I. Roll Call

() Arlene Schmuland () Peter Olsson () Zhaohui (Joey) Yang
() Tim Hinterberger () Susan Garton () FSAL vacancy (CAS) Ex-Officio Members:
() Patricia Sandberg () Mary Dallas Allen () FSAL Vacancy () David Yesner
() Greg Protasel () Deb Russ () FSAL Vacancy () Lora Volden
() Yoshito Kanamori () Hsing-Wen Hu () Jaime Spatrisano () Scheduling & Publications

II. Approval of Agenda (pg. 1)

III. Approval of Meeting Summary (pg. 2-3)

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

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

VI. Program/Course Action Request – Second Reading

VII. Program/Course Action Request - First Readings
Add BIOL A661L Advanced Molecular Biology Laboratory
(Stacked with BIOL A461L)(3)(0+6)(pg. 4-13)
Chg GEOL A690 Graduate Topics in Geology (Stacked with GEOL A490)(1-4 cr)(1-4+0)(pg. 14-23)
Add CE A426 Traffic Modeling and Simulation (Stacked with CE A626)(3 cr)(3+0)(pg. 24-31)

VIII. Old Business

IX. New Business
A. Electronic Signatures
B. Electronic Catalog Presentation (Lora Volden)

X. Informational Items and Adjournment
A.
I. Roll Call
(x) Arlene Schmuland (e) Peter Olsson (x) Zhaohui (Joey) Yang
(x) Tim Hinterberger (e) Susan Garton () FSAL vacancy (CAS) Ex-Officio Members:
(x) Patricia Sandberg (x) Mary Dallas Allen () FSAL Vacancy (x) David Yesner
(x) Greg Protasel (x) Deb Russ () FSAL Vacancy (x) Lora Volden
(x) Yoshito Kanamori (x) Hsing-Wen Hu (x) Jaime Spatrisano () Scheduling & Publications

II. Approval of Agenda (pg. 1)
BIOL A661L is postponed till next meeting
Approved as amended

III. Approval of Meeting Summary (pg. 2)
Approved

IV. Administrative Reports
A. Associate Dean of the Graduate School David Yesner
   Working towards electronic thesis submissions next year
   David met last week with Helena, Susan Kalina, and the Provost to plot a strategy for looking at
doctoral programs that will be coming forward
   Provost is moving the in-state tuition for graduate teaching and research assistants forward and will
   hopefully have a decision by the end of this year

B. Graduate Student Jaime Spatrisano
   Looking for a faculty and student representative from each department in the Graduate School to
   review applications for the Graduate Student Association scholarship

C. University Registrar Lora Volden
   October 26th is the registration deadline for those students who have to register for thesis or special
   projects
   Summer 2013 schedule proofs will be available soon

V. Chair’s Report
A. GAB Chair- Arlene Schmuland
   Chair thanked members for notifying her of upcoming absences and if quorum looked problematic in
   future, may ask members to find a voting proxy to attend in their stead

B. Faculty Alliance

C. Graduate Council

VI. Program/Course Action Request – Second Reading

VII. Program/Course Action Request - First Readings
Add BIOL A661L Advanced Molecular Biology Laboratory
   (Stacked with BIOL A461L)(3)(0+6)(pg. 3-12)
   Postponed

Add PM A690 Selected Topics in Project Management (3 cr)(3+0)(pg. 13-16)
   Waive first reading, approve for second

VIII. Old Business

IX. New Business
A. Summer Add Drop/Deadline (pg. 17)
   Unanimously Approved
B. Curriculum Handbook Changes (18-106)
   a. Revised PAR (pg. 107)
      A handout was distributed to the board regarding coordination language; information that needs to be
      included in a course coordination email will appear on page 20, 21, 22, 25, and 53.
      Additional information that will be changed in the handbook is the boxes that need to be completed on
      the CAR when deleting a course, this includes boxes: 2, 3, 6, 8, 11, 12

      Motion to accept changes to the Curriculum Handbook excluding changes to the PAR (Box 6d.).
      1st Patricia Sandberg
      2nd Mary Dallas Allen
      Unanimously Approved

X. Informational Items and Adjournment
   A.
1a. School or College  
AS CAS  

1b. Division  
AMSC Division of Math Science  

1c. Department  
Biology  

2. Course Prefix  
BIOL  

3. Course Number  
A661L  

4. Previous Course Prefix & Number  
N/A  

5a. Credits/CEUs  
3  

5b. Contact Hours  
(0+6)  

6. Complete Course Title  
Advanced Molecular Biology Laboratory  
Adv. Molecular Biology Lab  

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  
☐ Course Number  
☐ Contact Hours  
☐ Repeat Status  
☐ Grade Basis  
☐ Title  
☐ Grading Basis  
☐ Cross-Listed/Stacked  
☐ Course Description  
☐ Course Prerequisites  
☐ Co-requisites  
☐ Other Restrictions  
☐ Registration Restrictions  
☐ 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  
semester/year  
From: SPRING/2013  
To: XX/9/9999  

12. ☐ Cross Listed with  
☒ Stacked with BIOL A461L  

Cross-Listed Coordination  
Signature  

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

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

<table>
<thead>
<tr>
<th>Impacted Program/ Course</th>
<th>Catalog Page(s) Impacted</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.  
2.  
3.  

