Course Change Request

Date Submitted: 04/30/18 10:03 am

Viewing: ALEC 608: Leadership of Volunteers

Last approved: 02/24/18 3:29 am
Last edit: 06/19/18 3:02 pm

Changes proposed by: awinterrowd

Catalog Pages referencing this course
- ALEC - Ag Leadership, Ed. & Comm
- Department of Agricultural Leadership, Education, and Communications

Programs referencing this course
- CERT-CG63: Extension Education - Certificate

Faculty Senate Number: FS.35.102

Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
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<tbody>
<tr>
<td>Ashley Winterrowd</td>
<td><a href="mailto:awinterrowd@tamu.edu">awinterrowd@tamu.edu</a></td>
<td>9794580390</td>
</tr>
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</table>

Rationale for Course

Edit
The proposed changes are part of a routine curriculum review.

Course prefix: ALEC
Course number: 608

Department: Ag Leadership, Educ & Comm
College/School: Agriculture & Life Sciences
Academic Level: Graduate
Academic Level (alternate): Undergraduate
Effective term: 2018-2019
Complete Course Title: Leadership of Volunteers
Abbreviated Course Title: LEADERSHIP OF VOLUNTEERS

Catalog course description
Models of volunteerism; reasons for volunteers; assessment and evaluation techniques; task descriptions; organizational relationships.

Prerequisites and Restrictions
Graduate classification.

Concurrent Enrollment: No
Should catalog prerequisites / concurrent enrollment be enforced?: No

Crosslistings: No
Crosslisted With:

Approval Path

1. 05/04/18 2:44 pm
   Tracy Rutherford (rutherford): Approved for ALEC Department Head
2. 05/04/18 4:56 pm
   Sandra Williams (sandra-williams): Approved for Curricular Services Review
3. 05/09/18 8:42 am
   Dawn Kerstetter (dkersteer): Approved for AG Committee Preparer GR
4. 05/16/18 2:22 pm
   Dawn Kerstetter (dkersteer): Approved for AG Committee Chair GR
5. 05/16/18 2:24 pm
   Dawn Kerstetter (dkersteer): Approved for AG College Dean GR
6. 06/13/18 9:08 am
   LaRhesa Johnson (lrjohnson): Approved for GC Preparer
7. 06/14/18 3:50 pm
   LaRhesa Johnson (lrjohnson): Approved for GC Chair
8. 06/14/18 5:51 pm
   Janet Gonzales (janet-gonzales): Approved for Faculty Senate Preparer

https://nextcatalog.tamu.edu/courseleaf/approve/?role=Faculty%20Senate%20Preparer
### ALEC 608: Leadership of Volunteers

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Repeatable for credit? No

Three-peat? No

CIP/Fund Code: 5201010016

Default Grade Mode: Letter Grade (G)

Alternate Grade Modes: Satisfactory/Unsatisfactory

Method of instruction: Lecture

Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education) Yes

---

### Learning Outcomes

Meets traditional face-to-face learning outcomes.

Describe how learning outcomes are met or provide justification why they are not met. Learning outcomes are met through lectures and assignments.

### Hours

Meets traditional face-to-face hours.

Describe how hours are met or provide justification why they are not met. The hours are met through lectures and assignments.

Will this course be taught as a distance education course? Yes

I verify that I have reviewed the FAQ for Export Control Basics for Distance Education. Yes

Is 100% of this course going to be taught in Texas? Yes

Will classroom space be needed for this course? No

This will be a required course or an elective course for the following programs:

Required (select program)

Elective (select program)

---

### Course Syllabus

Syllabus: Upload syllabus

Upload syllabus: [ALEC 608 Online Syllabus_ Boyd.doc](https://nextcatalog.tamu.edu/courseleaf/approve/?role=Faculty%20Senate%20Preparer)
Letters of support or other documentation: No / Yes

Additional information

Reviewer Comments:
- Tracy Rutherford (rutherford) (04/30/18 9:59 am): Rollback: Missing information
- Janet Gonzales (janet-gonzales) (06/19/18 3:02 pm): Rollback: Arrived 3 days after June 11 deadline. Will be on August agenda

Reported to state? No
I don’t know what your destiny will be, but one thing I know: The only ones among you who will be truly happy are those who will have sought and found how to serve.

Albert Schweitzer

COURSE DESCRIPTION/NATURE OF THE COURSE:
Leadership of volunteers is a study of human relationships. This course is pragmatic in its approach and one that can be used in volunteer organizations no matter what your title: program coordinator, board member, paid staff, or volunteer. The class sessions will include an examination of theory and models of volunteerism; reasons for volunteering; assessment and evaluation techniques; task descriptions; and building organizational relationships. I have high expectations of you. You are expected to do your work, take an active role in discussion, THINK, and learn from each other.

PREREQUISITE: Graduate Classification

LEARNING OUTCOMES: Upon completion of the course you will:
1. Understand the role of volunteers in nonprofit organizations and the role of the volunteer administrator.
2. Compare and contrast the three major models of volunteer management and apply one to the management of a nonprofit organization.
3. Gain leadership skills necessary to create a positive organizational culture
4. Create a volunteer management handbook that incorporates models and theories evaluated in class.

INSTRUCTOR: Dr. Barry L. Boyd 222 AGLS BLDG
979-862-3693 b-boyd@tamu.edu
Office Hours by Appointment (call 862-3001)

MEETING TIME AND LOCATION: Course will be delivered online via eCampus


COURSE EVALUATION:
Volunteer Administrator Shadow 100 points 14%
Module Reflection Papers (6 @ 50 points each) 300 points 43%
Trends in Volunteerism Paper 100 points 14%
Volunteer Management Teaching Portfolio (2 lessons @ 100 ea.) 200 points 29%
TOTAL COURSE POINTS 700 points 100%

COURSE GRADE:

<table>
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<td>Lesson 2 – Categories of Volunteers/Master Volunteers</td>
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<td><strong>Models of Volunteer Administration</strong></td>
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<td>Lesson 3 – GEMS – Educating Volunteers orienting, protecting, resourcing, and teaching</td>
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<td>6</td>
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<td>Lesson 5 – Sustaining Volunteers evaluating, recognizing, and redirecting, retaining or disengaging</td>
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<td>Lesson 2 – Leaders as Creators of the Vision</td>
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<tr>
<td>Week 10</td>
<td>Lesson 3 – Strategic Planning – Using SWOT to Reach your Vision</td>
<td>View Slides; Read Ch. 6 from text. Module 4 Reflection due 11/4</td>
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<tr>
<td>Module 5 Week 11 Systems Leadership</td>
<td>Lesson 1 – Understanding the System in Which You Operate Lesson 2 – Power and Delegation</td>
<td>View Slides; Lesson 1 due November 11;</td>
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<tr>
<td>Week 12</td>
<td>Lesson 3 – Working with Volunteer Board Members</td>
<td>View Slides; L 3 - Read Digital A chapter from your text (chapter is online) Module 5 Reflection due 11/18</td>
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<td>Module 6 Week 13 Week Organizational Culture</td>
<td>Lesson 1 – What is organizational culture? Lesson 2 – Creating a positive culture that nurtures volunteers</td>
<td>View Slides; Read Ch. 4 – Shaping an organizational culture...</td>
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<td>Week 14</td>
<td>Course Evaluations</td>
<td>Lesson 2 due November 30; Module 6 Reflection due 12/1</td>
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This course has been assigned three credit hours based upon the work represented by verifiable student achievement of institutionally established learning outcomes, direct faculty instruction, and academically engaged time (Federal Rule 75 FR 66832; see https://www.gpo.gov/fdsys/pkg/FR-2010-10-29/pdf/2010-26531.pdf).

DESCRIPTION OF ASSIGNMENTS:
Module Summaries – Modules may be spread out over 2-3 weeks. You are to write a two page reflection at the end of each Module and post in the Discussions area of E-campus. Describe what you believe to be the 3-5 most critical items of information in that module. If there are questions for thought posted in the Module directions, then also answer those questions.

Analysis Paper - “Current Trends in Volunteer Administration or Volunteerism.” A trend implies direction. Something is happening more frequently or less frequently. You may have noticed a trend in volunteering that you would like to expound upon, that would be a great subject-matter choice as well. You will prepare an analysis paper of a current trend, new theories, and/or models of volunteerism or volunteer administration. Explain how this trend impacts the volunteer administrator.

This paper should be between 600 and 1,000 words. Your primary reference should be from either a refereed journal article or from a reputable newspaper or magazine, that is not more than five years old. A refereed journal is one that the articles have been peer-reviewed. The first three journals listed under “useful links,” are all refereed journals. You may utilize as many references as you wish, but you should find at least two other supporting articles that support your main article. Double-space this paper, and follow the APA Style Manual (6th ed.). Spelling, grammar, and punctuation will affect your grade for this paper.

Volunteer Administrator Shadow
You will spend a minimum of 6 hours shadowing a volunteer administrator in a non-profit organization. This is a shadowing experience, not an interview. You are to observe them in action. At the end of the shadowing experience, you should ask them to describe their personal philosophy on leading volunteers. The shadowing should be done in a minimum of two-hour blocks. You will need to respond to the following items: a) what was your overall opinion of the agency in which you did your shadow? b) what volunteer models or strategies did the
VA use to assist with the administration of the volunteer program? c) provide information for how the VA addresses each of the following:

- Recruitment
- Job Descriptions
- Motivation
- Training and Development
- Risk Minimization or Management
- Rewards and Recognition
- Policies and Procedures
- How does the VA interact with volunteers, paid staff, directors of the non-profit
- Describe the VA’s philosophy on managing/leading
- Include the name of the volunteer administrator and their agency

The total document should be about 5 ds pages. 100 points.

**Volunteer Instructor Portfolio**

One of the goals of this class is to prepare you to be able to teach a professional development course to a group of volunteers. You are to develop your own non-profit organization that uses volunteers. You will need to name the organization and describe the following components that describe your organization. Part I is due by **September 15**.

**Part 1:**

- Name
- Purpose (Mission) of organization
- Brief history of organization
- Values that agency operates by
- Vision for the organization – what do you want to be?
- Roles of volunteers in your organization – what tasks do they do for you?

You will then develop two lessons that can be used in orienting or training volunteers. Each lesson should last 30-45 minutes (even though you will not actually present it) and contain the following elements:

- Learning objective for the lesson
- Resources required for the lesson
- Your notes or outline on the topic that include examples to illustrate key points
- One power point that you will use to cover the topic – should follow your outline
- One interactive activity (complete directions required and an explanation of how it reinforces for teaches your topic)

**Lesson 1:** due **November 11**

**Lesson 2:** due **December 1**

You may find the information in Chapter 10 on Training volunteers useful in preparing your lessons.

This assignment should be loaded into e-campus. Each lesson should be in its own folder on the drive with all accompanying notes, power points and resources in that folder.

**Explanation of assignments** (written or verbal) will be made in class. Grammar, spelling, punctuation, and readability will be considered in grading. All assignments should be typed, double-spaced (unless otherwise stated), and professional in appearance. All papers should be referenced using the APA Style Manual, 6th Edition. Assignments are due on the due date. I do NOT accept late assignments that are unexcused.
The "make up" policy follows university regulations. Assignments may be made up only if the absence was "university excused." See the Student Policy and Procedures Manual for descriptions of excused absences. Refer to the Student Rules regarding Academics at http://student-rules.tamu.edu.

**Americans with Disabilities Act (ADA) Policy Statement**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit http://disability.tamu.edu.

**Aggie Honor Code**

*An Aggie does not lie, cheat, or steal or tolerate those who do.*

“Cheating is worse than being stupid.” - Tommy Lee Jones in the film *Man of the House.*

Upon accepting admission to Texas A&M University, you assume a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. We will talk about trust being central to leadership. I expect you to demonstrate a high level of trust and integrity. Ignorance of the rules does not exclude any member of the Texas A&M University community from the requirements or the processes of the Honor System. For additional information, please visit: www.aggiehonor.tamu.edu.
Course Change Request

Date Submitted: 05/10/18 10:22 am

Viewing: **ALEC 623 : Survey of Evaluation Strategies for Agriculture**

Last edit: 05/14/18 2:53 pm

Changes proposed by: awinterrowd

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<tr>
<td><strong>Name</strong></td>
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<tr>
<td>Ashley Winterrowd</td>
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<tr>
<td><strong>E-mail</strong></td>
</tr>
<tr>
<td><a href="mailto:awinterrowd@tamu.edu">awinterrowd@tamu.edu</a></td>
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<tr>
<td><strong>Phone</strong></td>
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Rationale for Course

**Edit**

_The proposed changes are part of a routine curriculum review._

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Complete Course Title

Survey of Evaluation Strategies for Agriculture

Abbreviated Course Title

SURVEY EVAL STRATEGIES

Catalog course description

Designed to pull together theory, concepts, and strategies to give a broad understanding of the fundamentals of evaluation and to provide the knowledge and skills necessary to design and administer appropriate and effective evaluations.

Prerequisites and Restrictions

Graduate classification.

Concurrent Enrollment

No

Should catalog prerequisites / concurrent enrollment be enforced?

No

Crosslistings

No

Crosslisted With

In Workflow

1. ALEC Department Head
2. Curricular Services Review
3. AG Committee Preparer GR
4. AG Committee Chair GR
5. AG College Dean GR
6. GC Preparer
7. GC Chair
8. Faculty Senate Preparer
9. Faculty Senate
10. Provost II
11. President
12. Curricular Services
13. Banner

Approval Path

1. 05/10/18 10:35 am
   Tracy Rutherford (rutherford): Approved for ALEC Department Head
2. 05/14/18 2:55 pm
   Terra Bisse (t.bisse): Approved for Curricular Services Review
3. 05/14/18 3:05 pm
   Dawn Kerstetter (dkerstetter): Approved for AG Committee Preparer GR
4. 05/16/18 2:23 pm
   Dawn Kerstetter (dkerstetter): Approved for AG Committee Chair GR
5. 05/16/18 2:24 pm
   Dawn Kerstetter (dkerstetter): Approved for AG College Dean GR
6. 06/13/18 9:09 am
   LaRhesa Johnson (lrjohnson): Approved for GC Preparer
7. 06/14/18 3:51 pm
   LaRhesa Johnson (lrjohnson): Approved for GC Chair

Catalog Pages referencing this course

- ALEC - Ag Leadership, Ed. & Comm
- Department of Agricultural Leadership, Education, and Communications
- CERT-CG64: Advanced Pedagogy in Agriculture - Certificate
- CERT-CG63: Extension Education - Certificate

Programs referencing this course

- CERT-CG64: Advanced Pedagogy in Agriculture - Certificate
- CERT-CG63: Extension Education - Certificate
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Stacked: No  

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Repeatable for credit: No

Three-peat: No

CIP/Fund Code: 1306010004

Default Grade Mode: Letter Grade (G)

Alternate Grade Modes: Satisfactory/Unsatisfactory

Method of instruction: Lecture

Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education): Yes

Learning Outcomes:

Meets traditional face-to-face learning outcomes.

Describe how learning outcomes are met or provide justification why they are not met.

Learning outcomes are through lectures and assignments.

Hours:

Meets traditional face-to-face hours.

Describe how hours are met or provide justification why they are not met.

The hours are met through lectures and assignments.

Will this course be taught as a distance education course? Yes

I verify that I have reviewed the FAQ for Export Control Basics for Distance Education. Yes

Is 100% of this course going to be taught in Texas? Yes

Will classroom space be needed for this course? No

This will be a required course or an elective course for the following programs:

Required (select program)

Elective (select program)

Course Syllabus

Syllabus: Upload syllabus

Upload syllabus: ALEC623_Syllabus_FALL_2018_Murphy.doc
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<td>Reviewer Comments</td>
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<td>Reported to state?</td>
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TEXAS A&M UNIVERSITY
DEPARTMENT OF AGRICULTURAL LEADERSHIP, EDUCATION, AND COMMUNICATIONS

ALEC 623 Sections: 699-700 – Survey of Evaluation Strategies for Agriculture
(3 credits; 3 lecture hours)
Fall 2018

Course Description: Designed to pull together theory, concepts, and strategies to give a broad understanding of the fundamentals of evaluation and to provide the knowledge and skills necessary to design and administer appropriate and effective evaluations.

Prerequisite: Graduate classification.

Learning Outcomes:
1. Recognize and describe theories that can assist in designing evaluations.
2. Critique strategies that can be employed to conduct effective evaluations.
3. Summarize the evaluation cycle and data sources.
4. Explain methods of designing, developing, and implementing evaluations.
5. Justify the importance of logic models.
6. Recommend methods to increase efficiency and effectiveness.

Instructor Information:
Dr. Theresa Murphrey
Agriculture and Life Sciences Building Room 236
Phone: (979) 458-2749
E-mail: t-murphrey@tamu.edu
Office Hours: by appointment

Meeting Time & Location: Course will be delivered Online via eCampus


Recommended Resources:

Grading:

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<td>D</td>
<td>60 - 69%</td>
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<td>F</td>
<td>below 60%</td>
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Class Participation (Discussion Board Postings, Online Meetings, Etc.) 10% (10 points)
Unit Quizzes (12) 10% (10 points)
Vocabulary Quizzes (10) 10% (10 points)
Reflection Logs (14) 15% (15 points)
Presentation (1) 10% (10 points)
Reaction Papers (3) 25% (25 points)
Final Examination 20% (20 points)

Total 100%
Schedule/Outline:
Each week students are responsible for completing the following:

1.) Unit Lectures & Support Materials [listen/read online] (eCampus: Materials)
2.) Unit Activities (eCampus: Discussions)
3.) Unit Quizzes (eCampus: Assessments)
4.) Submission of Appropriate Assignments (eCampus: Assignments)

Each week’s unit will become available in eCampus - [http://ecampus.tamu.edu/](http://ecampus.tamu.edu/) on Monday evening and you will have until the following Monday at 11:00 P.M. to complete the unit, quizzes, and turn-in all the assignments.

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<th>UNIT:</th>
<th>TEXTBOOK READING ASSIGNMENTS:</th>
<th>Time</th>
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| 1    | Unit 1: Introduction & Overview  
Due | - Lecture/Reading Quiz 1 (Q01)  
- Vocabulary Quiz 1 (V01)  
- Updated Reflection Log (L01) | Ch. 1: What is Evaluation?  
Ch. 2: Defining the Purpose of the Evaluation | Est 9 hours |
| 2    | Unit 2: Evaluator Competencies  
Due | - Team Selection  
- Lecture/Reading Quiz (Q02)  
- Vocabulary Quiz 2 (V02)  
- Updated Reflection Log (L02) | Ch. 3: Identifying Evaluative Criteria | Est 9 hours |
| 3    | Unit 3: Evaluation Models – Part 1  
Due | - Lecture/Reading Quiz (Q03)  
- Vocabulary Quiz 3 (V03)  
- Updated Reflection Log (L03) | Ch. 4: Organizing the Criteria and Identifying Potential Sources of Evidence | Est 9 hours |
| 4    | Unit 4: Evaluation Models – Part 2  
Due | - Peer Review of Evaluation Model Overviews  
- Lecture/Reading Quiz (Q04)  
- Vocabulary Quiz 4 (V04)  
- Updated Reflection Log (L04) | Ch. 5: Dealing with the Causation Issue | Est 9 hours |
| 5    | Unit 5: Logic Models  
Due | - Team Presentation #1 will be presented during week 5. PowerPoint file is due the day before the team presentation.  
- Lecture/Reading Quiz (Q05)  
- Vocabulary Quiz 5 (V05)  
- Updated Reflection Log (L05) | *No Textbook Reading Assignment* | Est 11 hours |
| 6    | Unit 6: Understanding Data  
Due | - Reaction to Case Study #1  
- Lecture/Reading Quiz (Q06)  
- Vocabulary Quiz 6 (V06)  
- Updated Reflection Log (L06) | Ch. 6: “Values” in Evaluation | Est 9 hours |
| 7    | Unit 7: Recognizing the Need/Request for an Evaluation  
Due | - Peer Review of Case Study #1  
- Lecture/Reading Quiz (Q07)  
- Vocabulary Quiz 7 (V07)  
- Updated Reflection Log (L07) | Ch. 7: Determining Importance | Est 11 hours |
<table>
<thead>
<tr>
<th>Unit</th>
<th>Title</th>
<th>Due</th>
<th>Reading Assignment</th>
<th>Est Hours</th>
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<tr>
<td>8</td>
<td>Unit 8: The Role of Technology in Evaluation</td>
<td>- Team Presentation #2 will be presented during the week 8. PowerPoint file is due the day prior to the presentation. - Lecture/Reading Quiz (Q08) - Vocabulary Quiz 8 (V08) - Updated Reflection Log (L08)</td>
<td>Ch. 8: The Merit Determination Step</td>
<td>Est 9 hours</td>
</tr>
<tr>
<td>9</td>
<td>Unit 9: Evaluation Checklists</td>
<td>- Reaction to Case Study Presented by Team 2 - Lecture/Reading Quiz (Q09) - Vocabulary Quiz 9 (V09) - Updated Reflection Log (L09)</td>
<td>Ch. 9: Synthesis Methodology</td>
<td>Est 9 hours</td>
</tr>
<tr>
<td>10</td>
<td>Unit 10: Documentation of an Evaluation</td>
<td>- Peer Review of Case Study #2 - Lecture/Reading Quiz (Q10) - Vocabulary Quiz 10 (V10) - Updated Reflection Log (L10)</td>
<td>Ch. 10: Putting It All Together</td>
<td>Est 11 hours</td>
</tr>
<tr>
<td>11</td>
<td>Unit 11: Implications of Evaluations</td>
<td>- Team Presentation #3 will be presented during week 11. PowerPoint file is due the day prior to the presentation. - Lecture/Reading Quiz (Q11) - Updated Reflection Log (L11)</td>
<td>Ch. 11: Meta-evaluation</td>
<td>Est 9 hours</td>
</tr>
<tr>
<td>12</td>
<td>Unit 12: The Evaluation Process</td>
<td>No Textbook Reading Assignment</td>
<td>Est 9 hours</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Unit 13: Summary</td>
<td>- Peer Review of Case Study #3 - Updated Reflection Log (L13)</td>
<td>No Textbook Reading Assignment</td>
<td>Est 9 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>November 23-24 Thanksgiving Holiday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Unit 14: Final Comments &amp; Preparing for Final Exam</td>
<td>- Updated Reflection Log (L14)</td>
<td></td>
<td></td>
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<tr>
<td>15</td>
<td>Time allotted for final exam</td>
<td>- Last Day of Fall Semester Classes - Final Exam Due</td>
<td>No Textbook Reading Assignment</td>
<td>Est 3 hours</td>
</tr>
</tbody>
</table>

* Course announcements will be posted each week on Monday by 11:00pm to guide you through the course.
** Discussion Board Participation is not listed. Remember to complete your unit quiz and participate in the discussion postings each week.
*** All Chapters refer to your text Evaluation Methodology Basics: The nuts and bolts of sound evaluation by E. J. Davidson.

This course has been assigned three credit hours based upon the work represented by verifiable student achievement of institutionally established learning outcomes, direct faculty instruction, and academically engaged time (Federal Rule 75 FR 66832; see https://www.gpo.gov/fdsys/pkg/FR-2010-10-29/pdf/2010-26531.pdf).
Late Work and Make Up Policy:
The course deadlines are clearly stated above – be sure to print this to help you stay on track. The only deadline to be determined is the presentation deadline. You will sign up for a date to present during the first few weeks of class. Late work will follow university rules. See University Rules regarding attendance at URL http://student-rules.tamu.edu/rule07.

CLASS PARTICIPATION (10% - 10 points)
Everyone is expected to participate in discussion postings via the online classroom and the LIVE class meetings via Centra.

a. Discussion postings:
Throughout the course, you will be asked to post your thoughts to the class discussion board at various times. While I will not be “counting” the number of individual postings, I will be reviewing your posts throughout the class and will assess your participation on the quality of information shared with the class.

I expect a minimum of one post per discussion topic from each student. There will be times that you can contribute more or less than others. If you feel that you do not have anything to contribute to a particular topic, you should contribute to the discussion by posting a question. You may respond to either my initial posting or to your fellow student postings.

Some discussion board postings are used to encourage dialogue between and among fellow students – I encourage you to make use of this medium.

b. LIVE class meetings via an Online Conferencing System:
An online conferencing system will be used throughout the course for online class meetings. Access is free but you must have a microphone in order to participate.

The LIVE online meetings will be recorded for those who are unable to attend. If you are unable to attend a LIVE session, you will be allowed to listen/view the recorded session and submit a 1-page single-spaced summary of the topics shared during the session.

VERY IMPORTANT: You need to verify your connectability prior to the first connection. To verify your connectability follow the instructions in the Getting Started Section located on the course homepage. If you need assistance please contact me and I will be happy to set up a connection with you.

