I. Roll
( ) Alberta Harder (FS)  
( ) Soren Orley (FS)  
( ) Francisco Miranda (CAS, Chair)  
( ) Barbara Harville (CAS)  
( ) Mari Ippolito (CAS)  
( ) Len Smiley (CAS)  
( ) Dave Fitzgerald (CBPP)  
( ) Eileen Weatherby (COH)  
( ) Irasema Ortega (COE)  
( ) Jeffrey Callahan (CTC)  
( ) Utpal Dutta (SOE)  
( ) Michael Hawfield (KPC)  
( ) Sheri Denison (Mat-su)  
( ) Kathryn Hollis Buchanan (Kod)  
( ) Kathrynn Hollis Buchanan (Kod)  
( ) Christina Stuive (ADV)  

Ex-Officio Members
( ) Susan Kalina  
( ) Lora Volden  
( ) Michael Worth

II. Approval of the Agenda (pg. 1-2)

III. Approval of Meeting Summary (pg. 3-4)

IV. Administrative Report
A. Vice Provost for Undergraduate Academic Affairs Susan Kalina
B. University Registrar Lora Volden

V. Chair’s Report
A. UAB Chair- Francisco Miranda
B. GERC

VI. Program/Course Action Request- Second Readings

VII. Program/Course Action Request- First Readings
Chg CIS A330 Database Management Systems (3 cr)(3+0)(pg. 5-8)
Add CIS A470 Data Warehouses and Business Intelligence (Stacked with CIS A670) (3 cr)(3+0)(pg. 9-17)
Add HNRS A498 Individual Research (1-6 cr)(0+2+12)(pg. 18-21)
Add HIST A406 Medieval Iberia (3 cr)(3+0)(pg. 22-28)
Add HIST A408 Early Modern Iberia (3 cr)(3+0)(pg. 29-35)
Chg HIST A453 Cold War America, 1945-1992 (3 cr)(3+0)(pg. 36-42)
Add HIST A465 U.S. Foreign Relations Since 1945 (3 cr)(3+0)(pg. 43-48)
Add JPN A391 Selected Topics: Studies in Japanese Culture and Society (3 cr)(3+0) (pg. 49-54)
Add CSCE A411 Artificial Intelligence (stacked with CSCE A611)(3 cr)(3+0)(pg. 55-62)
### Agenda

<table>
<thead>
<tr>
<th>Chg</th>
<th>CSCE A412</th>
<th>Evolutionary Computing (stacked with CSCE A612)(3 cr)(3+0)(pg. 63-71)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chg</td>
<td>CSCE A415</td>
<td>Machine Learning (stacked with CSCE A615)(3 cr)(3+0)(pg. 72-82)</td>
</tr>
<tr>
<td>Chg</td>
<td>CSCE A431</td>
<td>Compilers (stacked with CSCE A631)(3 cr)(3+0)(83-91)</td>
</tr>
<tr>
<td>Chg</td>
<td>CSCE A446</td>
<td>Digital Media and Interactive Systems (stacked with CSCE A646) (3 cr)(3+0)(pg. 92-103)</td>
</tr>
<tr>
<td>Chg</td>
<td>CSCE A450</td>
<td>Mobile Robotics (stacked with CSCE A650)(3 cr)(3+0)(pg. 104-113)</td>
</tr>
<tr>
<td>Chg</td>
<td>CSCE A460</td>
<td>Database Systems II (stacked with A660)(3 cr)(3+0)(pg. 114-121)</td>
</tr>
<tr>
<td>Chg</td>
<td>CSCE A462</td>
<td>Data Mining (stacked with CSCE A662)(3 cr)(3+0)(pg. 122-129)</td>
</tr>
<tr>
<td>Chg</td>
<td>CSCE A465</td>
<td>Computer and Network Security (stacked with CSCE A665) (3 cr)(3+0)(pg. 130-138)</td>
</tr>
<tr>
<td>Chg</td>
<td>CSCE A485</td>
<td>Computer and Machine Vision (stacked with CSCE A685) (3 cr)(3+0)(pg. 139-148)</td>
</tr>
<tr>
<td>Chg</td>
<td>CSCE A490</td>
<td>Topics in Computer Science and Computer Systems Engineering (stacked with CSCE A690)(3 cr)(3+0)(pg. 149-156)</td>
</tr>
</tbody>
</table>

#### VIII. Old Business

#### IX. New Business

- Academic Policies regarding Occupational Endorsement Certificates (OEC) (pg. 157-158)

#### X. Informational Items and Adjournment
I. Roll
(x) Alberta Harder (FS)
(x) Soren Orley (FS)
(x) Francisco Miranda (CAS, Chair)
(x) Barbara Harville (CAS)
(x) Mari Ippolito (CAS)
(x) Len Smiley (CAS)
(x) Dave Fitzgerald (CBPP)
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(x) Michael Hawfield (KPC)
(x) Sheri Denison (Mat-su)
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(x) Christina Stuive (ADV)

Ex-Officio Members
(x) Susan Kalina
(x) Lora Volden
(x) Michael Worth

II. Approval of the Agenda (pg.1-2)
Approved

III. Approval of Meeting Summary (pg. 3-4)
Approved

IV. Administrative Report
A. Vice Provost for Undergraduate Academic Affairs Susan Kalina

B. University Registrar Lora Volden
Today is the withdrawal deadline for the fall semester
The Registrar’s Office was able to generate a report from Degree Works to determine how many students will finish their degree in the Fall semester, but who have not yet applied for graduation

V. Chair’s Report
A. UAB Chair- Francisco Miranda

B. GERC

VI. Program/Course Action Request- Second Readings

VII. Program/Course Action Request- First Readings
Add  AKNS A240  Alaska Native Cultural Orientation – Alutiiq/Sugpiaq (3 cr)(3+0)(pg. 5-8)
Waive first reading, approve for second

Add  AKNS A292A  Alaska Native Language Apprenticeship I (1-3 cr)(1-3+0)(pg. 9-12)
Waive first reading, approve for second

Add  AKNS A292B  Alaska Native Language Conversational Fluency Intensive
(1-3 cr)(1-3+0)(pg. 13-16)
Waive first reading, approve for second

Add  OEC, Alutiiq Language (pg. 17-19)
Waive first reading, approve for second

Chg  CA A201  A la Carte Kitchen (4 cr)(2+8)(pg. 20-25)
Waive first reading, approve for second
Chg  CA A202  Advanced Bakery (4 cr)(2+8/)(pg. 26-30)
Waive first reading, approve for second

Chg  CA A224  Hospitality Service (3 cr)(1+6)(pg. 31-36)
Waive first reading, approve for second

Chg  CA A225  Hospitality Concept Design (3 cr)(3+0)(pg. 37-41)
Waive first reading, approve for second

Chg  CA A230  Foodservice Management (3 cr)(3+0)(pg. 42-46)
Waive first reading, approve for second

Add  DH A398  Individual Research (1-4 cr)(0+3-12)(pg. 47-50)
Waive first reading, approve for second

VIII. Old Business

IX. New Business
A.

X. Informational Items and Adjournment
### Complete Course Title

**Database Management Systems**

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

### Type of Course
- [ ] Academic
- [ ] Preparatory/Development
- [ ] Non-credit
- [ ] CEU
- [ ] Professional Development

### Type of Action
- [ ] Add
- [x] Change
- [ ] Delete

### Repeat Status No
- # of Repeats: ___________
- Max Credits: ___________

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

### Implementation Date
- Semester/Year: Fall/2014 to /9999

### Cross Listed with
- Stacked with

### Course Description
Covers principles of database management systems including relational database concepts, design, and application, methods of file organization, query languages, and online transaction processing systems. Students will be expected to design and implement a database project during the semester.

### Course Prerequisite(s)
- CIS A210 with a minimum grade of C

### Co-requisite(s)
- N/A

### Automatic Restriction(s)
- College
- Major
- Class
- Level

### Registration Restrictions
- General Education Requirement

### 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

### Registration Restriction(s) (non-codable)
- College of Business and Public Policy Majors must be admitted to upper-division standing;

### Mark course has fees Standard CBPP computer lab fee
- [ ]

### Mark if course is a selected topic course
- [ ]

### Justification for Action
- Update course description, course outline, suggested text, and bibliography.
COURSE CONTENT GUIDE
UNIVERSITY OF ALASKA ANCHORAGE
COLLEGE OF BUSINESS AND PUBLIC POLICY

I. Date Initiated
   October 25, 2013

II. Course Information
   College/School: College of Business and Public Policy
   Department: Computer Information Systems Department
   Program: Global Logistics and Supply Chain Management, BBA;
   Business Computer Information Systems, AAS; Management
   Information Systems, BBA;
   Computer Information Systems, Minor
   Course Title: Database Management Systems
   Course Number: CIS A330
   Credits: 3
   Contact Hours: 3 per week x 15 weeks = 45 hours
   0 lab hours
   6-12 hours outside of class per week x 15 weeks = 90 to 180
   hours
   Grading Basis: A-F
   Course Description:
   Covers principles of database management systems including relational database
   concepts, design, and application, methods of file organization, query languages, and
   online transaction processing systems. Students will be expected to design and
   implement a database project during the semester.
   Course Prerequisites: CIS A210 with a minimum grade of C.
   Registration Restrictions: College of Business and Public Policy Majors must be
   admitted to upper-division standing.
   Fees: Standard CBPP computer lab fee.

III. Course Activities
   A. Lectures
   B. Discussions
   C. Guest speakers
   D. In-class exercises

IV. Course Level Justification
   Course requires CIS A210 as prerequisite. Since this course is required for both the
   associate’s and bachelor’s degree, it does not require a background in database
   management systems or a total mastery of all of the tools and methods of the discipline.
V. Course Outline

A. Introduction to Structured Query Language (SQL)
   1. SQL for data definition
   2. SQL for relational queries
   3. SQL for table and constraint modification and deletion
   4. SQL views
B. The Relational Model and Normalization
   1. Relations
   2. Types of keys
   3. Functional dependencies and normalization
C. Data Modeling and the Entity-Relationship Model
   1. Requirement analysis
   2. The entity-relationship data model
   3. Entity-relationship diagrams
D. Database Design
   1. Transforming a data model into a database design
   2. Representing entities with the relational model
   3. Representing relationships
E. Database Administration
   1. The need for control, security, and reliability
   2. Concurrency control
   3. Cursor types
   4. Database security
   5. Database backup and recovery
F. Database Processing Applications
   1. The database processing environment
   2. Web database processing
G. Database Processing for Business Intelligence Systems
   1. Operational systems
   2. Business Intelligence systems
   3. Data Warehouses and Data Marts

VI. Suggested Text


VII. Bibliography


## Instructional Goals and Student Learning Outcomes

### A. Instructional Goals.

**The instructor will:**

1. Explain basic file structures, data structures, and physical database design issues.
2. Introduce SQL to define, manipulate, and retrieve data in databases.
3. Present data modeling and normalization concepts, and discuss the use of an Entity-Relationship Diagram (ERD) to design databases.
4. Explain the major database development environments and policies and describe their evolution over time.
5. Discuss database administration and database security issues.
6. Guide students in projects that require the application of database design and development tools that lead to the creation of a database management system.
7. Explain organizational memory management issues.

### B. Student Learning Outcomes.

**Students will be able to:**

<table>
<thead>
<tr>
<th>Students will be able to:</th>
<th>Assessment Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Evaluate different file organizations and data structures and compare current database systems.</td>
<td>Homework</td>
</tr>
<tr>
<td></td>
<td>Quizzes</td>
</tr>
<tr>
<td></td>
<td>Exams</td>
</tr>
<tr>
<td>2. Utilize SQL for data definition, data manipulation, and data retrieval.</td>
<td>Homework</td>
</tr>
<tr>
<td></td>
<td>In-class activities</td>
</tr>
<tr>
<td></td>
<td>Quizzes</td>
</tr>
<tr>
<td></td>
<td>Exams</td>
</tr>
<tr>
<td>3. Apply data modeling and normalization concepts to design databases using ERD.</td>
<td>Homework</td>
</tr>
<tr>
<td></td>
<td>In-class activities</td>
</tr>
<tr>
<td></td>
<td>Quizzes</td>
</tr>
<tr>
<td></td>
<td>Project</td>
</tr>
<tr>
<td></td>
<td>Exams</td>
</tr>
<tr>
<td>4. Investigate and research the major database development environments and policies.</td>
<td>Research paper</td>
</tr>
<tr>
<td></td>
<td>Oral presentation</td>
</tr>
<tr>
<td>5. Analyze database administration activities and database security issues.</td>
<td>Homework</td>
</tr>
<tr>
<td></td>
<td>Exams</td>
</tr>
<tr>
<td>6. Design user requirements to create a database management system.</td>
<td>Project</td>
</tr>
<tr>
<td>7. Explain organizational memory management issues.</td>
<td>Homework</td>
</tr>
<tr>
<td></td>
<td>Exams</td>
</tr>
</tbody>
</table>
# Course Action Request

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

## 1. School or College  
CB CBPP  

## 2. Course Prefix  
CIS

## 3. Course Number  
A470

## 4. Previous Course Prefix & Number  
N/A

## 5. Credits/CEUs  
3

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

## 6. Complete Course Title  
Data Warehouses and Business Intelligence  
Data Warehouses/Business Intel

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

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

## 9. Repeat Status No  
# of Repeats  
Max Credits

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

## 11. Implementation Date  
From: Spring/2014  
To: /9999

## 12. Cross Listed with  
- [ ] Stacked with CIS A670

## 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>10/25/2013</td>
<td>Minnie Yen, Ed Forrest, Bogdan Hoanca</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): **Alpana Desai**  
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)

Introduces students to the theory and practice of data warehouses for enterprises and business intelligence for Enterprise Resource Planning (ERP) systems. Surveys processes of extraction, cleansing, consolidation, and transformation of heterogeneous data into a single enterprise data warehouse. Reviews how business intelligence can be derived from data warehouses.