Initiator Name (typed): Ben Harrison  
Initiator Signed Initials:  
Date:  

13b. Coordination Email  
Date: 04-26-2012  
submitted to Faculty Listserve: (uaa-faculty@lists.uaa.alaska.edu)  

13c. Coordination with Library Liaison  
Date: 04-26-2012  

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)  
A practical implementation of the theory learned in BIOL A661, which includes in vitro DNA techniques, gene expression analysis, and genomics. Students will also learn and practice experimental design, proposal writing, and oral and written presentation skills, lead research groups, and learn mentorship skills.  

16a. Course Prerequisite(s) (list prefix and number)  
BIOL A661 with 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  
Students enrolled in BIOL A661 have frequently requested a laboratory to provide hands-on understanding of the molecular methodologies discussed in the lecture course, particularly when their graduate thesis work involves molecular approaches - an increasingly common trend. Most molecular biology courses at other institutions have associated laboratories, and a laboratory will significantly enhance the learning experience in BIOL A661. Stacking this course with BIOL A461L will enable BIOL A661L students to gain mentorship experience and pursue more elaborate research projects.
<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>Ben Harrison</td>
<td></td>
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<tr>
<th>Department Chairperson</th>
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<th>Undergraduate/Graduate Academic Board Chairperson</th>
<th>Date</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Curriculum Committee Chairperson</th>
<th>Date</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Provost or Designee</th>
<th>Date</th>
</tr>
</thead>
</table>
UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Implementation Date: Spring 2012.

II. Course Information
A. College: College of Arts and Sciences.
B. Course Subject/Number: BIOL A661L.
C. Course Title: Molecular Biology Laboratory.
D. Course Description: A practical implementation of the theory learned in BIOL A661, which includes in vitro DNA techniques, gene expression analysis, and genomics. Students will also learn and practice experimental design, proposal writing, and oral and written presentation skills, lead research groups, and learn mentorship skills. May be stacked with: BIOL A461L.
E. Credit Hours: 3.0
F. Contact Hours: 0+6.
G. Grading Basis: A-F.
H. Status of Course Relative to Degree Program: Elective course for graduate students studying at UAA.
I. Lab Fees (Yes/No): Yes.
J. Coordination: UAA Faculty Listserv, UAA Deans and Directors.
K. Prerequisites/Corequisite: BIOL A661, with minimum grade of C, or concurrent enrollment
L. Registration Restrictions: None

III. Course Activities: This is a laboratory class meeting for two 3 hour sessions per week for 15 weeks.

IV. Evaluation:

Course grading is A-F. The evaluation methods, while at the discretion of the faculty member teaching the course, may include participation in group discussions and experimental work, reading and interpreting primary scientific literature and a presentation of project outcomes.

V. Course Level Justification: Designed for graduate students in the biological sciences as an elective graduate course comparable to 600-level molecular biology laboratory courses offered at other universities. This course covers the practical applications of molecular biology, cell biology, genetics and genomics essential to the student's ability to succeed in biological research and apply this content to research topics in the
VI. Course Outline

1.0 Research Project Proposals
   1.1 Choice of topic and experimental system
      1.1.1 Developing a research project from a topic of interest
      1.1.2. Choosing an effective model organism or model system
   1.2 Experimental design
      1.2.1 Developing research aims
      1.2.2 Developing hypotheses and designing experiments to address them
      1.2.3 Elaborating experimental protocols

2.0 Experimentation
   2.1 Practical methodology
      2.1.1 Chemical safety
      2.1.2 Handling reagents and making solutions
      2.1.3. Biological media and organism care
      2.1.4 Biological assays and molecular techniques
      2.1.5 Data collection
   2.2 Data analysis
      2.2.1. Qualitative data analysis
      2.2.2. Quantitative data analysis
      2.2.3. Critical analysis and troubleshooting

3.0 Research communication
   3.1 In-lab journal article presentation/discussion
   3.2 In-lab research project presentation/discussion
   3.3 Research Proposal
      3.3.1 Peer review
   3.4 Primary research manuscript
   3.5 Oral presentation to a scientific audience - In-class presentation
   3.6 Poster presentation

VII. Instructional Goals and Student Learning Outcomes:

A. The instructor will:
   Support the development of group projects aimed at investigating one or more biological phenomena using molecular approaches. This includes facilitating the discussion of research topics, the developments of research aims and experimental design. The instructor will provide review and critical analysis of student proposals in addition to the student-to-student peer review.