UNIT QUIZZES (10% - 10 points)
There will be quizzes to reinforce learning and to test your knowledge of the content being covered. You are allowed to take each quiz two times (The highest grade will be recorded). I encourage you to review the material before taking the quiz. The quizzes will count as 10% of your course grade. Each Unit Quiz will cover your Online Unit Material and Textbook Readings. Each quiz must be completed in “Assessments” by at the end of each week’s Unit on Monday by 11:00 P.M.

VOCABULARY QUIZZES (10% - 10 points)
There will be vocabulary quizzes to help you become familiar with the language of evaluation. The vocabulary for these quizzes will come primarily from the glossary of your textbook. You are allowed to take each quiz two times (The highest grade will be recorded). You can refer to your textbook and course materials during the quiz, however, only a very limited amount of time is allowed for each quiz. It is HIGHLY RECOMMENDED that you familiarize yourself with the vocabulary terms before taking the quiz, since it will be almost impossible to look up every term during the quiz. Each week approximately 20 Evaluation Vocabulary Words will be featured -- the vocabulary quiz for that week will cover these words and the words from the previous week. All words will be covered by the end of the sixth vocabulary quiz. Vocabulary quizzes V07, V08, V09, and V10 will include the entire list of vocabulary and will be randomly generated. Each quiz must be completed in “Assessments” by at the end of each week’s Unit on Monday by 11:00 P.M.

REFLECTION LOG (15% - 15 points)
We will use the Reflection Log Assignment as a journal on eCampus. This is a very simple process; you will add journal entries to your reflection log each week.
You will be adding notes to this journal throughout the semester and will be submitting it to me weekly for review. During the Unit audio lectures, I will be asking you to "pause" the lecture to answer questions, give me examples, etc.; you will enter your responses into your journal. You will also be asked to reflect on textbook readings, the case presentations, and other pertinent material.

Your responses are not expected to be extremely long but should address the questions presented. As you compose your reflection, remember that there is not a "right" or "wrong" response. I am looking for your thoughts and ideas.

Please begin each "journal log" entry with an appropriate unit number (i.e., Unit 01 Reflection Log, Unit 02 Reflection Log, etc.), this will help to keep the entries separated and will serve as a reference point to refer back to later in the course. The Reflection Log journal entries will count as 10% of your course grade.

PRESENTATION (10% - 10 points)
Each student will signup for a presentation team at the beginning of the course to present a short overview of a case study focused on evaluation and lead the class in discussion. The purpose of the "Presentation" is to provide a connection between course content and real-world application. The presentations will take place LIVE online. More information regarding the scope and format of the "Presentation" will be discussed in class.

REACTION PAPERS (25% - 25 points)
Each student will submit reaction papers for the three case studies that are presented. Submissions should be approximately two single–spaced pages and include the following: a) a summary of the main points, b) the strategies, theories and techniques illustrated in the case, c) a description of the model used in the evaluation and d) the most important concepts you learned from the case. You will use Peerceptive to complete peer reviews and discussions. You will complete three peer reviews per case and you will receive three peer reviews per case. Your grade is based on the peer reviews you complete and the peer reviews you will receive.

FINAL EXAMINATION (20% - 20 points)
The final exam will be an open-book test that includes knowledge and application questions.

Americans with Disabilities Act (ADA) Policy Statement
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit http://disability.tamu.edu.

Academic Integrity – Aggie Honor Code
"An aggie does not lie, cheat or steal, or tolerate those who do."
For additional information please visit: http://aggiehonor.tamu.edu.

University Copyright and Plagiarism Notice
The handouts used in this course are copyrighted. By “handouts,” I mean all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, in-class materials, review sheets, and additional items. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I expressly grant permission. As commonly defined, plagiarism consists of passing off as one’s own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section “Scholastic Dishonesty.”
Course Change Request

Date Submitted: 05/02/18 3:08 pm

Viewing: **ECEN 602 : Computer Communication and Networking**

Last edit: 05/02/18 4:51 pm
Changes proposed by: w-lala

Catalog Pages referencing this course
- Department of Electrical and Computer Engineering
- ECEN - Electrical & Comp Engr

Programs referencing this course
- MEN-CYBR: Master of Engineering in Cybersecurity Engineering

Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windy Lala</td>
<td><a href="mailto:w-lala@tamu.edu">w-lala@tamu.edu</a></td>
<td>979-458-3127</td>
</tr>
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</table>

Rationale for Course Edit

*The proposed changes are part of a routine curriculum review.*

Course prefix ECEN  
Course number 602

Department Electrical & Computer Eng
College/School College of Engineering
Academic Level Graduate
Academic Level (alternate) Undergraduate

Effective term **2018-2019**

Complete Course Title Computer Communication and Networking

Abbreviated Course Title COMPUTER COMM & NET

Catalog course description

Computer communication and computer networks; use of the International Standards Organization (ISO) seven-layer Open Systems Interconnection model as basis for systematic approach; operational networks to be included in the study of each layer; homework assignments to make use of a campus computer network.

Prerequisites and Restrictions

ECEN 646 or equivalent probability background.

Concurrent Enrollment No
Should catalog prerequisites / concurrent enrollment be enforced? No

Crosslistings No  
Crosslisted With

Stacked No  
Stacked with
ECEN 602: Computer Communication and Networking

<table>
<thead>
<tr>
<th>Semester Credit Hour(s)</th>
<th>Contact Hour(s) (per week):</th>
<th>Lecture: 3</th>
<th>Lab: 0</th>
<th>Other: 0</th>
<th>Total 3</th>
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</table>

Repeatable for credit? No
Three-peat? No
CIP/Fund Code 1409010006
Default Grade Mode Letter Grade (G)
Alternate Grade Modes Satisfactory/Unsatisfactory
Method of instruction Lecture
Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education) Yes

Learning Outcomes

Meets traditional face-to-face learning outcomes.

Describe how learning outcomes are met or provide justification why they are not met.

Learning outcomes are met in the same manner as the traditional, on-campus sections

Hours

Meets traditional face-to-face hours.

Describe how hours are met or provide justification why they are not met.

Course is scheduled to meet the same lecture requirements as a traditional, face-to-face section through alternative methods.

Will this course be taught as a distance education course? Yes No
I verify that I have reviewed the FAQ for Export Control Basics for Distance Education. Yes No

Is 100% of this course going to be taught in Texas? Yes
Will classroom space be needed for this course? Yes

This will be a required course or an elective course for the following programs:

Required (select program)
Elective (select program)

<table>
<thead>
<tr>
<th>Program(s)</th>
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</thead>
<tbody>
<tr>
<td>(MEN-ELEN) Master of Engineering in Electrical Engineering</td>
</tr>
<tr>
<td>(MS-ELEN) Master of Science in Electrical Engineering</td>
</tr>
<tr>
<td>(PHD-ELEN) Doctor of Philosophy in Electrical Engineering</td>
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</table>

Course Syllabus

https://nextcatalog.tamu.edu/courseleaf/approve/?role=Faculty%20Senate 2/3
Syllabus: Upload syllabus

ECEN 602 Syllabus Fall 2018.docx

Letters of support or other documentation
No

Additional information

Reviewer Comments

Reported to state?
Course title and number: ECEN 602, Computer Communication and Networking
Term (e.g., Fall 200X): Fall 2018
Meeting times and location: MWF 8:00-8:50 am in ETB 1037; Lecture Capture for Distance Students

Course Description and Prerequisites
Computer Communication and Networking, (3-0), Credit 3: Use of the ISO seven-layer OSI model as basis for systematic approach; operational networks to be included in the study of each layer; homework assignments to make use of campus computer network.

Prerequisites: ECEN 646 or equivalent probability background

Learning Outcomes or Course Objectives
While the Internet and its protocols have been the dominate force in networking for many years, there continues to be significant evolution and innovation in network hardware and applications. A student who successfully fulfills the course requirements will demonstrate an understanding of computer network theory and practice. Students will also demonstrate basic socket programming skills. A detailed class-by-class topic and reading list is included below.

Instructor Information
Name: Dr. Pierce Cantrell
Telephone number: (979) 845-3719 (Office)
Email address: p-cantrell@tamu.edu
Office hours: TBD
Office location: Wisenbaker (WEB) 333D

Textbook and/or Resource Material
Required textbook: L. Peterson and B. Davie, Computer Networks: A Systems Approach, 5th Edition. San Francisco, CA: Morgan Kaufmann, 2012. Class notes and lecture capture videos will be provided for each lecture using the university's learning management system eCampus. Go to http://ecampus.tamu.edu and login with your NetID/password. The class notes are either developed by the course instructor or derived from the original copyrighted notes of the textbook authors. Additional online references will be provided for the network programming and simulation assignments.

Grading Policies
The midterm and final exams will be open book and notes. While the final exam will be cumulative, the emphasis will be on the material subsequent to the midterm exam. The only electronic device allowed during the midterm or final exam is a calculator. Please put your cell phone, smartphone, smartwatch, laptop, etc. in your backpack during the exam. Face-to-Face Students: The midterm exam will be in-class and is on the schedule below. The final exam will be at the scheduled time during final exam week. Distance Students: We will need to make arrangements for an exam proctor, which could be your work supervisor, the Examity online proctoring service, or TAMU Testing Services. Please contact me early in the semester to make arrangements.
Homework assignments will count for 15% of the overall course grade. Homework will be assigned weekly in most cases.

Network Programming and Simulation Assignments will count for 20% of the overall course grade. There will be four network programming and one network simulation assignments. See additional information below.

The Midterm Exam will count for 30% of the overall course grade. The midterm is scheduled for Monday, October 15, 2018.

The Final Exam will count for 35% of the overall course grade. The final exam schedule for Fall 2018 has not been posted as of May 1, 2018.

Grading Scale

A = 90-100
B = 80-89
C = 70-79
D = 60-69
F = <60
<table>
<thead>
<tr>
<th>DATE</th>
<th>READ P&amp;D</th>
<th>TOPICS</th>
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<tbody>
<tr>
<td>M 8-27</td>
<td>1.1-1.2.2</td>
<td>Introduction Computer Communication &amp; Networking</td>
</tr>
<tr>
<td>W 8-29</td>
<td>1.2.3-1.3+Notes</td>
<td>Resource Sharing; Network Services; Network Architecture</td>
</tr>
<tr>
<td>F 8-31</td>
<td>1.4+Notes</td>
<td>Socket Programming</td>
</tr>
<tr>
<td>M 9-3</td>
<td>1.4-1.5+Notes</td>
<td>Socket Programming (cont); Network Performance</td>
</tr>
<tr>
<td>W 9-5</td>
<td>2.1-2.2+Notes</td>
<td>Physical Layer—Encoding; Nyquist; Shannon Capacity</td>
</tr>
<tr>
<td>F 9-7</td>
<td>2.1.1+Notes</td>
<td>Modulation—QAM &amp; OFDM; Links; EM Spectrum; Internet Svc</td>
</tr>
<tr>
<td>M 9-10</td>
<td>Notes</td>
<td>Transmission Media—TP, Coax, Pwr Ln, Fiber, Wireless</td>
</tr>
<tr>
<td>W 9-12</td>
<td>2.3-2.4+Notes</td>
<td>Link Layer—Framing; Error Detection</td>
</tr>
<tr>
<td>F 9-14</td>
<td>2.5-2.5.1+Notes</td>
<td>Error Correction; Link Layer Protocols Overview; Stop and Wait</td>
</tr>
<tr>
<td>M 9-17</td>
<td>2.5.2+Notes</td>
<td>Sliding Window Protocols; Simplified Throughput Analysis</td>
</tr>
<tr>
<td>W 9-19</td>
<td>Notes</td>
<td>Queueing Models; Little’s Thm; Poisson process</td>
</tr>
<tr>
<td>F 9-21</td>
<td>Notes</td>
<td>Birth-Death Process; M/M/1 queue; M/M/1/n</td>
</tr>
<tr>
<td>M 9-24</td>
<td>Notes</td>
<td>M/M/2; M/M/n/n; M/M/∞; M/G/1; Queueing Networks</td>
</tr>
<tr>
<td>W 9-26</td>
<td>Notes</td>
<td>Media Access Control Sublayer—Aloha; Slotted Aloha, Stability</td>
</tr>
<tr>
<td>F 9-28</td>
<td>Notes</td>
<td>Stabilizing Aloha; CSMA and CSMA-CD;</td>
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<tr>
<td>M 10-1</td>
<td>2.6+Notes</td>
<td>CSMA and CSMA-CD (cont); Original Ethernet</td>
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<tr>
<td>W 10-3</td>
<td>2.7+Notes</td>
<td>CSMA-Collision Avoidance (CA); IEEE 802.11 (Wi-Fi)</td>
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<tr>
<td>F 10-5</td>
<td>2.7+Notes</td>
<td>IEEE 802.11n</td>
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<tr>
<td>M 10-8</td>
<td>2.7+Notes</td>
<td>802.11ac, 802.11ad; Bluetooth, 802.15.4 (Zigbee); LTE</td>
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<tr>
<td>W 10-10</td>
<td>2.8.3.1</td>
<td>Internet of Things (IoT); Switching and Bridging</td>
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<tr>
<td>F 10-12</td>
<td>3.1+Notes</td>
<td>Switching and Bridging (cont); Switched Ethernet</td>
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<tr>
<td>M 10-15</td>
<td>Midterm Exam</td>
<td>All material through 10-9: open book/notes</td>
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<tr>
<td>W 10-17</td>
<td>Notes</td>
<td>Switched Ethernet-100 Mbps, 1 Gbps, 10 G, 40/100 G, 400 G</td>
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<tr>
<td>F 10-19</td>
<td>3.2-3.2.5</td>
<td>Network Layer—IPv4, IPv4 addr.; IP forwarding, Classless Adr.</td>
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<tr>
<td>M 10-22</td>
<td>3.2.5-3.2.9</td>
<td>CIDR, ARP, DHCP, ICMP, VPN; GRE Tunnel</td>
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<tr>
<td>W 10-24</td>
<td>3.3-3.3.3</td>
<td>Routing-shortest path: distance vector; link state</td>
</tr>
<tr>
<td>F 10-26</td>
<td>3.3.3-3.4</td>
<td>Routing-OSPF, IGP, and Metrics; Switch and Router Architecture</td>
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<tr>
<td>M 10-29</td>
<td>3.4+Notes</td>
<td>Router Architecture (cont); Software Defined Networking (SDN)</td>
</tr>
<tr>
<td>W 10-31</td>
<td>4.1-4.1.2+Notes</td>
<td>Global Internet; Tier 1/2/3 ISPs; Internet2; IXP</td>
</tr>
<tr>
<td>F 11-2</td>
<td>4.1.2.4.1.3+Notes</td>
<td>Global R&amp;E Net; Border Gateway Protocol (BGP); IPv6; NAT</td>
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<tr>
<td>M 11-5</td>
<td>4.2</td>
<td>Multicast</td>
</tr>
<tr>
<td>W 11-7</td>
<td>4.3</td>
<td>MPLS</td>
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<tr>
<td>F 11-9</td>
<td>5.0-5.2.5.2</td>
<td>Transport Layer—UDP and TCP</td>
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<tr>
<td>M 11-12</td>
<td>5.2.5-5.4.3</td>
<td>TCP (cont); RPC; RTP</td>
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<tr>
<td>W 11-14</td>
<td>6.1-6.3.1+Notes</td>
<td>Congestion Control; TCP Congestion Control</td>
</tr>
<tr>
<td>F 11-16</td>
<td>6.3.2-6.4+Notes</td>
<td>TCP Congestion Control (cont); Congestion Avoidance</td>
</tr>
<tr>
<td>M 11-19</td>
<td>6.5</td>
<td>Quality of Service (QoS)</td>
</tr>
<tr>
<td>W 11-21</td>
<td>Reading Day (No Class)</td>
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</tr>
<tr>
<td>F 11-23</td>
<td>Thanksgiving Holiday</td>
<td></td>
</tr>
<tr>
<td>M 11-26</td>
<td>7.1.7.2</td>
<td>Presentation Services—Network Data Rep. and Multimedia data</td>
</tr>
<tr>
<td>W 11-28</td>
<td>8.1-8.3</td>
<td>Network Security—Crypto basics; Key distribution; Auth protocols</td>
</tr>
<tr>
<td>F 11-30</td>
<td>8.4.8.9.1-9.1.1</td>
<td>Example Network Security Systems; Applications Layer-SMTP</td>
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<tr>
<td>M 12-3</td>
<td>9.1.2</td>
<td>HTTP/HTTPS</td>
</tr>
<tr>
<td>W 12-5</td>
<td>9.3.1</td>
<td>Domain Name System (DNS)</td>
</tr>
</tbody>
</table>
Other Pertinent Course Information

Attendance and Makeup Policy: Attendance to class or the recitation is optional. You can access the recorded lectures and recitations in eCampus. Please do your best to be present for the midterm and final exams. If you miss the midterm or the final and have a university excused absence, you will have the option of a makeup exam or scaling up the midterm or final exam percentages. If you do not have an excused absence, you will receive a zero unless there are extenuating circumstances. Please see me before the scheduled time for the exam if possible. I will expect a written confirmation of a visit to a health care professional, affirming the date and time of the visit, for an injury or illness that requires you to be absent from the midterm or final exams. Please review the Student Rule on attendance http://student-rules.tamu.edu/rule07. If you have an excused absence, I will accept your late homework, network program, or network simulation without penalty. If you do not have an excused absence, I will accept late homework for up to one class period after the due date (e.g., if the homework is due on Wednesday, you can submit late homework no later than class time on Friday) with 10 points off (i.e., one letter grade). I will accept network programming assignments up to one week after the due date with 10 points off.

Network Programming and Simulation Assignments: There will be four network socket programming assignments in C or C++ and one ns-2 Network Simulator assignment. Online resources for socket programming and ns-2 as well as an account on the ECE Linux computers will be provided. The course Teaching Assistant will offer a weekly, evening recitation session to provide information and help on the network programming and simulation assignments. Attendance at the recitation session is optional; it will also be streamed live and recorded via CollaborateUltra, and you will be able to ask questions via audio and chat. You will work in a team of two people on the network programming and simulation assignments. You are welcome to form your own team and email me. If I do not receive an email from you with your team makeup by Wednesday, August 29, 2018, I will assign you to a team randomly (if possible, I will assign a Computer Science/Computer Engineering with an EE major).

Americans with Disabilities Act (ADA)
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit http://disability.tamu.edu.

Academic Integrity

“An Aggie does not lie, cheat, or steal, or tolerate those who do.”

It is acceptable to discuss homework problems with your classmates, but the work you turn in should be your own and not a team effort.

You will be on a team of two people for the network programming and simulation assignments. It is acceptable to discuss the network programming and simulation assignments with your classmates, but the work you turn in should be only that of your team. All programming assignments will be submitted to Turnitin.com through eCampus, which is used to detect software plagiarism.
Course Change Request

Date Submitted: 05/02/18 3:18 pm

Viewing: **ECEN 605: Linear Multivariable Systems**

Last approved: 06/18/17 3:16 am

Last edit: 05/02/18 4:55 pm

Changes proposed by: w-lala

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<th>Catalog Pages referencing this course</th>
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<tr>
<td>Department of Electrical and Computer Engineering</td>
</tr>
<tr>
<td>Department of Mechanical Engineering</td>
</tr>
<tr>
<td>ECEN - Electrical &amp; Comp Engr</td>
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<td>MEEN - Mechanical Engineering</td>
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Faculty Senate Number  FS.34.311

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<tr>
<td>Katie Bryan</td>
<td><a href="mailto:k.bryan@tamu.edu">k.bryan@tamu.edu</a></td>
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</table>

Rationale for Course

*The proposed changes are to support major changes to an existing program.*

*The proposed changes are part of a routine curriculum review.*

<table>
<thead>
<tr>
<th>Course prefix</th>
<th>ECEN</th>
<th>Course number</th>
<th>605</th>
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</table>

<table>
<thead>
<tr>
<th>Department</th>
<th>Electrical &amp; Computer Eng</th>
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</thead>
<tbody>
<tr>
<td>College/School</td>
<td>College of Engineering</td>
</tr>
<tr>
<td>Academic Level</td>
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</tr>
<tr>
<td>Academic Level (alternate)</td>
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<thead>
<tr>
<th>Effective term</th>
<th>2018-2019 2017-2018</th>
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<table>
<thead>
<tr>
<th>Complete Course Title</th>
<th>Linear Multivariable Systems</th>
</tr>
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<table>
<thead>
<tr>
<th>Abbreviated Course Title</th>
<th>LINEAR MULTIVARIABLE SYSTEMS</th>
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<table>
<thead>
<tr>
<th>Catalog course description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single input single output systems, multivariable systems, linear servomechanism problem and linear quadratic optimal control; emphasis on linear systems, classical linear control theory and modern state space control theory.</td>
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<table>
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<tr>
<th>Prerequisites and Restrictions</th>
<th>Graduate classification.</th>
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<table>
<thead>
<tr>
<th>Concurrent Enrollment</th>
<th>No</th>
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<table>
<thead>
<tr>
<th>Should catalog prerequisites / concurrent enrollment be enforced?</th>
<th>No</th>
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</table>

| Crosslistings | No |

<table>
<thead>
<tr>
<th>Crosslisted With</th>
</tr>
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In Workflow

1. ECEN Department Head
2. Curricular Services Review
3. EN Committee Preparer GR
4. EN Committee Chair GR
5. EN College Dean GR
6. GC Preparer
7. GC Chair
8. Faculty Senate Preparer
9. Faculty Senate
10. Provost II
11. President
12. Curricular Services
13. Banner

Approval Path

1. 05/02/18 3:25 pm Scott Miller (scott-l-miller): Approved for ECEN Department Head
2. 05/02/18 4:55 pm Terra Bissett (t.bissett): Approved for Curricular Services Review
3. 05/03/18 4:41 pm Jennifer Veracruz (jveracruz): Approved for EN Committee Preparer GR
4. 05/10/18 10:33 am Harry Hogan (h-hogan): Approved for EN Committee Chair GR
5. 05/10/18 10:37 am Harry Hogan (h-hogan): Approved for EN College Dean GR
6. 06/13/18 12:15 pm Meagan Kelly (meagankelly): Approved for GC Preparer
7. 07/20/18 4:25 pm LaRhesa Johnson (lrjohnson): Approved for GC Chair

History

1. Jun 18, 2017 by Katie Bryan (katieann06)
ECEN 605: Linear Multivariable Systems

Stacked: No

<table>
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<th>Semester</th>
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<tr>
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<tr>
<td>Lecture: 3</td>
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</table>

Repeatable for credit: No

Three-peat: No

CIP/Fund Code: 1410010006

Default Grade Mode: Letter Grade (G)

Alternate Grade Modes: Satisfactory/Unsatisfactory

Method of instruction: Lecture and Laboratory

Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education) Yes

Learning Outcomes

Meets traditional face-to-face learning outcomes.

Describe how learning outcomes are met or provide justification why they are not met.

Learning outcomes are met in the same manner as the traditional, on-campus sections.

Hours

Meets traditional face-to-face hours.

Describe how hours are met or provide justification why they are not met.

Course is scheduled to meet the same lecture and recitation requirements as a traditional, face-to-face section through alternative methods.

Will this course be taught as a distance education course? Yes

I verify that I have reviewed the FAQ for Export Control Basics for Distance Education. Yes

Is 100% of this course going to be taught in Texas? Yes

Will classroom space be needed for this course? Yes

This will be a required course or an elective course for the following programs:

Required (select program)

<table>
<thead>
<tr>
<th>Program(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MEN-ELEN) Master of Engineering in Electrical Engineering</td>
</tr>
<tr>
<td>(MS-ELEN) Master of Science in Electrical Engineering</td>
</tr>
<tr>
<td>(PHD-ELEN) Doctor of Philosophy in Electrical Engineering</td>
</tr>
<tr>
<td>(MEN-CEEN) Master of Engineering in Computer Engineering</td>
</tr>
<tr>
<td>(MS-CEEN) Master of Science in Computer Engineering</td>
</tr>
<tr>
<td>(PHD-CEEN) Doctor of Philosophy in Computer Engineering</td>
</tr>
</tbody>
</table>
Course Syllabus

Syllabus: Upload syllabus
ECEN 605 Syllabus Final Dr B 22817.docx

Letters of support or other documentation: No

Key: 4315
Course title and number
Linear Multivariable Systems, ECEN 605

Term
Fall 2017

Meeting times and location
To be arranged (3 hours lectures, 1 hour lab)

Course Description and Prerequisites

The course deals with the single input single output systems, multivariable systems, linear
servomechanism problem, and linear quadratic optimal control. The emphasis is on linear systems and
a thorough coverage of classical linear control theory and modern state space control theory is given.
It is assumed that the student has had an undergraduate course in Control Systems and has a working
knowledge of a programming language such as Matlab. A detailed listing of topics and a weekly
schedule follows:

1. Single input Single output systems

1.1 Laplace Transform Review

1.2 Linear Algebra Review

1.3 Static and Dynamic Models

1.4 State Variable and Transfer Function Models

1.5 Stability and Stabilization

1.6 Tracking, disturbance rejection and pole placement

1.7 Classical control, Nyquist criterion and stability margins

2. Multivariable Systems

2.1 Realization Theory

2.2 State Feedback

2.3 Observers

3. Linear Servomechanism problem

3.1 Problem formulation
3.2 Internal models
3.3 Existence conditions
3.4 Closed-loop structure

4. Linear Quadratic Optimal Control

4.1 $H_2$ optimal control Linear Quadratic Regulator (LQR)

4.2 $H_\infty$ optimal control

<table>
<thead>
<tr>
<th>Weekly Schedule of Topics</th>
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<tbody>
<tr>
<td>Week 1</td>
</tr>
<tr>
<td>Week 2</td>
</tr>
<tr>
<td>Week 3</td>
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<tr>
<td>Week 12</td>
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<td>Week 13</td>
</tr>
<tr>
<td>Week 14</td>
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</table>
Instructor Information

Name: S.P. Bhattacharyya
Telephone: 979-845-7484
Email: spb@tamu.edu
Office hours: 2-3pm T-R
Office location: 244C WERC

Textbook and/or Resource Material

References:
- Linear Systems, T. Kailath,
- Linear Systems, P. J. Antsaklis and A. N. Michel.