## 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)

College of Business and Public Policy Majors must be admitted to upper-division 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  
Course has been added to meet industry and student demand.

Initiator (faculty only)  
**Alpana Desai**

Initiator (TYPE NAME)  

<table>
<thead>
<tr>
<th>Approved</th>
<th>Disapproved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

- [ ] Approved  
- [ ] Disapproved
I. Date Initiated
   October 25, 2013

II. Course Information

   College/School: College of Business and Public Policy
   Department: Computer Information Systems
   Program: Bachelor of Business Administration (BBA), Management Information Systems (MIS)
   Course Title: Data Warehouses and Business Intelligence
   Course Number: CIS A470
   Stacked Course: CIS A670
   Credits: 3
   Contact Hours: 3 per week x 15 weeks = 45 hours
                   0 lab hours
                   6 hours outside of class per week x 15 weeks = 90 hours
   Grading Basis: A - F

   Course Description: Introduces students to the theory and practice of data warehouses for enterprises and business intelligence for Enterprise Resource Planning (ERP) systems. Surveys processes of extraction, cleansing, consolidation, and transformation of heterogeneous data into a single enterprise data warehouse. Reviews how business intelligence can be derived from data warehouses.

   Course Prerequisites: N/A.
   Registration Restrictions: CBPP majors must be admitted to upper-division standing.
   Fees: Standard CBPP computer lab fee.

III. Course Activities

   A. Lectures
   B. Hands-on exercises
   C. Guest speakers

IV. Course Level Justification

   CBPP undergraduate students need to complete a significant portion of lower-level courses to complete this course. CIS A470 introduces students to concepts in data warehouses and business intelligence.
V. Outline

A. Relational Database Review
   1. Relations, attributes, and relationships
   2. Database normalization
   3. Denormalization of tables
   4. Structured Query Language (SQL)
   5. Transactional databases

B. Introduction to Data Warehousing Fundamentals
   1. Multidimensional model for data warehouses
   2. Differences between Traditional Star Schema and SAP BW Star Schema
   3. Dimension and fact tables

C. Introduction to Business Intelligence (BI)
   1. Navigating in reports
   2. Designing queries in the query designer
   3. Using InfoProviders and InfoObjects for Queries
   4. Calculated and restricted key figures in BEx
   5. Properties and attributes of characteristics

D. Front-End Visualization of Business Intelligence
   1. Designing Dashboards

E. Designing Ad-Hoc Reports and Advanced Reports
   1. Crystal Reports
   2. BusinessObjects web intelligence

F. Data Mining
   1. Statistical techniques in data mining
   2. Market Basket Analysis
   3. Clustering
   4. Classification

G. In-Memory Analytics
   1. Row and columnar databases
   2. In-Memory computing

VI. Suggested Texts


VII. Bibliography


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

<table>
<thead>
<tr>
<th>A. Instructional Goals.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The instructor will:</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Explain data modeling and normalization concepts and discuss Structured Query Language (SQL) to define, manipulate, and retrieve data in relational databases.</td>
</tr>
<tr>
<td>2.</td>
<td>Present multidimensional modeling for designing data warehouses.</td>
</tr>
<tr>
<td>3.</td>
<td>Discuss business intelligence tools for data visualization and reporting.</td>
</tr>
<tr>
<td>4.</td>
<td>Demonstrate the use of popular data warehouse and business intelligence software.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Student Learning Outcomes.</th>
<th>Assessment Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students will be able to:</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Utilize introductory SQL statements for data retrieval.</td>
</tr>
<tr>
<td>2.</td>
<td>Apply multidimensional modeling to design data warehouses.</td>
</tr>
<tr>
<td>3.</td>
<td>Study and apply the process of data extraction, transformation, and loading (ETL) in a business warehouse.</td>
</tr>
<tr>
<td>4.</td>
<td>Apply business intelligence tools for data visualization and reporting.</td>
</tr>
<tr>
<td>5.</td>
<td>Design and create business dashboards and reports.</td>
</tr>
<tr>
<td>6.</td>
<td>Explain in-memory analytics.</td>
</tr>
</tbody>
</table>
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
   CIS

2. Course Prefix
   CIS

3. Course Number
   A670

4. Previous Course Prefix & Number
   N/A

5a. Credits/CEUs
   3

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

6. Complete Course Title
   Data Warehouses and Business Intelligence
   Data Warehouses/Business Intel

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
- Class
- College
- Major
- Contact Hours
- Grade Requirement
- Cross-Listed/Stacked
- Registration Restrictions
- General Education Requirement
- Repeat Status
- Course Prerequisites
- Co-requisites
- Test Score Prerequisites
- Corequisites
- Repeat Status
- Title
- Cross-Listed/Stacked
- Registration Restrictions
- General Education Requirement
- Repeat Status
- Course Prerequisites
- Co-requisites

9. Repeat Status No
   # of Repeats
   Max Credits

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

11. Implementation Date
    From: Spring/2014
    To: 9999

12. ☐ Cross Listed with
    Stacked with CIS A470

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></td>
<td></td>
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</tbody>
</table>

Initiator Name (typed): Alpana Desai
Initiator Signed Initials: ________ Date: __________

13b. Coordination Email
    Date: 10/25/2013
    submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
    Date: 10/25/2013

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)
    Provides strategic knowledge and insight into the theory and design of data warehouses for enterprises and business intelligence for Enterprise Resource Planning (ERP) systems. Analyzes processes of extraction, cleansing, consolidation, and transformation of heterogeneous data into a single enterprise data warehouse. Students research how business intelligence can be derived from data warehouses.

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 CBPP computer lab fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
    Course has been added to meet industry and student demand.

Initiator (faculty only)
Alpana Desai
Initiator (TYPE NAME)

Approved
Disapproved
Date
Dean/Director of School/College
Date

Approved
Disapproved
Undergraduate/Graduate Academic
Date

Approved
Disapproved
Board Chair
Date

Approved
Disapproved
Provost or Designee
Date

13
I. Date Initiated
   October 25, 2013

II. Course Information
   College/School: College of Business and Public Policy
   Department: Computer Information Systems
   Program: Master of Business Administration (MBA)
   Course Title: Data Warehouses and Business Intelligence
   Course Number: A670
   Stacked Course: A470
   Credits: 3
   Contact Hours: 3 per week x 15 weeks = 45 hours
                  0 lab hours
   Grading Basis: A - F
   Course Description: Provides strategic knowledge and insight into the theory and
design of data warehouses for enterprises and business intelligence for Enterprise
Resource Planning (ERP) systems. Analyzes processes of extraction, cleansing,
consolidation, and transformation of heterogeneous data into a single enterprise
data warehouse. Students research how business intelligence can be derived from
data warehouses.
   Course Prerequisites: N/A.
   Registration Restrictions: Graduate standing.
   Fees: Standard CBPP computer lab fee.

III. Course Activities
   A. Discussion
   B. Lectures
   C. Guest presenters
   D. Case studies

IV. Course Level Justification
   CIS A670 requires an undergraduate degree. This course requires in-depth analysis and
research skills where students design and model a data warehouse and utilize advanced
business intelligence techniques.
V. Outline

A. Relational Database Review
   1. Relations, Attributes, and Relationships
   2. Database Normalization
   3. Denormalization of Tables
   4. Structured Query Language (SQL)
   5. Transactional Databases

B. Data Warehousing Fundamentals
   1. Multidimensional Model for Data Warehouses
   2. Different Star Schemas
   3. Dimension and Fact Tables
   4. Modeling and Creating Cubes

C. Modeling the Data Warehouse
   1. Data Sources, Operational Data Store, and Data Marts
   2. Characteristics and Key Figures
   3. Building Cubes

D. Data Extraction, Transformation, and Loading (ETL) Processes
   1. Extraction from Data Sources
   2. Flat File Extraction
   3. Defining and Using Persistent Staging Areas (PSA)
   4. Data Store Objects DSO
   5. Loading Master Data
   6. Loading Transactional Data

E. Business Intelligence (BI) Concepts
   1. Reporting
   2. Navigating in Reports
   3. Designing Queries
   4. Properties and Attributes of Characteristics
   5. Hierarchies
   6. Query Properties and Navigation
   7. Exceptions and Conditions

F. Front-End Visualization of Business Intelligence
   1. Designing Dashboards

G. Designing Ad-Hoc Reports and Advanced Reports

H. Data Mining
   1. Statistical Techniques in Data Mining
   2. Association Analysis
   3. Market Basket Analysis
   4. Clustering
   5. Classification
   6. Regression
   7. Decisions Trees

I. In-Memory Analytics
   1. Row and Columnar Databases
   2. In-Memory Computing
### VI. Instructional Goals and Student Learning Outcomes

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

1. Present strategies and theory of multidimensional modeling for designing data warehouses.
2. Explain the analysis and process involved in data extraction, transformation, and loading (ETL) in a business warehouse.
3. Demonstrate the advanced use of business intelligence tools for data visualization and reporting.
4. Guide students in projects that demonstrate the use of business analytics and data tools to support quantitative decision making.
5. Demonstrate the use of popular data warehouse and business intelligence software.

#### B. Student Learning Outcomes.

<table>
<thead>
<tr>
<th>Students will be able to:</th>
<th>Assessment Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe the process of data modeling and normalization to design databases using entity-relationship diagram.</td>
<td>Project Discussion</td>
</tr>
<tr>
<td>2. Utilize advanced Structured Query Language (SQL) statements for data retrieval.</td>
<td>Exams</td>
</tr>
<tr>
<td>3. Develop strategies for applying multidimensional modeling to design data warehouses.</td>
<td>Project Exams</td>
</tr>
<tr>
<td>4. Investigate and research the major data warehouse development environments and policies.</td>
<td>Research paper Oral presentation</td>
</tr>
<tr>
<td>5. Demonstrate competence in using processes involved in data extraction, transformation, and loading (ETL) in a business warehouse.</td>
<td>Project Discussion</td>
</tr>
<tr>
<td>6. Apply advanced business intelligence strategies for data visualization and reporting.</td>
<td>Project</td>
</tr>
<tr>
<td>7. Examine advanced data mining techniques.</td>
<td>Discussion Project</td>
</tr>
<tr>
<td>8. Research and investigate in-memory analytics.</td>
<td>Research paper Exams</td>
</tr>
</tbody>
</table>
VII. Suggested Texts


VIII. Bibliography


1. **School or College**
   HC Honors College
2. **Course Prefix**
   HNRS
3. **Course Number**
   A498
4. **Previous Course Prefix & Number**
   n/a
5. **Credits/CEUs**
   1-6
6. **Contact Hours**
   (Lecture + Lab) (0+2-12)
7. **Complete Course Title**
   Individual Research
8. **Type of Course**
   Academic
9. **Repeat Status**
   Yes
   # of Repeats 5
   Max Credits 6
10. **Grading Basis**
    A-F
11. **Implementation Date**
    semester/year
    From: Fall/2013
    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.
   1. Impacted Program/Course
   2. Date of Coordination
   3. Chair/Coordinator Contacted
   4. Chair/Coordinator Contacted
14. **General Education Requirement**
    Mark appropriate box:
    - Oral Communication
    - Written Communication
    - Social Sciences
    - Quantitative Skills
    - Natural Sciences
    - Humanities
    - Integrative Capstone
15. **Course Description** (suggested length 20 to 50 words)
    Individual research projects under the supervision of a faculty member. Special Note: May be repeated for 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. **Other Restriction(s)**
    - College
    - Major
    - Class
    - Level
16d. **Registration Restriction(s)** (non-codable)
    Permission from the University Honors College and approval by a faculty member acting as research project advisor
17. Mark if course has fees
18. Mark if course is a selected topic course
19. **Justification for Action**
   Course will enable honors students working on multi-disciplinary projects and/or enrolled in degrees that currently do not offer A498 Directed Research the ability to complete individual research.

**Initiator Name (typed):** David Pfeiffer
**Initiator Signed Initials:** __________
**Date:** __________

**Initiator (faculty only)**
David Pfeiffer
**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:** __________
I. Initiation Date: February 2013

II. Course Information
A. College: University Honors College
B. Course Title: Individual Research
C. Course Subject/Number: HNRS A498
D. Credit Hours: 1.0-6.0 Credits
E. Contact Time: 0+2-12 Contact Time
F. Grading Information: A-F
G. Course Description: Individual research projects under the supervision of a faculty member. Special Note: May be repeated for once for a maximum of 6 credits.
H. Status of course relative to degree or certificate program: Upper division elective for any UAA student.
I. Lab Fees: Yes
J. Coordination: UAA Faculty Listserv
K. Course Prerequisites: n/a
L. Registration Restrictions: Permission from the University Honors College and approval by a faculty member acting as a research project advisor

III. Course Activities
This is a research class meeting 2 hours per week per credit to a maximum of 12 hours per week for 15 weeks.

IV. Evaluation
Course grading is A-F. Evaluation procedures and the criteria for grading are at the discretion of the instructor and will be discussed at the first class meeting of the semester. Students will be evaluated on the successful completion of the project/research tasks established at the beginning of the course by the faculty advisor and student.

V. Course Level Justification
Designed as an elective undergraduate course comparable to 400-level research courses offered at other universities. This course covers the principal concepts, processes and practical application of the scientific method essential to the student’s ability to succeed in and integrate content with other 400-level courses.

