignments In-class exercises</td>
</tr>
<tr>
<td>3. Apply leadership theories to strategic decisions</td>
<td>Class discussions Written assignments In-class exercises</td>
</tr>
<tr>
<td>4. Identify components of an organization and articulate the role of strategic leadership as it relates to leveraging these components for success</td>
<td>Written assignments In-class exercises</td>
</tr>
<tr>
<td>5. Demonstrate critical thinking during the strategic management process</td>
<td>Written assignments In-class exercises</td>
</tr>
<tr>
<td>6. Work within a team to deliver a strategic plan for partnering organization</td>
<td>Written report Project evaluation</td>
</tr>
</tbody>
</table>

VII. Suggested Texts

N/A. The instructor will provide relevant articles and case studies.

VIII. Bibliography and Resources


Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College
CB CBPP

1b. Division
ADBP Division of Business Programs

1c. Department
BA

2. Course Prefix
BA

3. Course Number
A649

4. Previous Course Prefix & Number
N/A

5a. Credits/CEUs
3

5b. Contact Hours
(Lecture + Lab)
(3+0)

6. Complete Course Title
Advanced Business Data Analysis
Advanced Business Data Analysis
Abbreviated Title for Transcript (30 character)

7. Type of Course
☑ Academic
☐ Preparatory/Development
☐ Non-credit
☐ CEU
☐ Professional Development

8. Type of Action: ☑ Add ☐ Change ☐ Delete

If a change, mark appropriate boxes:
☐ Prefix
☐ Credits
☐ Title
☐ Grade Basis
☐ Course Description
☐ Test Score Prerequisites
☐ Co-requisites
☐ Other

9. Repeat Status No
☐ # of Repeats
☐ Max Credits

10. Grading Basis
☐ A-F
☐ P/HP
☐ NG

11. Implementation Date
From: Fall/2014
To: Spring/2014

12. ☐ Cross Listed with:
☐ Stacked with:
☐ Cross-Listed Coordination
Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.aaa.alaska.edu/governance.

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<td>Ed Forrest</td>
</tr>
<tr>
<td>2. Courtesy Coordination</td>
<td>10/23/2013</td>
<td>Bogdan Hoanca</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initiator Name (typed): Yonggang Lu
Initiator Signed Initials: __________ Date: __________

13b. Coordination Email
Date: 10/23/2013
submitted to Faculty Listserv: (uaa-faculty@lists.aaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 10/23/2013

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication
☐ Written Communication
☐ Quantitative Skills
☐ Humanities
☐ Social Sciences
☐ Natural Sciences
☐ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
Analyze business data using popular statistical methods including ANOVA, ANCOVA, regression, and logistic regression. Emphasis is on the appropriate selection, use and interpretation of statistical analysis for business decision making, and presentation of results. Statistical software package of SAS is intensively used to build statistical models for business data. This course will prepare students for the SAS certification exam for Statistical Business Analyst.

16a. Course Prerequisite(s) (list prefix and number or test code and score)
BA A610

16b. Co-requisite(s) (concurrent enrollment required)
N/A

16c. Automatic Restriction(s)
☐ College
☐ Major
☐ Class ☑ Level

16d. Registration Restriction(s) (non-codable)
Graduate standing

17. ☑ Mark if course has fees Standard CBPP computer lab fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Fills a need for a more updated and applied course in quantitative decision-making and executive decision support systems.

Initiator (faculty only)
Yonggang Lu
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved

Department Chair
Date

☐ Approved
☐ Disapproved

Board Chair
Date

☐ Approved
☐ Disapproved

Provost or Designee
Date
I. Date Initiated

January 21, 2014

II. Course Information

College/School: College of Business and Public Policy

Department: Business Administration

Program: Master of Business Administration, Business Intelligence and Analytics

Course Title: Advanced Business Data Analysis

Course Number: BA A649

Credits: 3

Contact Hours: 3 hours per week x 15 weeks = 45 hours
6 hours outside of class per week x 15 weeks = 90 hours

Grading Basis: A-F

Course Description: Analyze business data using popular statistical methods including ANOVA, ANCOVA, regression, and logistic regression. Emphasis is on the appropriate selection, use and interpretation of statistical analysis for business decision making, and presentation of results. Statistical software package of SAS is intensively used to build statistical models for business data. This course will prepare students for the SAS certification exam for Statistical Business Analyst.

Course Prerequisites: BA A610

Registration Restrictions: Graduate Standing

Fees: Standard CBPP computer lab fee

III. Course Activities

A. Lecture
B. Discussion
C. Lab

IV. Course Level Justification

This course requires rigorous statistical analysis and synthesis, as well as quantitative logical thinking skills.
V. Outline

A. Introduction to Statistics
   1. Fundamental Statistical Concepts
   2. Picturing Distributions
   3. Confidence Intervals for the Mean
   4. Hypothesis Testing

B. Analysis of Variance
   1. Two-Sample t-Tests in PROC TTEST
   2. One-Way ANOVA
   3. ANOVA with Data from a Randomized Block Design
   4. ANOVA Post Hoc Tests
   5. Two-Way ANOVA with Interactions

C. Regression
   1. Exploratory Data Analysis
   2. Simple Linear Regression
   3. Concepts of Multiple Regression
   4. Model Building and Interpretation