B. Student Learning Outcomes:

<table>
<thead>
<tr>
<th>Students will be able to:</th>
<th>Assessment Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop an experimental research plan,</td>
<td>Oral literature summary, written</td>
</tr>
<tr>
<td>including the elaboration of research</td>
<td>proposal, group discussion and peer</td>
</tr>
<tr>
<td>aims and experimental strategies, and the</td>
<td>review.</td>
</tr>
</tbody>
</table>


| Demonstrate competency in molecular laboratory technique including, in vitro DNA/RNA protein methods, genomics and gene expression analysis. | Laboratory exercises and group discussion. |
| Lead a small research team by coordinating group activity, maintaining communication and coordination of group efforts in written work and oral presentation | Laboratory exercises, primary research, written proposals, oral presentation and group discussion. |
| Communicate, to an audience of scientific peers, their project as primary scientific research. | Oral presentation, primary research paper. |

VIII. Suggested Text(s):

Barker K. 1998. At the Bench: A Laboratory Navigator. CSHL Press, Woodbury, NY

IX. Bibliography:

Journal articles from the primary literature (Science, Nature, Cell, EMBO J, Cell and Molecular Biology, etc) related to student research projects.

Web-based resources for project development and data analysis, including genomic analysis (NCBI and model organism databases), microarray and image analysis platforms (Image J and MAGIC Tool), and DNA sequence analysis.

Reference books related to student research topics and model systems, including:


### 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>AMSC Division of Math Science</td>
<td>Biology</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>BIOL</td>
<td>A461L</td>
<td>N/A</td>
<td>3</td>
<td>(0+6)</td>
</tr>
</tbody>
</table>

6. **Complete Course Title**

Molecular Biology Laboratory

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

<table>
<thead>
<tr>
<th>7. Type of Course</th>
<th>8. Type of Action:</th>
<th>9. Repeat Status No</th>
<th>10. Grading Basis</th>
<th>11. Implementation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Academic</td>
<td>☑ Add</td>
<td>N/A</td>
<td>☑ A-F</td>
<td>SPRING/2013</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>12. Cross Listed with</th>
<th>13a. Impacted Courses or Programs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Stacked with BIOL A661L</td>
<td>List any programs or college requirements that require this course.</td>
</tr>
</tbody>
</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).

13b. **Coordination Email**

Date: 04-26-2012

Submitted to Faculty Listserve: (uaa-faculty@lists.uaa.alaska.edu)

13c. **Coordination with Library Liaison**

Date: 04-26-2012

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)**

A practical implementation of the theory learned in BIOL A461, which includes in vitro DNA techniques, gene expression analysis, and genomics. Students will also learn experimental design, proposal writing, and oral and written presentation skills.

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

BIOL A461 with minimum grade of C or concurrent enrollment

16b. **Test Score(s)**

N/A

16c. **Co-requisite(s)**

(Concurrent enrollment required)

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**

Students enrolled in BIOL A461 have frequently requested a laboratory to provide hands-on understanding of the molecular methodologies discussed in the lecture course. Most molecular biology courses at other institutions have associated laboratories, and a laboratory will significantly enhance the learning experience in BIOL A461. Changing the BIOL A461L from one credit to three reflects the significant time commitment of students in the course (6hrs in lab per week), and will attract students to the course when it does not run concurrently with the lecture course.
<table>
<thead>
<tr>
<th>Role</th>
<th>Approval Status</th>
<th>Approval Status</th>
<th>Date</th>
</tr>
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<tbody>
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UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Implementation Date: Spring 2012.

II. Course Information
A. College: College of Arts and Sciences.
B. Course Subject/Number: BIOL A461L.
C. Course Title: Molecular Biology Laboratory.
D. Course Description: A practical implementation of the theory learned in BIOL A461, which includes in vitro DNA techniques, gene expression analysis, and genomics. Students will also learn experimental design, proposal writing, and oral and written presentation skills.
   Stacked with: BIOL A661L.
E. Credit Hours: 3.0
F. Contact Hours: 0+6.
G. Grading Basis: A-F.
H. Status of Course Relative to Degree Program: Selective course for BA-Biological Sciences, BS-Biological Sciences majors, Biology minors; BS Natural Sciences major.
I. Lab Fees (Yes/No): Yes.
J. Coordination: UAA Faculty Listserv, UAA Deans and Directors.
K. Prerequisites/Corequisite: BIOL A461, with minimum grade of C, or concurrent enrollment
L. Registration Restrictions: None

III. Course Activities:
This is a laboratory class meeting for two 3 hour sessions per week for 15 weeks.

IV. Evaluation:
Course grading is A-F. The evaluation methods, while at the discretion of the faculty member teaching the course, may include participation in group discussions and experimental work, reading and interpreting primary scientific literature and a presentation of project outcomes.