Grading Policies

Assignments and Tests

Homework will be assigned approximately every two weeks. (Total 7 assignments)

Tests will be administered once every four weeks (Total 3 tests)
- All Homeworks are required.
- There will be three tests
- Homework grade is worth 60%.
- Test grade is worth 40%

Grading Scale

*Standard Letter Grading Scale:*
A = 90-100
B = 80-89
C = 70-79
D = 60-69
F = <=60

Attendance and make-up policies: Please refer to http://student-rules.tamu.edu/rule07
Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit http://disability.tamu.edu.

Academic Integrity

For additional information please visit: http://aggiehonor.tamu.edu

"An Aggie does not lie, cheat, or steal, or tolerate those who do."
Course Change Request

Viewing: ECEN 608 : Modern Control

Also listed as: MEEN 674

Last edit: 05/14/18 2:57 pm
Changes proposed by: w-lala

Catalog Pages referencing this course
ECEN 608: Department of Electrical and Computer Engineering
Department of Mechanical Engineering
ECEN - Electrical & Comp Engr
MEEN - Mechanical Engineering
MEEN 674: Department of Electrical and Computer Engineering
Department of Mechanical Engineering

Faculty Senate Number

Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windy M. Lala</td>
<td><a href="mailto:w-lala@tamu.edu">w-lala@tamu.edu</a></td>
<td>979-458-3127</td>
</tr>
</tbody>
</table>

Rationale for Course Edit

The proposed changes are part of a routine curriculum review.

Course prefix: ECEN
Course number: 608
Department: Electrical & Computer Engineering
College/School: College of Engineering
Academic Level: Graduate
Academic Level (alternate): Undergraduate
Effective term: 2018-2019

Complete Course Title: Modern Control
Abbreviated Course Title: MODERN CONTROL

Catalog course description
Vector Norms; Induced Operator Norms; Lp stability; the small gain theorem; performance/robustness trade-offs; L1 and Hoo optimal P control as operator norm minimization; H2 optimal control.

Prerequisites and Restrictions
ECEN 605 or equivalent.

Concurrent Enrollment: No
Should catalog prerequisites / concurrent enrollment be enforced? No

Crosslistings: Yes
Crosslisted With:

In Workflow
1. ECEN Department Head
2. MEEN Department Head
3. Curricular Services Review
4. EN Committee Preparer GR
5. EN Committee Chair GR
6. EN College Dean GR
7. GC Preparer
8. GC Chair
9. Faculty Senate Preparer
10. Faculty Senate
11. Provost II
12. President
13. Curricular Services
14. Banner

Approval Path
1. 04/09/18 10:12 am
   Windy Lala (w-lala): Approved for ECEN Department Head
2. 05/11/18 9:58 am
   Dan McAdams (dmcadams): Approved for MEEN Department Head
3. 05/14/18 2:57 pm
   Terra Bisset (t.bisset): Approved for Curricular Services Review
4. 06/14/18 4:51 pm
   Jennifer Veracruz (jveracruz): Approved for EN Committee Preparer GR
5. 06/28/18 5:35 pm
   Harry Hogan (h-hogan): Approved for EN College Dean GR
6. 06/28/18 5:36 pm
   Harry Hogan (h-hogan): Approved for EN College Dean GR
7. 07/03/18 8:40 am
   LaRhesa Johnson (lrjohnson): Approved for GC Preparer
8. 07/20/18 4:25 pm
   LaRhesa Johnson (lrjohnson): Approved for GC Chair

https://nextcatalog.tamu.edu/courseleaf/approve/?role=Faculty%20Senate
<table>
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<tr>
<td>Three-peat?</td>
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<tr>
<th>CIP/Fund Code</th>
<th>Default Grade Mode</th>
<th>Alternate Grade Modes</th>
<th>Method of instruction</th>
<th>Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education)</th>
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<tr>
<td>141010006</td>
<td>Letter Grade (G)</td>
<td>Satisfactory/Unsatisfactory</td>
<td>Lecture</td>
<td>Yes</td>
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</table>

**Learning Outcomes**

- **Meets traditional face-to-face learning outcomes.**
- **Learning outcomes are met in the same manner as the traditional, on-campus sections;**

**Hours**

- **Meets traditional face-to-face hours.**
- **Course is scheduled to meet the same lecture and recitation requirements as a traditional, face-to-face section through alternative methods.**

<table>
<thead>
<tr>
<th>Will this course be taught as a distance education course?</th>
<th>Yes No</th>
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<tbody>
<tr>
<td>I verify that I have reviewed the FAQ for Export Control Basics for Distance Education.</td>
<td>Yes No</td>
</tr>
<tr>
<td>Is 100% of this course going to be taught in Texas?</td>
<td>Yes</td>
</tr>
<tr>
<td>Will classroom space be needed for this course?</td>
<td>Yes</td>
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</table>

This will be a required course or an elective course for the following programs:

**Required (select program)**

**Elective (select program)**

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<tr>
<td>(PHD-ELEN) Doctor of Philosophy in Electrical Engineering</td>
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# Course Syllabus

<table>
<thead>
<tr>
<th>Syllabus:</th>
<th>Upload syllabus</th>
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<tbody>
<tr>
<td>Letters of support or other documentation</td>
<td>No</td>
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<td>Additional information</td>
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<tr>
<td>Reviewer Comments</td>
<td></td>
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<tr>
<td>Reported to state?</td>
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[ECEN608 syllabus.doc]
Course title and number: ECEN 608 - Modern Control
Term: Fall 2018
Meeting times and location: 2:20 p.m.-3:35 p.m., Tu, Th, 1003 ETB

Course Description and Prerequisites
This course introduces students to the modern optimal control techniques of H-infinity and l-1 optimal control. Starting from the basics, it introduces the necessary mathematical machinery and poses several optimal control problems as ones involving the minimization of induced norms, under the constraint of closed loop stability. Several mathematically elegant solutions from the control literature are discussed.

Prerequisites: ECEN 605 or equivalent

Learning Outcomes or Course Objectives
Most graduate students entering the Controls area lack enough mathematical background to follow the vast literature that has been accumulated since the 1980’s. This can seriously impede their progress and the objective of this course is to remedy the situation. Having taken this course, the students will develop a good understanding of the modern control techniques of H-infinity and l-1 optimal control. In addition, they will be well equipped to follow the highly mathematical literature typically associated with the controls area.

Instructor Information
Name: Dr. A. Datta
Telephone number: (979) 845-5917
Email address: datta@ece.tamu.edu
Office hours: 3:45 p.m.-4:45 p.m., Tu, Th, and by appointment
Office location: 212F WEB

Textbook and/or Resource Material

Due to the potential conflict of interest involved in prescribing this book, I have checked with the publisher, and they have offered me the following solution. Since the book is a reference, it is on ENGnetBASE which Texas A & M subscribes to. This means that every chapter of the book is available to you (for free) online since our library already subscribes to ENGnetBASE. Please look into this and let me know if you encounter any problems.

Grading Policies
Grading will be based on an in-class exam and homeworks. The exam will count towards 50% of the grade while the homeworks will account for the remaining 50%.
Grading Scale: A=90-100, B=80-89, C=70-79, D=60-69, F=below 60.
# Course Topics, Calendar of Activities, Major Assignment Dates

Exam 1: Thursday, October 11th, 2018.
Homework 1: due on Tuesday, November 20th, 2018.
Homework 2: due on Thursday, November 29th, 2018

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Required Reading</th>
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<tbody>
<tr>
<td>1</td>
<td>Vector Spaces and Norms</td>
<td>Appendix A, Section A.1</td>
</tr>
<tr>
<td>2</td>
<td>Metric Spaces</td>
<td>Appendix A, Section A.2</td>
</tr>
<tr>
<td>3</td>
<td>Equivalent Norms and Convergence</td>
<td>Appendix A, Section A.3</td>
</tr>
<tr>
<td>4</td>
<td>Induced Norms for Linear Maps</td>
<td>Appendix B, Section B.1</td>
</tr>
<tr>
<td>5</td>
<td>Properties of Fourier and Laplace Transforms</td>
<td>Appendix B, Sections B.2 &amp; B.3</td>
</tr>
<tr>
<td>6</td>
<td>Induced Norms for Convolution Maps</td>
<td>Appendix B, Section B.4</td>
</tr>
<tr>
<td>7</td>
<td>Small Gain Theorem</td>
<td>Chapter 14, Sections 14.1 &amp; 14.2</td>
</tr>
<tr>
<td>8</td>
<td>L-Stability and Robustness</td>
<td>Chapter 14, Section 14.3</td>
</tr>
<tr>
<td>9</td>
<td>YJBK Parametrization of All Stabilizing Controllers</td>
<td>Chapter 14, Section 14.4</td>
</tr>
<tr>
<td>10</td>
<td>Posing Control Problems in the H-infinity Framework</td>
<td>Chapter 14, Section 14.5</td>
</tr>
<tr>
<td>11</td>
<td>Single-Input Single-Output H-infinity Optimal Control</td>
<td>Chapter 14, Section 14.6</td>
</tr>
<tr>
<td>12</td>
<td>Single-Input Single-Output I-1 Optimal Control</td>
<td>Chapter 14, Section 14.7</td>
</tr>
<tr>
<td>13</td>
<td>Multi-Input Multi-Output H-infinity Optimal Control using Hankel Approximation Theory</td>
<td>Chapter 15, Section 15.1</td>
</tr>
<tr>
<td>14</td>
<td>The Doyle-Glover-Khargonekar-Francis Solution</td>
<td>Chapter 15, Section 15.2</td>
</tr>
</tbody>
</table>

## Other Pertinent Course Information

None

## Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-
845-1637. For additional information, visit [http://disability.tamu.edu](http://disability.tamu.edu).

## Academic Integrity

For additional information please visit: [http://aggiehonor.tamu.edu](http://aggiehonor.tamu.edu)

*“An Aggie does not lie, cheat, or steal, or tolerate those who do.”*
Course Change Request

Date Submitted: 05/11/18 7:14 pm

Viewing: **ECEN 620 : Network Theory**

Last edit: 06/13/18 3:27 pm

Changes proposed by: w-lala

| Catalog Pages referencing this course | Department of Electrical and Computer Engineering  
ECEN - Electrical & Comp Engr |
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Programs referencing this course</td>
<td>CERT-AMIC: Analog and Mixed-Signal Integrated Circuit Design</td>
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Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windy Lala</td>
<td><a href="mailto:w-lala@tamu.edu">w-lala@tamu.edu</a></td>
<td>979-458-3127</td>
</tr>
</tbody>
</table>

Rationale for Course

The proposed changes are part of a routine curriculum review.

Course prefix: ECEN  
Course number: 620

Department: Electrical & Computer Eng

College/School: College of Engineering

Academic Level: Graduate

Effective term: 2018-2019

Complete Course Title: Network Theory

Abbreviated Course Title: NETWORK THEORY

Catalog course description

Development and application of advanced topics in circuit analysis and synthesis in both the continuous and discrete time and frequency domains.

Prerequisites and Restrictions

ECEN 326 or equivalent.

Should catalog prerequisites / concurrent enrollment be enforced?

No

Crosslistings

No

Crosslisted With

Stacked

No

Stacked with

Semester: 3  
Contact Hour(s): 3  
Lecture: 3  
Lab: 0  
Other: 0  
Total: 3

Repeatable for credit?

No

In Workflow

1. ECEN Department Head
2. Curricular Services Review
3. EN Committee Preparer GR
4. EN Committee Chair GR
5. EN College Dean GR
6. GC Preparer
7. GC Chair
8. Faculty Senate Preparer
9. Faculty Senate
10. Provost II
11. President
12. Curricular Services
13. Banner

Approval Path

1. 05/31/18 4:29 pm  
   Sco Miller (sco-lmiller): Approved for ECEN Department Head

2. 06/01/18 11:02 am  
   Terra Bissett (t.bissett): Approved for Curricular Services Review

3. 06/14/18 4:52 pm  
   Jennifer Veracruz (jveracruz): Approved for EN Committee Preparer GR

4. 06/28/18 5:35 pm  
   Harry Hogan (h-hogan): Approved for EN Committee Chair GR

5. 06/28/18 5:36 pm  
   Harry Hogan (h-hogan): Approved for EN College Dean GR

6. 07/03/18 8:40 am  
   LaRhesa Johnson (lrjohnson): Approved for GC Preparer

7. 07/20/18 4:25 pm  
   LaRhesa Johnson (lrjohnson): Approved for GC Chair
CIP/Fund Code: 1410010006
Default Grade Mode: Letter Grade (G)
Method of instruction: Lecture
Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education) Yes

Learning Outcomes

Meets traditional face-to-face learning outcomes.

Describe how learning outcomes are met or provide justification why they are not met.

Learning outcomes are met in the same manner as the traditional, on-campus sections

Hours

Meets traditional face-to-face hours.

Describe how hours are met or provide justification why they are not met.

Course is scheduled to meet the same lecture requirements as a traditional, face-to-face section through alternative methods.

Will this course be taught as a distance education course? Yes

I verify that I have reviewed the FAQ for Export Control Basics for Distance Education. Yes

Is 100% of this course going to be taught in Texas? Yes

Will classroom space be needed for this course? Yes

This will be a required course or an elective course for the following programs:

Required (select program)  
Elective (select program)  

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

Course Syllabus

Syllabus: Upload syllabus
Upload syllabus: ECEN 620 syllabus.doc

Letters of support or other documentation: No
Additional information
Reviewer Comments
Course title and number  ECEN 620 – Network Theory: Broadband Circuit Design
Term  Fall 2018
Meeting times and location  TR 2:20-3:35pm in ETB 1035

Course Description and Prerequisites
Development and application of advanced topics in circuit analysis and synthesis in both the continuous and discrete time and frequency domains.

Prerequisites: ECEN 474

Learning Outcomes or Course Objectives
At the end of this course, students be able to
1. Understand broadband circuit design methodologies and key principles
2. Understand phase-locked loop system design for applications such as frequency synthesis and clock recovery.
3. Understand the design specifications and implementation details of phase-locked loops and clock and data recovery systems.
4. Understand the design specifications and implementation details of broadband amplifiers, such as limiting, transimpedance, and variable-gain amplifiers.

Instructor Information
Name  Sam Palermo
Telephone number  979/458-4114
Email address  spalermo@ece.tamu.edu
Office hours  TW 8:30-10:00am
Office location  315E WEB

Textbook and/or Resource Material
Textbook: Class Notes and Technical Papers

References:

Class Notes:
Posted on the web and will hand out hard copies in class

Grading Policies
Exams 60%
- Three Midterm Exams (20% each), No Final Exam
- Closed book
- One double sided 8.5x11 note sheet allowed
- No make-up exams except for university excused absences

Homework 20%
- You are encouraged to work together with your colleagues on the homework. However,
each student must turn in an independent write-up.
- No late assignments will be graded

**Final Project 20%**
- Report and PowerPoint presentation required

### Grading Scale*

**Letter Grade x = Your Average**

- **A** \( x \geq 90.00 \)
- **B** \( 89.99 \geq x \geq 80.00 \)
- **C** \( 79.99 \geq x \geq 70.00 \)
- **D** \( 69.99 \geq x \geq 60.00 \)
- **F** \( 59.99 \geq x \)

*This is the lowest grade that you are guaranteed for your raw average, \( x \). Depending on the relative performance of the class, your grade **MAY** be adjusted higher.

### Course Topics, Calendar of Activities, Major Assignment Dates

<table>
<thead>
<tr>
<th>Topic</th>
<th>Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Introduction and Linear Systems II. PLL System Analysis</td>
<td>Week 1-4</td>
</tr>
<tr>
<td>1st Exam</td>
<td>Oct. 2</td>
</tr>
<tr>
<td>III. PLL Building Blocks</td>
<td>Week 5-9</td>
</tr>
<tr>
<td>IV. CDRs</td>
<td></td>
</tr>
<tr>
<td>2nd Exam</td>
<td>Nov. 6</td>
</tr>
<tr>
<td>V. Broadband Amplifiers</td>
<td>Week 10-14</td>
</tr>
<tr>
<td>VI. Other Topics</td>
<td></td>
</tr>
<tr>
<td>3rd Exam</td>
<td>Nov. 29</td>
</tr>
<tr>
<td>Project Report Due</td>
<td>Dec. 5</td>
</tr>
<tr>
<td>Project Presentation</td>
<td>Dec. 12</td>
</tr>
</tbody>
</table>

*Exam dates are approximate and subject to change with reasonable notice.

### Other Pertinent Course Information

#### Attendance Policy

“The University views class attendance as the responsibility of an individual student. Attendance is essential to complete the course successfully. University rules related to excused and unexcused absences are located on-line at [http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07).”

#### Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit [http://disability.tamu.edu](http://disability.tamu.edu).

#### Academic Integrity

For additional information please visit: [http://aggiehonor.tamu.edu](http://aggiehonor.tamu.edu)

“An Aggie does not lie, cheat, or steal, or tolerate those who do.”
Course Change Request

Viewing: ECEN 622 : Active Network Synthesis

Last edit: 06/13/18 3:28 pm
Changes proposed by: w-lala

Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windy Lala</td>
<td><a href="mailto:w-lala@tamu.edu">w-lala@tamu.edu</a></td>
<td>979-458-3127</td>
</tr>
</tbody>
</table>

Rationale for Course

The proposed changes are part of a routine curriculum review.

Catalog course description

Methods of analyzing and synthesizing active networks; sensitivity analysis, methods of rational fraction approximation, OP AMP modeling and stability.

Prerequisites and Restrictions

ECEN 457 or equivalent.

Should catalog prerequisites / concurrent enrollment be enforced?

No

Crosslistings

No

Stacked

No

Semester

3

Contact Hour(s)

3 (per week):

Lecture:

3

Lab:

0

Other:

0

Total

3

Repeatable for credit?

No

In Workflow

1. ECEN Department Head
2. Curricular Services Review
3. EN Committee Preparer GR
4. EN Committee Chair GR
5. EN College Dean GR
6. GC Preparer
7. GC Chair
8. Faculty Senate Preparer
9. Faculty Senate
10. Provost II
11. President
12. Curricular Services
13. Banner

Approval Path

1. 05/06/18 11:33 pm Miroslav Begovic (begovic): Approved for ECEN Department Head
2. 05/07/18 8:26 am Sandra Williams (sandra-williams): Approved for Curricular Services Review
3. 06/14/18 4:52 pm Jennifer Veracruz (jveracruz): Approved for EN Committee Preparer GR
4. 06/28/18 5:35 pm Harry Hogan (h-hogan): Approved for EN Committee Chair GR
5. 06/28/18 5:37 pm Harry Hogan (h-hogan): Approved for EN College Dean GR
6. 07/03/18 8:40 am LaRhesa Johnson (lrjohnson): Approved for GC Preparer
7. 07/20/18 4:26 pm LaRhesa Johnson (lrjohnson): Approved for GC Chair
Learning Outcomes

Meets traditional face-to-face learning outcomes.

Describe how learning outcomes are met or provide justification why they are not met.

Learning outcomes are met in the same manner as the traditional, on-campus sections

Hours

Meets traditional face-to-face hours.

Describe how hours are met or provide justification why they are not met.

Course is scheduled to meet the same lecture requirements as a traditional, face-to-face section through alternative methods.

I verify that I have reviewed the FAQ for Export Control Basics for Distance Education.

Yes No

Will this course be taught as a distance education course?

Yes No

Is 100% of this course going to be taught in Texas?

Yes

Will classroom space be needed for this course?

Yes

This will be a required course or an elective course for the following programs:

Required (select program)

Elective (select program)

<table>
<thead>
<tr>
<th>Program(s)</th>
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<tbody>
<tr>
<td>(MEN-ELEN) Master of Engineering in Electrical Engineering</td>
</tr>
<tr>
<td>(MS-ELEN) Master of Science in Electrical Engineering</td>
</tr>
<tr>
<td>(PHD-ELEN) Doctor of Philosophy in Electrical Engineering</td>
</tr>
</tbody>
</table>

**Course Syllabus**

Syllabus: Upload syllabus

Upload syllabus  **ECEN 622 syllabus.doc**

Letters of support or other documentation

No

Additional information

Reviewer Comments
Course title and number: ECEN 622 – Active Network Synthesis
Term: Fall 2018
Meeting times and location: TR 3:55-5:10pm in ETB 1035

Course Description and Prerequisites
Methods of analyzing and synthesizing active networks; sensitivity analysis, methods of rational fraction approximation, OP AMP modeling and stability.

Prerequisites: ECEN 457 or Equivalent

Learning Outcomes or Course Objectives
To analyze, understand and synthesize integrated CMOS active-filters. In particular the design of functional filters for a host of practical applications, from very low frequency of less than 1Hz up to GHz range RF Filters. Several applications for data communication and medical will be discussed. To learn how to apply design trade-offs and to combine optimally theory, simulations and practice in filter designs.

Instructor Information
Name: Edgar Sanchez-Sinencio
Telephone number: 979/845-7498
Email address: s-sanchez@tamu.edu
Office hours: Mon, Wed. 11:00am-12:00pm
Office location: 318E WEB

Textbook and/or Resource Material
No single textbook is suggested. Use Ref [7] as a basic reference.

Notes: see our webpage under: http://www.ece.tamu.edu/~s-sanchez/

Reference:
Press. Good discussion on Gm-C filters.


**Grading Policies**

<p>| | |</p>
<table>
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<tr>
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<tbody>
<tr>
<td>Partial Exam 1</td>
<td>25%</td>
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<tr>
<td>Partial Exam 2</td>
<td>25%</td>
</tr>
<tr>
<td>Final Project*</td>
<td>35%</td>
</tr>
<tr>
<td>Homework</td>
<td>10%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
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</table>

**Grading Scale**

- A = 90-100
- B = 80-89
- C = 70-79
- D = 60-69
- F = <60

**Course Topics, Calendar of Activities, Major Assignment Dates**

<table>
<thead>
<tr>
<th>DATE</th>
<th>SUBJECT</th>
<th>REMARKS</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug. 28, &amp; Aug. 30</td>
<td>Into &amp; evolution of Electronic devices and passive and active filters</td>
<td>Overall view of course, and Historical development</td>
<td>Notes</td>
</tr>
<tr>
<td>Sept. 11 &amp; 13</td>
<td>Tow Thomas Biquad and Non-Ideal Integrators</td>
<td>Discussion on Integrated Biquad Filters</td>
<td>References [2], [3], [7]</td>
</tr>
<tr>
<td>Sept. 18, &amp; 20</td>
<td>Filter approximation Magnitude And Phase</td>
<td>Trade-Offs of different approximations</td>
<td>Notes and References [4], [7]</td>
</tr>
<tr>
<td>Sept. 25 &amp; 27</td>
<td>Band-Pass based and Multi-Phase Oscillators. Adaptive Filters</td>
<td>Power, area and noise considerations</td>
<td>Notes and Papers [3], [9]</td>
</tr>
<tr>
<td>Oct. 2 &amp; 4</td>
<td>Gm-C filter Fundamentals and Biquads and higher order cascade filters</td>
<td>High and Low Frequency Filters</td>
<td>Note and references [3], [6], [8]</td>
</tr>
<tr>
<td>Exam 1(outside Scheduled Class time).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oct. 9, &amp; 11</td>
<td>Continuous-Time Leap-Frog Topologies</td>
<td>Low sensitivity structures</td>
<td>Notes and references [4], [7], [9]</td>
</tr>
<tr>
<td>Oct. 23 &amp; 25</td>
<td>Active –R &amp; Active -C</td>
<td>Use GB as a design parameter</td>
<td>Papers [7], [9]</td>
</tr>
<tr>
<td>Oct 30 &amp; Nov. 1</td>
<td>Ring Oscillator Based Filters</td>
<td>A New Filter Design Approach</td>
<td>Papers [9]</td>
</tr>
<tr>
<td>Nov. 6 &amp; 8</td>
<td>Switched-R Filters</td>
<td>Z-Domain Mathematics</td>
<td>Notes and references [4]</td>
</tr>
<tr>
<td>Nov. 13 &amp; 15</td>
<td>Switched Capacitor Building Blocks</td>
<td>Design Trade-Offs</td>
<td>Notes and references, [2], [6]</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------</td>
<td>------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td><em>Nov. 20 (22 Thanksgiving)</em></td>
<td>Examples of filter applications: Multi-Standard RX Baseband Filters</td>
<td>Details on Applications</td>
<td>Notes and references [8], Sec. XV</td>
</tr>
<tr>
<td>Nov. 27 &amp; 29</td>
<td>Other Examples Final Presentation 1</td>
<td>Recent results.</td>
<td>References and Notes [2], [6]</td>
</tr>
<tr>
<td>Dec. 4 (Last day of semester)</td>
<td>Final Project Presentation 2</td>
<td>Powerpoint oral presentations of Final projects.</td>
<td></td>
</tr>
</tbody>
</table>

**Other Pertinent Course Information**

1) No final exam will be given. Partial exams might be take-home or closed book (with only one page information possibly). Exams might be scheduled to be out of class.