D. Regression Diagnostics
   1. Examining Residuals
   2. Influential Observations
   3. Collinearity

E. Categorical Data Analysis
   1. Describing Categorical Data
   2. Tests of Association
   3. Introduction to Logistic Regression
   4. Multiple Logistic Regression

VI. Instructional Goals and Student Learning Outcomes

A. Instructional Goals.
   The instructor will:

   1. Introduce students to popular statistical modeling for business data analysis.
   2. Explain the role and significance of data-driven decision making in the organization.
   3. Demonstrate statistical inference regarding estimation and hypotheses testing.
   4. Discuss selected statistical methods and their applicability to business decision making.
B. Student Learning Outcomes.
Students will be able to:

<table>
<thead>
<tr>
<th></th>
<th>Assessment Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Demonstrate an understanding of a statistical model as a tool for business prediction and forecasting, primarily the probabilistic foundations of the model and their implications.</td>
<td>Exams and written assignments</td>
</tr>
<tr>
<td>2. Apply regression-based methods for analyzing and interpreting data.</td>
<td>Exams and written assignments</td>
</tr>
<tr>
<td>3. Use model regression data in non-standard situations, e.g., discrete response variables, correlated error models, interaction, indicator variables, multicollinearity, time series, nonlinear models, heteroscedastic and correlated error models, and models for non-normal distributions.</td>
<td>Exams, written assignments, and case studies</td>
</tr>
<tr>
<td>4. Use SAS for basic data management, statistical programming, display, and analysis of data.</td>
<td>Case studies and presentation</td>
</tr>
</tbody>
</table>

VII. Suggested Texts


Supplemented with SAS Teaching Notes
Designation for Community-Engaged Learning Courses

University of Alaska Anchorage

Faculty Senate-approved definitions of community engagement and community-engaged courses at UAA have been in place since 2010. The Community Engagement Task Force, charged with UAA’s application for re-designation as a Carnegie-identified Engaged University, proposes modifications that will better distinguish between courses that generally include community engagement in the course objectives and more stringently-defined service-learning courses. The Community Engagement designation (CE) encompasses a broad range of ways that courses might engage students in learning about and taking action for the public good. Courses with the Service-Learning designation (SL) are a subset of that broad range meeting additional criteria. A course may be designated as either CE or SL but not both. Faculty members will select the designation, if either, that best fits the course or section of the course. The designation is voluntary and will be designated on Schedule Proofs as they are completed each semester.

There are two main benefits to having two categories. First, students can make more informed choices about their course selection. Given current IT configurations, the course database will not show the CE/SL designation to students but will be accessible through the Banner system as a search by staff. CCEL will compile the list of courses each semester and make a list of community-engaged courses that are offered available through their website (www.uaa.alaska.edu/engage) for students’ benefit. Second, CCEL will be able to track and monitor our community-engaged offerings, #s of students & faculty participating in community-engaged courses for participation in national reviews such as the President’s Honor Roll for Community Service, Campus Compact, the Carnegie Foundation designation as an Engaged University, and accreditation reporting.

We, the Engagement Task Force, request that GAB and UAB recommend that the Faculty Senate move to accept these revised definitions.

The two recommended designations with their revised definitions are:

**CE**  A Community Engaged course involves the student(s) in some kind of work outside of the classroom that contributes to the public good. At a minimum, the course should:

- Design and implement the community work with appropriate community input so that the students’ efforts will provide an identifiable public benefit rather than a community burden.
- Clearly link the community work to course learning goals in the syllabus.
- Engage students in some oral or written reflection that explores their experience of engagement and connects it with the course learning goals.
SL* A Service-Learning course is a Community-Engaged course which integrates the service and learning more deeply and more intentionally. At a minimum, the course should have:

- Service: significant community-based work defined in response to a need or aspiration presented by one or more partnering community organizations and for which core issues of impact, sustainability and reciprocity have been addressed.
- Clear linkage between the service and course learning goals: both academic and civic learning are addressed, and this is communicated in the syllabus.
- Preparation for service: students are prepared for the roles they will play, including engaging respectfully with a community that may differ significantly in race, class, age, or other elements of social identity.
- Structured reflection: intentional, systematic reflection on students’ experience in the community is integrated throughout the course – not added as a one-time or final assignment. Reflection activities may include talking, writing or other means, and may be individual, group-based, or both.
- Evaluation: assessment of student learning and community impact has been planned. This could consist of asking the CCEL to survey the community partner and students, or could be instructor-designed assessment activities.

*Definitions and parameters are taken and modified from University of Massachusetts Amherst Office of Civic Engagement & Service Learning (http://cesl.umass.edu/).

Existing definitions copied from http://www.uaa.alaska.edu/engage/aboutus/UAA_SL_Definition/

Community engagement [consists of] collaborations between institutions of higher educations and individuals, organizations, and institutions in their larger communities (local, regional/state, national, global) for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity.

Curricular engagement includes approaches where teaching, learning and scholarship engage faculty, students, and community in mutually beneficial and respectful collaboration. Their interactions address community-identified needs, deepen students' civic and academic learning, enhance community well-being, and enrich the scholarship of the institution.

One form of curricular engagement is community-based, service-learning courses. UAA's definition of a community-engaged learning course is a course or competency-based, credit-bearing educational experience in which students:

- participate in an organized service activity that meets identified community needs;
- gain an enhanced sense of civic responsibility; and
- reflect on the service activity in such a way as to gain further understanding.