V. Course Level Justification:
Designed for Biological and Natural Sciences majors as a selective undergraduate course comparable to 400-level molecular biology laboratory courses offered at other universities.
VI. Course Outline

1.0 Research Project Proposals
1.1 Choice of topic and experimental system
   1.1.1 Developing a research project from a topic of interest
   1.1.2 Choosing an effective model organism or model system
1.2 Experimental design
   1.2.1 Developing research aims
   1.2.2 Developing hypotheses and designing experiments to address them
   1.2.3 Elaborating experimental protocols

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   2.1.2 Handling reagents and making solutions
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   2.2.1 Qualitative data analysis
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   2.2.3 Critical analysis and troubleshooting

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3.1 In-lab journal article presentation/discussion
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B. Student Learning Outcomes:

<table>
<thead>
<tr>
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<th>Assessment Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop an experimental research plan, including the elaboration of research aims and experimental strategies, and the evaluation of similar research proposals.</td>
<td>Oral literature summary, written proposal, group discussion and peer review.</td>
</tr>
<tr>
<td>Demonstrate competency in molecular</td>
<td>Laboratory exercises and group</td>
</tr>
</tbody>
</table>
laboratory technique including, in vitro DNA/RNA protein methods, genomics and gene expression analysis. discussion.

Communicate, to an audience of scientific peers, their project as primary scientific research. Oral presentation, primary research paper.

VIII. Suggested Text(s):

Barker K. 1998. At the Bench: A Laboratory Navigator. CSHL Press, Woodbury, NY

IX. Bibliography:

Journal articles from the primary literature (Science, Nature, Cell, EMBO J, Cell and Molecular Biology, etc) related to student research projects.

Web-based resources for project development and data analysis, including genomic analysis (NCBI and model organism databases), microarray and image analysis platforms (Image J and MAGIC Tool), and DNA sequence analysis.

Reference books related to student research topics and model systems, including:


# Course Action Request

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

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
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<tr>
<td>AS CAS</td>
<td>AMSC Division of Math Science</td>
<td>Geological Sciences</td>
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<tr>
<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours</th>
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<tr>
<td>GEOL</td>
<td>A690</td>
<td>none</td>
<td>1-4</td>
<td>(Lecture + Lab)</td>
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### 6. Complete Course Title

Graduate Topics in Geology

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

### 7. Type of Course

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

### 8. Type of Action:

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

If a change, mark appropriate boxes:

- [ ] Prefix
- [ ] Credits
- [ ] Title
- [ ] Grading Basis
- [ ] Course Description
- [ ] Test Score Prerequisites
- [ ] Other Restrictions
  - [ ] Class
  - [ ] Level
  - [ ] College
  - [x] Major
  - [ ] Other CCG (please specify)
- [ ] Cross-Listed with
- [x] Stacked with GEOL A490

### 9. Repeat Status

<table>
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<th># of Repeats</th>
<th>Max Credits</th>
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</table>

### 10. Grading Basis

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

### 11. Implementation Date

- From: Spring 2013
- To: /

### 12. Cross Listed with

### 13. Impact on Courses or Programs

- [ ] List any programs or college requirements that require this course.
- [ ] Submit a separate table.
- [ ] A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

### 14. General Education Requirement

Mark appropriate box:

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

### 15. Course Description

Intensive study of narrowly defined topic in geology with emphasis on current problems. Independent research project required.

Special note: May be repeated twice for a maximum of 12 credits with change of topic.

### 16. Course Prerequisite(s)

- (list prefix and number)

### 17. Mark if course has fees

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

### 19. Justification for Action

Designed as 600-level graduate course requiring independent research. Course takes advantage of the expertise of resident faculty, visiting faculty and community professionals. Current issues and topics not normally taught on a scheduled basis will be offered under this heading.

### Initiator (faculty only)

Kristine J Crossen

Initiator (TYPE NAME)

<table>
<thead>
<tr>
<th>Approved</th>
<th>Disapproved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dean/Director of School/College</td>
<td>Date</td>
</tr>
<tr>
<td>Undergraduate/Graduate Academic</td>
<td>Date</td>
</tr>
<tr>
<td>Provost or Designee</td>
<td>Date</td>
</tr>
</tbody>
</table>
I. Date of Initiation: Spring 2013

II. Course Information:
   A. College or School: College of Arts and Sciences
   B. Course Title: Graduate Topics in Geology
   C. Course Subject/Number: GEOL A690
   D. Credit Hours: 1-4
   E. Contact time: (1-4 + 0)
   F. Grading Information: A-F
   G. Course Description: Intensive study of narrowly defined topic in geology with emphasis on current problems. Independent research project required. Special note: May be repeated twice for a maximum of 12 credits with change of topic.
   H. Status of course relative to degree program: Graduate level course to serve students in interdisciplinary studies, the AEST joint CAS/SOE master’s program, and other M.S. degree programs.
   I. Course Attributes: Applies toward graduate level degree programs in interdisciplinary studies, AEST and other M.S. programs.
   J. Lab fees: yes
   K. Coordination: UAA faculty list serve
   L. Registration restrictions: Graduate standing

III. Instructional Goals and Student Learning Outcomes:
   A. Instructional Goals. The instructor will:
      1) Convey the geological concepts to the study of the particular topic.
      2) Demonstrate the applications of the selected topic to solving geologic problems and problems related to environmental sciences or other areas of interest.
      3) Guide students to utilize their problem solving skills to understand both the principles and applications of the selected geologic topic.
      4) Guide students in choosing a research topic and completing it in a professional manner.