2) There will be no make-up exams for individual cases, unless it is properly justified, e.g. medical or family emergency.

3) Quizzes will be given randomly without previous notice.

4) Homework is due at the beginning of the class on the due date. Late homework is not accepted.

5) Knowledge of using CADENCE, and SIMULINK (of MATLAB) is highly recommended.

*Written final report is due December 8, 2018 before noon. Hard copy and soft copy.

**Official Final:** December 12th 8:00 – 10:00AM

* Thanksgiving, Nov. 22 & 23.

**Americans with Disabilities Act (ADA)**

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**Academic Integrity**

For additional information please visit: [http://aggiehonor.tamu.edu](http://aggiehonor.tamu.edu)

“An Aggie does not lie, cheat, or steal, or tolerate those who do.”
Course Change Request

Date Submitted: 05/02/18 3:57 pm

Viewing: ECEN 665: Integrated CMOS RF Circuits and Systems

Last edit: 05/02/18 5:02 pm
Changes proposed by: w-lala

Catalog Pages referencing this course
Department of Electrical and Computer Engineering
ECEN - Electrical & Comp Engr

Programs referencing this course
CERT-AMIC: Analog and Mixed-Signal Integrated Circuit Design

Faculty Senate Number

Contact(s)

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<td>979-458-3127</td>
</tr>
</tbody>
</table>

Rationale for Course

The proposed changes are part of a routine curriculum review.

Course prefix ECEN Course number 665
Department Electrical & Computer Eng
College/School College of Engineering
Academic Level Graduate
Academic Level (alternate) Undergraduate
Effective term 2018-2019

Complete Course Title Integrated CMOS RF Circuits and Systems
Abbreviated Course Title INTEGRATED CMOS RF CIRCT

Catalog course description
Introduction to wireless communication systems at the theoretical, algorithmic and circuit levels; emphasis on simulation at the architecture, transistor levels of the communication systems; focus on circuits implementable on CMOS and BiCMOS technologies.

Prerequisites and Restrictions
ECEN 453, ECEN 456, ECEN 474.

Concurrent Enrollment No
Should catalog prerequisites / concurrent enrollment be enforced? No
Crosslistings No Crosslisted With
Stacked No Stacked with

Approval Path

1. 05/02/18 4:39 pm Miroslav Begovic (begovic): Approved for ECEN Department Head
2. 05/02/18 5:02 pm Terra Bisse (t.bisse): Approved for Curricular Services Review
3. 05/03/18 4:41 pm Jennifer Veracruz (jveracruz): Approved for EN Committee Preparer GR
4. 05/10/18 10:33 am Harry Hogan (h-hogan): Approved for EN Committee Chair GR
5. 05/10/18 10:37 am Harry Hogan (h-hogan): Approved for EN College Dean GR
6. 06/13/18 12:15 pm Meagan Kelly (meagankelly): Approved for GC Preparer
7. 07/20/18 4:26 pm LaRhesa Johnson (lrjohnson): Approved for GC Chair

https://nextcatalog.tamu.edu/courseleaf/approve/?role=Faculty%20Senate
 Semester 4  
Credit Hour(s)  
Contact Hour(s) (per week):  3  2  0  
Total  5  
Repeatable for credit? No  
Three-peat? No  
CIP/Fund Code 1410010006  
Default Grade Mode Letter Grade (G)  
Alternate Grade Modes Satisfactory/Unsatisfactory  
Method of instruction Lecture and Laboratory  
Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education) Yes  
Learning Outcomes  
Meets traditional face-to-face learning outcomes.  
Describe how learning outcomes are met or provide justification why they are not met. Learning outcomes are met in the same manner as the traditional, on-campus sections  
Hours  
Meets traditional face-to-face hours.  
Describe how hours are met or provide justification why they are not met. Course is scheduled to meet the same lecture and lab requirements as a traditional, face-to-face section through alternative methods.  
Will this course be taught as a distance education course? Yes No  
I verify that I have reviewed the FAQ for Export Control Basics for Distance Education. Yes No  
Is 100% of this course going to be taught in Texas? Yes  
Will classroom space be needed for this course? Yes  
This will be a required course or an elective course for the following programs:  
Required (select program)  
Elective (select program)  
<table>
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</tr>
<tr>
<td>(PHD-ELEN) Doctor of Philosophy in Electrical Engineering</td>
</tr>
</tbody>
</table>

Course Syllabus

https://nextcatalog.tamu.edu/courseleaf/approve/?role=Faculty%20Senate
Syllabus: Upload syllabus

ECEN665-Syllabus.docx

Letters of support or other documentation: No

Additional information:

Reviewer Comments:

Reported to state?
Course title and number: **ECEN 665: Integrated CMOS RF Circuits and Systems**
Section 600, 700

Term: Fall 2018

Meeting times and location:
MWF 3:00 – 3:50 pm; ETB1035
Lecture: 3 hours     Lab: 3 hours
Credit: 4

**Course Description and Prerequisites**
The purpose of this course is to understand, analyze and design of RF integrated systems and circuits. Special attention for a top-down design approach will be given. In particular the analysis and design of key building blocks are presented. Discussion of modern applications of RFICs will be provided. It is advisable that you are familiar with CADENCE, Simulink, RF-Spectre and other communication system simulators.

Course Prerequisites: ECEN 474 (Needs to be taken at least simultaneously), Graduate standing, Approval of the instructor

**Learning Outcomes or Course Objectives**
This is a graduate level course on the principles and applications of RF integrated circuits for wireless transceivers. The principles of operation, modeling, design and fabrication of the most common RF CMOS integrated circuits will be discussed.

**Instructor Information**
Name: Prof. Sebastian Hoyos, Department of Electrical and Computer Engineering
Telephone: 979-845-4253
Email address: hoyos@ece.tamu.edu
Office hours: MW 4:00-5:00 pm or by appointment.
Office location: 315D WERC

**Textbook and/or Resource Material**

**Recitation**
No official recitation class is scheduled by the department. Students can set individual appointments with the TA if necessary
Attendance is optional. Class participation grade will be determined by one or more of the following: attendance in lecture, in-class quizzes.
Grading Policies

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Laboratory</td>
<td>25%</td>
</tr>
<tr>
<td>Two Exams</td>
<td>35%</td>
</tr>
<tr>
<td>Homework</td>
<td>15%</td>
</tr>
<tr>
<td>Final Project</td>
<td>25%</td>
</tr>
</tbody>
</table>

Grading Scale (out of 100): A: 90-100; B: 80-89; C: 70-79; D: 60-69; F: 59 or lower

Homework

They will be assigned at the conclusion of each topic taught in class.

Computer Access

To use NI Multisim or LabView, you can either use the ECE open labs (205, WEB) and the ECEN 325 lab.

Course Topics, Calendar of Activities, Major Assignment Dates

<table>
<thead>
<tr>
<th>Sessions</th>
<th>Topic (tentative, subject to change)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classes 1-4</td>
<td>Basic concepts in RF design</td>
</tr>
<tr>
<td>Classes 5-10</td>
<td>Wireless standards and transceiver architectures</td>
</tr>
<tr>
<td>Classes 11-14</td>
<td>Passive devices on silicon</td>
</tr>
<tr>
<td>Classes 15-17</td>
<td>Low-noise amplifiers</td>
</tr>
<tr>
<td>Exam 1</td>
<td>Date</td>
</tr>
<tr>
<td>Classes 19-26</td>
<td>Mixers</td>
</tr>
<tr>
<td>Classes 27-32</td>
<td>Voltage-controlled oscillators</td>
</tr>
<tr>
<td>Classes 33-35</td>
<td>Phase Noise</td>
</tr>
<tr>
<td>Exam 2</td>
<td>Date</td>
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Academic Integrity

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“An Aggie does not lie, cheat, or steal, or tolerate those who do.”

The handouts used in this course are copyrighted. The definition of "handouts" is all materials generated for this class, which include but are not limited to syllabi, homework assignments, in-
class materials, and additional printed materials except published scientific papers for personal use. Because these materials are copyrighted, you do not have the right to make additional copies of the handouts unless the instructor of this course expressly grants permission. As commonly defined, plagiarism consists of passing off the ideas, words, writings, etc., of another as one's own. In accordance with this definition, you are committing plagiarism if you copy the work of another person without proper citation and acknowledgement, and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic offenses, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. Paraphrasing without proper citation and acknowledgement is one form of plagiarism. If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty". Any forms of dishonesty including, but not limited to, cheating on any examinations and plagiarism will be handled according to the procedures outlined by the Aggie Honor System Office. Please check the following websites for further information:

University Regulations Student Handbook: http://student-rules.tamu.edu
Definition of Academic Misconducts: http://www.tamu.edu/aggiehonor/acadmisconduct.htm

Americans with Disabilities Act (ADA)

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Course Change Request

Date Submitted: 04/06/18 12:08 pm

Viewing: ECEN 676: Advanced Computer Architecture

Last edit: 04/06/18 1:31 pm

Changes proposed by: w-lala

Catalog Pages referencing this course

<table>
<thead>
<tr>
<th>Department of Electrical and Computer Engineering</th>
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<tbody>
<tr>
<td>ECEN - Electrical &amp; Comp Engr</td>
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Faculty Senate Number

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<td>979-458-3127</td>
</tr>
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</table>

Rationale for Course Edit

The proposed changes are part of a routine curriculum review.

Course prefix: ECEN
Course number: 676
Department: Electrical & Computer Eng
College/School: College of Engineering
Academic Level: Graduate
Academic Level (alternate): Undergraduate
Effective term: 2018-2019

Complete Course Title
Advanced Computer Architecture

Abbreviated Course Title
ADV COMPUTER ARCHITEC

Catalog course description
Design of advanced computers for parallel processing; emphasis on the overall structure; interconnection networks; including single-stage and multi-stage structures; shared memory and message passing architectures; control-flow and demand-driven programming; multithreaded architectures; fine-grain and coarse-grain parallelism; SIMD and MIMD; processor designs for parallel operation.

Prerequisites and Restrictions
ECEN 651 or CSCE 614 or approval of instructor.

Concurrent Enrollment
No

Should catalog prerequisites / concurrent enrollment be enforced?
No

Crosslistings
No

Crosslisted With

Approval Path

1. 04/06/18 12:18 pm
   Miroslav Begovic (begovic): Approved for ECEN Department Head
2. 04/06/18 1:31 pm
   Sandra Williams (sandra-williams): Approved for Curricular Services Review
3. 04/18/18 11:02 am
   Jennifer Veracruz (jveracruz): Approved for EN Committee Preparer GR
4. 04/25/18 2:17 pm
   Harry Hogan (h-hogan): Approved for EN Committee Chair GR
5. 04/25/18 2:19 pm
   Harry Hogan (h-hogan): Approved for EN College Dean GR
6. 06/13/18 12:15 pm
   Meagan Kelly (meagankelly): Approved for GC Preparer
7. 06/13/18 12:15 pm
   Meagan Kelly (meagankelly): Approved for GC Chair
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<th>Stacked with</th>
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<tr>
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<td>Contact Hour(s)</td>
</tr>
<tr>
<td>Credit</td>
<td>3</td>
<td>Lecture:</td>
</tr>
<tr>
<td>Hour(s)</td>
<td>(per week):</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lab:</td>
</tr>
<tr>
<td>Repeatable for credit?</td>
<td>No</td>
<td>Other:</td>
</tr>
<tr>
<td>Three-peat?</td>
<td>No</td>
<td>Total</td>
</tr>
<tr>
<td>CIP/Fund Code</td>
<td>1410010006</td>
<td>Lecture:</td>
</tr>
<tr>
<td>Default Grade Mode</td>
<td>Letter Grade (G)</td>
<td>Lab:</td>
</tr>
<tr>
<td>Alternate Grade Modes</td>
<td>Satisfactory/Unsatisfactory</td>
<td>Other:</td>
</tr>
<tr>
<td>Method of instruction</td>
<td>Lecture</td>
<td>Total</td>
</tr>
<tr>
<td>Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education)</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

Learning Outcomes

Meets traditional face-to-face learning outcomes.
Describe how learning outcomes are met or provide justification why they are not met.
Learning outcomes are met in the same manner as the traditional, on-campus sections;

Hours

Meets traditional face-to-face hours.
Describe how hours are met or provide justification why they are not met.
Course is scheduled to meet the same lecture and recitation requirements as a traditional, face-to-face section through alternative methods.

Will this course be taught as a distance education course?
Yes

I verify that I have reviewed the FAQ for Export Control Basics for Distance Education.
Yes

Is 100% of this course going to be taught in Texas?
Yes

Will classroom space be needed for this course?
Yes

This will be a required course or an elective course for the following programs:

<table>
<thead>
<tr>
<th>Required (select program)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Elective (select program)</th>
</tr>
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</table>

<table>
<thead>
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<tbody>
<tr>
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<tr>
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</tr>
<tr>
<td>(PHD-ELEN) Doctor of Philosophy in Electrical Engineering</td>
</tr>
<tr>
<td>Syllabus:</td>
</tr>
<tr>
<td>----------</td>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Letters of support or other documentation</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional information</td>
<td></td>
</tr>
<tr>
<td>Reviewer Comments</td>
<td></td>
</tr>
<tr>
<td>Reported to state?</td>
<td>No</td>
</tr>
</tbody>
</table>

Key: 4384
Course title and number: ECEN 676: Advanced Computer Architecture

Term: Fall, 2018, 3 credits

Sections:
Section 600:
Class Lecture Time: TR 11:10 am – 2:00 pm
Class Room: ETB 1037

Section 700:
Lecture video will be posted online: TR at ~5:00pm

Section 600 and 700:
Class Discussion Time: W 7:00 pm – 8:00 pm
Class Room: live online only (details to be given first week of class)
Course page: TBD

Course Description and Prerequisites

Computer architects have been striving to improve performance and efficiency since the first stored program computer was designed half a century ago. Superscalar execution is a key technique towards this aim. Superscalar processors issue more than one instruction per cycle. Most modern microprocessors from the latest smartphone ARM processors, to Intel i7s, to IBM’s latest Power Series employ superscalar issue and other instruction-level parallelism techniques to enhance their performance. This course examines the tradeoffs and design considerations in the design of superscalar or instruction level parallel (ILP) microprocessors. The course will also explore other current microarchitectural approaches to improve performance and efficiency.

Prerequisites: Soft prereq of ECEN 651 Microprogrammed Control of Digital Systems or CPSC 614 Computer Architecture or a solid undergraduate architecture background. Talk to the professor if you have questions on prerequisite.
Some programming skills (C and Unix) and at least one assembly language.
Interest in state-of-the-art microprocessors

Learning Outcomes or Course Objectives

By the end of this course the student will have an understanding of the following fundamental Computer Architecture concepts:
A quantitative and qualitative understanding at a microarchitectural level of superscalar, superpipelined, dataflow, EDGE and VLIW processors; Available parallelism in programs; Out of order instruction execution; Reservation stations; Reorder buffers; Exception handling in out of order processors; Memory systems for superscalar processors; Cache organizations; Memory disambiguation and load/store reordering; Performance evaluation of superscalar processors; Multicore processors; Composable distributed processors.

Instructor Information

Name: Paul Gratz
Telephone number: 979-488-4551
Email address: pgratz@tamu.edu
Office hours: TBD
Office location: WEB 333M
Textbook and/or Resource Material

Modern Processor Design: Fundamentals of Superscalar Processors, John P. Shen and Mikko Lipasti, Waveland Press, Inc. (any edition is fine)

Grading Policies

Grade Breakdown:
30% – 2 Exams
45% – Homework Assignments, Paper Critiques, Class Participation, Literature Survey
25% – Course Project

Exams:
There will be two, in class exams. Each exam is worth 15% of the total grade.

Lit Survey, Simulation and Homework assignments:
- You are expected to turn in into eCampus by midnight of the day it is due.
- Any time after midnight is considered late.
- Late assignments will not be accepted!

Class Participation:
- Come prepared to lecture, and be on-time.
- Your class participation grade will be based upon your ability to keep up with and add to the discussion during the discussion section.
- I will note which students respond to my questions and provide meaningful input and base this grade upon that.
- Note that attendance for the live online discussions is mandatory and will discount from your class participation grade if you miss them.

Grading Scale

Standard Letter Grading Scale:
A = 90-100
B = 80-89
C = 70-79
D = 60-69
F = <60

Course Topics, Calendar of Activities, Major Assignment Dates

Topic 1
S&P Chp 1 Course introduction; Moore’s Law; MHz wars; Power Wall; Definitions; Anatomy of a design; ISA/HSI

Topic 2
S&P Chp 1 Processor performance; RISC v CISC; Components of execution; Amdahl’s Law; ILP; Superscalar

Topic 3
S&P Chp 2 Pipelined processors review; Pipeline overheads; Hazards Review; Pipelining idealism; Generic Instruction Pipeline; Coalescing components; Physical Pipeline; Dependencies and Bypass Loops; Pipeline Interlock

Topic 4
S&P Chp 3 Memory System Review; Cache organization; Cache design parameters; Cache impact on performance; DRAM organization; Virtual Memory; Paging and the page table; TLBs; Multi-level page tables

Topic 5
S&P Chp 4 Limitations of Pipelining; Machine Parallelism; In-order Superscalar; OoO overview;

**Topic 6**
S&P Chp 4 Instruction Flow; Fetch; Decoding for CISC; Data Flow; Dispatch and issue; reservation stations (centralized vs. distributed);

**Topic 7**
S&P Chp 4 Execution; Functional unit types; Completion and retirement; Reorder buffer overview; Dealing with Exceptions

**Topic 8**
S&P Chp 5 Midterm Review and Exam

**Topic 9**
S&P Chp 5 Superscalar Out-of-Order challenges: Register data flow; Register allocation, reuse and false dependencies;

**Topic 10**
S&P Chp 5 Superscalar Out-of-Order challenges: Register renaming; RRF/ARF and other designs; Data-flow graph; Tomasulo’s Algorithm;

**Topic 11**
S&P Chp 5 Register data flow cont.; Dynamic execution core; Dispatch; Execution; Completion; Instruction Windows/Reservation Stations; Wakeup and Select; Reorder-buffer; Scheduling;

**Topic 12**
S&P Chp 5 Superscalar Out-of-Order challenges: Memory data flow; Address generation; Ordering of Memory Accesses; Address disambiguation; Load Bypass and Forward; Memory dependence prediction; MSHRs; Prefetching

**Topic 13**
S&P Chp 5 Full OoO processor model working example

**Topic 14**
N/A Final Review and Final

**Americans with Disabilities Act (ADA) Policy Statement:**
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit [http://disability.tamu.edu](http://disability.tamu.edu).

If you find that course content or software are not accessible, please contact your course instructor or disability services so that appropriate accommodations to the learning environment can be made.

**Academic Integrity Statement and Policy:**
For many years Aggies have followed a Code of Honor, which is stated in this very simple verse:

"An Aggie does not lie, cheat or steal, or tolerate those who do."

The Aggie Code of Honor is an effort to unify the aims of all Texas A&M men and women toward a high code of ethics and personal dignity. For most, living under this code will be no problem, as it asks nothing of a person that is beyond reason. It only calls for honesty and integrity, characteristics that Aggies have always exemplified. The Aggie Code of Honor functions as a symbol to all Aggies,
promoting understanding and loyalty to truth and confidence in each other.

For more information please visit [http://aggiehonor.tamu.edu/](http://aggiehonor.tamu.edu/)

**Statement of Plagiarism:**
All materials generated by the instructor for this class (which may include but are not limited to syllabi and in-class materials) are copyrighted. You do not have the right to copy such materials unless the instructor expressly grants permission. As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writing, etc. which belong to another. Plagiarism is one of the worst academic violations, for the plagiarist destroys trust among others. If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty."

**Export Control Statement:**
United States export control laws regulate the release of goods and technologies that affect U.S. national security or foreign policy interests. Distance education students and course content MUST comply with these U.S. export control laws. If TAMU indicates that you are attempting to access course content from an IP address associated with a country currently subject to economic and trade sanction, your TAMU NetID account will be terminated and you will be contacted by the TAMU Export Control Office and the Office of Identity Management. For additional information visit, [https://vpr.tamu.edu/resources/export-controls/resources](https://vpr.tamu.edu/resources/export-controls/resources).
Course Change Request

Date Submitted: 06/04/18 5:14 pm

Viewing: **ECEN 760 : Introduction to Probabilistic Graphical Models**

Last edit: 06/05/18 9:13 am

Changes proposed by: w-lala

<table>
<thead>
<tr>
<th>Contact(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Windy Lala</td>
</tr>
</tbody>
</table>

Rationale for Course Edit

The proposed changes are part of a routine curriculum review.

Course prefix        | ECEN  
Course number        | 760  
Department           | Electrical & Computer Eng  
College/School        | College of Engineering  
Academic Level        | Graduate  
Academic Level (alternate) | Undergraduate  
Effective term        | 2018-2019  

Complete Course Title

Introduction to Probabilistic Graphical Models

Abbreviated Course Title

INTRO PROB GRAPHICAL MDL

Catalog course description

Broad overview of various probabilistic graphical models, including Bayesian networks, Markov networks, conditional random fields, and factor graphs; relevant inference and learning algorithms, as well as their application in various science and engineering problems will be introduced throughout the course.

Prerequisites and Restrictions

Undergraduate level probability theory; basic programming skill in any programming language (C, C++, Python, Matlab, etc.

Concurrent Enrollment | No  
Should catalog prerequisites / concurrent enrollment be enforced? | No
Crosslistings: No
Stacked: No

Semester: 3
Credit Hour(s): 3
Contact Hour(s) (per week): 3
Lecture: 3
Lab: 0
Other: 0
Total: 3

Repeatable for credit?: No
Three-peat?: No
CIP/Fund Code: 1410010006
Default Grade Mode: Letter Grade (G)
Alternate Grade Modes: Satisfactory/Unsatisfactory
Method of instruction: Lecture
Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education): Yes

Learning Outcomes:
- Meets traditional face-to-face learning outcomes.

Hours:
- Meets traditional face-to-face hours.

Will this course be taught as a distance education course? Yes No
I verify that I have reviewed the FAQ for Export Control Basics for Distance Education. Yes No
Is 100% of this course going to be taught in Texas? Yes
Will classroom space be needed for this course? Yes

This will be a required course or an elective course for the following programs:
- Required (select program)
- Elective (select program)

<table>
<thead>
<tr>
<th>Program(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MEN-ELEN) Master of Engineering in Electrical Engineering</td>
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# Course Syllabus

<table>
<thead>
<tr>
<th>Syllabus:</th>
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<tbody>
<tr>
<td>Upload syllabus</td>
<td><a href="https://nextcatalog.tamu.edu/courseleaf/approve/?role=Faculty%20Senate">ECEN760-Fall2018-DL-syllabus.pdf</a></td>
</tr>
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</table>

**Letters of support or other documentation**

- **No**

**Additional information**

**Reviewer Comments**

**Reported to state?**

- Key: 4425
ECEN760 Introduction to Probabilistic Graphical Models

Fall 2018
Distance Learning

Course Description and Prerequisites
This course provides a broad overview of various probabilistic graphical models, including Bayesian networks, Markov networks, conditional random fields, and factor graphs. Relevant inference and learning algorithms, as well as their application in various science and engineering problems will be introduced throughout the course.