VI. Outline
There is no fixed or formal outline for this course, given the variable demands and expectations of different research disciplines. At the beginning of the semester, undergraduate students and their faculty mentors will develop a contract outlining specific tasks to be performed by the student researcher. Both the student and faculty mentor will meet regularly through the semester to discuss relevant issues as they arise.
in the course of the project. A highly generalized outline for research projects in the sciences is presented below:

Part 1. Literature search and review. Conceptualization of research hypothesis. Framing of working null hypothesis leading to contextual working null hypothesis. Training and review of laboratory and/or field research protocols and techniques. Experimental design.

Part 2. Experimental testing of working hypothesis and data collection. Analysis of data Finish collecting data.

Part 3. Complete data analysis. Complete final draft of manuscript describing the research results and its significance to the discipline.

Part 4. Submit final draft of research paper, which may be presented as an oral/poster presentation to the host department and/or submitted to the UAA Undergraduate Research Symposium and submitted to a peer-reviewed journal for publication if appropriate.

VII. **Instructional Goals and Defined Outcomes**

A. **Instructional Goals.** The Instructor Will:

1. Mentor students in the performance and practice of research using the scientific method.
2. Guide students to become proficient in using literature in their research specialties.
3. Assist students with the process of experimental design, data collection and analysis.
4. Encourage and promote student critical thinking, speaking, and writing skills in their research specialties.

B. **Defined Outcomes.** Student will be able to:

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Apply the scientific method by conducting original research.</td>
<td>Faculty mentoring, Literature search and Research project.</td>
</tr>
<tr>
<td>2. Conduct comprehensive literature searches, formulate and test a working hypothesis,</td>
<td>Research project and Faculty mentoring.</td>
</tr>
<tr>
<td>analyze data and write a formal research report following instructions to authors in</td>
<td></td>
</tr>
<tr>
<td>an appropriate peer-reviewed journal.</td>
<td></td>
</tr>
<tr>
<td>3. Demonstrate their ability to speak, think, read and write critically by participating</td>
<td>Research project, Faculty mentoring and Paper and/or poster.</td>
</tr>
<tr>
<td>in and conducting an original research project.</td>
<td></td>
</tr>
</tbody>
</table>

VIII. **Suggested Text**

The text will vary depending upon the research subject.
IX. Bibliography and Resources
Students are expected to rely on source material relevant and appropriate to the research project in which they are engaged.
### 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>AS CAS</td>
<td>AHUM Division of Humanities</td>
<td>HISTORY</td>
</tr>
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</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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<tbody>
<tr>
<td>HIST</td>
<td>A406</td>
<td>N/A</td>
<td>3</td>
<td>(3+0)</td>
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<table>
<thead>
<tr>
<th>6. Complete Course Title</th>
<th>Medieval Iberia</th>
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</table>

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

<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>
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<tr>
<th>8. Type of Action:</th>
<th>Add</th>
<th>Change</th>
<th>Delete</th>
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If a change, mark appropriate boxes:
- Prefix
- Credits
- Title
- Grading Basis
- Course Description
- Test Score Prerequisites
- Other Restrictions
- Repeat Status
- Contact Hours
- Cross-Listed/Stacked
- Course Prerequisites
- Co-requisites
- Registration Restrictions
- College
- Major
- (please specify)

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<th>9. Repeat Status No</th>
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<tr>
<th>10. Grading Basis</th>
<th>A-F</th>
<th>P/NP</th>
<th>NG</th>
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<th>11. Implementation Date</th>
<th>semester/year</th>
<th>From: Fall/2014</th>
<th>To: /9999</th>
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</table>

| 12. Cross Listed with |  |
|----------------------|  |

<table>
<thead>
<tr>
<th>13a. Impacted Courses or Programs:</th>
<th>List any programs or college requirements that require this course.</th>
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</thead>
</table>

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).

**Initiator Name (typed): Ray Ball**

<table>
<thead>
<tr>
<th>13b. Coordination Email</th>
<th>Date: 10/25/2013</th>
</tr>
</thead>
</table>

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

<table>
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<tr>
<th>13c. Coordination with Library Liaison</th>
<th>Date: 10/24/2013</th>
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**14. General Education Requirement**

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<tr>
<th>Mark appropriate box:</th>
<th>Oral Communication</th>
<th>Written Communication</th>
<th>Quantitative Skills</th>
<th>Humanities</th>
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</table>

| | Fine Arts | Social Sciences | Natural Sciences | Integrative Capstone |
| |          |                |                  |                      |

<table>
<thead>
<tr>
<th>15. Course Description</th>
<th>(suggested length 20 to 50 words)</th>
</tr>
</thead>
</table>

An analysis of key issues in Iberia from roughly 700-1492, including changing relationships between communities of Christians, Muslims, and Jews. Particular emphasis will be placed on the Reconquista, the development of different kingdoms, rural and urban life, the growth of military orders, the unification of crowns, and Iberian expansion.

<table>
<thead>
<tr>
<th>16a. Course Prerequisite(s) (list prefix and number)</th>
<th>HIST A101 and (ENGL A111 or ENGL A211) with a minimum grade of C</th>
</tr>
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</table>

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<thead>
<tr>
<th>16b. Test Score(s)</th>
<th>16c. Co-requisite(s) (concurent enrollment required)</th>
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</table>

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<thead>
<tr>
<th>16d. Other Restriction(s)</th>
<th>16e. Registration Restriction(s) (non-codable)</th>
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<tbody>
<tr>
<td></td>
<td>Appropriate score on on English Placement Test, SAT Verbal Section, or ACT English Test will waive the ENGL A111 or ENGL A 211 prerequisite.</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>17. Mark if course has fees</th>
<th>18. Mark if course is a selected topic course</th>
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</table>

<table>
<thead>
<tr>
<th>19. Justification for Action</th>
<th>Development of a new upper-division course on the history of Iberia in the Middle Ages to fill a gap in the curriculum of the History Department.</th>
</tr>
</thead>
</table>

22
<table>
<thead>
<tr>
<th>Initiator (faculty only)</th>
<th>Date</th>
<th>Approved</th>
<th>Disapproved</th>
<th>Dean/Director of School/College</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ray Ball</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Initiator (TYPE NAME)</th>
<th>Date</th>
<th>Approved</th>
<th>Disapproved</th>
<th>Department Chairperson</th>
<th>Date</th>
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<tr>
<th>Approved</th>
<th></th>
<th>Disapproved</th>
<th>Date</th>
<th>Undergraduate/Graduate Academic Board Chairperson</th>
<th>Date</th>
</tr>
</thead>
<tbody>
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<tr>
<th>Approved</th>
<th></th>
<th>Disapproved</th>
<th>Date</th>
<th>Provost or Designee</th>
<th>Date</th>
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<tr>
<th>Approved</th>
<th>Disapproved</th>
<th>Date</th>
<th>Curriculum Committee Chairperson</th>
<th>Date</th>
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<tbody>
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</tbody>
</table>
Course Content Guide  
University of Alaska Anchorage  
Department of History: HIST A406 Medieval Iberia  

I. Initiation Date: Fall 2013  

II. Course Information:  
A. College: College of Arts and Sciences  
B. Department: History  
C. Course Title: Medieval Iberia  
D. Course Subject/Number: HIST A406  
E. Credit Hours: 3.0 Credits  
F. Contact Time: 3+0 Contact Time  
G. Grading Information: A-F  
H. Course Description: An analysis of key issues in Iberia from roughly 700-1492, including changing relationships between communities of Christians, Muslims, and Jews. Particular emphasis will be placed on the Reconquista, the development of different kingdoms, rural and urban life, the growth of military orders, the unification of crowns, and Iberian expansion.  
I. Course Prerequisites: HIST A101 and (ENGL A111 or ENGL A211) with a minimum grade of C  
J. Course Fees: None  
K. Status of Course: Elective for upper-division requirement for BA in History  

III. Instructional Goals and Student Learning Outcomes:  
A. Instructional Goals:  

<table>
<thead>
<tr>
<th>Instructional Goals</th>
<th>Methods of Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To present and examine the key political, social, economic, religious, intellectual, and cultural developments in Iberian history during the Middle Ages.</td>
<td>Lectures, assigned readings, and discussions of texts</td>
</tr>
<tr>
<td>2. Use the study of medieval Iberian history to develop the student’s ability to think historically.</td>
<td>Lectures and class discussions of topics and assigned readings focused on analyzing patterns, establishing causation and consequences (e.g. the internal conflicts and the pace of the Reconquista), assessing contingency and observing complexity</td>
</tr>
</tbody>
</table>
3. Develop the student’s ability to read, think and write critically through the examination and analysis of (translated) primary and secondary sources (in English) on medieval Iberian history.

Lectures and discussions; short in-class writing assignments as well as lengthier analytical and research-based analytical papers and essays; peer review and revision of some writing assignments to incorporate feedback.

4. Develop the student’s ability to communicate effectively orally and in writing at an advanced undergraduate level.

Discussions, assignment of individual and group presentations, content exams and analytical essays.

---

**B. Student Learning Outcomes and Assessment Procedures.**

<table>
<thead>
<tr>
<th>Student Learning Outcomes: Students will be able to:</th>
<th>Assessment Procedures:</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Note: This course is writing intensive.</em></td>
<td></td>
</tr>
</tbody>
</table>

| 1. Describe the key political, social, religious, economic and cultural developments in Iberian History from 700-1492. | Content exams and analytical essays |
| 2. Identify, place in proper historical context and evaluate for historical significance primary documents and texts relating to medieval Iberian history | Analytical essays and/or research paper |
| 3. Discuss and analyze the causes and consequences of key historical developments in the history of Iberia during the Central and Late Middle Ages. | Analytical essays and exams, and/or research paper, oral presentations and discussion |
| 4. Recognize and analyze patterns of change and continuity across region and time in medieval Iberian history. | Analytical essays and exams, and/or research paper |
| 5. Recognize and assess the role of complexity and contingency in Iberian history during the Middle Ages through study and analysis of specific historical events and processes (for example, the role of military technology, disease, and religious fervor during the Conquest of Granada). | Analytical essays and exams, and/or research paper |
| 6. Communicate effectively orally and in writing at an advanced undergraduate level. | Analytical essays and exams, and/or research paper, oral presentations and discussion |

---

**IV. Guidelines for Evaluation:**

Students will be evaluated on the above outcomes through participation in classroom discussions and presentations, content and essay exams, analytical essays based on assigned readings of both primary and secondary sources, and research papers.
The specific number, type and weighting of assignments will vary by individual instructor. All assignments will emphasize reading, writing, historical thinking, and research skills.

V. Course Level Justification:
This course requires students to analyze, to evaluate and to synthesize historical data, and to demonstrate upper-division written and speaking skills. To be able to complete this course successfully, students will already need to have mastered some presentation, writing, and study skills. The stress on analysis, critical thinking and careful evaluation of contrasting historical arguments and sources makes this course an upper-division offering.

VI. Topical Course Outline:

1.0 The Muslim Conquest
2.0 Al-Andalus
3.0 The Reconquista’s Origins
4.0 Frontier Societies and Christian Kingdoms
5.0 Convivencia?
6.0 Romanticizing the Reconquista?
7.0 The Jewish Golden Age
8.0 Mudejar Communities
9.0 Piracy, Slavery, and Trade Networks
10.0 Missionizing and Military Orders
11.0 Marriage and Family in Late Medieval Iberia
12.0 Civil Wars and Unification
13.0 The Spanish Inquisition
14.0 Seaborne Expansion

VII. Suggested Text and Readings:


VIII. Select Bibliography: There is a vast and ever-growing bibliography on medieval Iberian history. The following are just a few of the most important works.


Databases and Websites:

Fordham Internet Medieval Sourcebook: [http://www.fordham.edu/Halsall/sbook.asp](http://www.fordham.edu/Halsall/sbook.asp)

Hanover Historical Texts Project, The Middle Ages: [http://history.hanover.edu/project.php#ma](http://history.hanover.edu/project.php#ma)

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

## 1. School or College
AS CAS

## 1b. Division
AHUM Division of Humanities

## 1c. Department
HISTORY

## 2. Course Prefix
HIST

## 3. Course Number
A408

## 4. Previous Course Prefix & Number
N/A

## 5a. Credits/CEUs
3

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

## 6. Complete Course Title
Early Modern Iberia

## 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
- [ ] Repeat Status
- [ ] Grading Basis
- [ ] Course Description
- [ ] Cross-Listed/Stacked
- [ ] Test Score Prerequisites
- [ ] Co-requisites
- [ ] Registration Restrictions
- [ ] Other Restrictions
- [ ] College
- [ ] Major
- [ ] Class
- [ ] Level
- [ ] (please specify)

## 9. Repeat Status No

### # of Repeats

### Max Credits

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

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

## 12. Cross Listed with

## Stacked with

## Cross-Listed Coordination Signature

## 13. 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.

### Initiated Name (typed):
Ray Ball

### 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**

An analysis of key issues in Iberia from roughly 1450-1808, including imperial expansion and religious, political, and social developments. Particular emphasis will be placed on the impact of ideologies of universal monarchy, the Union of Crowns, the Inquisition, rural and urban life, religious minorities, and the economics empires.

## 16. Course Prerequisite(s)

### (list prefix and number)

**HIST A101** and **(ENGL A111 or ENGL A211)** with a minimum grade of C

## 16a. Course Prerequisite(s)

## 16b. Test Score(s)

## 16c. Co-requisite(s)

### (concurrent enrollment required)

## 16d. Other Restriction(s)

### College

### Major

### Class

### Level

## 16e. Registration Restriction(s)

### (non-codable)

Appropriate score on English Placement Test, SAT Verbal Section, or ACT English Test will waive the ENGL A111 or ENGL A211 prerequisite.