   B. Student Learning Outcomes. The students will:
      1) Apply the principles of the selected topic to geologic, environmental, and other appropriate fields of study. Assessment: exams.
      2) Analyze recent literature and examples of modern applications of geological studies. Assessment: literature reviews and discussions.
3) Demonstrate research skills by participating in original research projects. Assessment: presentations and written papers.
4) Produce a professional quality presentation and a professional quality report at the conclusion of an individual research project. Improve their critical thinking skills through the analysis, discussion and synthesis of relevant professional literature. Assessment: professional quality presentations and written reports.

IV. Course Activities

The course consists of lectures, discussions, and small group collaboration facilitated by the instructor. Each student will initiate and complete a research project under the direction of the instructor.

VI Methods of Assessment:

Students will be evaluated based on homework assignments, exams, presentations, reports, and analysis, discussion, and synthesis of professional literature and the design and completion of professional quality research projects. Grades will be determined according to the syllabus of the individual instructor.

VI. Course Level Justification

Designed to be used as graduate level course to serve students in interdisciplinary studies, the AEST joint CAS/SOE master’s program, and other M.S. degree programs. Independent research, professional quality presentations and written reports required.

VII. Topical Course Outline

Course outline will vary by topics selected.

Example from existing course - GEOL A665 - Isotope Geochemistry

1. Law of Radioactivity
2. Radioactive Decay Modes
3. Isotope geochronometers
4. Methods of Dating
5. Applications of Radioactive Isotopes to Environmental Problems
6. Principles of stable isotope geochemistry
7. Isotope fractionation
8. Equilibrium effects
9. Kinetic effects
10. Biological fractionation
11. Trace metal isotopes
12. Isotopes of other elements

VII. Suggested Text(s)

Texts will vary depending on the topic of the course.

**Example from Isotope Geochemistry above:**


IX. Bibliography

References will vary depending on the selected topic.

**Example from Isotope Geochemistry above.**


1a. School or College
AS CAS

1b. Division
AMSC Division of Math Science

1c. Department
Geological Sciences

2. Course Prefix
GEOL

3. Course Number
A490

4. Previous Course Prefix & Number
none

5a. Credits/CEUs
1-4

5b. Contact Hours
(Lecture + Lab)
(1-4+0)

6. Complete Course Title
Advanced Topics in Geology

Abbreviated Title for Transcript (30 character)

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

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

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

9. Repeat Status Yes  ☐ # of Repeats  2  ☒ Max Credits  12

10. Grading Basis
☒ A-F  ☐ P/NP  ☐ NG

11. Implementation Date  semester/year
From:  Spring/2013  To:  /

12. ☐ Cross Listed with

☒ Stacked with GEOL A690  Cross-Listed Coordination

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

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

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

Initiator Name (typed): Kristine J Crossen  Initiator Signed Initials: _________  Date:_______________

13b. Coordination Email  Date: 10-8-12
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison  Date: 10-8-12

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)

Detailed study of selected topics in geology. Special note: May be repeated twice for a maximum of 12 credits with change of topic.

16a. Course Prerequisite(s) (list prefix and number)
GEOL A221

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)

17. ☒ Mark if course has fees

18. ☒ Mark if course is a selected topic course

19. Justification for Action

Designed as 400-level undergraduate course. Course takes advantage of the expertise of resident faculty, visiting faculty and community professionals. Current issues and topics not normally taught on a scheduled basis will be offered under this heading.

Initiator (faculty only)  Date
Kristine J Crossen
Initiator (TYPE NAME)

☑ Approved  ☐ Disapproved
Dean/Director of School/College  Date

☐ Approved  ☐ Disapproved
Undergraduate/Graduate Academic  Date

☐ Approved  ☐ Disapproved
Board Chairperson  Date

☐ Approved  ☐ Disapproved
Provost or Designee  Date
Course Content Guide
University of Alaska Anchorage
Department of Geological Sciences

GEOL A490
Advanced Topics in Geology

I. Date of Initiation: Spring 2013

II. Course Information:
   A. College or School: College of Arts and Sciences
   B. Course Title: Advanced Topics in Geology
   C. Course Subject/Number: GEOL A490
   D. Credit Hours: 1-4
   E. Contact time: (1-4 + 0)
   F. Grading Information: A-F
   G. Course Description: Detailed study of selected topics in geology. Special note:
      May be repeated twice for a maximum of 12 credits with change of topic.
   H. Status of course relative to degree program: May be used as upper-division
      elective to satisfy Geological Sciences major or minor.
   I. Course Attributes: Applies toward upper division requirement for Geological
      Sciences major or minor.
   J. Lab fees: yes
   K. Coordination: UAA faculty list serve
   L. Course Prerequisites: GEOL A221

III. Instructional Goals and Student Learning Outcomes:
A. Instructional Goals. The instructor will:
   1) Convey the geological concepts to the study of the particular topic.
   2) Demonstrate the applications of the selected topic to solving geologic
      problems and problems related to environmental sciences or other areas of
      interest.
   3) Guide students to utilize their problem solving skills to understand both
      the principles and applications of the selected geologic topic.