Prerequisites: ECEN303 or equivalent. Basic programming skill in any programming language.

Learning Outcomes or Course Objectives
1. Students will be able to articulate how probabilistic graphical models can be used to compactly represent high-dimensional probability distributions
2. Students will be able to decode the independence relations between random variables encoded in the graph structure of a given probabilistic graphical model
3. Students will be able to use probabilistic graphical models for making inference based on data
4. Students will be able to discern what type of probabilistic graphical model may be suitable under different situations
5. Students will be able to apply probabilistic graphical models to real world applications and research problems across various scientific and engineering domains
6. Students will appreciate how probabilistic graphical models can be learned from data

Instructor Information
Name: Byung-Jun Yoon
Telephone number: 979-845-6942
Email address: bjyoon@ece.tamu.edu
Office hours: TBD
Office location: WEB 205L

Textbook and/or Resource Material
Required textbook:
• D. Koller and N. Friedman, Probabilistic Graphical Models: Principles and Techniques, MIT Press.

Other references:
• F. V. Jensen, Bayesian Networks and Decision Graphs, Springer.
• R. E. Neapolitan, Learning Bayesian Networks, Prentice Hall.
Grading Policies

The final grade will be determined based on the following weights:

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Assignments</td>
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<tr>
<td>Final Project</td>
<td>30%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30%</td>
</tr>
</tbody>
</table>

Penalty for late submission

All assignments should be submitted before the beginning of the class on the due date. Penalty for late submission is as follows: same day after class (-10%), next day (-20%), 2 days (-30%), 3 days (-40%), 4 days (-50%), 5 days or more (not accepted).

Grading Scale

The final letter grade will be decided according to the following table. If your final score falls within one of these ranges, you are guaranteed to receive at least the letter grade shown in the table below:

<table>
<thead>
<tr>
<th>Final Score</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 – 100 %</td>
<td>A</td>
</tr>
<tr>
<td>80 – 89 %</td>
<td>B</td>
</tr>
<tr>
<td>70 – 79 %</td>
<td>C</td>
</tr>
<tr>
<td>60 – 69 %</td>
<td>D</td>
</tr>
<tr>
<td>0 - 59 %</td>
<td>F</td>
</tr>
</tbody>
</table>

Course Topics, Calendar of Activities, Major Assignment Dates

Academic calendar: [https://registrar.tamu.edu/Catalogs-Policies-Procedures/Academic-Calendar](https://registrar.tamu.edu/Catalogs-Policies-Procedures/Academic-Calendar)
Final schedule: TBD

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Required Reading</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>TBA</td>
</tr>
<tr>
<td>1</td>
<td>Review: basic probability theory</td>
<td>TBA</td>
</tr>
<tr>
<td>2</td>
<td>Basic graph theory</td>
<td>TBA</td>
</tr>
<tr>
<td>3 – 5</td>
<td>Bayesian Networks</td>
<td>TBA</td>
</tr>
<tr>
<td>6</td>
<td>Undirected Graphical Models</td>
<td>TBA</td>
</tr>
<tr>
<td>9 – 10</td>
<td>Exact inference</td>
<td>TBA</td>
</tr>
<tr>
<td>11 – 12</td>
<td>Message passing algorithms</td>
<td>TBA</td>
</tr>
<tr>
<td>13 – 14</td>
<td>Applications &amp; final project</td>
<td>TBA</td>
</tr>
<tr>
<td>15</td>
<td>Final exam</td>
<td>TBA</td>
</tr>
</tbody>
</table>

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit [http://disability.tamu.edu](http://disability.tamu.edu).
Academic Integrity
For additional information please visit: http://aggiehonor.tamu.edu


Students are expected to attend all classes, complete assignments on time, and participate fully in class discussions and group projects. Violations will be handled in accordance with the Texas A&M University Regulations governing academic integrity.
Course Change Request

New Course Proposal

Date Submitted: 06/04/18 8:37 am

Viewing: ECEN 768 : Bioelectronics

Last edit: 06/04/18 8:37 am
Changes proposed by: cbrodriguez

Contact(s) | Name | E-mail | Phone
--- | --- | --- | ---
Crystal Rodriguez | cbrodriguez@tamu.edu | 9798629188

Course prefix | ECEN | Course number | 768
Department | Electrical & Computer Eng
College/School | College of Engineering
Academic Level | Graduate
Effective term | 2019-2020

Complete Course Title | Bioelectronics
Abbreviated Course Title | BIOELECTRONICS

Catalog course description
Basic biological systems from individual neuron to neural networks in the brain/nervous system by leveraging engineering principles, basic electrical circuit theory and electromagnetic theory; applications include biosensors including electrodes, chemical, mechanical and optical sensors and bioelectronic systems.

Prerequisites and Restrictions
Should catalog prerequisites / concurrent enrollment be enforced? No
Crosslistings No Crosslisted With
Stacked No Stacked with

Semester | 3 | Contact Hour(s) (per week): | Lecture: Total | 3 | Lab: 0 | Other: 0 | Repeatable for credit? No
Credit Hour(s) | |
Default Grade Mode | Letter Grade (G)
Repeatable for credit? No
CIP/Fund Code | 1410010006
Method of instruction
Lecture
Will sections of this course be taught as non-traditional? No
parts of term, distance education)

Will this course be taught as a distance education course? No

Is 100% of this course going to be taught in Texas? Yes

Will classroom space be needed for this course? Yes

This will be a required course or an elective course for the following programs:

Required (select program)

Elective (select program)

<table>
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</tbody>
</table>

Course Syllabus

Syllabus: Upload syllabus

Letters of support or other documentation: No

Additional information

Reviewer Comments

Crystal Rodriguez (cbrodriguez) (05/31/18 2:08 pm): Rollback: Submit test
Crystal Rodriguez (cbrodriguez) (05/31/18 2:14 pm): Rollback: IE rollback test
Sandra Williams (sandra-williams) (06/04/18 8:25 am): Rollback: Syllabus has incorrect link to student rule 7.
Sandra Williams (sandra-williams) (06/04/18 1:18 pm): Update received.
Course title and number  ECEN 768  Bioelectronics
Term  Spring 2019
Meeting times and location  MW 10:00 to 11:15 PM  ETB 1035

Course Description and Prerequisites

**Bioelectronics:** Students will learn about basic biological systems from individual neuron to neural networks in the brain/nervous system by leveraging engineering principles: basic electrical circuit theory and electromagnetic theory; applications will include biosensors including electrodes, chemical, mechanical, and/or optical sensors and bioelectronic systems

**Course Prerequisites:** N/A (Antenna theory or advanced integrated circuit design course helpful, but not required.)

**Learning Outcome:** After completing the course the students will gain better understandings of how basic biological systems work and will be able to design basic biosensors and/or bioelectronics systems that directly interface with biological systems from individual neurons to complex neural circuits. The student will be able to discuss and implement optimization of biosensors and/or bioelectronics systems.

Instructor Information

Prof. Sung Il Park (ECEN), 207 GERB  sipark@tamu.edu
Office hours: Monday & Wednesday 1:30 to 2:30, GERB 207 or by appointment.

Textbook and/or Resource Material

Course notes are available on eCampus. Supplemental material will be posted as needed.

**Supplementary Material:**
*Design and analysis of analog circuit integrated circuits,* P. Gray, Wiley ASIN: B00J8Y0DC0

**Grading scale:**  90-100 A, 80-89 B, 70-79 C, 60-69 D, below 60 F.
**Grading Policy:** Final Exam 60 % each.  HW and Projects 40 %
Attendance and Make-up Policies

Attendance and make-up policies will follow the general student rule of the university: http://student-rules.tamu.edu/rule07/.

Course Topics, Calendar of Activities, Major Assignment Dates

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Required Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td><strong>How the brain works.</strong> Neurons, Brain architecture, Synaptic mechanisms, Neurotransmitter, Language, Vision, Memory &amp;</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><strong>How nervous systems work.</strong> Peripheral nervous systems, Central nervous systems, Sensory neuron, Motor neuron</td>
<td></td>
</tr>
<tr>
<td>4-5</td>
<td><strong>Make analogy with electric circuit systems.</strong> Electricity and the Brain, Neural signaling, Signal propagation through neural networks, Cell action or resting potential, Synaptic mechanisms</td>
<td></td>
</tr>
<tr>
<td>6-7</td>
<td><strong>Analysis of biological systems using electromagnetic theory.</strong> Transmission down axons, Synapse, Electromagnetic wave propagation into biological tissue, Communication between biological systems.</td>
<td></td>
</tr>
<tr>
<td>8-9</td>
<td><strong>Design of biosensors.</strong> Electrodes, Optical sensors, Chemical sensors, Mechanical sensors, Scaffolds, Modulation of neural signals.</td>
<td></td>
</tr>
<tr>
<td>10-11</td>
<td><strong>Design of bioelectronic systems.</strong> Wireless power transmission, Implantable wireless, Wireless communication system, Stimulation and/or recording neural activity.</td>
<td></td>
</tr>
<tr>
<td>12-14</td>
<td><strong>Applications in bioelectronics,</strong> biosensors for measuring blood flow &amp; current, physiological conditions, glucose, Mechanisms or algorithm for detecting changes in cardiovascular system, Methods to deliver power to implanted systems</td>
<td></td>
</tr>
</tbody>
</table>

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Academic Integrity
For additional information please visit: http://aggiehonor.tamu.edu

“An Aggie does not lie, cheat, or steal, or tolerate those who do.”
Course Change Request

Date Submitted: 05/07/18 3:50 pm

Viewing: MGMT 680: Business and Corporate Strategy

Last edit: 05/07/18 3:50 pm
Changes proposed by: k-mora

Catalog Pages referencing this course
Department of Management
MGMT - Management

Programs referencing this course
CERT-CG7: Business Management - Certificate

Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kris Mora</td>
<td><a href="mailto:k-mora@tamu.edu">k-mora@tamu.edu</a></td>
<td>9798456127</td>
</tr>
</tbody>
</table>

Rationale for Course

Edit Other

Explain other rationale

Teaching a section of this course in a non-traditional shortened format.

Course prefix          MGMT  
Course number           680
Department              Management
College/School          Mays Business School
Academic Level          Graduate
Effective term          2018-2019

Complete Course Title  Business and Corporate Strategy
Abbreviated Course Title BUSINESS & CORP STRATEGY

Catalog course description


Prerequisites and Restrictions
Graduate classification.

Should catalog prerequisites / concurrent enrollment be enforced? No

Crosslistings No Crosslisted With

Stacked No Stacked with
Semester: 3
Credit Hour(s): 3
Contact Hour(s) (per week):
Lecture: 3
Lab: 0
Other: 0
Total: 3
Repeatable for credit?: No
CIP/Fund Code: S202010016
Default Grade Mode: Letter Grade (G)
Method of instruction: Lecture
Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education) Yes

Learning Outcomes
Meets traditional face-to-face learning outcomes.
Describe how learning outcomes are met or provide justification why they are not met.
Will be met just as in the regular full-length semester.

Hours
Meets traditional face-to-face hours.
Describe how hours are met or provide justification why they are not met.
This shortened section will meet for 2730 minutes/45+ hours in a condensed timeframe—MW 2:00-5:15 p.m., 10/8 to 11/28 (except 11/19 and 11/21).

Will this course be taught as a distance education course? No
Is 100% of this course going to be taught in Texas? Yes
Will classroom space be needed for this course? Yes

This will be a required course or an elective course for the following programs:

<table>
<thead>
<tr>
<th>Program(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MS-FINC) Master of Science in Finance</td>
</tr>
</tbody>
</table>

Course Syllabus

Syllabus: Upload syllabus
Upload syllabus: MGMT 680 Syllabus for MSF-Flint - Fall 2018.pdf
Letters of support or other documentation: No
Additional information
Reviewer Comments
George Cunningham (gbcunningham) [05/03/18 11:28 am]: Not sure 750 minutes per credit hour is enough for the course.
Janet Gonzales (janet-gonzales) [05/04/18 1:17 pm]: Rollback: LaRhesa Johnson requested the roll back on May
3 - this was prematurely sent forward to the FS consideration.

LaRhesa Johnson (lrjohnson) (05/07/18 2:42 pm): Rollback: Updates needed per Graduate Council request.
MGMT 680 – BUSINESS AND CORPORATE STRATEGY
Section 606 – Fall Minimester 2018
2:00 p.m. – 5:15 p.m. MW (October 15 – November 28)
Wehner 192

Instructor: David Flint, Ph.D.
Office: Wehner 401T
Phone: (979) 845-4851 (messages)
E-Mail: dflint@mays.tamu.edu
Office Hours: by appointment

COURSE OVERVIEW

Why do some organizations achieve their objectives, grow, and attract resources while others stagnate, become insolvent, or succumb to hostile takeovers? Possible answers to these questions can be found in the subject matter of this course. This course is about strategic thinking and the advantages that may accrue to organizations whose leaders think and act strategically in a programmatic and process oriented manner. The perspective taken in the course is that of the senior level general manager who is responsible for the performance of the total organization.

This perspective requires viewing the business entity holistically and analyzing its relationship with its broader environment and with other competitor organizations. The class will involve integrating the knowledge you have learned in the different functional areas of business such as accountancy, finance, marketing, management, operations, information technology, human resource management, and economics.

Effectively integrating the activities of these functional areas requires developing a clear sense of the organization’s mission, objectives, and strategies that serve to enhance its organizational performance. To do this, managers must rely heavily on conceptual and analytical skills. Case analysis and simulated competitive environments will be used in this course to provide you with opportunities to analyze, select, articulate, and defend strategic decisions that can be formulated using course material, concepts, and tools.
**Course Learning Outcomes**

At the completion of the course, successful students should be able to

- understand, describe, and assess the Strategic Management Process and factors that affect Strategic Competitiveness
- summarize, demonstrate, and draw conclusions from both Industry / External Environmental Analysis and Internal Analysis processes for organizations
- define, analyze, and recommend both Business-Level and Corporate-Level Strategies within businesses
- identify and explain Competitive Dynamics within industries
- recognize and classify International Strategies implemented by businesses

**Catalog Description**

The nature of strategy and its relationship with performance. Business level strategies, including product and cost differentiation, cooperation, and imitation impeding strategies. Corporate level strategies, including diversification, mergers and acquisitions, innovation and market share. Case analyses emphasized.

**Prerequisite:** Graduate classification.

**Course Materials - Required**


Used 12th edition books as well as rental and electronic versions of the text should be available. *The Wall Street Journal* is not required, but it is a very useful tool.
**INSTRUCTOR’S OBJECTIVES**

1. Each student should be able to recognize key organizational phenomena and apply analytical skills in a strategic manner to the identified phenomena at the functional, business, and corporate levels of organizations.

2. Each student should be able to apply operational and analytical techniques from accountancy, finance, marketing, management, etc. studied prior to this course while accomplishing goal number one as given above.

3. Each student should be able to analyze the competitive environment facing a firm from the local to the global level, including within that analysis an understanding of industry effects, non-market factors, and competitor behaviors.

4. Each student should be able to isolate distinctive competency and incompetency associated with an organization that are potential sources of competitive advantage or disadvantage.

5. Each student should be able to synthesize the results obtained by pursuing goals one through four as given above and formulate organizational strategies, recommend strategic goals and tactics, and develop a high-level plan for the implementation of the recommended strategic goals and tactics.

6. Each student should be able to persuasively communicate his or her analytical conclusions, formulation of strategy, strategic recommendations, and plans for implementation of strategic goals and tactics. Communication must be engaged in both verbal and written forms.

7. Each student should develop the ability to view the organization holistically, to recognize an organization's role in the broader competitive and social environments, and to appreciate the responsibilities and potential power of top executives.

8. Each student should incorporate awareness of the diversity inherent in the modern global business environment and its potential effect on the conduct of business while pursuing the analytical goals as given above.

9. Each student should apply ethical reasoning and judgment in the pursuit of his or her analytical goals as given above. Ethical reasoning should also be considered in the formulation, recommendation, and implementation of strategic goals and tactics that result from the analytical goals.

10. Each student should improve his or her ability to work within a team environment that demands interdependent relationships among the individual team members’ activities to successfully accomplish team assignments.
**GRADING AND COURSE REQUIREMENTS**

The course requirements and evaluation of each student’s work in the course are based upon performance in several areas. Grade contributions and letter grade determination are shown below.

**GRADING -** The final course grade will be computed in the following manner:

### Individual Effort

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance and Participation</td>
<td>50</td>
</tr>
<tr>
<td>Practice Simulation</td>
<td>30 (at least 3 rounds engaged)</td>
</tr>
<tr>
<td>One Current Event Summary</td>
<td>50 (20 points – technical aspects)</td>
</tr>
<tr>
<td>One Case Overview/Recommendation</td>
<td>50 (20 points – technical aspects)</td>
</tr>
<tr>
<td>Exam #1</td>
<td>100</td>
</tr>
<tr>
<td>Exam #2</td>
<td>100</td>
</tr>
</tbody>
</table>

**Subtotal for Individual Effort** 380

### Team Related Effort

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Participation</td>
<td>70 (35 points per team experience)</td>
</tr>
<tr>
<td>Team Performance Sim #1</td>
<td>30</td>
</tr>
<tr>
<td>Team Performance Sim #2</td>
<td>70</td>
</tr>
<tr>
<td>Team Strategy Journal Entries Sim #1</td>
<td>50 (10 points – technical aspects)</td>
</tr>
<tr>
<td>Team Strategy Journal Entries Sim #2</td>
<td>100 (20 points – technical aspects)</td>
</tr>
</tbody>
</table>

**Subtotal for Team Related Effort** 320

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**Total** 700 points
No grading curves will be used. Grades will be assigned based upon the number of points each student earns without regard to the grade distribution within the class. **NOTE: Grades are based on point totals not upon percentages of the total available points for the course.** Assignment of the final course letter grade will be based on the following point totals:

- 630 to 700 points: A
- 560 to 629 points: B
- 490 to 559 points: C
- 420 to 489 points: D
- 0 to 419 points: F

**Attendance Policy**

The university views class attendance as an individual student responsibility. Students are expected to attend class and to complete all assignments. Absences from an exam/assignment/class will be excused only for a university-approved reason. Read [http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07) for reasons that constitute an excused absence. For absences relating to injury or illness, read the information from the Student Health Center about the types of notes it will furnish: [http://shs.tamu.edu/medical-excuse](http://shs.tamu.edu/medical-excuse). Contrary to popular belief, it will **not** give you an excused absence. Excused absences are given by the instructor.

1. For absences of less than three business days we require **both** the Explanatory Statement for Absence from Class form (see [http://shs.tamu.edu/forms](http://shs.tamu.edu/forms)) and a valid note from a health care professional specifically stating the date and time you were seen. A note from the Student Health Center does not constitute an excused absence. Excusing these short-term absences is solely at the discretion of the instructor. If the instructor decides that it is an **unexcused** absence, you will **not** be allowed to take the make-up exam/assignment or get attendance credit for that day. Please note that when you sign these forms, you are saying that your injury or illness is too severe or contagious for you to attend class. Don’t take a chance on getting an unexcused absence just because you don’t feel great that day!
2. For absences of three or more business days (to include classes on Saturday), you must obtain a medical confirmation note from a medical provider. The Student Health Center or an off-campus medical professional can provide a medical confirmation. The medical confirmation note must contain the date and time of the illness and the **medical professional’s confirmation that you are unable to attend class**. The Student Health Center will work with you through Student Assistance Services to ensure that your instructor knows that you had a serious injury or illness.

The authenticity of all notes will be verified. You will be charged under the Aggie Honor Code if you provide false information.

Note: An absence for a non-acute medical service does NOT constitute an excused absence.

If you miss an exam/assignment/class, please e-mail your instructor, either before the exam/assignment/class or as soon as possible after missing the exam/assignment/class, but **no later than the second business day after the date of absence**. Failure to contact your instructor in writing within two days will make you ineligible to take the make-up exam/assignment or get credit for the class. Make sure you include your name, UIN, class and section, phone number, and reason for missing the exam/assignment/class. Bring the documentation of your absence the first day you return to class.

**MAKE-UP WORK POLICY**

Students with excused absences will receive adequate time and opportunities to submit the required deliverables that are delayed due to those absences. To submit work under the “make-up” policy requires documentation as specified in the TAMU student rules (see Student Rules: Rule 7 – [http://student-rules.tamu.edu](http://student-rules.tamu.edu)).

Students with unexcused absences will receive no credit for missed deliverables.
**Late Work Policy**

Any course deliverable turned in late will be discounted by 10% per day. “Late” means submitting a deliverable any time after the assignment deadline has passed. Deliverables submitted more than 72 hours late will not be graded.

**Exception:** Students with excused absences will receive adequate time and opportunities to submit work they missed due to absence. Students must provide documentation and notice to the instructor as specified in TAMU student rules. (Student Rules: Rule 7 -- [http://student-rules.tamu.edu](http://student-rules.tamu.edu)).

**Students with Disabilities**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in White Creek Apartments (Building 62) at 701 West Campus Boulevard or call 979-845-1637. For additional information visit [http://disability.tamu.edu](http://disability.tamu.edu).

**Aggie Honor Code**

"An Aggie does not lie, cheat, or steal or tolerate those who do."

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System. You can learn more about the Honor Council Rules and Procedures as well as your rights and responsibilities at the following URL:

[http://aggiehonor.tamu.edu](http://aggiehonor.tamu.edu)
For each assignment or project that is submitted for grading in this course, students must affirm their commitment to the Aggie Honor Code with the following statement.

“On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work.”

Even if you do not explicitly state the above, by submitting any course deliverable, you affirm your adherence to the Aggie Honor Statement for that deliverable.

“Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one’s work, should the instructor request it, is sufficient grounds to initiate an academic dishonesty case.”
(http://aggiehonor.tamu.edu/RulesAndProcedures/HonorSystemRules.aspx)

I will follow the steps and processes outlined in the Honor Council Rules and Procedures in all cases of academic misconduct in this class (see http://aggiehonor.tamu.edu/RulesAndProcedures).

**STATEMENT ON PLAGIARISM**

As commonly defined, plagiarism consists of passing off as one’s own, ideas, words, writing, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have any questions regarding plagiarism, please review additional information provided under Student Rule 20 and Aggie Honor System Rules under “Plagiarism” (see Student Rule 20 http://student-rules.tamu.edu and Aggie Honor System Rules http://aggiehonor.tamu.edu/RulesAndProcedures/HonorSystemRules.aspx).
FOOD AND DRINK IN THE CLASSROOM

We have beautiful, state-of-the-art classrooms in the Wehner Building. We want to maintain the high quality of these classrooms for current and future students. Thus, it is necessary for you to adhere to the established policy of no beverages (except water), food, tobacco products, or like items within the Wehner Building classrooms.

CLASS DISCUSSION - ATTENDANCE AND PARTICIPATION

Class discussions are critical to the learning process in this course. Therefore, students must be prepared to discuss assigned readings, current events, and cases when physically attending class. Preparation for class discussion requires a basic understanding of the facts and details in the class material. Additionally, students should analytically consider the facts and details in regard to developing a better understanding of the material in pursuit of the course goals given above. Discussion regarding text material, current events, and cases is heavily dependent upon the students’ abilities to develop and communicate an understanding of the multiple factors contributing to the success or failure of various business endeavors. The instructor will rate each student’s discussion participation for each class session and total the points earned in each session to arrive at a total for the course. Therefore, any single class session will determine only a portion of the class discussion participation points. Consistent performance throughout the course is necessary for successful participation.

Quality of participation is rated more highly than quantity of participation; nevertheless, some quantity of participation that is of acceptable quality is necessary to earn participation points. Absences and tardiness for non-excused reasons do reduce the number of participation points earned by a student primarily because of the inability to earn points. A student who attends a class session but never actually voices any relevant questions or raises points for discussion earns the equivalent of a C+/B- for the session. A student who attends a class session and voices a relevant, non-trivial question or raises a point for discussion moves solidly into the B or A- range during the class session. A student...
who attends a class session and voices a very interesting question or raises a significant issue for discussion will move into the A range for the class session. The team Q&A sessions toward the end of the course are prime opportunities for students to participate. Reading text materials before class sessions and thinking about questions or issues to clarify will help students prepare to participate during lectures.

**EXAMS**

Two exams will be given during the course. Questions may consist of multiple choice, true or false, short answer, and definition questions along with essays. Material for the exams will come from textual information, additional lecture information, PPT slide information, and any assigned readings.

**CURRENT EVENT SUMMARY PAPER**

Each student is required to submit one current event summary paper. A full explanation of the expectations for a current event summary paper and its submission will be provided during the first week of class. The goal of the paper is to allow a student to show that a current event involving a strategic issue (or multiple strategic issues) facing an organization (or multiple organizations) can be recognized, the key issues identified clearly, course material is linked to those issues, and a reasonable analysis of the circumstances can be offered to the reader. A current event summary paper is limited to four pages (double-spaced) at a maximum.