## 17. Mark if course has fees

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

## 19. Justification for Action

Development of a new upper-division course on the history of early modern Iberia to fill a gap in the curriculum of the History Department.
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<th>Role</th>
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<th>Date</th>
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Course Content Guide  
University of Alaska Anchorage  
Department of History: HIST A408 Early Modern Iberia

I. Initiation Date:  
Fall 2013

II. Course Information:  
A. College:  
   College of Arts and Sciences
B. Department:  
   History
C. Course Title:  
   Early Modern Iberia
D. Course Subject/Number:  
   HIST A408
E. Credit Hours:  
   3.0 Credits
F. Contact Time:  
   3+0 Contact Time
G. Grading Information:  
   A-F
H. Course Description:  
   An analysis of key issues in Iberia from roughly 1450-1808, including imperial expansion and religious, political, and social developments. Particular emphasis will be placed on the impact of ideologies of universal monarchy, the Union of Crowns, the Inquisition, rural and urban life, religious minorities, and the economics of empires.
I. Course Prerequisites:  
   HIST A101 and (ENGL A111 or ENGL A211) with a minimum grade of C
J. Course Fees:  
   None
K. Status of Course:  
   Elective for upper-division requirement for BA in History

III. Instructional Goals and Student Learning Outcomes:  
   A. Instructional Goals:

<table>
<thead>
<tr>
<th>Instructional Goals</th>
<th>Methods of Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To present and examine the key political, social, economic, religious, intellectual, and cultural developments in early modern Iberian history.</td>
<td>Lectures, assigned readings, and discussions of texts</td>
</tr>
<tr>
<td>2. Use the study of early modern Iberian history to develop the student’s ability to think historically.</td>
<td>Lectures and class discussions of topics and assigned readings focused on analyzing patterns, establishing causation and consequences (e.g. dynastic politics and the growth of the Hapsburg monarchy), assessing contingency and observing complexity</td>
</tr>
</tbody>
</table>
3. Develop the student’s ability to read, think and write critically through the examination and analysis of (translated) primary and secondary sources (in English) on early modern Iberian history.

Lectures and discussions; short in-class writing assignments as well as lengthier analytical and research-based analytical papers and essays; peer review and revision of some writing assignments to incorporate feedback.

4. Develop the student’s ability to communicate effectively orally and in writing at an advanced undergraduate level.

Discussions, assignment of individual and group presentations, content exams and analytical essays.

### B. Student Learning Outcomes and Assessment Procedures.

<table>
<thead>
<tr>
<th><strong>Student Learning Outcomes: Students will be able to:</strong></th>
<th><strong>Assessment Procedures:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe the key political, social, religious, economic and cultural developments in Iberian History from 1450-1808.</td>
<td>Content exams and analytical essays</td>
</tr>
<tr>
<td>2. Identify, place in proper historical context and evaluate for historical significance primary documents and texts relating to early modern Iberian history.</td>
<td>Analytical essays and/or research paper</td>
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<tr>
<td>3. Discuss and analyze the causes and consequences of key historical developments in the history of Iberia from 1450 to 1808.</td>
<td>Analytical essays and exams, and/or research paper, oral presentations and discussion</td>
</tr>
<tr>
<td>4. Recognize and analyze patterns of change and continuity across region and time in early modern Iberian history.</td>
<td>Analytical essays and exams, and/or research paper</td>
</tr>
<tr>
<td>5. Recognize and assess the role of complexity and contingency in Iberian history during the early modern period through study and analysis of specific historical events and processes (for example, the role of the threat of warfare in the Treaty of Tordesillas between Castile and Portugal).</td>
<td>Analytical essays and exams, and/or research paper</td>
</tr>
<tr>
<td>6. Communicate effectively orally and in writing at an advanced undergraduate level.</td>
<td>Analytical essays and exams, and/or research paper, oral presentations and discussion</td>
</tr>
</tbody>
</table>

**IV. Guidelines for Evaluation:**

Students will be evaluated on the above outcomes through participation in classroom discussions and presentations, content and essay exams, analytical essays based on assigned readings of both primary and secondary sources, and research papers.
V. **Course Level Justification:**
This course requires students to analyze, to evaluate and to synthesize historical data, and to demonstrate upper-division written and speaking skills. To be able to complete this course successfully, students will already need to have mastered some presentation, writing, and study skills. The stress on analysis, critical thinking and careful evaluation of contrasting historical arguments and sources makes this course an upper-division offering.

VI. **Topical Course Outline:**

1.0 Legacies of the Reconquista
2.0 Unification, Civil War, and Rivalries
3.0 Portuguese Exploration and Trade
4.0 Pursuit of Religious Orthodoxy: The Inquisition
5.0 The European Empire of Charles V
6.0 Imperial Administration
7.0 The Union of Crowns
8.0 Golden Age Spain
9.0 The Economy of Empire
10.0 The Seventeenth Century Crisis: Catalan and Portuguese Revolts
11.0 The War of Spanish Succession
12.0 Enlightened Iberia, Bourbon and Pombaline Reforms
13.0 Napoleonic Invasions and Republican Constitutions

VII. **Suggested Text and Readings:**


**VIII. Select Bibliography:** There is a vast and ever-growing bibliography on early modern Iberian history. The following are just a few of the most important works in English.


---- *The Spanish Inquisition: A Historical Revision*  


Databases and Websites:

Fordham Internet Medieval Sourcebook: [http://www.fordham.edu/Halsall/sbook.asp](http://www.fordham.edu/Halsall/sbook.asp)

### 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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<tr>
<td>AS CAS</td>
<td>AHUM Division of Humanities</td>
<td>HISTORY</td>
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<th>3. Course Number</th>
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<th>5a. Credits/CEUs</th>
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<td>Cold War America, 1945-1992</td>
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<th>Abbreviated Title for Transcript (30 character)</th>
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<th>7. Type of Course</th>
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<th>11. Implementation Date</th>
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| 12. Cross Listed |
|-----------------|-----------------|
| ☐ Stacked       | Cross-Listed Coordination Signature |

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<td>List any programs or college requirements that require this course.</td>
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</table>

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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>425-426</td>
<td>10/23/2013</td>
<td>Elizabeth Dennison and Paul Dunscomb &amp; department curriculum committee</td>
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Initiator Name (typed): Kelly J. Shannon  
Initiator Signed Initials: ___________  
Date: ______________

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<th>13b. Coordination Email</th>
<th>Date: 10/25/2012</th>
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</tr>
</tbody>
</table>

| 13c. Coordination with Library Liaison | Date: 10/25/2012 |

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)
An examination of the domestic history of the United States during the Cold War. Focuses on how the US status as a superpower and competition with the Soviet Union influenced the American economy, culture, politics, and society. Special emphasis will be placed upon social movements, culture, and politics.

16a. Course Prerequisite(s) (list prefix and number)
HIST A132 with a minimum grade of C and (ENGL A111 or ENGL A211) with a minimum grade of C

16b. Test Score(s)
16c. Co-requisite(s) (concurent enrollment required)

16d. Other Restriction(s)
- College
- Major
- Class
- Level

16e. Registration Restriction(s) (non-codable)
Appropriate score on an English Placement Test, SAT Verbal Section, or ACT English Test will waive the ENGL A111 or ENGL A211 prerequisite. Completion of GER Tier I courses

17. Mark if course has fees

18. Mark if course is a selected topic course

19. Justification for Action
Adjustment of course to align with new faculty members and new courses; to distinguish HIST A453 more clearly from the proposed new course HIST A465, U.S. Foreign Relations Since 1945
<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Approved</th>
<th>Disapproved</th>
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<td>Kelly J. Shannon</td>
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<td>Dean/Director of School/College</td>
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<td>Provost or Designee</td>
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I. Initiation Date: Fall 2013

II. Course Information:
A. College: College of Arts and Sciences
B. Department: History
C. Course Title: Cold War America, 1945-1992
D. Course Subject/Number: HIST A453
E. Credit Hours: 3.0 Credits
F. Contact Time: 3+0 Contact Time
G. Grading Information: A-F
H. Course Description: An examination of the domestic history of the United States during the Cold War. Focuses on how the US status as a superpower and competition with the Soviet Union influenced the American economy, culture, politics, and society. Special emphasis will be placed upon social movements, culture, and politics.
I. Course Prerequisites: HIST A132 with minimum grade of C and (ENGL A111 or ENG A211)
J. Registration Restrictions Completion of GER Tier I (Basic college level skills) courses.
K. Course Fees: None
L. Status of Course: Upper-division elective for History BA

III. Instructional Goals and Student Learning Outcomes:
A. Instructional Goals:

<table>
<thead>
<tr>
<th>Instructional Goals</th>
<th>Methods of Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To provide a broad examination of the key political, social, economic, and political developments in U.S. history from 1945 through 1992.</td>
<td>Lectures, assigned readings, and discussions of texts</td>
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<tr>
<td>2. To use the history of Cold War America to develop the student’s ability to think historically, that is: to place ideas, events, objects and texts in proper historical context; to examine causation and consequences (e.g., the causes of the Cold War, the consequences of McCarthyism, etc.); to analyze patterns of change and continuity (e.g., similarities</td>
<td>Lectures and class discussions of topics and assigned readings focused on analyzing patterns, establishing causation and consequences, assessing contingency, and observing complexity</td>
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</table>
and differences in U.S. race relations over time); to assess possibilities of **contingency** (i.e., moments when different choices could have led to different historical outcomes, as when the U.S. chose to go to war in Vietnam); and to recognize and evaluate the **complexity** of the historical process.

| **3. To develop the student’s ability to read, think, and write critically through the examination and analysis of primary and secondary sources.** |
| Lectures and discussions; short in-class writing assignments, as well as lengthier analytical and research-based analytical papers and essays; peer review and/or revision of some writing assignments to incorporate feedback |

| **4. To develop the student’s ability to communicate effectively orally and in writing at an advanced undergraduate level.** |
| Discussions, assignment of individual and/or group presentations, content exams, and/or analytical essays |

### B. Student Learning Outcomes and Assessment Procedures.

<table>
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<tr>
<th><strong>Students will be able to:</strong></th>
<th><strong>Assessment Procedures:</strong></th>
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<tbody>
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<td>1. Describe the key political, social, economic, and political developments in U.S. history from 1945 through 1992</td>
<td>Content exams and/or analytical essays</td>
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<tr>
<td>2. Identify, place in proper historical context, and evaluate for historical significance primary documents and texts relating to American history, 1945-1992</td>
<td>Analytical essays and/or research paper</td>
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<tr>
<td>3. Discuss and analyze the causes and consequences of key historical developments during the Cold War era of U.S. history</td>
<td>Analytical essays and/or content exams and/or research paper, oral presentations, and discussion</td>
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<tr>
<td>4. Recognize and analyze patterns of change and continuity across regions and time in U.S. history, 1945-1992</td>
<td>Analytical essays and/or exams and/or research paper</td>
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<tr>
<td>5. Integrate knowledge and employ skills gained to synthesize and make critical judgments in assessing the role of complexity and contingency during U.S. history from 1945-1992</td>
<td>Analytical essays and/or exams and/or research paper</td>
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<tr>
<td>6. Communicate effectively orally and in writing at an advanced undergraduate level</td>
<td>Analytical essays and/or exams and/or research paper, oral presentations and discussion</td>
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*Note: This course is writing intensive.*
IV. Guidelines for Evaluation:

Students will be evaluated on the above outcomes through participation in classroom discussions and presentations, content and essay exams, analytical essays based on assigned readings of both primary and secondary sources, and/or research papers. The specific number, type, and weighting of assignments will vary by individual instructor, although this 400-level course should include a research paper as one of the main assignments. All assignments will emphasize reading, writing, and historical thinking and research skills.

V. Course Level Justification:

This course requires students to analyze, to evaluate, and to synthesize historical data, and to demonstrate upper division written and oral skills. To be able to complete this course successfully, students will need a base of knowledge and skills available through introductory level courses. The amount of student work, research paper assignment, and stress on analysis, critical thinking, and careful evaluation of contrasting historical arguments and sources makes this course an upper division offering.

VI. Topical Course Outlines:

Each section of the course will represent the instructor’s own design. As such, each section may look somewhat different. A model course outline is below:

1.0: Introduction to the Cold War & key concepts
2.0: The Early Cold War
3.0: Cold War Culture: Gender and the Family
4.0: McCarthyism, the Lavender Scare, and Espionage
5.0: The Rosenberg Espionage Trial
6.0: The Civil Rights Movement
7.0: The Civil Rights Movement in Global Perspective
8.0: 1960s America & the Great Society
9.0: The Vietnam War & the Counterculture
10.0: The Sexual Revolution
11.0: Second Wave Feminism
12.0: The Rights Revolution & America in the 1970s
13.0: The Reagan Revolution & America in the 1980s
14.0: The End of the Cold War

VII. Suggested Text and Readings:


VIII. Select Bibliography:


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>
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<th>10. Grading Basis</th>
<th>11. Implementation Date</th>
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<td>425-426</td>
<td>10/23/2013</td>
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Initiator Name (typed): Kelly J. Shannon
Initiator Signed Initials: _________
Date: __________

13b. Coordination Email: Date: 10/25/2012
submitted to Faculty Listserv: (uas-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison: Date: 10/25/2012

14. General Education Requirement:
Mark appropriate boxes:
- Oral Communication
- Written Communication
- Quantitative Skills
- Social Sciences
- Natural Sciences
- Integrative Capstone

15. Course Description (suggested length 20 to 50 words):
An examination of the history of U.S. foreign relations, broadly defined, since 1945, with a special emphasis on the global Cold War

16a. Course Prerequisite(s) (list prefix and number):
HIST A132 with a minimum grade of C and (ENGL A111 or ENGL A211) with a minimum grade of C

16b. Test Score(s):

16c. Co-requisite(s) (concurrent enrollment required):

16d. Other Restriction(s):
- College
- Major
- Class
- Level

16e. Registration Restriction(s) (non-codable):
Appropriate score on English Placement Test, SAT Verbal Section, or ACT English Test will waive the ENGL A111 or ENGL A211 prerequisite. Completion of GER Tier I courses

17. Mark if course has fees

18. Mark if course is a selected topic course

19. Justification for Action:
Development of a new upper-division course on the history of U.S. foreign relations since 1945 to fill a gap in the curriculum of the History Department.