B. Student Learning Outcomes. The students will:
   1) Apply the principles of the selected topic to geologic, environmental, and
      other appropriate fields of study. Assessment: exams.
   2) Analyze recent literature and examples of modern applications of
      geological studies. Assessment: literature reviews.
   3) Develop research skills by participating in original research projects with
      their peers. Assessment: professional presentation.
IV. Course Activities

The course consists of lectures, discussions, and small group collaboration facilitated by the instructor.

V. Methods of Assessment:

Students will be evaluated based on homework assignments, exams, presentations, reports, and analysis, discussion, and synthesis of professional literature and the design and completion of research projects. Grades will be determined according to the syllabus of the individual instructor.

VI. Course Level Justification

Designed for Geological Science majors as an elective undergraduate course comparable to 400-level offerings at other universities. Designed to provide flexibility to offer and teach innovative senior-level lecture courses on a developmental basis. Such courses are essential to the student’s ability to succeed and integrate content with other 400-level courses in geological sciences.

VII. Topical Course Outline

Course outline will vary by topics selected.

Example from existing course - GEOL A465 - Isotope Geochemistry

1. Law of Radioactivity
2. Radioactive Decay Modes
3. Isotope geochronometers
4. Methods of Dating
5. Applications of Radioactive Isotopes to Environmental Problems
6. Principles of stable isotope geochemistry
7. Isotope fractionation
8. Equilibrium effects
9. Kinetic effects
10. Biological fractionation
11. Trace metal isotopes
12. Isotopes of other elements
VIII. Suggested Text(s)

Texts will vary depending on the topic of the course.

**Example from Isotope Geochemistry above:**


IX. Bibliography

References will vary depending on the selected topic.

**Example from Isotope Geochemistry above.**


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

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<th>1c. Department</th>
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<tr>
<td>EN SOENGR</td>
<td>No Division Code</td>
<td>CE</td>
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<tr>
<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours</th>
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</thead>
<tbody>
<tr>
<td>CE</td>
<td>A626</td>
<td>N/A</td>
<td>3.0</td>
<td>(3+0)</td>
</tr>
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</table>

6. Complete Course Title
Traffic Modeling and Simulation
Abbreviated Title for Transcript (30 character)

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

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

9. Repeat Status
- [ ] choose one
- [ ] # of Repeats
- [ ] Max Credits

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

11. Implementation Date
- [ ] semester/year
- [ ] From: Spring/2013
- [ ] To: 9999/9999

12. [ ] Cross Listed with
- [x] Stacked with CE A426

13a. Impacted Courses or Programs:
List any programs or college requirements that require this course.
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<td>Courtesy Coordination, 10/12/2012</td>
<td>Dr. Osama Abaza</td>
<td></td>
</tr>
<tr>
<td>Civil Engineering, MS</td>
<td>Courtesy Coordination, 10/12/2012</td>
<td>Dr. Osama Abaza</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Initiator Name (typed): Ghulam H. Bham
Initiator Signed Initials: __________
Date: __________

13b. Coordination Email
Date: 10/09/2012
submitted to Faculty Listserv: (ui-a-faculty@lists.uita.alaska.edu)

13c. Coordination with Library Liaison
Date: 10/09/2012

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
Introduces concepts of traffic flow simulation, modeling of driver behavior, and application of traffic simulation in Intelligent Transportation Systems (ITS).

16a. Course Prerequisite(s) (list prefix and number)
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)
Instructor’s permission and graduate standing
17. [ ] Mark if course has fees
18. [ ] Mark if course is a selected topic course

19. Justification for Action
A new course for transportation graduate students in traffic simulation. Not offered by other departments.

Initiator (faculty only)
Initiator (TYPE NAME)
Ghulam H. Bham

[ ] Approved
[ ] Disapproved

Date
Dean/Director of School/College

[ ] Approved
[ ] Disapproved

Date
Undergraduate/Graduate Academic

[ ] Approved
[ ] Disapproved

Date
Board Chairperson

[ ] Approved
[ ] Disapproved

Date
Provost or Designee

Ghulam H. Bham
Initiator (TYPE NAME)

[ ] Approved
[ ] Disapproved

Date
Department Chairperson

[ ] Approved
[ ] Disapproved

Date
Curriculum Committee Chairperson

Ghulam H. Bham
Initiator (TYPE NAME)

[ ] Approved
[ ] Disapproved

Date
Dean/Director of School/College

[ ] Approved
[ ] Disapproved

Date
Undergraduate/Graduate Academic

[ ] Approved
[ ] Disapproved

Date
Board Chairperson

[ ] Approved
[ ] Disapproved

Date
Provost or Designee

[ ] Approved
[ ] Disapproved

Date
Undergraduate/Graduate Academic
I. **Initiation Date:**

   October 9, 2012

II. **Course Information**

   A. **College:** School of Engineering  
   B. **Course Title:** Traffic Modeling and Simulation  
   C. **Course Subject/Number:** CE A626  
   D. **Credit Hours:** 3.0  
   E. **Contact:** 3+0  
   F. **Grading Information:** A-F  
   G. **Course Description:** Introduces concepts of traffic flow simulation, modeling of driver behavior, and application of traffic simulation in Intelligent Transportation Systems (ITS).