**CASE OVERVIEW / RECOMMENDATION PAPERS**

Each student is required to submit one case overview paper. A full explanation of the expectations for a case discussion overview paper will be provided prior to the case discussion; however, one key aspect of the class component to be noted here is that an overview paper is limited to five pages (double-spaced) at a maximum. The purpose of an overview paper is to allow a student to demonstrate an ability to identify and prioritize key strategic issues for a company and offer reasonable, high-level recommendations that
address those issues. Overview papers must be submitted before the case is discussed in class.

**PARTICIPATION IN TEAMS**

One online feedback opportunity regarding team members' participation in teamwork will be provided to team members at the end of each simulation game. The instructor will consider the team member evaluations provided online. After using the evaluations to help assess how well individual team members participated within the teams, team participation points will be allocated to each individual from the points noted above. Less than adequate participation within a team will result in a reduction in the number of participation points awarded to an individual.

**TEAMS FOR THE COURSE**

This course requires teamwork. There is no feasible means by which the material can be adequately mastered or achieve the course’s desired goals without team efforts. Team sizes will depend upon class enrollment and will be discussed during the first class session. Separate and different sets of teams will be created for Simulation Game #1 and Simulation Game #2. Each team will be responsible for the following: 1) selecting a set of strategic decisions and playing the simulation game against other teams in the course, and 2) preparing strategic journal entries within the simulation game and engaging Q&A sessions about team strategies and subsequent performance in the simulation.

**WRITTEN DELIVERABLES FROM TEAMS**

Strategy journal entries in the simulation game should be of the quality and form that one would expect to present to managerial decision makers during formal business presentations. Grading considerations will encompass both content and technical proficiency. The strategy journal entries for this class should focus on the most critical strategic recommendation(s) for the team’s company and provide some thoughts regarding the implementation and future evaluation of the recommended strategic plan. There is no
set length for the journal entries and quality of thought and reasoning is preferred over quantity of output.

**INTERNAL TEAM DYNAMICS**

The instructor of the course is ultimately responsible for assigning the grades to individual team members for their participation in the team efforts; however, the instructor will give serious consideration to the information gathered via the team participation feedback opportunities noted above in this syllabus. Not all team members are guaranteed to receive equivalent grades for the team's performance in the course. This will be reflected primarily through the team participation points as discussed above.

Team dynamics are an important and unavoidable part of this course and of life in general. Suggestions for successful team interactions follow:

1. Attempt to find compatible people (schedules, project ideas, personality types, etc.) with whom to work.
2. Establish good lines of communication among the team members with multiple means of contact.
3. Develop clear goals regarding team tasks and document them for all team members.
4. Assign individual responsibilities for tasks that are understood and agreed to by all team members.
5. Resolve any misunderstandings quickly and with face-to-face meetings whenever possible.
6. Take advantage of the time set aside by the instructor of the course for team work or interacting with the instructor regarding the team work.
7. Keep a good attitude by focusing on desired outcomes rather than team dynamics.

**CONDUCT AND CONSEQUENCES**

The intention of the instructor of this course is to provide a learning experience that will help prepare the students for the professional business world and the ranks of those who
will have responsibility for the conduct of business in a highly competitive market. Given that intention, the tone of the class will be set at a professional level with respect for the individuals in the class and the process of learning. Debate and questioning is an important part of the class and will be vigorous at times, but these activities are not meant to demean or attack students. Disagreement is not disrespect and is often appropriate to further understanding. However, any student who does not participate in the class in a professional and courteous manner may be assured that the instructor will pursue university approved means to either improve the student’s behavior or remove the student from the course.

Professionalism is important in the conduct of business. The practice of being punctual, exhibiting good levels of preparation and participation, attitude, and a student’s style used to question and debate all will affect how a student’s level of professionalism is perceived. As noted above, students are rewarded with points for behavior that is consistent with a professional business mindset, such as punctuality and participation. Students are not rewarded for behavior that is not consistent with that mindset. Take the opportunity given in this class to improve your preparation for future careers in business.

**DETAILS FOR WRITTEN ASSIGNMENTS**

Incorrect grammar, punctuation, spelling, or a poorly written assignment will significantly affect the grade given to an assignment. As noted above in the “Grading” section of the syllabus, a percentage of points on each written assignment will be awarded based upon the technical aspects of the material. Do not take the technical aspects of the written assignments lightly. Effective written communication is based upon knowing and appropriately utilizing the rules of written language. Employers value people who can clearly express themselves with written words. Use this course’s assignments to help strengthen and expand your written communication skills.

Written assignments in hard copy form should be turned in on standard 8.5” by 11” paper with no larger than 1.5” margins along the sides, top, or bottom. Margins should not be less than 0.5” on the sides, bottom or top of the paper. Double line or one-and-one-half line spacing is required. Acceptable fonts include Times Roman, Courier, Arial, Helvetica, or any other standard, easily readable type. Font size should not be larger than 12 and should not be smaller than 10, except for headings, titles, graphical legends, within exhibits, or in
other portions of the assignment that are not part of the main text. A cover page is required. Special bindings, plastic covers, color printing, and other “special” features of written assignments are not specifically required and will not affect the grading of the material. The assignment should simply be attractive and easy to read without extraneous clutter.

References that indicate where students are finding company and industry information must be submitted. After watching students struggle with references and citations within the assignments over many semesters, the instructor decided to impose some standardization upon referencing within assignments. Therefore, use of the APA style for referencing is required. The West Campus Library website maintains information about the use of APA style referencing.

https://wcl.library.tamu.edu/assets/pdf/WCLCitationGuide.pdf

Also, please note the proper use of subject, verb, and pronoun agreement when writing. If “company” or the name of a company (e.g., Apple) is first used in a singular mode, then all subsequent verbs and pronouns should reflect that singular state. An example follows:

“Apple makes iPhones. It also produces iPads. Its cash reserve is enormous. Some people think it may become the first trillion dollar company by market capitalization. Samsung and Google are two of its competitors. They are successful, but not as successful as it is.”
# Course Schedule

<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPIC</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 1</strong></td>
<td><strong>Intro to Course</strong></td>
<td>Syllabus/Lecture</td>
</tr>
<tr>
<td><strong>Oct 15 – 17</strong></td>
<td><strong>Strategic Management and Strategic Competitiveness</strong></td>
<td>Chapter 1</td>
</tr>
<tr>
<td></td>
<td>The External Environment: Opportunities, Threats, Industry Competition, and Competitor Analysis</td>
<td>Chapter 2</td>
</tr>
<tr>
<td><strong>Oct 15 - 21</strong></td>
<td><strong>Introduction to GoVenture CEO Simulation and Individual Practice Rounds (3 Required)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Week 2</strong></td>
<td><strong>The Internal Environment: Resources, Capabilities, and Core Competences</strong></td>
<td>Chapter 3</td>
</tr>
<tr>
<td><strong>Oct 22 – 24</strong></td>
<td><strong>Business Level Strategy</strong></td>
<td>Chapter 4</td>
</tr>
<tr>
<td></td>
<td><strong>Competitive Rivalry and Competitive Dynamics</strong></td>
<td>Chapter 5</td>
</tr>
<tr>
<td></td>
<td><strong>Discussion of Current Events &amp; Strategy</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Simulation Game #1 Team Assignments</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Oct 24</strong></td>
<td><strong>Simulation Game #1 – Round 1</strong></td>
<td></td>
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<tr>
<td><strong>Oct 26</strong></td>
<td><strong>Simulation Game #1 – Round 2</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Oct 28</strong></td>
<td><strong>Simulation Game #1 – Round 3</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Week 3</strong></td>
<td><strong>Corporate-Level Strategy</strong></td>
<td>Chapter 6</td>
</tr>
<tr>
<td><strong>Oct 29 – 31</strong></td>
<td>and Catch Up Day on Monday <strong>Exam #1 Wednesday 2:00 – 3:30 PM</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Merger and Acquisition Strategies</strong></td>
<td>Chapter 7</td>
</tr>
<tr>
<td></td>
<td><strong>Discussion of Current Events &amp; Strategy</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Oct 29</strong></td>
<td><strong>Simulation Game #1 – Round 4</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Oct 31</strong></td>
<td><strong>Simulation Game #2 Team Assignments</strong></td>
<td></td>
</tr>
</tbody>
</table>
Week 4

Nov 5 – 7  Cooperative Strategy  Chapter 9
Corporate Governance  Chapter 10
Discussion of Current Events & Strategy

Nov 6  Simulation Game #2 – Round 1
Nov 11  Simulation Game #2 – Round 2

Week 5

Nov 12 – 14  Organizational Structure and Control  Chapter 11
Strategic Leadership  Chapter 12
Discussion of Current Events & Strategy

Nov 13  Simulation Game #2 – Round 3
Nov 19  Simulation Game #2 – Round 4

Week 6  No Class Sessions Held

Week 7

Nov 26 – 28  Case Discussion – Bulembu Water Enterprise  Monday
Simulation Game Debrief
Discussion of Current Events & Strategy
Exa#2  Wed 2:00 PM – 3:30 PM

The Case Overview / Recommendation Paper focused on Bulembu Water Enterprise is due Monday December 4 before 2:15 PM to avoid a late penalty. Two hard copies are required.

IMPORTANT CAVEAT

Given the uncertainty inherent in life, circumstances may cause the scheduled activities and materials of this course to vary in some degree from that which is outlined herein. Should changes to the activities and requirements of this course become necessary, the instructor will discuss any changes with the students and the details of this syllabus will be amended accordingly.
Course Change Request

Date Submitted: 04/27/18 2:07 pm

Viewing: **PETE 602 : Well Stimulation**

Last edit: 04/27/18 2:07 pm

Changes proposed by: e-schuler

Catalog Pages referencing this course

<table>
<thead>
<tr>
<th>Harold Vance Department of Petroleum Engineering</th>
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<tbody>
<tr>
<td>PETE - Petroleum Engineering</td>
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Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
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<th>Phone</th>
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<tbody>
<tr>
<td>Eleanor Schuler</td>
<td><a href="mailto:e-schuler@tamu.edu">e-schuler@tamu.edu</a></td>
<td>9798458402</td>
</tr>
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Rationale for Course

**The proposed changes are part of a routine curriculum review.**

Course prefix  PETE  

Course number  602  

Department  Petroleum Engineering  

College/School  College of Engineering  

Academic Level  Graduate  

Effective term  2018-2019  

Complete Course Title  Well Stimulation  

Abbreviated Course Title  WELL STIMULATION  

Catalog course description

Design and analysis of well stimulation methods, including acidizing and hydraulic fracturing; causes and solutions to low well productivity.

Prerequisites and Restrictions

Should catalog prerequisites / concurrent enrollment be enforced?  No  

Crosslistings  No  Crosslisted With  

Stacked  No  Stacked with  

<table>
<thead>
<tr>
<th>Semester</th>
<th>3</th>
<th>Contact Hour(s) (per week):</th>
<th>Lecture: 3</th>
<th>Lab: 0</th>
<th>Other: 0</th>
<th>Total 3</th>
</tr>
</thead>
</table>

Repeatable for credit?  No

In Workflow

1. PETE Department Head
   04/27/18 2:10 pm  Kathy Beladi (k-beladi): Approved for PETE Department Head

2. Curricular Services Review
   04/30/18 9:34 am  Sandra Williams (sandra-williams): Approved for Curricular Services Review

3. EN Committee Preparer GR
   05/03/18 4:41 pm  Jennifer Veracruz (jveracruz): Approved for EN Committee Preparer GR

4. EN Committee Chair GR
   05/04/18 10:57 am  Harry Hogan (h-hogan): Approved for EN Committee Chair GR

5. EN College Dean GR
   05/04/18 11:00 am  Harry Hogan (h-hogan): Approved for EN College Dean GR

6. GC Preparer
   06/13/18 12:16 pm  Meagan Kelly (meagankelly): Approved for GC Preparer

7. GC Chair
   06/14/18 3:52 pm  LaRhesa Johnson (lrjohnson): Approved for GC Chair
PETE 602: Well Stimulation

CIP/Fund Code: 1425010006
Default Grade Mode: Letter Grade (G)
Method of instruction: Lecture
Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education) Yes

Learning Outcomes

Meets traditional face-to-face learning outcomes.

Describe how learning outcomes are met or provide justification why they are not met.

Distance learning courses taught by the Department of Petroleum Engineering, provide the same lectures, assignments, and exams as on campus face-to-face courses. Student learning outcomes are evaluated by gradable assignments, which are distributed and collected through eCampus and exams are proctored by approved exam centers or equivalent.

Hours

Meets traditional face-to-face hours.

Describe how hours are met or provide justification why they are not met.

The credit hours of distance learning courses by the Department of Petroleum Engineering are ensured to be equivalent to on-campus face-to-face exams. In addition to the same lectures, DL students have equal opportunities to interact with instructors through email and online chat during office hours. For each three-credit hour course, a distance learning course accounts for 45-48 hours of instruction time.

Will this course be taught as a distance education course? Yes No

I verify that I have reviewed the FAQ for Export Control Basics for Distance Education. Yes No

Is 100% of this course going to be taught in Texas? Yes

Will classroom space be needed for this course? Yes

This will be a required course or an elective course for the following programs:

<table>
<thead>
<tr>
<th>Program(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MEN-PETE) Master of Engineering in Petroleum Engineering</td>
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<tr>
<td>(MS-PETE) Master of Science in Petroleum Engineering</td>
</tr>
<tr>
<td>(PHD-PETE) Doctor of Philosophy in Petroleum Engineering</td>
</tr>
</tbody>
</table>

Course Syllabus

Syllabus: Upload syllabus
Upload syllabus: SYLLABUS-PETE 602-Fall 2018.pdf
Letters of support or other documentation: No

Additional information: New syllabus attached.

Reviewer Comments:
- Sandra Williams (sandra-williams) (04/04/18 11:58 am): Rollback: You will need to include a traditional syllabus and a non-traditional syllabus (if applicable).
- Jennifer Veracruz (jveracruz) (04/26/18 10:09 am): Rollback: Needs updated syllabus

Key: 12451
Course Description and Prerequisites

Design and analysis of well stimulation methods, including acidizing and hydraulic fracturing as well as the causes and solutions to low well productivity.

Prerequisites

Graduate classification in the Department of Petroleum Engineering or instructor approval

Learning Outcomes

The course is designed for engineers who deal with well performance enhancement. The course will go through various techniques that can be used to enhance productivity of oil and gas wells. This is followed by an overview of acid and hydraulic fracturing, matrix treatments for carbonate and sandstone formations. Issues related to candidate selection, treatment design, selection of acid additives, lab testing, acid placement, QA/QC, job execution, and treatment evaluation, all of which will be discussed in detail. The course will end with an introduction new technologies for carbonate and sandstone acidizing. Field cases will be presented to highlight problems and how lab testing is used to find cost effective solutions to these problems.

Instructor Information

Name: Hisham A. Nasr-El-Din
Telephone number: 979.862.1473
Email address: hisham.nasreldin@tamu.edu
Office hours: TBD
Office location: RICH 710BA

Textbook and/or Resource Material

Several textbooks will be used including, but not limited to:

Economides et al., Petroleum Production Systems, 1993
Economides and Nolte, Reservoir Stimulation, 3rd Ed., 2000
Civan, Reservoir Formation Damage, 2000
Economides et al., Well Construction, 1998
SPE Reprint Series, Hydraulic Fracturing, 1990
Gidley et al., Recent Advances in Hydraulic Fracturing, 1989
Williams et al., Acidizing Fundamentals, 1979
Grading Policies

Homework 20%
Quizzes 15%
Midterm 25%
Final 40%

Letter grades will be assigned to the following guideline:

A=90-100 (Excellent)
B= 80-89 (Good)
C=70-79 (Satisfactory)
D=60-69 (Passing)
F=59 and below (Failing)
I=Incomplete.

Attendance and Make-up Policies

Texas A&M views class attendance as an individual student responsibility (http://studentrules.tamu.edu/rule07). Attendance is essential to complete the course successfully. Material presented in lecture and class discussion may expand upon points only briefly considered in the required text.

Course Topics, Calendar of Activities, Major Assignment Dates

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Required Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>Introduction</td>
<td>Mineralogy of oil and gas reservoirs&lt;br&gt;Well types based on function&lt;br&gt;Well types based on completion&lt;br&gt;Matrix versus fracture acidizing&lt;br&gt;Formation damage issues</td>
</tr>
<tr>
<td>3-6</td>
<td>Acid Types and their Reaction with Various Rocks</td>
<td>Carbonates – Chemistry Issues&lt;br&gt;Carbonates – Physics Issues&lt;br&gt;Sandstone Formations-Chemistry Issues&lt;br&gt;Sandstone Formations – Physics Issues</td>
</tr>
<tr>
<td>7-9</td>
<td>Acid Additives</td>
<td>Criteria used for selecting acid additives&lt;br&gt;Anti-sludge agents&lt;br&gt;Mutual solvents&lt;br&gt;Drag reducing agents&lt;br&gt;Low-surface tension surfactants&lt;br&gt;Corrosion inhibitors&lt;br&gt;Hydrogen sulfide scavengers&lt;br&gt;Scale inhibitors&lt;br&gt;Clay Stabilizers&lt;br&gt;Damage due to acid additives</td>
</tr>
<tr>
<td>10</td>
<td>Reaction Kinetics</td>
<td>Methods to measure reaction rate&lt;br&gt;Surface reaction kinetics&lt;br&gt;Mass transfer kinetics&lt;br&gt;Impact of additives&lt;br&gt;Effect of clays&lt;br&gt;Temperature effects</td>
</tr>
<tr>
<td>11</td>
<td>Acid Placement Techniques</td>
<td>Bull heading&lt;br&gt;Drill pipe</td>
</tr>
<tr>
<td></td>
<td>Coiled tubing</td>
<td>Methods to extend CT reach in long horizontal wells</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Entry into various laterals in multilateral wells</td>
<td>Field cases</td>
</tr>
<tr>
<td>12</td>
<td>Acid Fracturing</td>
<td>Candidate selection</td>
</tr>
<tr>
<td></td>
<td>Fluid selection</td>
<td>HW5</td>
</tr>
<tr>
<td></td>
<td>Rock and fluid properties</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lab testing before the job</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fracture conductivity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Field testing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Simulation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Field examples</td>
<td></td>
</tr>
<tr>
<td>13-14</td>
<td>Hydraulic Fracturing</td>
<td>Rock mechanics</td>
</tr>
<tr>
<td></td>
<td>Proppant characteristics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fluid selection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lab and field testing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Methods to control proppant flow back</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Damage due to polymer residue</td>
<td></td>
</tr>
</tbody>
</table>

**Americans with Disabilities Act (ADA)**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit [http://disability.tamu.edu](http://disability.tamu.edu).

**Academic Integrity**

"An Aggie does not lie, cheat, or steal, or tolerate those who do."
Course Change Request

Date Submitted: 04/04/18 12:16 pm


Last edit: 04/04/18 12:37 pm
Changes proposed by: e-schuler

Catalog Pages referencing this course
Harold Vance Department of Petroleum Engineering
PETE - Petroleum Engineering

Faculty Senate Number

Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eleanor Schuler</td>
<td><a href="mailto:e-schuler@tamu.edu">e-schuler@tamu.edu</a></td>
<td>9798458402</td>
</tr>
</tbody>
</table>

Rationale for Course

**Edit**

The proposed changes are part of a routine curriculum review.

Course prefix: PETE  
Course number: 645

Department: Petroleum Engineering
College/School: College of Engineering
Academic Level: Graduate
Academic Level (alternate): Undergraduate

Effective term: 2018-2019

Complete Course Title
Upscaling of Geologic Models for Flow Simulation

Abbreviated Course Title
UPSCALING GEOL MODELS

Catalog course description
In-depth understanding of current approaches to upscaling of 3D geologic models for reservoir flow simulation; includes development of upscaling solvers.

Prerequisites and Restrictions
Graduate classification.

Concurrent Enrollment
No

Should catalog prerequisites / concurrent enrollment be enforced?
No

Crosslistings
No

Crosslisted With

In Workflow
1. PETE Department Head
2. Curricular Services Review
3. EN Committee Preparer GR
4. EN Committee Chair GR
5. EN College Dean GR
6. GC Preparer
7. GC Chair
8. Faculty Senate Preparer
9. Faculty Senate
10. Provost II
11. President
12. Curricular Services
13. Banner

Approval Path
1. 04/04/18 12:24 pm Kathy Beladi (k-beladi): Approved for PETE Department Head
2. 04/04/18 12:37 pm Sandra Williams (sandra-williams): Approved for Curricular Services Review
3. 04/18/18 11:02 am Jennifer Veracruz (jveracruz): Approved for EN Committee Preparer GR
4. 04/25/18 2:17 pm Harry Hogan (h-hogan): Approved for EN Committee Chair GR
5. 04/25/18 2:19 pm Harry Hogan (h-hogan): Approved for EN College Dean GR
6. 06/13/18 12:17 pm Meagan Kelly (meagankelly): Approved for GC Preparer
7. 06/14/18 3:52 pm LaRhesa Johnson (lrjohnson): Approved for GC Chair
Stacked: No  
Stacked with:  

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credit Hour(s)</th>
<th>Contact Hour(s)</th>
<th>Lecture:</th>
<th>Lab:</th>
<th>Other:</th>
<th>Total</th>
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</thead>
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<td>(per week):</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Repeatable for credit? No  
Three-peat? No  
CIP/Fund Code 1425010006  
Default Grade Mode Letter Grade (G)  
Alternate Grade Modes Satisfactory/Unsatisfactory  
Method of instruction Lecture  
Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education) Yes  

Learning Outcomes  
Meets traditional face-to-face learning outcomes.  
Describe how learning outcomes are met or provide justification why they are not met.  
Distance learning courses taught by the Department of Petroleum Engineering, provide the same lectures, assignments, and exams as on campus face-to-face courses. Student learning outcomes are evaluated by gradable assignments, which are distributed and collected through eCampus and exams are proctored by approved exam centers or equivalent.  

Hours  
Meets traditional face-to-face hours.  
Describe how hours are met or provide justification why they are not met.  
The credit hours of distance learning courses by the Department of Petroleum Engineering are ensured to be equivalent to on-campus face-to-face exams. In addition to the same lectures, DL students have equal opportunities to interact with instructors through email and online chat during office hours. For each three-credit hour course, a distance learning course accounts for 45-48 hours of instruction time.  

Will this course be taught as a distance education course? Yes No  
I verify that I have reviewed the FAQ for Export Control Basics for Distance Education. Yes No  
Is 100% of this course going to be taught in Texas? Yes  
Will classroom space be needed for this course? Yes  

This will be a required course or an elective course for the following programs:  
Required (select program)  
Elective (select program)  

Program(s)  
(MEN-PETE) Master of Engineering in Petroleum Engineering  
(MS-PETE) Master of Science in Petroleum Engineering  
(PHD-PETE) Doctor of Philosophy in Petroleum Engineering
# Course Syllabus

<table>
<thead>
<tr>
<th>Syllabus:</th>
<th>Upload syllabus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upload syllabus</td>
<td><a href="PETE645_King.pdf">PETE645_King.pdf</a></td>
</tr>
</tbody>
</table>

| Letters of support or other documentation | No |

| Additional information | |

| Reviewer Comments       | Sandra Williams (sandra-williams) (04/04/18 12:01 pm): Rollback: You will need to include a traditional syllabus and a non-traditional syllabus (if applicable). |

| Reported to state? | No |
Course title and number    PETE 645: Upscaling of Geologic Models for Flow Simulation
Term (e.g., Fall 200X)     Fall 2017
Meeting times and location 3:55 pm - 6:55 p.m., Thursday, RICH 208

Course Description and Prerequisites

This is an advanced reservoir engineering course which covers the concepts behind 3D geologic modeling and the upscaling of these geologic models for reservoir flow simulation. It is based on published papers and supplemented by research topics. The students will be expected to develop upscaling solvers as part of this course.

Graduate classification. Attendance will be limited to a maximum of 20 students.

Learning Outcomes or Course Objectives

The objectives of the course are for students to:
1. Acquire an awareness of different types of geologic and flow simulation models, their components, their construction, and their uses.
2. Acquire an in-depth understanding of current approaches to upscaling of geologic models for flow simulation.
3. Develop tools that are more advanced than those available within any commercial application

Instructor Information

Name                     Prof. Michael J. King
Telephone number         (979) 845-1488
Email address            mike.king@tamu.edu
Office hours             Monday, 3:00-5:30 p.m.
Office location          401E Richardson Building

Textbook and/or Resource Material

Recommended:
Additional readings will be supplied with the course.