Initiator (faculty only): Kelly J. Shannon
Initiator (TYPE NAME): ___________________________
Date: __________

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Disapproved

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Disapproved
Course Content Guide  
University of Alaska Anchorage  
Department of History: HIST A465 U.S. Foreign Relations Since 1945

I. Initiation Date: Fall 2013

II. Course Information:
A. College: College of Arts and Sciences  
B. Department: History  
C. Course Title: U.S. Foreign Relations Since 1945  
D. Course Subject/Number: HIST A465  
E. Credit Hours: 3.0 Credits  
F. Contact Time: 3+0 Contact Time  
G. Grading Information: A-F  
H. Course Description: An examination of the history of U.S. foreign relations, broadly defined, since 1945, with a special emphasis on the global Cold War  
I. Course Prerequisites: HIST A132 with minimum grade of C and (ENGL A111 or ENG A211)  
J. Registration Restrictions: Completion of GER Tier I (Basic college level skills) courses.  
K. Course Fees: None  
L. Status of Course: Upper-division elective for History BA

III. Instructional Goals and Student Learning Outcomes:
A. Instructional Goals:

<table>
<thead>
<tr>
<th>Instructional Goals</th>
<th>Methods of Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To provide a broad examination of the history of U.S. foreign relations since 1945 and introduce students to key themes, figures, concepts, and events relating to U.S. relations with the world during this period.</td>
<td>Lectures, assigned readings, and discussions of texts</td>
</tr>
<tr>
<td>2. To develop the student’s ability to think historically, that is: to place ideas, events, objects and texts in proper historical <strong>context</strong>, to examine <strong>causation</strong> and <strong>consequences</strong>; to analyze patterns of <strong>change</strong> and <strong>continuity</strong>, to assess possibilities of <strong>contingency</strong>, and to recognize and evaluate the <strong>complexity</strong> of the historical process.</td>
<td>Lectures and class discussions of topics and assigned readings focused on analyzing patterns, establishing causation and consequences, assessing contingency, and observing complexity</td>
</tr>
<tr>
<td>3. To develop the student’s ability to read, think, and write critically through the examination and analysis of primary and secondary sources.</td>
<td>Lectures and discussions; short in-class writing assignments, as well as lengthier analytical and research-</td>
</tr>
</tbody>
</table>
B. Student Learning Outcomes and Assessment Procedures.

<table>
<thead>
<tr>
<th>Students will be able to:</th>
<th>Assessment Procedures:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe the key developments and consequences of significant global events and U.S. foreign policy since 1945</td>
<td>Content exams and/or analytical essays</td>
</tr>
<tr>
<td>2. Identify, place in proper historical context, and evaluate for historical significance primary documents and texts relating to the history of U.S. foreign relations since 1945</td>
<td>Analytical essays and/or research paper</td>
</tr>
<tr>
<td>3. Discuss and analyze the causes and consequences of key historical developments in U.S. foreign relations since 1945</td>
<td>Analytical essays and/or content exams and/or research paper, oral presentations, and discussion</td>
</tr>
<tr>
<td>4. Recognize and analyze patterns of change and continuity across regions and time in U.S. foreign relations since 1945</td>
<td>Analytical essays and/or exams and/or research paper</td>
</tr>
<tr>
<td>5. Integrate knowledge and employ skills gained to synthesize and make critical judgments in assessing the role of complexity and contingency in global events and processes</td>
<td>Analytical essays and/or exams and/or research paper</td>
</tr>
<tr>
<td>6. Communicate effectively orally and in writing at an advanced undergraduate level</td>
<td>Analytical essays and/or exams and/or research paper, oral presentations and discussion</td>
</tr>
</tbody>
</table>

IV. Guidelines for Evaluation:

Students will be evaluated on the above outcomes through participation in classroom discussions and presentations, content and essay exams, analytical essays based on assigned readings of both primary and secondary sources, and/or research papers. The specific number, type, and weighting of assignments will vary by individual instructor, although this 400-level course should include a research paper as one of the main assignments. All assignments will emphasize reading, writing, and historical thinking and research skills.
V. Course Level Justification:

This course requires students to analyze, to evaluate, and to synthesize historical data, and to demonstrate upper division written and oral skills. To be able to complete this course successfully, students will need a base of knowledge and skills available through introductory level courses. The amount of student work, research paper assignment, and stress on analysis, critical thinking, and careful evaluation of contrasting historical arguments and sources makes this course an upper division offering.

VI. Topical Course Outlines:

Each section of the course will represent the instructor’s own design. As such, each section may look somewhat different. A model course outline is below:

1.0:  Introduction to U.S. Foreign Relations History

2.0:  Harry S. Truman and the Start of the Cold War

3.0:  Eisenhower’s “New Look” and the Making of the Third World

4.0:  John F. Kennedy’s “New Frontier”

5.0:  The Cold War in Europe: Cooperation and Tension within the NATO Alliance

6.0:  The Cold War in the Third World: Decolonization and the Non-Aligned Movement

7.0:  America’s Longest War: The Vietnam War

8.0:  U.S. Relations with the Middle East

9.0:  The Rise of Détente: The Nixon-Ford Administrations

10.0:  Jimmy Carter and Human Rights in the Age of Limits

11.0:  1979: The Iranian Revolution and the Soviet-Afghan War

12.0:  Dirty Wars: U.S.-Latin American Relations

13.0:  The End of the Cold War

14.0:  The 1990s: A Moment of Flux
VII.  Suggested Text and Readings:


VIII.  Select 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>AS CAS</td>
<td>AHUM Division of Humanities</td>
<td>Languages</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>
</tr>
</thead>
<tbody>
<tr>
<td>JPN</td>
<td>A391</td>
<td>N/A</td>
<td>3.0</td>
<td>(3+0)</td>
</tr>
</tbody>
</table>

**6. Complete Course Title**

Selected Topics: Studies in Japanese Culture and Society (taught in English)

ST: JPN Culture and Society

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

<table>
<thead>
<tr>
<th>7. Type of Course</th>
<th>8. Type of Action: Add or Change or Delete</th>
</tr>
</thead>
<tbody>
<tr>
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**If a change, mark appropriate boxes:**

<table>
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<tr>
<th>Prefix</th>
<th>Credits</th>
<th>Contact Hours</th>
<th>Title</th>
<th>Repeat Status</th>
<th>Grading Basis</th>
<th>Cross-Listed/Stacked</th>
<th>Course Description</th>
<th>Test Score Prerequisites</th>
<th>Course Prerequisites</th>
<th>Co-requisites</th>
<th>Registration Restrictions</th>
<th>Class</th>
<th>Level</th>
<th>College</th>
<th>Major</th>
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<td>X-A-F</td>
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</table>

**9. Repeat Status Yes # of Repeats 1 Max Credits 6**

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<th>11. Implementation Date semester/year From: Fall/2014 To: 9999/9999</th>
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</tbody>
</table>

**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>Catalog Page(s) Impacted</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
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</thead>
<tbody>
<tr>
<td>International Studies</td>
<td>115-114</td>
<td>9/23/2013</td>
<td>Dorn Van Dommelen</td>
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<tr>
<td>2.</td>
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<td></td>
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</tr>
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</table>

**Initiator Name (typed): Michihiro Ama**

**Initiator Signed Initials: _________ Date:_________**

**13b. Coordination Email Date: 10/15/2013**

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

**13c. Coordination with Library Liaison Date: 10/15/2013**

**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)**

An overview of Japanese culture and society on a selected topic, with critical analysis through a variety of disciplinary methodologies (e.g. historical, sociological, political, and literary). Special note: Course may be repeated once with change of subtitle. Course conducted in English.

**16a. Course Prerequisite(s) (list prefix and number)**

JPN A202 with a minimum grade of "C"

**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)**

N/A

**17. Mark if course has fees**

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

**19. Justification for Action**

The Japanese program is expanding its upper-division course offerings in Japanese literature and culture due to Japanese Major/Minor student demand.

**Initiator (faculty only) Date**

Michihiro Ama

**Initiator (TYPE NAME)**

- Approved
- Disapproved

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

**Department Chairperson Date**

**Board Chairperson Date**

**Curriculum Committee Chairperson Date**

**Provost or Designee Date**
JPN A391
Selected Topics: Studies in Japanese Culture and Society (taught in English)

I. Initiation Date: Fall 2013
II. Course Information:
A. College: College of Arts and Sciences
B. Course Title: Studies in Japanese Culture and Society (taught in English)
C. Course Subject/Number: JPN A391
D. Credit Hours: 3.0
E. Contact Time: 3 + 0 hours per week
F. Grading Information: A-F
G. Course Description: An overview of Japanese culture and society on a selected topic, with critical analysis using a variety of disciplinary methodologies (e.g. historical, sociological, political, and literary).
Special note: Course may be repeated once with change of subtitle. Course conducted in English.
H. Status of Course Relative to Degree or Certificate Programs:
Course may be used as an elective to satisfy the upper-division requirement of a Japanese major.
I. Course Attributes: Applies toward the upper-division requirement for Japanese majors.
J. Lab Fees: Yes
K. Coordination: UAA Faculty List Serve
L. Course Prerequisite: JPN A202 with a minimum grade of “C”

III. Instructional Goals and Student Learning Outcomes
A. Instructional Goals: The instructor will
   1. Introduce students to various aspects of Japanese culture and society, such as Japanese literature and film, performing arts, linguistics, political economy, philosophy, religion, and popular culture.
   2. Guide students in critical analysis and interpretation of
Japanese culture and society by using appropriate disciplinary approaches and terminology, and by conducting comparative case studies.

3. Provide materials that promote an understanding of cultural values inherent in Japanese terminology.

B. Student Learning Outcomes:

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upon successful completion of the course, students will be able to</td>
<td></td>
</tr>
<tr>
<td>1. Discuss various aspects of Japanese culture and society in historical, theoretical, and thematic terms.</td>
<td>Tests, Quizzes, Essays, Discussions</td>
</tr>
<tr>
<td>2. Apply appropriate disciplinary approaches to the subject under investigation and conduct critical analyses.</td>
<td>Oral Presentations, Research Papers</td>
</tr>
<tr>
<td>3. Demonstrate an understanding of correlations among Japanese language, history, and society.</td>
<td>Tests, Quizzes, Discussions</td>
</tr>
</tbody>
</table>

IV. Course Activities:
This course consists of lectures and small-group collaboration facilitated by instructor.

V. Methods of Assessment:
A student’s grade will be determined according to the syllabus of the individual instructor.

VI. Course-level Justification:
Course requires a minimum proficiency level of Intermediate Japanese as well as advanced analytical writing skills in English and the ability to interpret multiple disciplinary concepts dealing with Japanese culture.

VII. Course Outline:
Form as Emptiness: Aesthetic and Religious Expressions in Japanese Culture

This course analyzes Japanese culture as shaped by the institutional values of Shinto, Buddhism, and Confucianism in relation to Japan’s historical experiences. The interaction of “emptiness”/“form” and impermanence as manifestation of protocol and aesthetics are explored through various forms of Japanese culture, such as lyricism, literature, traditional performing arts, the arrangement of rock gardens and
tea ceremony, the samurai code of ethics, anime, and film.

1.1 Cherry Blossoms and Cicada’s Shell
1.2 Emptiness and Mahayana Buddhism
1.3 Zen and Traditional Arts
1.4 Life in the Floating World
1.5 Aesthetic Network in Tokugawa Japan
1.6 Samurai Protocol
1.7 Discourse of Emptiness in Japanese Empire
1.8 Postwar Revival of Japanese Aesthetics
1.9 Japanese Cinema
1.10 Anime Culture

The following reflects other possible versions of the course according to selected topics:

2.0 Japanese Literature and Cinema
   2.1 Selections from Classical Japanese Literature
   2.2 Selections from Modern and Contemporary Japanese Literature
   2.3 Selections from Japanese Films in the Twentieth-Century

3.0 Variety of Performing Arts in Japan
   3.1 Kyogen and Noh plays
   3.2 Kabuki and Bunraku (puppet theater)
   3.3 Modern/Contemporary Drama

4.0 Popular Culture in Japan
   4.1 Manga and Anime
   4.2 Magazine, Music, and Fashion
   4.3 Food, Architecture, and Contemporary Arts

5.0 Japanese Linguistics
   5.1 Syntax and Morphology
   5.2 Semantics and Phonetics
   5.3 Sociolinguistics

6.0 Political Economy of Japan
   6.1 Political Economy before the Pacific War
   6.2 Postwar Political Economy
6.3 Present Political Economy

7.0 Philosophy and Religion in Japan
   7.1 Ancient and Medieval Japanese Thought
   7.2 Philosophy and Religion in Modern Japan
   7.3 Twentieth-Century Japanese Philosophy

VIII. Suggested Texts


IX. 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 (Lecture + Lab)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCE</td>
<td>A411</td>
<td>n/a</td>
<td>3</td>
<td>(3+0)</td>
</tr>
</tbody>
</table>

### Complete Course Title

Artificial Intelligence

### Abbreviated Title for Transcript (30 character)

Artificial Intelligence

<table>
<thead>
<tr>
<th>6. Type of Course</th>
<th>7. Type of Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>Preparatory/Development</td>
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</table>

<table>
<thead>
<tr>
<th>8. Type of Action:</th>
<th>9. Repeat Status No</th>
<th># of Repeats</th>
<th>Max Credits</th>
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</thead>
<tbody>
<tr>
<td>Add</td>
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<td>n/a</td>
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<tr>
<td>Change</td>
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<td>Delete</td>
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If a change, mark appropriate boxes:

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

<table>
<thead>
<tr>
<th>10. Grading Basis</th>
<th>11. Implementation Date</th>
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<tbody>
<tr>
<td>A-F</td>
<td>From: Fall/2014</td>
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<td>P/NP</td>
<td>To: 99/9999</td>
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</table>

<table>
<thead>
<tr>
<th>12. Cross Listed with</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCE A611</td>
</tr>
</tbody>
</table>

### 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. See spreadsheet</td>
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<tr>
<td>2.</td>
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<td></td>
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<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initiator Name (typed): Frank Moore

Initiator Signed Initials: _________ Date: __________

### General Education Requirement

Mark appropriate box:

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

### 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.

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

CSCE A311 with a minimum grade of C.