   **Special Note:** Stacked with CE A426

   H. **Status of course relative to degree or certificate program:** Graduate level course in Civil Engineering

   I. **Lab Fees:** No

   J. **Coordination:** UAA/SOE/CE faculty list serves

   K. **Course Prerequisites:** Graduate standing

   L. **Registration Restrictions:** Instructor’s permission and graduate standing

III. **Course Activities**

   Course activities will be composed of demonstration, lectures and discussion by instructor. Instructor will provide regular homework assignments, a project, review of high quality technical literature including journal papers and self-study materials. The instructor will also train students in related traffic simulation software. The students’ performance will be assessed based on homework, a final examination, project assignments that will lead to a detailed project report, and technical presentation on the project assigned.

IV. **Evaluation**

   Evaluation procedures are at the discretion of the instructor and will be discussed during the first class in the semester. Students will be evaluated on a semester long class project, homework assignments, presentations, technical skills, attendance and participation in class activities. Project evaluation will generally include quality of content, problem solving, and amount of effort. It is understood that progress will vary with individual students and is dependent upon skills, expertise, creativity, and/or amount of time devoted to each assignment.
V. Course Level Justification
This course builds on material covered in CE A402, Transportation Engineering, and CE A423/623, Traffic Engineering. It adds an important graduate level course in transportation engineering.

VI. Course Outline

- Fundamentals of system simulation
  - Define systems, models, simulation models
  - Define types of simulation models
- Building simulation models
  - Components of a simulation model
  - Steps in a simulation model
- Traffic flow simulation approaches
  - Analytical versus simulation
  - Discrete versus continuous
  - Macroscopic, mesoscopic, microscopic
- Traffic flow simulation software
  - PTV-America, McTrans, Transport Simulation System
- Review of probability and statistics
  - Random variables and their properties
  - Simulation output data and stochastic processes
  - Estimation of means and variances
  - Confidence interval
- Detailed review of development, calibration and validation of a microscopic multilane traffic simulation model
  - Concepts
  - Approaches
  - Methods
  - Statistical analysis of results
  - Stability analysis of the model
- Statistical modeling
  - Continuous distributions
  - Goodness-of-fit tests
- Random numbers
  - Mid-Square method
  - Linear Congruential Generators (LCG)
  - Test for random number generators
- Random variates
  - Inverse Transform
  - Composition
  - Convolution
  - Acceptance-Rejection
- Variance reduction technique
  - Common random numbers
VII. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. The instructor will:
   1. Emphasize the fundamental concepts and models of traffic simulation with emphasis on the techniques and skills of utilizing traffic simulation software to evaluate traffic operation and control strategies.
   2. Develop skills to conduct simulation studies for traffic operation and control, and the application of simulation models in research and the industry.

Student Learning Outcomes. After successful completion of course, student will be able to demonstrate:

<table>
<thead>
<tr>
<th>Learning Outcomes</th>
<th>Assessment Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proficiency in the use of microscopic traffic simulation models</td>
<td>Final project report, Class presentations, Exam.</td>
</tr>
<tr>
<td>Techniques to evaluate and interpret the results from microscopic traffic simulation models</td>
<td>Project assignments, Class presentations</td>
</tr>
<tr>
<td>Proficiency in the concepts of calibration and validation of simulation models</td>
<td>HW assignments, Project assignments, Project report, Exam</td>
</tr>
<tr>
<td>The application of simulation models for analyzing traffic operation and control</td>
<td>HW assignments, Project report, Exam.</td>
</tr>
<tr>
<td>Understanding of technical literature and their application</td>
<td>Review of technical literature related to traffic simulation models</td>
</tr>
<tr>
<td>The capability to write a technical report and present the results of their simulation studies to professionals</td>
<td>Project report and presentation</td>
</tr>
</tbody>
</table>

VIII. Suggested Text


IX. Bibliography and Resources

1. Technical journal papers
3. The following software can be used:
   a. VISSIM from PTV-America (http://www.ptvamerica.com),
   b. CORSIM from McTrans at Univ. of Florida (http://mctrans.ce.ufl.edu/),
   c. AIMSUN from Transport Simulation System (TSS) (http://www.aimsun.com).
### Course Action Request

**University of Alaska Anchorage**

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

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<thead>
<tr>
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<tr>
<td>5a. Credits/CEUs</td>
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<tr>
<td>5b. Contact Hours</td>
<td>(Lecture + Lab) (3+0)</td>
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</table>

**Complete Course Title**

Traffic Modeling and Simulation

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

**Type of Course**

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

**Type of Action:** Add

**Repeat Status**

- choose one

<table>
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<tr>
<th># of Repeats</th>
<th>Max Credits</th>
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</thead>
</table>

**Grading Basis**

- A-F
- P/NP
- NG

**Implementation Date**

- From: Spring/2013
- To: 9999/9999

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<th>12. Cross Listed with</th>
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**Initiator Name (typed): Ghulam H Bham**

**Initiator Signed Initials:**

**Date:**

**Impacted Courses or Programs:**

- List any programs or college requirements that require this course.