Grading Policies

Presentations & Class Participation .............................................(10%)
Homework ....................................................................................(15%)
Mid-Term Exam. ..........................................................................(25%)
Major Project / Final Exam. ...........................................................(50%)
Total .........................................................................................(100%)

Grading Scale

A ............................................................... 90-100%
B ............................................................... 80-89%
C ............................................................... 70-79%
D ............................................................... 60-69%
F ............................................................... 0-59%
## Course Topics, Calendar of Activities, Major Assignment Dates

**Details may be modified during the Semester**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
</table>
| 1    | Introduction to geologic modeling and flow simulation  
  o Uses of geologic models and reservoir simulators  
  o Understanding the overall iterative workflow  
  o Streamline flow visualization |
| 2    | Steady state / pseudo steady state / pressure transient flow equations in porous media  
  o Black oil equations  
  o Derivation and solution of the pressure transient and PSS pressure equation  
  o Neumann and Dirichlet boundary conditions |
| 3-4  | Finite difference/Finite element discretizations/flow visualization and solver projects  
  o Five point discretization (2D)  
  o Peaceman Well Indices (2D)  
  o K/O/U methods (2D)  
  o Development of student projects |
| 5-6  | Upscaling of Flow  
  o Permeability Upscaling  
  o Analytic Approaches  
  o Flow Based Upscaling  
  o Local / Non-Local / Global Upscaling  
  o Transmissibility Upscaling  
  o Near Well Upscaling  
  o Diagnostics  
  o Recommendations |
| 7-8  | Upscaling of Static Properties  
  o Stratigraphic Grids  
  o Bulk Rock Volume / Net Rock Volume / Pore Volume / Fluid Volumes  
  o Facies  
  o Well Blocking  
  o Diagnostics  
  o Recommendations |
| 9-10 | Grid Upscaling  
  o Corner Point Grids  
  o Multiscale Grid Mapping  
  o Error Analysis & Simulation Grid Design  
  o Faults and Fault Blocks  
  o Unstructured Grids  
  o Recommendations |
| 11-12| Multiphase Flow  
  o Relative Permeability End-points and Capillary Pressure  
  o Steady State Upscaling  
  o Pseudoization and Unsteady State Upscaling  
  o Multiscale Simulation  
  o Recommendations |
| 13-15| Class Projects  
  o Student Presentations |
Other Pertinent Course Information

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu

Academic Integrity

For additional information please visit: http://www.tamu.edu/aggiehonor

“An Aggie does not lie, cheat, or steal, or tolerate those who do.”
Course Change Request

Course: PETE 647: Petroleum Thermodynamics

Date Submitted: 04/04/18 1:02 pm

Last approved: 05/02/17 3:18 am

Last edit: 04/04/18 1:55 pm

Changes proposed by: e-schuler

Catalog Pages referencing this course

In Workflow

1. PETE Department Head
2. Curricular Services Review
3. EN Committee Preparer GR
4. EN Committee Chair GR
5. EN College Dean GR
6. GC Preparer
7. GC Chair
8. Faculty Senate Preparer
9. Faculty Senate
10. Provost II
11. President
12. Curricular Services
13. Banner

Faculty Senate Number

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<tbody>
<tr>
<td>Eleanor Schuler</td>
<td><a href="mailto:e-schuler@tamu.edu">e-schuler@tamu.edu</a></td>
<td>9798458402</td>
</tr>
</tbody>
</table>

Rationale for Course

The proposed changes are part of a routine curriculum review.

Course prefix: PETE

Course number: 647

Department: Petroleum Engineering

College/School: College of Engineering

Academic Level: Graduate

Effective term: 2018-2019 2017-2018

Complete Course Title: Petroleum Thermodynamics

Abbreviated Course Title: PETROLEUM THERMODYNAMICS

Catalog course description:

Understanding the principles of bulk equilibrium, bulk non-equilibrium, interfacial and thin-film thermodynamics in relation to hydrocarbon reservoirs; application in shale gas, shale light oil, heavy oil production, CO2 injection in light and heavy oils, and phase-splitting calculations; complex diffusion processes and species distribution in hydrocarbon reservoirs from irreversible thermodynamics.

Prerequisites and Restrictions

Graduate classification or approval of instructor.

Concurrent Enrollment: No

Should catalog prerequisites / concurrent enrollment be enforced? No

Approval Path

1. 04/04/18 1:22 pm
   Kathy Beladi (k-beladi): Approved for PETE Department Head
2. 04/04/18 1:55 pm
   Sandra Williams (sandra-williams): Approved for Curricular Services Review
3. 04/18/18 11:02 am
   Jennifer Veracruz (jveracruz): Approved for EN Committee Preparer GR
4. 04/25/18 2:17 pm
   Harry Hogan (h-hogan): Approved for EN Committee Chair GR
5. 04/25/18 2:19 pm
   Harry Hogan (h-hogan): Approved for EN College Dean GR
6. 06/13/18 12:17 pm
   Meagan Kelly (meagankelly): Approved for GC Preparer
7. 06/14/18 3:52 pm
   LaRhessa Johnson (lrjohnson): Approved for GC Chair

History

1. May 2, 2017 by sarah.gordon
PETE 647: Petroleum Thermodynamics

| Crosslistings | No | Crosslisted With | No |
| Stacked       | No | Stacked with     |    |

| Semester      | 3  |
| Credit Hour(s)| 3  |
| Contact Hour(s) (per week): | 3 |
| Lecture:      | 3  |
| Lab:          | 0  |
| Other:        | 0  |
| Total:        | 3  |

Repeatability for credit? No

Three-peat? No

CIP/Fund Code: 1425010006

Default Grade Mode: Letter Grade (G)

Alternate Grade Modes: Satisfactory/Unsatisfactory

Method of instruction: Lecture

Will sections of this course be taught as non-tradional? (i.e., parts of term, distance education) Yes

Learning Outcomes

Meets traditional face-to-face learning outcomes.

Describe how learning outcomes are met or provide justification why they are not met.

Distance learning courses taught by the Department of Petroleum Engineering, provide the same lectures, assignments, and exams as on campus face-to-face courses. Student learning outcomes are evaluated by gradable assignments, which are distributed and collected through eCampus and exams are proctored by approved exam centers or equivalent.

Hours

Meets traditional face-to-face hours.

Describe how hours are met or provide justification why they are not met.

The credit hours of distance learning courses by the Department of Petroleum Engineering are ensured to be equivalent to on-campus face-to-face exams. In addition to the same lectures, DL students have equal opportunities to interact with instructors through email and online chat during office hours. For each three-credit hour course, a distance learning course accounts for 45-48 hours of instruction time.

Will this course be taught as a distance education course? Yes No

I verify that I have reviewed the FAQ for Export Control Basics for Distance Education. Yes

Is 100% of this course going to be taught in Texas? Yes

Will classroom space be needed for this course? Yes

This will be a required course or an elective course for the following programs:

Required (select program)

Elective (select program)

Program(s)

(MS-PETE) Master of Science in Petroleum Engineering

(PHD-PETE) Doctor of Philosophy in Petroleum Engineering
### Course Syllabus

<table>
<thead>
<tr>
<th>Syllabus:</th>
<th>Upload syllabus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upload syllabus</td>
<td>PETE 647 Syllabus Petroleum Thermodynamics.pdf</td>
</tr>
</tbody>
</table>

| Letters of support or other documentation | No |
| Additional information             |    |

**Reviewer Comments**

- Kathy Beladi (k-beladi) (04/04/18 12:30 pm): Rollback: needs syllabus

**Reported to state?**

- No

Key: 17057
Course title and number: PETE 647: Petroleum Thermodynamics
Term: Fall 2018
Meeting times and location: TR 9:35-10:50, RICH 308

Course Description and Prerequisites

The purpose of this course is to prepare the student to understand the principles of bulk equilibrium, bulk non-equilibrium, interfacial, and thin-film thermodynamics in relation to hydrocarbon reservoirs. Important applications of these principles in shale gas, shale light oil, heavy oil production, CO₂ injection in light and heavy oils, and phase-splitting calculations are presented. A focus of the course will be complex diffusion processes and species distribution in hydrocarbon reservoirs from irreversible thermodynamics.

Prerequisites: graduate classification or instructor approval.

Learning Outcomes or Course Objectives

The objective of the class is to teach thermodynamic principles in relation to hydrocarbon reservoirs and production that will enable the student to achieve differentiating performance as a petroleum engineer.

Instructor Information

Name: Hadi Nasrabadi, Assistant Professor
Telephone number: 979-862-6483
Email address: hadi.nasrabadi@tamu.edu
Office hours: TR 11:00-11:50 am
Office location: 401Q Richardson Building

Textbook and/or Resource Material

The main source of material for the course will be presentation slides and other reference material posted on a shared class site.

Grading Policies

Homework: 15%
Quiz: 15%
Midterm Exam: 20%
Final Exam: 30%
Project: 20%
Total: 100%
Grading Scale

A……………………………………………………………………………………………………..90-100%
B………………………………………………………………………………………………………80-89%
C………………………………………………………………………………………………………70-79%
D………………………………………………………………………………………………………60-69%
F………………………………………………………………………………………………………..0-59%

Course Topics, Calendar of Activities, Major Assignment Dates

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Introduction and syllabus. Basic Concepts and Equations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 2</td>
<td>Basic Concepts and Equations</td>
</tr>
<tr>
<td>Week 3</td>
<td>Conservation of Mass, Energy, Entropy</td>
</tr>
<tr>
<td>Week 4</td>
<td>Theory of Phase Equilibria in Hydrocarbon Reservoirs</td>
</tr>
<tr>
<td>Week 5</td>
<td>Complex Diffusion Processes from Irreversible Thermodynamics</td>
</tr>
<tr>
<td>o Molecular Diffusion</td>
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<td>o Pressure Diffusion</td>
<td></td>
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<tr>
<td>o Thermal Diffusion</td>
<td></td>
</tr>
<tr>
<td>Week 6</td>
<td>Natural Convection and Diffusion in Porous Media</td>
</tr>
<tr>
<td>Week 7</td>
<td>Two- and Three-Phase Isothermal Compressibility</td>
</tr>
<tr>
<td>Two- and Three-Phase Partial Molar Volume</td>
<td></td>
</tr>
<tr>
<td>Week 8</td>
<td>Phase Stability Analysis</td>
</tr>
<tr>
<td>o Tangent Plane Distance Analysis</td>
<td></td>
</tr>
<tr>
<td>o Gibbs Free Energy Surface Analysis</td>
<td></td>
</tr>
<tr>
<td>Week 9</td>
<td>Two- and Three-Phase Flash Calculations</td>
</tr>
<tr>
<td>Week 10</td>
<td>Direct Minimization of Gibbs Free Energy in Multiphase Flash</td>
</tr>
<tr>
<td>Week 11</td>
<td>Thermodynamics of Asphaltene Precipitation</td>
</tr>
<tr>
<td>Week 12</td>
<td>Cubic-Plus-Association Equation of State</td>
</tr>
<tr>
<td>Week 13</td>
<td>PC-SAFT Equation of State</td>
</tr>
<tr>
<td>Week 14</td>
<td>Gibbs Free Energy of Asphaltene Micellization</td>
</tr>
</tbody>
</table>

Americans with Disabilities Act (ADA)

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**Academic Integrity**

*For additional information please visit: [http://aggiehonor.ramu.edu](http://aggiehonor.ramu.edu)*

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Course Change Request

Date Submitted: 04/04/18 1:10 pm

Viewing: **PETE 651 : Probabilistic Reserves Evaluation**

Last approved: 06/23/17 3:24 am

Last edit: 04/04/18 1:56 pm

Changes proposed by: e-schuler

Catalog Pages referencing this course

Harold Vance Department of Petroleum Engineering
PETE - Petroleum Engineering

Faculty Senate Number

Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eleanor Schuler</td>
<td><a href="mailto:e-schuler@tamu.edu">e-schuler@tamu.edu</a></td>
<td>9798458042</td>
</tr>
</tbody>
</table>

Rationale for Course

The proposed changes are part of a routine curriculum review.

Course prefix       PETE  
Course number       651

Department          Petroleum Engineering
College/School      College of Engineering
Academic Level      Graduate
Academic Level (alternate) Undergraduate

Effective term      2018-2019 2017-2018

Complete Course Title Probabilistic Reserves Evaluation

Abbreviated Course Title PROBABILISTIC RESERVES EVAL

Catalog course description
Oil and gas reserves definitions and reporting regulations; probabilistic reserves estimation methods; unconventional resources characterization; reserves valuation techniques.

Prerequisites and Restrictions
Graduate classification or approval of instructor.

Concurrent Enrollment No

Should catalog prerequisites / concurrent enrollment be enforced? No

Crosslistings No

Crosslisted With

---

In Workflow
1. PETE Department Head
2. Curricular Services Review
3. EN Committee Preparer GR
4. EN Committee Chair GR
5. EN College Dean GR
6. GC Preparer
7. GC Chair
8. Faculty Senate Preparer
9. Faculty Senate
10. Provost II
11. President
12. Curricular Services
13. Banner

Approval Path
1. 04/04/18 1:23 pm Kathy Beladi (k-beladi): Approved for PETE Department Head
2. 04/04/18 1:56 pm Sandra Williams (sandra-williams): Approved for Curricular Services Review
3. 04/18/18 11:02 am Jennifer Veracruz (jveracruz): Approved for EN Committee Preparer GR
4. 04/25/18 2:17 pm Harry Hogan (h-hogan): Approved for EN Committee Chair GR
5. 04/25/18 2:20 pm Harry Hogan (h-hogan): Approved for EN College Dean GR
6. 06/13/18 12:17 pm Meagan Kelly (meagankelly): Approved for GC Preparer
7. 06/14/18 3:52 pm LaRhesa Johnson (lrjohnson): Approved for GC Chair

History
1. Jun 23, 2017 by sarah.gordon
### PETE 651: Probabilistic Reserves Evaluation

<table>
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<tbody>
<tr>
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<td>3 (per week):</td>
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<td>Contact Hour(s)</td>
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<td>Lecture:</td>
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<td>Lab:</td>
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<td>Other:</td>
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<td>Total</td>
<td>3</td>
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</table>

**Repeatable for credit?**  No

**Three-peat?**  No

**CIP/Fund Code**  1425010006

**Default Grade Mode**  Letter Grade (G)

**Alternate Grade Modes**  Satisfactory/Unsatisfactory

**Method of instruction**  Lecture

**Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education)**  Yes

**Learning Outcomes**  
Meets traditional face-to-face learning outcomes.

Describe how learning outcomes are met or provide justification why they are not met.

Distance learning courses taught by the Department of Petroleum Engineering, provide the same lectures, assignments, and exams as on campus face-to-face courses. Student learning outcomes are evaluated by gradable assignments, which are distributed and collected through eCampus and exams are proctored by approved exam centers or equivalent.

**Hours**  
Meets traditional face-to-face hours.

Describe how hours are met or provide justification why they are not met.

The credit hours of distance learning courses by the Department of Petroleum Engineering are ensured to be equivalent to on-campus face-to-face exams. In addition to the same lectures, DL students have equal opportunities to interact with instructors through email and online chat during office hours. For each three-credit hour course, a distance learning course accounts for 45-48 hours of instruction time.

**Will this course be taught as a distance education course?**  Yes

**I verify that I have reviewed the FAQ for Export Control Basics for Distance Education.**  Yes

**Is 100% of this course going to be taught in Texas?**  Yes

**Will classroom space be needed for this course?**  Yes

This will be a required course or an elective course for the following programs:

<table>
<thead>
<tr>
<th>Program(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MS-PETE) Master of Science in Petroleum Engineering</td>
</tr>
<tr>
<td>(PHD-PETE) Doctor of Philosophy in Petroleum Engineering</td>
</tr>
<tr>
<td>(MEN-PETE) Master of Engineering in Petroleum Engineering</td>
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</table>
## Course Syllabus

<table>
<thead>
<tr>
<th>Syllabus:</th>
<th>Upload syllabus</th>
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<tbody>
<tr>
<td>Upload syllabus</td>
<td><a href="PETE_651_Syllabus_Probabilistic_Reserves_Evaluation.pdf">PETE 651 Syllabus Probabilistic Reserves Evaluation.pdf</a></td>
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</table>

<table>
<thead>
<tr>
<th>Letters of support or other documentation</th>
<th>No</th>
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</thead>
<tbody>
<tr>
<td>Additional information</td>
<td></td>
</tr>
<tr>
<td>Reviewer Comments</td>
<td></td>
</tr>
<tr>
<td>Reported to state?</td>
<td>No</td>
</tr>
</tbody>
</table>
Course title and number: PETE 651: Probabilistic Reserves Evaluation
Term: Fall 2018
Meeting times and location: TR 12:45 – 2:00 PM, RICH 1009

Course Description and Prerequisites

Oil and gas reserves definitions and reporting regulations. Probabilistic reserves estimation methods. Unconventional resources characterization. Reserves valuation techniques.

Prerequisites

Graduate classification or approval of instructor

Learning Outcomes and Course Objectives

This course will equip students to classify and categorize petroleum resources properly and to estimate and report these resources (especially reserves) correctly using probabilistic estimation procedures. Students will be able to estimate reserves and non-reserves resource volumes using probabilistic techniques in unconventional (low permeability) resource petroleum accumulations.

Instructor Information

Name: John Lee, Professor
Telephone number: 979.845.2208
Email address: john-lee@tamu.edu
Office hours: Monday and Tuesday, 9:00-11:00 a.m.
Office location: 401P Richardson Building

Textbook and/or Resource Material


Grading Policies

Term papers………………………………………………………………… ………………………..    20%
Homework…………………………………………………………………… ………………………..   20%
Mid-semester exams (2)………………………………………………………………….…………     30%
Final Exam…………………………………………………………………………………………….    30%
Total……………………………………………………………………………………………………. 100%

Grading Scale

A……………………………………………………………………………………………………..90-100%
B………………………………………………………………………………………………………80-89%
C………………………………………………………………………………………………………70-79%
D………………………………………………………………………………………………………60-69%
F………………………………………………………………………………………………………..0-59%
Course Topics, Calendar of Activities, Major Assignment Dates

Homework will be due before the start of each class, and will be submitted electronically. Late homework will not be accepted without prior approval except in emergencies or approved university absences. Classes will be recorded and students may access the recordings. Students are expected to attend class. Graduate students will submit two term papers during the semester. [http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07)

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>SPE Petroleum Resources Management System (PRMS)</td>
</tr>
<tr>
<td>2</td>
<td>PRMS and SEC reserves reporting requirements</td>
</tr>
<tr>
<td>3</td>
<td>Descriptive statistics, basic probability concepts</td>
</tr>
<tr>
<td>4</td>
<td>Expected value and decision trees</td>
</tr>
<tr>
<td>5</td>
<td>Probability distributions 1; mid-semester exam 1</td>
</tr>
<tr>
<td>6</td>
<td>Probability distributions 2</td>
</tr>
<tr>
<td>7</td>
<td>Overview of probabilistic reserves estimation procedures</td>
</tr>
<tr>
<td>8</td>
<td>Monte Carlo simulation 1</td>
</tr>
<tr>
<td>9</td>
<td>Monte Carlo simulation 2</td>
</tr>
<tr>
<td>10</td>
<td>Capen’s alternative to Monte Carlo simulation; mid-semester exam 2</td>
</tr>
<tr>
<td>11</td>
<td>Unconventional resources 1</td>
</tr>
<tr>
<td>12</td>
<td>Unconventional resources 2</td>
</tr>
<tr>
<td>13</td>
<td>Unconventional resources 3</td>
</tr>
<tr>
<td>14</td>
<td>Unconventional resources 4</td>
</tr>
<tr>
<td>15</td>
<td>Final exam</td>
</tr>
</tbody>
</table>

Graduate Students

Graduate students will submit two term papers during the semester.

Americans with Disabilities Act (ADA)

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Academic Integrity

For additional information please visit: [http://aggiehonor.ramu.edu](http://aggiehonor.ramu.edu)
“An Aggie does not lie, cheat, or steal, or tolerate those who do.”
Course Change Request

Date Submitted: 04/04/18 1:20 pm

Viewing: PETE 653: Linear and Nonlinear Rock Mechanics

Last approved: 02/01/18 3:23 am
Last edit: 04/04/18 2:06 pm
Changes proposed by: e-schuler

Catalog Pages referencing this course

Harold Vance Department of Petroleum Engineering
PETE - Petroleum Engineering

Faculty Senate Number: Fs.35.003

Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
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</thead>
<tbody>
<tr>
<td>Eleanor Schuler</td>
<td><a href="mailto:e-schuler@tamu.edu">e-schuler@tamu.edu</a></td>
<td>9798458402</td>
</tr>
</tbody>
</table>

Rationale for Course

The proposed changes are part of a routine curriculum review.

Course prefix: PETE  
Course number: 653

Department: Petroleum Engineering
College/School: College of Engineering
Academic Level: Graduate
Academic Level (alternate): Undergraduate
Effective term: 2018-2019

Complete Course Title
Linear and Nonlinear Rock Mechanics

Abbreviated Course Title
LINEAR & NONLINEAR ROCK MECH

Catalog course description

Formulation of linear poro-elasticity equations; formulation of non-linear poro-elasticity and plasticity equations; formulation of various rock failure theories; solving linear and non-linear elasticity and plasticity equations using analytical methods; solving 2-D poro-elasticity and plasticity equations using a semi-analytical method; applying the solutions to drill string, casing, reservoir compaction, breakouts and sand production problems.

Prerequisites and Restrictions
Calculus and graduate classification.

Concurrent Enrollment
No

Should catalog prerequisites / concurrent enrollment be enforced?
No

In Workflow

1. PETE Department Head
2. Curricular Services Review
3. EN Committee Preparer GR
4. EN Committee Chair GR
5. EN College Dean GR
6. GC Preparer
7. GC Chair
8. Faculty Senate Preparer
9. Faculty Senate
10. Provost II
11. President
12. Curricular Services
13. Banner

Approval Path

1. 04/04/18 1:23 pm Kathy Beladi (k-beladi): Approved for PETE Department Head
2. 04/04/18 2:06 pm Sandra Williams (sandra-williams): Approved for Curricular Services Review
3. 04/18/18 11:02 am Jennifer Veracruz (jveracruz): Approved for EN Committee Preparer GR
4. 04/25/18 2:17 pm Harry Hogan (h-hogan): Approved for EN Committee Chair GR
5. 04/25/18 2:20 pm Harry Hogan (h-hogan): Approved for EN College Dean GR
6. 06/13/18 12:17 pm Meagan Kelly (meagankelly): Approved for GC Preparer
7. 06/14/18 3:52 pm LaRhesa Johnson (lrjohnson): Approved for GC Chair

History

1. Feb 1, 2018 by Eleanor Schuler (e-schuler)
PETE 653: Linear and Nonlinear Rock Mechanics

| Crosslistings | No |
| Stacked | No |

| Semester | 3 |
| Credit | 3 |
| Hour(s) | Contact Hour(s) (per week): 3 |

| Lecture: 3 |
| Lab: 0 |
| Other: 0 |
| Total: 3 |

Repeatable for credit? No

Three-peat? No

CIP/Fund Code: 1425010006

Default Grade Mode: Letter Grade (G)

Alternate Grade Modes: Satisfactory/Unsatisfactory

Method of instruction: Lecture

Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education) Yes

Learning Outcomes

Meets traditional face-to-face learning outcomes.

Describe how learning outcomes are met or provide justification why they are not met.

Distance learning courses taught by the Department of Petroleum Engineering, provide the same lectures, assignments, and exams as on campus face-to-face courses. Student learning outcomes are evaluated by gradable assignments, which are distributed and collected through eCampus and exams are proctored by approved exam centers or equivalent.

Hours

Meets traditional face-to-face hours.

Describe how hours are met or provide justification why they are not met.

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Will this course be taught as a distance education course? Yes No

I verify that I have reviewed the FAQ for Export Control Basics for Distance Education. Yes

Is 100% of this course going to be taught in Texas? Yes

Will classroom space be needed for this course? Yes

This will be a required course or an elective course for the following programs:

Required (select program)

Elective (select program)

| Program(s) |
| (PHD-PETE) Doctor of Philosophy in Petroleum Engineering |
| (MS-PETE) Master of Science in Petroleum Engineering |
### Course Syllabus

<table>
<thead>
<tr>
<th>Syllabus:</th>
<th>Upload syllabus</th>
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<tbody>
<tr>
<td></td>
<td>PETE_689_Linear_Non-LinearRM_Morita_Syllabus.pdf</td>
</tr>
<tr>
<td></td>
<td>PETE_653_Linear_Non-LinearRM_Syllabus.pdf</td>
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</table>

- Letters of support or other documentation: Yes
- Additional information: 
- Reviewer Comments: 
- Reported to state? Yes
  - No

Key: 17510
Course title and number  PETE 653 – Linear and Non-Linear Rock Mechanics
Term (e.g., Fall 200X)  Fall 2018
Meeting times and location  TR 12:45 – 2:00 PM

Course Description and Prerequisites
Formulation of linear poro-elasticity equations; formulation of non-linear poro-elasticity and plasticity equations; formulation of various rock failure theories; solving linear and non-linear elasticity and plasticity equations using analytical methods; solving 2-D poro-elasticity and plasticity equations using a semi-analytical method; applying the solutions to drill string, casing, reservoir compaction, breakouts and sand production problems.