### Co-requisite(s) (concurrent enrollment required)

n/a

### Registration Restriction(s) (non-codable)

n/a

### Mark if course has fees Standard SOE fee

### Mark if course is a selected topic course

### Justification for Action

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

### Approval

Initiator (faculty only) Date

Frank Moore

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
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

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>Introduce students to classic artificial intelligence topics, including search, knowledge representation, propositional logic, predicate calculus, and game playing.</td>
</tr>
<tr>
<td>2.</td>
<td>Introduce 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. Apply AI-based techniques, tools, and languages to solve problems.</td>
</tr>
<tr>
<td>2. Design, implement, test, debug, and verify the correct operation of AI programs.</td>
</tr>
</tbody>
</table>

V. **Guidelines for Evaluation**

A. Assignments
B. Exams
C. Projects

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

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

1a. School or College: EN SOENG R
1b. Division: Computer Science & Engineering
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: (Lecture + Lab)
(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
☐ Change
☐ Delete

If a change, mark appropriate boxes:
☐ Prefix
☐ Credits
☐ Title
☐ Grading Basis
☐ Course Description
☐ Test Score Prerequisites
☐ Co-requisites
☐ Automatic Restrictions
☐ College
☐ Level
☐ Major
☐ Other
(please specify)

9. Repeat Status No:

# of Repeats:

Max Credits:

n/a

10. Grading Basis:
☒ A-F
☐ P/NP
☐ NG

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

12. ☐ Cross Listed with:

☒ Stacked with CSCE A411

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.ualaska.edu/governance.

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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: (uafaculty@lists.ualaska.edu)

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

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):
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):
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:
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
Frank Moore
Initiator (TYPE NAME)

Approved
Disapproved
Dean/Director of School/College
Date

Approved
Disapproved
Department Chair
Date

Approved
Disapproved
Undergraduate/Graduate Academic
Board Chair
Date

Approved
Disapproved
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: CSCE A311 with a minimum grade of C.
J. Fees: Yes, standard SOE fee
K. Stacked: Yes: CSCE A411

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>A. Instructional Goals.</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></th>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Apply AI-based techniques, tools, and languages to solve problems.</td>
</tr>
<tr>
<td>2.</td>
<td>Design, implement, test, debug, and verify the correct operation of AI programs.</td>
</tr>
<tr>
<td>3.</td>
<td><em>Conduct a literature review, write a research summary paper, and present findings in a public forum.</em></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  
4. 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

### 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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<th>1c. Department</th>
</tr>
</thead>
<tbody>
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<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>
</thead>
<tbody>
<tr>
<td>CSCE</td>
<td>A412</td>
<td>n/a</td>
<td>3</td>
<td>(3+0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Complete Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evolutionary Computing</td>
</tr>
</tbody>
</table>

**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
- [ ] Contact Hours
- [ ] Title
- [ ] Repeat Status
- [ ] Grading Basis
- [x] Cross-Listed/Stacked
- [ ] Contact
- [ ] Credits
- [ ] Registration Restrictions
- [ ] Cross-Listed Coordination
- [ ] Co-requisites
- [ ] Course Prerequisites
- [ ] General Education Requirement
- [ ] General
- [ ] Skills
- [ ] Writing
- [ ] Critical Thinking
- [ ] Oral Communication
- [ ] Written Communication
- [ ] Quantitative Skills
- [ ] Social Sciences
- [ ] Natural Sciences
- [ ] Integrative Capstone
- [ ] Other Course Content Guide (please specify)

### 9. Repeat Status No

- # of Repeats: n/a
- Max Credits: n/a

### 10. Grading Basis

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

### 11. Implementation Date

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

### 12. Cross Listed with

- [x] Stacked with CSCE A612

### 13. 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.ualaska.edu/governance](http://www.ualaska.edu/governance).

#### 13a. Impacted Courses or Programs

<table>
<thead>
<tr>
<th>Course Description</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>Khry 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:** [Blank]

**Date:** [Blank]

### 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)

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.

### 16. Course Prerequisite(s)

- [x] CSCE A311 with a minimum grade of C.

### 17. Mark if course has fees

- [x] 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**

**Frank Moore**

**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**

---

**Signature**

**Date:** [Blank]

---

**63**
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**

<table>
<thead>
<tr>
<th>A. <strong>Instructional Goals</strong></th>
<th>The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Introduce students to the theory and practice of evolutionary computation.</td>
</tr>
<tr>
<td>2.</td>
<td>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.** Students will be able to:

<table>
<thead>
<tr>
<th></th>
<th>Assessment method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe similarities and differences between biological evolution and evolutionary computing.</td>
<td>Exams</td>
</tr>
<tr>
<td>2. 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. 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. 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. Design, implement, test, and debug a moderately complex software project.</td>
<td>Major Project</td>
</tr>
<tr>
<td>6. Present project results in a public forum.</td>
<td>Presentation</td>
</tr>
</tbody>
</table>

V. **Guidelines for Evaluation**

A. Exams
B. Major Project
C. Projects
D. Reports
E. Presentations

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


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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<tr>
<td>EN SOENGR</td>
<td>No Division Code</td>
<td>Computer Science &amp; Engineering</td>
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<table>
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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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6. Complete Course Title  
Advanced Evolutionary Computing
Abbreviated Title for Transcript (30 character)

<table>
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<th>7. Type of Course</th>
<th>8. Type of Action:</th>
<th>9. Repeat Status No</th>
<th>10. Grading Basis</th>
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<tbody>
<tr>
<td>Academic</td>
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<td>n/a</td>
<td>A-F</td>
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<tr>
<td>Preparatory/Development</td>
<td>Change</td>
<td></td>
<td>P/NP</td>
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<tr>
<td>Non-credit</td>
<td>Delete</td>
<td></td>
<td>NG</td>
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</table>

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

12. Cross Listed with  
CSCE A412
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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<th>Chair/Coordinator Contacted</th>
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<td>Impacted Program/Course</td>
<td>Date of Coordination</td>
<td>Chair/Coordinator Contacted</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)  
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)  
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  
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>
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<tbody>
<tr>
<td>Frank Moore</td>
<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>Department Chair</th>
<th>Date</th>
<th>Undergraduate/Graduate Academic</th>
<th>Date</th>
</tr>
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<tbody>
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<table>
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<th>College/School Curriculum Committee Chair</th>
<th>Date</th>
<th>Provost or Designee</th>
<th>Date</th>
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<tr>
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<td>Disapproved</td>
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- Approved
- Disapproved
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:** CSCE A311 with a minimum grade of C.
   J. **Fees:** Yes, standard SOE fee
   K. **Stacked:** Yes: CSCE A412

III. **Course Level Justification**

   This course is an elective for any graduate student who seeks knowledge in the field of evolutionary computing. 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**

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

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<td>2.</td>
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<td>3.</td>
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<td>4.</td>
<td>Analyze the results of several program runs for each project and effectively describe relevant conclusions in a written report.</td>
</tr>
<tr>
<td>5.</td>
<td>Design, implement, test, and debug a moderately complex software project.</td>
</tr>
<tr>
<td>6.</td>
<td>Present project results in a public forum.</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>
</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
V. Advanced Topics

6. 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)
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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

VII. Suggested Texts


VIII. Bibliography


### Machine Learning

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.

#### Impacted Courses or Programs

- **Type of Course**: Academic
- **Course Prefix**: CSCE
- **Course Number**: A415
- **Previous Course Prefix & Number**: n/a
- **Credits/CEUs**: 3
- **Contact Hours**: (3+0)
- **Repeat Status**: n/a
- **Grading Basis**: A-F
- **Implementation Date**: From: Fall/2014 To: 99/9999
- **Cross Listed with**: CSCE A615
- **Stacked with**: CSCE A615
- **Cross-Listed Coordination**: n/a

#### 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.

#### 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 Name (typed): Martin Cenek**

**Initiator Signed Initials**: _________ **Date:** __________

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

**Coordination with Library Liaison**: Date: 11/4/2013

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

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

**Registration Restriction(s)** (non-codable) n/a

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

**Mark if course is a selected topic course**
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 (STATS A253 or STATS 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:

<table>
<thead>
<tr>
<th>Assessment method</th>
</tr>
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<tbody>
<tr>
<td><strong>1.</strong> Apply machine learning algorithms to solve computational and applied problems.</td>
</tr>
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</table>

| **2.** Design, implement, train/test, and analyze machine learning algorithms. | Exams, Assignments, Project |

| **3.** Prepare oral and written presentations about machine learning. | Project |

### V. Guidelines for Evaluation

A. Exams

B. Project

C. Assignments

### 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**


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

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<td>In-depth survey of basic and advanced concepts of machine learning. Topics include linear discrimination, supervised, unsupervised, semi-supervised learning, multilayer perceptrons, 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.</td>
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| 17. | ☒ Mark if course has fees Standard SOE fee | 18. | ☐ Mark if course is a selected topic course |

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- [ ] Approved
- [ ] Disapproved

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- [ ] Approved
- [ ] Disapproved

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<th>Provost or Designee</th>
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- [ ] Approved
- [ ] Disapproved
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**: (CSCE A311 and (STATS A253 or STATS A307)) with a minimum grade of C.
J. **Fees**: Yes, standard SOE fee
K. **Stacked**: Yes: CSCE A415

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. *This course is stacked with CSCE A415. Graduate 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>Student Learning Outcomes</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. Conduct a literature review, write a research summary paper, and present findings in a public forum.</td>
<td>Research Summary Paper, Presentation</td>
</tr>
<tr>
<td>5. 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.</td>
<td>Research Project</td>
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</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


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

1a. School or College
EN SOENGR

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

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 ☔ Cross-Listed/Stacked ☐ Course Prerequisites ☐ Test Score Prerequisites ☔ Co-requisites ☔ Registration Restrictions ☔ General Education Requirement ☐ 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: ___________]

☐ Stackable

[☐ 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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<td>2. BSE Computer Systems Engineering</td>
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Initiator Name (typed): Kenrick Mock
Initiator Signed Initials: _________ Date: ________________

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

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
Dean/Director of School/College Date

☐ Approved ☐ Disapproved
Undergraduate/Graduate Academic Date

☐ Approved ☐ Disapproved
Board Chair Date

☐ Approved ☐ Disapproved
Provost or Designee Date

83
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 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

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<td>2. Provide an understanding of the differences between context-sensitive and context-free languages</td>
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<tr>
<td>3. Provide an understanding of semantic language parsing methods</td>
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<tr>
<td>4. Demonstrate the importance of optimizing programs for added efficiency of</td>
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programs

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

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<td>1. Write a lexical analyzer in a high level language that will handle a given set of language tokens</td>
<td>Assignments, Exams, Project</td>
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<td>2. Write a parser in a high level language that will generate intermediate code</td>
<td>Assignments, Exams, Project</td>
</tr>
<tr>
<td>3. 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>
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V. **Guidelines for Evaluation**

A. Assignments
B. Exams
C. Project

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

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

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If a change, mark appropriate boxes:
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- Credits
- Title
- Repeat Status
- Contact Hours
- Course Number
- Cross-Listed/Stacked
- Course Prerequisites
- Co-requisites
- Test Score Prerequisites
- Registration Restrictions
- General Education Requirement
- Grading Basis
- A-F
- P/NP
- NG

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</tr>
<tr>
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**Initiator Name (typed):** Kenrick Mock  
**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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<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>
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<td>Social Sciences</td>
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<tr>
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<td>Integrative Capstone</td>
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<tr>
<td>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.</td>
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<tr>
<th>16a. Course Prerequisite(s)</th>
<th>16b. Co-requisite(s)</th>
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<tbody>
<tr>
<td>[CSCE A331 or CSCE A351]</td>
<td>(concurrent enrollment required)</td>
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<td>with minimum grade of C.</td>
<td>n/a</td>
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<td>(non-codable)</td>
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<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>
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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 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: [(CSCE A331 or CSCE A351) and CSCE A248] with a minimum grade of C.
J. Fees: Yes, standard SOE fee
K. Stacked: Yes: CSCE A431

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:

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<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>
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<td>3.</td>
<td>Provide an understanding of semantic language parsing methods</td>
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<td>4.</td>
<td>Demonstrate the importance of optimizing programs for added efficiency of programs</td>
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</table>

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

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<thead>
<tr>
<th></th>
<th>Assessment method</th>
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<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>
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<td>2.</td>
<td>Write a parser in a high level language that will generate intermediate code</td>
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<td>3.</td>
<td>Write a code generator in a high level language that will produce assembly code for a given machine architecture</td>
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<tr>
<td>4.</td>
<td>Conduct a literature review, write a research summary paper, and present the findings in a public forum.</td>
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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

Aho, A., Lam, M., Sethi, R., Ullman, J. Compilers: Principles, Techniques, and
MA, 2012.