**Impact Program/Course**

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<th>Impact Program/Course</th>
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</table>

**Course Description**

Introduces concepts of traffic flow simulation, modeling of driver behavior, and application of traffic simulation in Intelligent Transportation Systems (ITS).

**Course Prerequisite(s)**

- [CE A402 and ES A302] with a minimum grade of C

**Test Score(s)**

**Co-requisite(s)**

**Other Restriction(s)**

**Registration Restriction(s)**

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

**Justification for Action**

Increases the available technical electives for civil engineering students. Not offered by other departments.

**Initiator (faculty only)**

**Ghulam H. Bham**

**Initiator Signed Initials:**

**Date:**

**Department Chairperson**

**Date:**

**Curriculum Committee Chairperson**

**Date:**

**Provost or Designee**

**Date:**

---

**General Education Requirement**

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

**Course Action Request**

**University of Alaska Anchorage**

---

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

---

**Initiator (TYPE NAME)**

**Approved**

**Disapproved**

**Dean/Director of School/College**

**Date**

**Undergraduate/Graduate Academic**

**Date**

**Board Chairperson**

**Date**

**Provost or Designee**

**Date**

---

28
I. Initiation Date: October 9, 2012

II. Course Information
A. College: School of Engineering
B. Course Title: Traffic Modeling and Simulation
C. Course Subject/Number: CE A426
D. Credit Hours: 3.0
E. Contact: 3+0
F. Grading Information: A-F
G. Course Description: Introduces concepts of traffic flow simulation, modeling of driver behavior, and application of traffic simulation in Intelligent Transportation Systems (ITS).

Special Note: Stacked with CE A626

H. Status of course relative to degree or certificate program:
   Technical elective, BS program in Civil Engineering

I. Lab Fees: No
J. Coordination: UAA/SOE/CE faculty list serves
K. Course Prerequisites: [CE A402 and ES A302] with a minimum grade of C
L. Registration Restrictions: None

III. Course Activities
Course activities will be composed of demonstration, lectures and discussion by instructor. Instructor will provide regular homework assignments, a project, review of high quality technical papers and self-study materials. The instructor will also train students in related traffic simulation software. The students’ performance will be assessed based on homework, a final examination, project assignments that will lead to a detailed project report, and technical presentation on the project assigned.

IV. Evaluation
Evaluation procedures are at the discretion of the instructor and will be discussed during the first class in the semester. Students will be evaluated on a semester long class project, homework assignments, presentations, technical skills, attendance and participation in class activities. Project evaluation will generally include quality of content, problem solving, and amount of effort. It is understood that progress will vary with individual students and is dependent upon skills, expertise, creativity, and/or amount of time devoted to each assignment.
V. Course Level Justification
This course is offered as a technical elective in transportation engineering. The course builds on material covered in CE A402, Transportation Engineering, and CE A423, Traffic Engineering.

VI. Course Outline

- Fundamentals of system simulation
  - Define systems, models, simulation models
  - Define types of simulation models
- Building simulation models
  - Components of a simulation model
  - Steps in a simulation model
- Traffic flow simulation approaches
  - Analytical versus simulation
  - Discrete versus continuous
  - Macroscopic, mesoscopic, microscopic
- Traffic flow simulation software
  - PTV-America, McTrans, Transport Simulation System
- Review of probability and statistics
  - Random variables and their properties
  - Simulation output data and stochastic processes
  - Estimation of means and variances
  - Confidence interval
- Detailed review of development, calibration and validation of a microscopic multilane traffic simulation model
  - Concepts
  - Approaches
  - Methods
  - Statistical analysis of results
  - Stability analysis of the model
- Statistical modeling
  - Continuous distributions
  - Goodness-of-fit tests
- Random numbers
  - Mid-Square method
  - Linear Congruential Generators (LCG)
  - Test for random number generators
- Random variates
  - Inverse Transform
  - Composition
  - Convolution
  - Acceptance-Rejection
- Variance reduction technique
  - Common random numbers
VII. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. The instructor will:

1. Emphasize the fundamental concepts and models of traffic simulation with emphasis on the techniques and skills of utilizing traffic simulation software to evaluate traffic operation and control strategies.
2. Develop skills to conduct simulation studies for traffic operation and control, and the application of simulation models for the industry.

Student Learning Outcomes. After successful completion of course, student will be able to demonstrate:

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<td>HW assignments, Project report, Exam.</td>
</tr>
<tr>
<td>The capability to write a technical report and present the results of their simulation studies to professionals</td>
<td>Project report and presentation</td>
</tr>
</tbody>
</table>

VIII. Suggested Texts


IX. Bibliography and Resources

2. The following software can be used:
   a. VISSIM from PTV-America (http://www.ptvamerica.com),
   b. CORSIM from McTrans at Univ. of Florida (http://mctrans.ce.ufl.edu/),
   c. AIMSUN from Transport Simulation System (TSS) (http://www.aimsun.com).