VIII. Bibliography

Appel, A. Modern Compiler Implementation in Java. Cambridge University Press.
Cambridge, MA 2002.
Mak, R. Writing Compilers and Interpreters: A Software Engineering Approach.
## 1. School or College
EN SOENGR

## 2. Course Prefix
CSCE

## 3. Course Number
A446

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

## 5a. Credits/CEUs
3

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

## 6. Complete Course Title
Digital Media and Interactive Systems

## 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 Prerequisites
- Test Score Prerequisites
- Co-requisites
- Registration Restrictions
- General Education Requirement
- College
- Major
- Class
- 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
- Semester/year:
  - From: Fall/2014
  - To: 99/9999

## 12. Cross Listed with
- CSCE A646
- Cross-Listed Coordination

## 13a. Impacted Courses or Programs
1. BA/BS Computer Science: 10/26/2013
   - Kenrick Mock
2. BSE Computer Systems Engineering: 10/26/2013
   - Kenrick Mock
3. [List more if needed]

## 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 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. The historical progression from traditional analog audio and video to digital formats are covered, 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.

## 16a. Course Prerequisite(s) (list prefix and number or test code and score)
(CSCE A320 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
- n/a

## 19. Justification for Action
Stack with graduate course in support of proposed MS in Computer Engineering & Computer Science.
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<tr>
<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: 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: 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. The historical progression from traditional analog audio and video to digital formats are covered, 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. Evaluation 
Grades are based on written examinations, class assignments, and projects. 

IV. 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. 

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. Instruct students on the use of MPEG tools, Linux software development for digital media processing, storage and networking applied to digital media

<table>
<thead>
<tr>
<th>B. Student Learning Outcomes</th>
<th>Assessment Methods</th>
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<tbody>
<tr>
<td>Upon successful completion of this course, students will be able to:</td>
<td></td>
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<tr>
<td>1. Explain the methods of encoding and decoding digital video and audio</td>
<td>Exams, quizzes, assignments, projects</td>
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<tr>
<td>2. Demonstrate methodologies used in the design of digital media systems</td>
<td>Exams, quizzes, assignments, projects</td>
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<td>3. Demonstrate methodologies used to transport digital media with quality of service (latency control)</td>
<td>Exams, quizzes, assignments, projects</td>
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<tr>
<td>4. Develop the necessary code to complete the course projects</td>
<td>Exams, quizzes, assignments, projects</td>
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<tr>
<td>5. Implement course projects, test their operation, and report their findings to the instructor and colleagues</td>
<td>Projects</td>
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<td>6. Demonstrate recognition of the engineering tradeoffs necessary in the design of production CG</td>
<td>Exams, quizzes, assignments, projects</td>
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imagery and interactive 3D graphics

VII.  Suggested Texts


VIII. Bibliography and Resources


### 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>EN SOENGR</th>
<th>1b. Division</th>
<th>No Division Code</th>
<th>1c. Department</th>
<th>Computer Science &amp; Engineering</th>
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| 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 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  
- Class  
- Level  
- College  
- Major  
- Other  
(please specify)  
- Course Number  
- Contact Hours  
- Repeat Status  
- Cross-Listed/Stacked  
- Course Prerequisites  
- Co-requisites  
- Registration Restrictions  
- General Education Requirement  
- Repeat Status No | ☐ of Repeats | n/a | Max Credits | n/a |  

| 9. Grading Basis | ☒ A-F | ☐ P/NP | ☐ NG |

| 10. Implementation Date | semester/year | From: Fall/2014 | To: 99/9999 |

| 11. Cross Listed with | ☐ CSCE A446 | ☐ Cross-Listed Coordination |

| 12. Coordination Email | Date: 11/4/2013 | submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu) |

| 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): 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 |


| 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. The historical progression from traditional analog audio and video to digital formats are covered, 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. 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 to an academic audience. 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) | (CSCE A320 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 |

<p>| 19. Justification for Action | 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. |</p>
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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. The historical progression from traditional analog audio and video to digital formats are covered, 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. 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 to an academic audience. 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: (CSCE A320 and CSCE A365) with a minimum grade of C.
K. Registration Restrictions: None
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 to an academic audience.

V. Outline
A. Lecture
   1. Analog Video and Audio Transmission
      a. Brief history
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 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 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>Student Learning Outcomes</th>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain the methods of encoding and decoding digital video and audio</td>
<td>Exams, quizzes, assignments, projects</td>
</tr>
<tr>
<td>Demonstrate methodologies used in the design of digital media systems</td>
<td>Exams, quizzes, assignments, projects</td>
</tr>
<tr>
<td>Demonstrate methodologies used to transport digital media with quality of service (latency control)</td>
<td>Exams, quizzes, assignments, projects</td>
</tr>
<tr>
<td>Develop the necessary code to complete the course projects</td>
<td>Exams, quizzes, assignments, projects</td>
</tr>
</tbody>
</table>
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.

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<tbody>
<tr>
<td></td>
<td>Projects</td>
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<tr>
<td>Exams, quizzes, assignments, projects</td>
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<tr>
<td>Projects</td>
<td></td>
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<tr>
<td>Research summary paper, presentation</td>
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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>
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<tbody>
<tr>
<td>EN SOENGR</td>
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<table>
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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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<td>(3+0)</td>
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<th>Academic</th>
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<th>CEU</th>
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<th>Delete</th>
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If a change, mark appropriate boxes:
- Prefix
- Credits
- Title
- Grading Basis
- Course Description
- Test Score Prerequisites
- Automatic Restrictions
- College
- Major
- Course Number
- Contact Hours
- Repeat Status
- Cross-Listed/Stacked
- Course Prerequisites
- Co-requisites
- Registration Restrictions
- General Education Requirement

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<tr>
<td></td>
<td>Stacked with CSCE A650</td>
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**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>Kenrick Mock</td>
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Initiator Name (typed): Kenrick Mock  
Initiator Signed Initials: _________  
Date: ____________

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<th>13c. Coordination with Library Liaison</th>
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| 14. General Education Requirement | | |
|-----------------------------------|-------------------------------|
| Mark appropriate box: | Oral Communication | Written Communication | Quantitative Skills | Humanities |
| | Fine Arts | Social Sciences | Natural Sciences | Integrative Capstone |

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<td>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.</td>
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<th>Mark if course is a selected topic course</th>
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<th>19. Justification for Action</th>
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<td>Stack with graduate course in support of proposed MS in Computer Engineering &amp; Computer Science. Title reflects emphasis on mobile robots.</td>
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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**

<table>
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<tr>
<th>A. <strong>Instructional Goals</strong></th>
<th>The instructor will:</th>
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<tr>
<td>1.</td>
<td>Present the basic principles behind mobile robots.</td>
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<td>2.</td>
<td>Describe electronic sensors and what sensors are needed for different operations.</td>
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<td>3.</td>
<td>Describe the different types of autonomous robots.</td>
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<tr>
<td>4.</td>
<td>Describe the importance of localization, navigation, and real-time processing</td>
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</table>
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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<tr>
<th></th>
<th>Assessment method</th>
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<tbody>
<tr>
<td>1. Create a robot with appropriate sensors to perform dedicated tasks.</td>
<td>Assignments, Exams, Project</td>
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<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>
</tbody>
</table>

V. **Guidelines for Evaluation**
A. Assignments
B. Exams
C. Project

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 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  
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  
☑ 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
- ☐ Class
- ☐ Level
- ☐ College
- ☐ Major
- ☐ 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 A450  
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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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)  
Introduction to robotics with embedded systems. Mobile robots, sensors, motors, and their control with autonomous and user-controlled operations. Different types of robots, including aerial, underwater, and automotive robots. 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)  
(CSCE A241 and CSCE A311 and CSCE A365) with 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  
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>
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<tbody>
<tr>
<td>Kenrick Mock</td>
<td></td>
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<tr>
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<th>Date</th>
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<th>Undergraduate/Graduate Academic Board Chair</th>
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<th>Disapproved</th>
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<th>College/School Curriculum Committee Chair</th>
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<th>Disapproved</th>
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<table>
<thead>
<tr>
<th>Provost or Designee</th>
<th>Date</th>
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<th>Disapproved</th>
</tr>
</thead>
</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. Mobile robots, sensors, motors, and their control with autonomous and user-controlled operations. Different types of robots, including aerial, underwater, and automotive robots. 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: (CSCE A241 and CSCE A311 and CSCE A365) with a minimum grade of C.
   J. Fees: Yes, standard SOE fee
   K. Stacked: Yes: CSCE A450

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

   A. Instructional Goals. The instructor will:
      1. Present the basic principles behind mobile robots.
      2. Describe electronic sensors and what sensors are needed for different
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.

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>Create a robot with appropriate sensors to perform dedicated tasks.</td>
</tr>
<tr>
<td>2.</td>
<td>Write code to control a robot by a user with a computer or handheld device.</td>
</tr>
<tr>
<td>3.</td>
<td>Write code to allow a robot to autonomously perform tasks.</td>
</tr>
<tr>
<td>4.</td>
<td>Write a program to allow a robot to learn using neural networks and artificial intelligence principles.</td>
</tr>
<tr>
<td>5.</td>
<td>Conduct a literature review, write a research summary paper, and present the findings in a public forum.</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
A460

4. Previous Course Prefix & Number
n/a

5a. Credits/CEUs
3

5b. Contact Hours
(3+0)

6. Complete Course Title
Database Systems II

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

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

9. Repeat Status No: 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.

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>
</tbody>
</table>

Initiator Name (typed): Kirk Scott
Initiator Signed Initials: _________ Date: ___________

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

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)
Kirk Scott
Initiator (TYPE NAME)

Approved ☐ Disapproved ☐

Dean/Director of School/College Date:

Disapproved ☐ Approved ☐

Undergraduate/Graduate Academic Dean Date:

Board Chair
Disapproved ☐ Approved ☐

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

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

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

V. **Guidelines for Evaluation**
   A. Assignments
   B. Exams
   C. 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


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

<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>A660</td>
<td>n/a</td>
<td>3</td>
<td>(3+0)</td>
</tr>
</tbody>
</table>

### 6. Complete Course Title
Advanced Database Systems

### 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
- [ ] Grading Basis
- [ ] Course Description
- [ ] Test Score Prerequisites
- [ ] Automatic Restrictions
- [ ] College
- [ ] Major
- [ ] 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
- [x] Stacked with CSCE A460
- Cross-Listed Coordination

### 13a. Impacted Courses or Programs

<table>
<thead>
<tr>
<th>Impact Program/Course</th>
<th>Date of Coordination</th>
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<td>2.</td>
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<td>3.</td>
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</table>

Initiator (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)

CSCE A360 with 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
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)

<table>
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</table>

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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 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: CSCE A360 with a minimum grade of C.
J. Fees: Yes, standard SOE fee
K. Stacked: Yes: CSCE A460

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. The requirements for 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 to fellow students and the outside client.

IV. Instructional Goals and Student Learning Outcomes

<table>
<thead>
<tr>
<th>A. Instructional Goals. The instructor will:</th>
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<tr>
<td>1. Provide a thorough treatment of the theoretical foundations of relational database management systems.</td>
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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, Advanced Project</td>
</tr>
<tr>
<td>2. Install, configure, and administer a database management system.</td>
<td>Assignments, Advanced Project</td>
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<tr>
<td>3. Design a database and write queries for it.</td>
<td>Assignments, Advanced Project</td>
</tr>
<tr>
<td>4. Implement a system that correctly and successfully supports secure, concurrent transactions in a multi-user environment.</td>
<td>Advanced Project</td>
</tr>
<tr>
<td>5. <em>Work with a client to elicit user requirements and system specifications.</em></td>
<td>Advanced Project</td>
</tr>
<tr>
<td>6. <em>Write and present the results of their project.</em></td>
<td>Advanced Project</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
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   c. Transaction rollback and recovery
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


VIII. Bibliography

1. School or College
EN SOENGR

2. Course Prefix
CSCE

3. Course Number
A462

4. Previous Course Prefix & Number
n/a

5a. Credits/CEUs
3

5b. Contact Hours
(3+0)

6. Complete Course Title
Data Mining

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 A662
Cross-Listed Coordination

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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<td>3.</td>
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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)
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.

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.

Initiator Name (typed): Kirk Scott
Initiator Signed Initials: _________
Date: ___________

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

______ Approved
☐ Disapproved

Dean/Director of School/College
Date

______ Approved
☐ Disapproved

Undergraduate/Graduate Academic
Date

______ Approved
☐ Disapproved

Board Chair

______ Approved
☐ Disapproved

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><strong>A. Instructional Goals.</strong> The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 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. 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. Present a survey of typical approaches to evaluate the results of data mining.</td>
</tr>
<tr>
<td>4. 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. Guidelines for Evaluation

A. Research Paper  
B. Project  
C. Homework  
D. Exams

### VI. 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
c. 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

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

2. Course Prefix: CSCE
3. Course Number: A662
4. Previous Course Prefix & Number: n/a
5a. Credits/CEUs: 3
5b. Contact Hours: (3+0)

6. Complete Course Title:
Advanced Data Mining

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
[ ] Major
[ ] Other

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:
[ ] Stacked with CSCE A462

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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
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<tr>
<td>2.</td>
<td></td>
<td></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):
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):
CSCE A360 with 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:
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

[ ] Approved
[ ] Disapproved

Undergraduate/Graduate Academic Board Chair

Date

[ ] Approved
[ ] Disapproved

Provost or Designee

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

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: CSCE A360 with a minimum grade of C

J. Fees: Yes, standard SOE fee

K. Stacked: Yes: CSCE A462

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. The requirements for 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</td>
</tr>
<tr>
<td>types of data mining algorithms, how they work, their theoretical basis, their</td>
</tr>
<tr>
<td>evaluation and comparison, and practical aspects of their use.**</td>
</tr>
<tr>
<td><strong>Applied research paper and project, Homework, Exams</strong></td>
</tr>
<tr>
<td><strong>2. Do research using library or web-based resources to find additional information on the current development and application of data mining techniques.</strong></td>
</tr>
<tr>
<td><strong>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.</strong></td>
</tr>
<tr>
<td><strong>4. Integrate and format raw data for the purposes of data mining.</strong></td>
</tr>
<tr>
<td><strong>5. Form meaningful hypotheses about relationships in data and analyze and explain both successful and unsuccessful tests of the hypotheses using data mining techniques.</strong></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
   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  

VII. Suggested Texts  


VIII. Bibliography  

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

**Computer and Network Security**

### Abbreviated Title for Transcript (30 character)

### Summary

- **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.**

### Course Information

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division Code</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>
</thead>
<tbody>
<tr>
<td>CSCE</td>
<td>A465</td>
<td>n/a</td>
<td>3</td>
<td>(Lecture + Lab) (3+0)</td>
</tr>
</tbody>
</table>

### Type of Course

- **Academic**

### Type of Action

- **Add**

### 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.**

### Impacted Courses or Programs

- **Cross Listed with CSCE A665**

### Justification for Action

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

### Signatures

- **Initiator (faculty only): Kenrick Mock**
- **Initiator Signed Initials:**
- **Date:**

### Coordination Email

- **Date:** 11/4/2013

### General Education Requirement

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

### Course Prerequisite(s)

- **CSCE A365 with a minimum grade of C.**

### Co-requisite(s)

- **CSCE A665**

### Registration Restriction(s)

- **Cross-Listed Coordination**

### Repeat Status

- **# of Repeats:** n/a
- **Max Credits:** n/a

### Implementation Date

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

---

### Additional Information

- **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.
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 sniffer, 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Describe security problems encountered with computer systems and computer network systems.</td>
</tr>
<tr>
<td>2.</td>
<td>Explain how to prevent computer and network security breaches.</td>
</tr>
<tr>
<td>3.</td>
<td>Demonstrate how to trace and identify computer and network security threats.</td>
</tr>
<tr>
<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>
</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>
</tbody>
</table>

V. **Guidelines for Evaluation**
A. Assignments
B. Exams
C. Project

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 SOENG

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)

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
   Grade Basis
   Course Description
   Test Score Prerequisites
   Automatic Restrictions
   Other
   Course Number
   Contact Hours
   Repeat Status
   Cross-Listed/Stacked
   Co-requisites
   Registration Restrictions
   General Education Requirement

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 A465
    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>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
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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)

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)
    CSCE A365 with minimum grade of C.

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

16c. Automatic Restriction(s)

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
    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>Approved</th>
<th>Disapproved</th>
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<tbody>
<tr>
<td>Kenrick Mock</td>
<td></td>
<td></td>
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<table>
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<th>Initiator (TYPE NAME)</th>
<th>Date</th>
<th>Approved</th>
<th>Disapproved</th>
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<thead>
<tr>
<th>Dean/Director of School/College</th>
<th>Date</th>
<th>Approved</th>
<th>Disapproved</th>
</tr>
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<tbody>
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<table>
<thead>
<tr>
<th>Department Chair</th>
<th>Date</th>
<th>Approved</th>
<th>Disapproved</th>
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<tbody>
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</table>

<table>
<thead>
<tr>
<th>College/School Curriculum Committee Chair</th>
<th>Date</th>
<th>Approved</th>
<th>Disapproved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>
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: CSCE A365 with a minimum grade of C
J. Fees: Yes, standard SOE fee
K. Stacked: Yes: CSCE A465

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

A. Instructional Goals. The instructor will:
   1. Describe security problems encountered with computer systems and computer network systems.
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>
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<tr>
<th>B. Student Learning Outcomes. Students will be able to:</th>
<th>Assessment method</th>
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<tbody>
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<td>1. Identify potential security problems with computer systems and computer network systems.</td>
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<td>2. Design computer and network systems resistant to attack.</td>
<td>Assignments, Exams, Project</td>
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<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)
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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
   A485

4. Previous Course Prefix & Number
   n/a

5a. Credits/CEUs
   3

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

6. Complete Course Title
   Computer and Machine Vision

   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  ☐ Contact Hours  ☑ Repeat Status  ☑ Title  ☐ Repeat Status
   ☑ Grading Basis  ☑ Cross-Listed/Stacked  ☐ Course Prerequisites  ☐ Co-requisites
   ☑ Test Score Prerequisites  ☐ Registration Requirements  ☐ General Education Requirement
   ☐ College  ☐ Level  ☐ Class  ☐ 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 A685  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>
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<tr>
<th>Impacted Program/Course</th>
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<tr>
<td>1. BA/BS Computer Science</td>
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<td>Kenrick Mock</td>
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<tr>
<td>2. BSE Computer Systems Engineering</td>
<td>10/26/2013</td>
<td>Kenrick Mock</td>
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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 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.

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

   (PHYS A124 or PHYS A212) and CSCE A320 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..
<table>
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<tr>
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<table>
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<table>
<thead>
<tr>
<th>Provost or Designee</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tr>
</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:      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. Evaluation
Grades are based on written examination, assignments, and projects.

IV. 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.

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

<table>
<thead>
<tr>
<th>A. Instructional Goals</th>
<th>The instructor will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe principles of machine and computer vision, clearly defining the differences between the two.</td>
<td></td>
</tr>
</tbody>
</table>
2. Instruct students on the design, implementation and use of computer and machine vision algorithms.

3. Instruct students on 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:

<table>
<thead>
<tr>
<th></th>
<th>Assessment Methods</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>
</tbody>
</table>

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>EN SOENGR</th>
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<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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<tr>
<td>2. Course Prefix</td>
<td>CSCE</td>
</tr>
<tr>
<td>3. Course Number</td>
<td>A685</td>
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<td>4. Previous Course Prefix &amp; Number</td>
<td>n/a</td>
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<tr>
<td>5a. Credits/CEUs</td>
<td>3</td>
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<tr>
<td>5b. Contact Hours</td>
<td>(Lecture + Lab) (3+0)</td>
</tr>
</tbody>
</table>

#### 6. Complete Course Title

- **Advanced Computer and Machine Vision**
- **Adv Computer & Machine Vision**

**Abbreviated Title for Transcript (30 character)**: Adv Computer & Machine Vision

#### 7. Type of Course

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

#### 8. Type of Action

- **Add**

If a change, mark appropriate boxes:

- Prefix
- Credits
- Title
- Grading Basis
- Course Description
- Test Score Prerequisites
- Automatic Restrictions
- College
- Major
- 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 A685

#### 13. Coordination

- with Library Liaison
- Date: 11/4/2013
- Signature

- Cross Listed Coordination

#### 14. General Education Requirement

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<td>Social Sciences</td>
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<td>Natural Sciences</td>
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<tr>
<td>Integrative Capstone</td>
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</table>

#### 15. 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. 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 to an academic audience. Special note: Not available for credit to students who have completed CSCE A685.

#### 16a. Course Prerequisite(s)

- (PHYS A124 or PHYS A212) and CSCE A320 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

- 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>Initator (faculty only)</th>
<th>Date</th>
<th>Dean/Director of School/College</th>
<th>Date</th>
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<tbody>
<tr>
<td>Samuel Siewert</td>
<td></td>
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<td>Disapproved</td>
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</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 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. Applications include inspection, surveillance, search and rescue, and machine vision navigation. 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 to an academic audience. Special note: Not available for credit to students who have completed CSCE A485.
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 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 to an academic audience.

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
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   a. Binary shape and boundary analysis
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   c. Pattern patching
   d. Keypoint and Scale Invariant Feature Transform / Speeded Up Robust Feature (SIFT/SURF) algorithms
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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)
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   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:

<table>
<thead>
<tr>
<th>No.</th>
<th>Activity</th>
<th>Assessment Methods</th>
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<tr>
<td>1</td>
<td>Explain the implementation and use of machine and computer vision for automation and interaction.</td>
<td>Exams, quizzes, assignments, class projects</td>
</tr>
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<td>2</td>
<td>Demonstrate methodologies used in the design of machine and computer vision systems.</td>
<td>Exams, quizzes, assignments, class projects</td>
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<td>3</td>
<td>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</td>
<td>Demonstrate recognition of the engineering tradeoffs necessary in the design of production machine vision systems.</td>
<td>Exams, quizzes, assignments, class projects</td>
</tr>
<tr>
<td>5</td>
<td>Review research literature, write a research summary paper, and present to an academic audience.</td>
<td>Research summary paper, presentation</td>
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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>
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<tr>
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<th>3. Course Number</th>
<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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**6. Complete Course Title**  
Topics in Computer Science & Computer Systems Engineering  
Topics in CS and CSE

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

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8. If a change, mark appropriate boxes:

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

---

9. **Repeat Status**: Yes  
**# of Repeats**: Unlimited  
**Max Credits**: Unlimited

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<th>11. Implementation Date</th>
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<td>To: 99/9999</td>
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</table>

**11. Date of Coordination**: 10/26/2013

---

**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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<tbody>
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<td>1. BA/BS Computer Science</td>
<td>10/26/2013</td>
<td>Kenrick Mock</td>
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<td>Kenrick Mock</td>
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<tr>
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</table>

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

10. **Date of Coordination**: 10/26/2013

---

**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)**

- [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

**Dean/Director of School/College**

- [ ] Approved
- [ ] Disapproved

**Undergraduate/Graduate Academic**

- [ ] Approved
- [ ] Disapproved

**Board Chair**

- [ ] Approved

**Provost or Designee**

- [ ] Approved

---

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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 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: Faculty 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 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>
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<tbody>
<tr>
<td>1.</td>
<td>Describe principles of machine and computer vision, clearly defining the differences between the two.</td>
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<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>
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<td>1.</td>
<td>Explain the implementation and use of machine and computer vision for automation and interaction</td>
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<td>Demonstrate methodologies used in the design of machine vision systems</td>
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<td>Implement course projects, test their operation, and report their findings to the instructor and colleagues</td>
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<td>Demonstrate recognition of the engineering tradeoffs necessary in the design of production machine vision systems</td>
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V. **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. Projects  
F. Homework Assignments

VI. **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 Texts

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

## 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>A690</td>
<td>n/a</td>
<td>3</td>
<td>(3+0)</td>
</tr>
</tbody>
</table>

### 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

- 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
- Automatic Code
- Other

### 9. Repeat Status

- Yes
- # of Repeats
- Max Credits

### 10. Grading Basis

- A-F
- P/NP
- NG

### 11. Implementation Date

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

### 12. Cross Listed with

- Stacked with CSCE A490

### 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.</td>
<td></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](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 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.

### 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

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) Kenrick Mock**

Initiator (TYPE NAME)

<table>
<thead>
<tr>
<th>Approved</th>
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**Date**

Dean/Director of School/College

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Undergraduate/Graduate Academic

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Provost or Designee

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**Date**

153
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: None
J. Fees: Yes, standard SOE fee
K. Registration Restrictions: Faculty 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.

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G. Research Summary Paper  
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November 15, 2013

To: Faculty Senate Executive Board

Cc: Bruce Schultz, Vice Chancellor for Student Affairs
    Elisha “Bear” Baker, Provost
    Eric Pedersen, Associate Vice Chancellor for Enrollment Services

From: Lora Volden, University Registrar
      Susan Kalina, Vice Provost for Undergraduate Academic Affairs

Re: Academic Policies regarding Occupational Endorsement Certificates (OEC)

Issue
Since the initial creation of Occupational Endorsement Certificates in fall 2006 there have continued to be a number of questions regarding application of academic policies. Although these policies exist in the catalog, they currently apply only to traditional one and two year certificate and degree seeking students. Examples of policy questions that have arisen for OECs include:

- Should students admitted to OECs be subject to academic standing (warning, probation, Dean’s List, etc.)?
- Should students be allowed to utilize transfer work to meet requirements of OECs?
- May students/departments use academic petitions to meet OEC requirements?

Additionally, a process for awarding an OEC was developed which differs significantly from the awarding of other certificates and degrees. This process has led to confusion on the program level as well as in the Office of the Registrar and Enrollment Services.

Considerations
Although OEC students receive the same administrative services (admissions, degree audits and use of DegreeWorks, and financial aid), they do not currently pay the admission or graduation fees that other degree-seeking students pay.

Proposal
To assure consistency for all students, students admitted to an OEC should be subject to the same academic policies as other certificate and degree seeking students. Policies regarding academic standing will be updated to include OECs and students will be able to utilize academic petitions to meet OEC requirements. However, since most OECs require a small number of credits, we recommend that transcripts from other institutions are only evaluated when classes from the institution are listed on an academic petition as meeting OEC requirements. This is similar to how we handle graduate degrees and is intended to prevent over awarding of departmental electives that become problematic with federal regulations to satisfactory academic progress and also provides a more efficient work flow.
Once a student has completed all requirements for an OEC, including any necessary academic petitions, the student will submit an application for graduation (similar to all certificate and degree seeking students). The OEC will then be awarded and indicated on the student transcript and the student and department notified via email of the outcome. In keeping with current practice, the student will not be required to pay the standard $50 application for graduation fee and as such will not receive a UAA diploma or be invited to participate in the annual commencement ceremony. Departments who chose to create and award departmental completion certificates are encouraged to use the attached template after they have received confirmation from the Registrar’s Office that the OEC has been awarded.