Learning Outcomes
Formulation and practice of various linear and non-linear constitutive equations and failure theories in solving geomechanics problems; practice drill string stability, casing stability, reservoir compaction, subsidence and borehole breakout problems using analytical solutions and using a semi-analytical program to be developed by students.

Prerequisites: Calculus and graduate classification

Instructor Information
Name  Nobuo Morita
Telephone number  979-458-3273
Email address  Nobuo.morita@tamu.edu
Office hours  By appointment
Office location  501 P Richardson Bldg

Textbook and/or Resource Material
A textbook is provided.

Grading Policies
A(80-100), B(70-79), C(60-69), D(50-59), F(below 50)
Homework … 30%
Program coding … 30%
Final … 40%

Attendance and Make-up Policies
The student is responsible for providing satisfactory evidence to the instructor to substantiate the reason for any absence. Among the reasons absences are considered excused by the University are the following. See Student Rule 7 at http://student-rules.tamu.edu/rule07. A high score is essential for the final exam if absences are repeated.
Course Topics, Calendar of Activities, Major Assignment Dates

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Required Reading</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Fundamental equations of poro-elasticity</td>
<td>Textbook</td>
</tr>
<tr>
<td>2</td>
<td>Fundamental equations of poro-elasticity (continued)</td>
<td>Textbook</td>
</tr>
<tr>
<td>3</td>
<td>Fundamental equations of poro-elasticity (continued)</td>
<td>Textbook</td>
</tr>
<tr>
<td>4</td>
<td>Two dimensional problems</td>
<td>Textbook</td>
</tr>
<tr>
<td>5</td>
<td>Two dimensional solutions for oil field applications</td>
<td>Textbook</td>
</tr>
<tr>
<td>6</td>
<td>Two dimensional solutions for geomechanics problems</td>
<td>Textbook</td>
</tr>
<tr>
<td>7</td>
<td>Definition of the effective stresses Rock strength and triaxial stress strain tests</td>
<td>Textbook</td>
</tr>
<tr>
<td>8</td>
<td>Fundamental equations of elasto-plastic analysis</td>
<td>Textbook</td>
</tr>
<tr>
<td>9</td>
<td>Elasto-visco-plastic problems</td>
<td>Textbook</td>
</tr>
<tr>
<td>10</td>
<td>Analytical solutions of elasto-plasticity problems</td>
<td>Textbook</td>
</tr>
<tr>
<td>11</td>
<td>Analytical solutions of elasto-plasticity problems (continued)</td>
<td>Textbook</td>
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<tr>
<td>12</td>
<td>Application of numerical methods to elasto-plastic problems</td>
<td>Textbook</td>
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<tr>
<td>13</td>
<td>Slip line theories of plasticity</td>
<td>Textbook</td>
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<tr>
<td>14</td>
<td>Application of slip line theories to geomechanics problems</td>
<td>Textbook</td>
</tr>
<tr>
<td>15</td>
<td>Final project report and final exam</td>
<td></td>
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</table>

Other Pertinent Course Information

Computer usage: Require Fortran or C language

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Course title and number    PETE 653 – Linear and Non-Linear Rock Mechanics
Term (e.g., Fall 200X)    Fall 2018
Meeting times and location    TR 12:45 – 2:00 PM

Course Description and Prerequisites
Formulation of linear poro-elasticity equations; formulation of non-linear poro-elasticity and plasticity equations; formulation of various rock failure theories; solving linear and non-linear elasticity and plasticity equations using analytical methods; solving 2-D poro-elasticity and plasticity equations using a semi-analytical method; applying the solutions to drill string, casing, reservoir compaction, breakouts and sand production problems.

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Instructor Information
Name    Nobuo Morita
Telephone number    979-458-3273
Email address    Nobuo.morita@tamu.edu
Office hours    By appointment
Office location    501 P Richardson Bldg

Textbook and/or Resource Material
A textbook is provided.

Grading Policies
A(80-100), B(70-79), C(60-69), D(50-59), F(below 50)
Homework … 30%
Program coding … 30%
Final … 40%

Attendance and Make-up Policies
The student is responsible for providing satisfactory evidence to the instructor to substantiate the reason for any absence. Among the reasons absences are considered excused by the University are the following. See Student Rule 7 at http://student-rules.tamu.edu/rule07. A high score is essential for the final exam if absences are repeated.
### Course Topics, Calendar of Activities, Major Assignment Dates

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Required Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fundamental equations of poro-elasticity</td>
<td>Textbook</td>
</tr>
<tr>
<td>2</td>
<td>Fundamental equations of poro-elasticity (continued)</td>
<td>Textbook</td>
</tr>
<tr>
<td>3</td>
<td>Fundamental equations of poro-elasticity (continued)</td>
<td>Textbook</td>
</tr>
<tr>
<td>4</td>
<td>Two dimensional problems</td>
<td>Textbook</td>
</tr>
<tr>
<td>5</td>
<td>Two dimensional solutions for oil field applications</td>
<td>Textbook</td>
</tr>
<tr>
<td>6</td>
<td>Two dimensional solutions for geomechanics problems</td>
<td>Textbook</td>
</tr>
<tr>
<td>7</td>
<td>Definition of the effective stresses Rock strength and triaxial stress strain tests</td>
<td>Textbook</td>
</tr>
<tr>
<td>8</td>
<td>Fundamental equations of elasto-plastic analysis</td>
<td>Textbook</td>
</tr>
<tr>
<td>9</td>
<td>Elasto-visco-plastic problems</td>
<td>Textbook</td>
</tr>
<tr>
<td>10</td>
<td>Analytical solutions of elasto-plasticity problems</td>
<td>Textbook</td>
</tr>
<tr>
<td>11</td>
<td>Analytical solutions of elasto-plasticity problems (continued)</td>
<td>Textbook</td>
</tr>
<tr>
<td>12</td>
<td>Application of numerical methods to elasto-plastic problems</td>
<td>Textbook</td>
</tr>
<tr>
<td>13</td>
<td>Slip line theories of plasticity</td>
<td>Textbook</td>
</tr>
<tr>
<td>14</td>
<td>Application of slip line theories to geomechanics problems</td>
<td>Textbook</td>
</tr>
<tr>
<td>15</td>
<td>Final project report and final exam</td>
<td></td>
</tr>
</tbody>
</table>

### Other Pertinent Course Information

Computer usage: Require Fortran or C language

#### Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit [http://disability.tamu.edu](http://disability.tamu.edu).

#### Academic Integrity

For additional information please visit: [http://aggiehonor.tamu.edu](http://aggiehonor.tamu.edu)

"An Aggie does not lie, cheat, or steal, or tolerate those who do."
Course Change Request

Date Submitted: 04/04/18 1:21 pm

Viewing: PETE 659: Rock Mechanics Related to Hydraulic Fracturing

Last approved: 02/03/18 3:23 am
Last edit: 04/04/18 2:07 pm
Changes proposed by: e-schuler

Catalog Pages referencing this course
Harold Vance Department of Petroleum Engineering
PETE - Petroleum Engineering

Faculty Senate Number FS.35.003

Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eleanor Schuler</td>
<td><a href="mailto:e-schuler@tamu.edu">e-schuler@tamu.edu</a></td>
<td>9798458402</td>
</tr>
</tbody>
</table>

Rationale for Course Edit

The proposed changes are part of a routine curriculum review.

Course prefix  PETE  Course number  659
Department  Petroleum Engineering
College/School  College of Engineering
Academic Level  Graduate
Academic Level (alternate)  Undergraduate
Effective term  2018-2019

Complete Course Title
Rock Mechanics Related to Hydraulic Fracturing

Abbreviated Course Title
ROCK MECH HYDRAULIC FRAC

Catalog course description
Fundamentals of rock mechanics; calculation of displacements and stresses of opening fractures; evaluation of stress shadow effects; investigation of local stress reorientation and fracture interaction; analysis of near-tip stresses; determination of fracture propagation direction; summary of hydraulic fracturing treatments and modeling in unconventional reservoirs.

Prerequisites and Restrictions
Graduate classification.

Concurrent Enrollment  No
Should catalog prerequisites /  No
| concurrent enrollment be enforced? | No |
| Crosslistings | No |
| Stacked | No |

| Semester | 3 |
| Credit Hour(s) | 3 |
| Contact Hour(s) (per week): | Lecture: 3 |
| Lab: 0 |
| Other: 0 |
| Total | 3 |

| Repeatable for credit? | No |
| Three-peat? | No |

| CIP/Fund Code | 1425010006 |
| Default Grade Mode | Letter Grade (G) |
| Alternate Grade Modes | Satisfactory/Unsatisfactory |
| Method of instruction | Lecture |

| Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education) | Yes |

**Learning Outcomes**

Meets traditional face-to-face learning outcomes.

Describe how learning outcomes are met or provide justification why they are not met.

Distance learning courses taught by the Department of Petroleum Engineering, provide the same lectures, assignments, and exams as on campus face-to-face courses. Student learning outcomes are evaluated by gradable assignments, which are distributed and collected through eCampus and exams are proctored by approved exam centers or equivalent.

Hours

Meets traditional face-to-face hours.

Describe how hours are met or provide justification why they are not met.

The credit hours of distance learning courses by the Department of Petroleum Engineering are ensured to be equivalent to on-campus face-to-face exams. In addition to the same lectures, DL students have equal opportunities to interact with instructors through email and online chat during office hours. For each three-credit hour course, a distance learning course accounts for 45-48 hours of instruction time.

Will this course be taught as a distance education course? Yes

I verify that I have reviewed the FAQ for Export Control Basics for Distance Education.

Yes

Is 100% of this course going to be taught in Texas? Yes

Will classroom space be needed for this course? Yes

This will be a required course or an elective course for the following programs:

Required (select program)

Elective (select program)

| Program(s) |  |
Program(s)

(MEN-PETE) Master of Engineering in Petroleum Engineering
(MS-PETE) Master of Science in Petroleum Engineering
(PHD-PETE) Doctor of Philosophy in Petroleum Engineering
Course title and number: Rock mechanics related to hydraulic fracturing, PETE 659
Term (e.g., Fall 200X): Fall 2018
Meeting times and location: TR 9:35pm – 10:50 am; RICH 313

Course Description and Prerequisites
The goals of this course are to apply fundamentals of rock mechanics, calculate displacements and stresses of opening fractures, evaluate stress shadow effects and investigate local stress reorientation and fracture interaction, analyze near-tip stresses and determine fracture propagation direction, and summarize hydraulic fracturing treatments and modeling in unconventional reservoirs.

Learning Outcomes
Students will be able to
- Identify and evaluate the fundamental principles of rock mechanics
- Apply knowledge of rock mechanics in modeling hydraulic fractures
- Identify the difference of hydraulic fracturing in unconventional and conventional reservoirs and characteristics of fracture geometry in unconventional reservoirs

Instructor Information
Name: Kan Wu
Telephone number: 979-862-7654
Email address: Kan.wu@tamu.edu
Office hours: TR 2:30 pm -3:30 pm
Office location: RICH 501Q

Textbook and/or Resource Material
Reservoir Geomechanics, Zoback, Cambridge University Press
Hydraulic Fracture Mechanics, Valko and Economides, Wiley and Sons, 1995

Grading Policies
Regular university scale will be applied (A = 90-100, B = 80-89, C = 70-79, D = 60-69, F<60)

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Exam 1</td>
<td>30%</td>
</tr>
<tr>
<td>Midterm Exam 2</td>
<td>30%</td>
</tr>
<tr>
<td>Homework</td>
<td>20%</td>
</tr>
<tr>
<td>Final project</td>
<td>20%</td>
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</tbody>
</table>

Attendance and Make-up Policies
The student is responsible for providing satisfactory evidence to the instructor to substantiate the reason for any absence. Among the reasons absences are considered excused by the University are the following. See Student Rule 7 at [http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07). A high score is essential for the final exam if absences are repeated.
### Course Topics, Calendar of Activities, Major Assignment Dates

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Required Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stress and Strain</td>
<td>Chapter 1 of Fundamentals of Rock Mechanics</td>
</tr>
<tr>
<td>2</td>
<td>In-situ stresses and pore pressure</td>
<td>Chapters 1 and 2 of Reservoir Geomechanics</td>
</tr>
<tr>
<td>3</td>
<td>Structural geology</td>
<td>Chapter 5 of Reservoir Geomechanics</td>
</tr>
<tr>
<td>4</td>
<td>Stress resolution and Mohr diagram</td>
<td>Chapter 5 of Reservoir Geomechanics</td>
</tr>
<tr>
<td>5</td>
<td>Rock failure analysis and <strong>given exam 1</strong></td>
<td>Chapter 4 of Reservoir Geomechanics</td>
</tr>
<tr>
<td>6</td>
<td>Linear elasticity</td>
<td>Chapter 5 of Fundamentals of Rock Mechanics</td>
</tr>
<tr>
<td>7</td>
<td>Linear elasticity</td>
<td>Chapter 5 of Fundamentals of Rock Mechanics</td>
</tr>
<tr>
<td>8</td>
<td>Displacements near fractures</td>
<td>Chapter 8 of Fracture mechanics of rock</td>
</tr>
<tr>
<td>9</td>
<td>Stresses near fractures and tips</td>
<td>Chapter 8 of Fracture mechanics of rock</td>
</tr>
<tr>
<td>10</td>
<td>Rock fracture mechanics and <strong>given exam 2</strong></td>
<td>Chapter 1 of Fracture mechanics of rock</td>
</tr>
<tr>
<td>11</td>
<td>Hydraulic fracture modeling</td>
<td>TBA</td>
</tr>
<tr>
<td>12</td>
<td>Hydraulic fracture in unconventional reservoirs</td>
<td>TBA</td>
</tr>
<tr>
<td>13</td>
<td>Numerical modeling of rock mechanics</td>
<td>TBA</td>
</tr>
<tr>
<td>14</td>
<td>Review and final presentation</td>
<td>N/A</td>
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</table>

### Other Pertinent Course Information

#### Americans with Disabilities Act (ADA)

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Course Change Request

Date Submitted: 05/09/18 1:15 pm

Viewing: **PHPM 644: Texas Training Initiative For Emergency Response (T-Tier)**

Last edit: 05/18/18 1:40 pm
Changes proposed by: monica-a-garza

Catalog Pages referencing this course
- Department of Health Policy and Management
- PHPM - Public Hlth Pol & Mgmt

Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monica Garner</td>
<td><a href="mailto:magarner@sph.tamhsc.edu">magarner@sph.tamhsc.edu</a></td>
<td>979-436-9483</td>
</tr>
</tbody>
</table>

Rationale for Course

Edit

The proposed changes are part of a routine curriculum review.

Course prefix: **PHPM**
Course number: 644

Department: Health Policy & Management
College/School: Public Health
Academic Level: Graduate
Effective term: 2018-2019

Complete Course Title
Texas Training Initiative For Emergency Response (T-Tier)

Abbreviated Course Title
TX TRNG INITVE FOR EMERG RESP

Catalog course description
Texas Training Initiative for Emergency Response (T-Tier). (3-0). This course develops the knowledge, skills, and abilities needed to effectively respond to bioterrorism, infectious disease outbreaks, and other public health threats and emergencies in a multi-disciplinary approach. The course will focus on competencies paralleling the critical benchmark of emergency preparedness as identified by the Centers for Disease Control and Prevention, as well as to gain the knowledge, skills, and abilities along with practice to protect the public's health. Roles of the many public health workers will be explored.

Prerequisites and Restrictions

Should catalog prerequisites/concurrent enrollment be enforced?
No

Crosslistings
No
Crosslisted With

Stacked
No
Stacked with
<table>
<thead>
<tr>
<th>Semester</th>
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<th>Contact Hour(s)</th>
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<th>Lecture:</th>
<th>3</th>
<th>Lab:</th>
<th>0</th>
<th>Other:</th>
<th>0</th>
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<td></td>
<td></td>
<td>Lecture:</td>
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<td>Repeateble for credit?</td>
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<tr>
<td>CIP/Fund Code</td>
<td>512211</td>
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<tr>
<td>Default Grade Mode</td>
<td>Letter Grade (G)</td>
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<tr>
<td>Method of instruction</td>
<td>Lecture</td>
<td></td>
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<tr>
<td>Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education)</td>
<td>Yes</td>
<td></td>
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</tbody>
</table>

### Learning Outcomes

**Meets traditional face-to-face learning outcomes.**

Describe how learning outcomes are met or provide justification why they are not met.

**Learning outcomes are met using the course modules, adobe connect sessions and the tabletop exercise.**

### Hours

**Meets traditional face-to-face hours.**

Describe how hours are met or provide justification why they are not met.

**Learning outcomes are met using the course modules, adobe connect sessions and the tabletop exercise.**

Will this course be taught as a distance education course?

No

Is 100% of this course going to be taught in Texas?

Yes

Will classroom space be needed for this course?

No

This will be a required course or an elective course for the following programs:

<table>
<thead>
<tr>
<th>Program(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MPH-PHPM) Master of Public Health in Health Policy Management</td>
</tr>
</tbody>
</table>

## Course Syllabus

- **Syllabus:**
  - Upload syllabus
  - *PHPM 644 Syllabus.docx*

- **Letters of support or other documentation:**
  - No

- **Additional information:**

- **Reviewer Comments:**
  - Szu-hsuan Lin (micheyszu) (05/18/18 1:41 pm): SPH CC approved for nontraditional delivery, per University Rule 11.03.99.M1.
Instructor Information

Course title and number: Texas Training Initiative for Emergency Response
CRN 27118 PHPM 644 Section 699
Term: Fall 2018
Weekly Online via eCampus
Adobe Connect Sessions: 09/05/17 at 9:30am, 11/07/17 at 9:30am
Meeting times and location: Friday, December 1, 2017, 8 AM to 2 PM
TAMHSC SPH College Station
(IN PERSON, REQUIRED)
Instructor Name(s): Barbara Quiram, PhD
Angela Clendenin, PhD
Telephone number:
(979) 436-9472 – Dr. Quiram
(979) 436-9499 – Dr. Clendenin
Email address:
quiram@sph.tamhsc.edu
clendenin@sph.tamhsc.edu
Office hours: By appointment
Office location:
Dr. Quiram – 272 SPH Administration Bldg.
Dr. Clendenin – 217 SPH Administration Bldg.

Course Description

Texas Training Initiative for Emergency Response (T-TIER). This course develops the knowledge, skills, and abilities needed to effectively respond to bioterrorism, infectious disease outbreaks, and other public health threats and emergencies using a multi-disciplinary approach. The course will focus on competencies paralleling the critical benchmark of emergency preparedness as identified by the Centers for Disease Control and Prevention, as well as to gain the knowledge, skills and abilities along with practice to protect the public’s health. Roles of the many public health workers will be explored.

Prerequisites

There are no prerequisites for this course.

Course Competencies and Objectives

<table>
<thead>
<tr>
<th>Competencies</th>
<th>Course Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Explain methods of ensuring community health safety and preparedness.</td>
<td>Describe the roles of public health workers and public health organizations in preparedness and response.</td>
</tr>
<tr>
<td>• Identify critical stakeholders for the planning, implementation, and evaluation of public health programs, policies, and interventions.</td>
<td></td>
</tr>
<tr>
<td>• In collaboration with others, prioritize individual, organizational, and community concerns and resources for public health programs.</td>
<td></td>
</tr>
<tr>
<td>• Describe alternative strategies for collaboration and partnership among organizations, focused on public health goals.</td>
<td>Identify the roles and relationships among federal, tribal, state, and local governments and non-governmental organizations in preparedness and response.</td>
</tr>
<tr>
<td>• Engage in dialogue and learning from others to advance public health goals.</td>
<td></td>
</tr>
<tr>
<td>• Appreciate the importance of working collaboratively with diverse communities and constituencies (e.g., researchers, practitioners, agencies, and organizations).</td>
<td></td>
</tr>
<tr>
<td><strong>Textbook and/or Resource Material</strong></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Required reading assignments and supplemental resources will be provided electronically via eCampus. In addition, you will be required to register a user account and create a login on the USA Center for Rural Health Preparedness website. You will use this login the rest of the semester for the T-TIER Modules. Additional instructions on how to set up your account are included in the Module 1 folder on eCampus. Go to: <a href="http://www.rural-preparedness.org/campus/">http://www.rural-preparedness.org/campus/</a>.</td>
<td></td>
</tr>
</tbody>
</table>
Abstract Assignments

The abstract assignments encourage students to become familiar with a wide range of professional public health journals. Articles selected for this assignment should pertain to an aspect of public health emergency preparedness.

Each abstract should:
- address only one article
- summarize purpose, identify research methods and findings, and provide critical commentary about the strengths and weaknesses of the article
- be two, double-spaced pages with 1-inch margins
- use 12-pt font
- include name, date, and abstract number in the upper right hand header of the page
- include APA citation of article at end of abstract
- be submitted as a Word document via Blackboard
- include attachment of journal article

Thought Questions

In nine weeks, you will be assigned a Thought Question. This question is designed to encourage you to integrate and to think critically about the material presented to include assigned readings and completion of the required weekly online modules.

Each Thought Question response should:
- address all parts of the question presented
- reflect understanding of and the ability to assimilate material presented in the course leading to the ability to think critically about the material and apply it in a meaningful and relevant way
- be 1 ½ to two, double-spaced pages with 1-inch margins
- use 12-pt font
- include name, date, and thought question number in the upper right hand header of the page
- include APA citations of any outside material included on a reference page at the end of the document
- be submitted as a Word document via Blackboard

Adobe Connect Sessions

During the course, we will schedule two online discussion sessions scheduled for Tuesday, September 5th and Tuesday, November 7th at 9:30am. This provides an opportunity for instructors and students to touch base, ask questions, and further discuss the material covered to that point. We will be using Adobe® Connect™ for these sessions. A quicklink is provided in eCampus for your convenience.

Individual Press Release

A public health emergency scenario will be provided via Blackboard. As a public health professional, you will prepare an individual press release using the information from class, handouts, and additional resources.

The press release should
- be double spaced with 1-inch margins
- use 12-pt font
- be no longer than two pages
- include name and date in the upper right hand header of the page
- be submitted in Word via Blackboard
In-Person Public Health Emergency Table Top Exercise, Mock News Conference, and Press Release

All students are required to participate in the public health emergency table top exercise in College Station, Texas, at TAMHSC SPH on Friday, December 1, 2017, from 8:00 AM to 2:00 PM.

Students will be divided into groups. A public health emergency incident will be presented to each group. Group discussions will be facilitated by the instructors throughout the entire exercise. As part of the exercise, each group will develop a press release and conduct a mock news conference.

Your group will be evaluated according to:
- Participation in group discussions
- Development of written press release
- Participation in mock news conference

Final Exam (Take Home)

Your final exam, in the form of an After Action Review (AAR), will be assigned at the completion of the Table Top Exercise. The exam will consist of essay questions covering the material presented and discussed throughout the course and how it specifically related to the Table Top Exercise. Additional instructions will be provided the day of the Table Top Exercise.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Assignment/Due Date &amp; Time*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1: 08/28/17</td>
<td>Class Introductions Intro to Public Health Emergency Preparedness</td>
<td>Adobe Connect Session One 09/05/17  9:30 am  Abstract 1 due 09/08/17 by 9:00 AM</td>
</tr>
<tr>
<td>Week 2: 09/04/17</td>
<td>Fundamentals of Emergency Management</td>
<td>TQ1 due 09/13/17 by 9 AM</td>
</tr>
<tr>
<td>Week 3: 09/11/17</td>
<td>Fundamentals of Emergency Management (con't)</td>
<td>TQ2 due 09/20/17 by 9 AM</td>
</tr>
<tr>
<td>Week 4: 09/18/17</td>
<td>Biological Agents</td>
<td>TQ3 due 09/27/17 by 9 AM</td>
</tr>
<tr>
<td>Week 5: 09/25/17</td>
<td>Foreign and Emerging Animal Diseases: Animals in Disasters: Community Planning</td>
<td>TQ4 due 10/04/17 by 9 AM</td>
</tr>
<tr>
<td>Week 6: 10/02/17</td>
<td>Chemical Agents</td>
<td>TQ5 due 10/11/17 by 9 AM</td>
</tr>
<tr>
<td>Week 7: 10/09/17</td>
<td>The Strategic National Stockpile CHEMPACK</td>
<td>TQ6 due 10/18/17 by 9 AM</td>
</tr>
<tr>
<td>Week 8: 10/16/17</td>
<td>Community Assessment for Public Health Emergency Response (CASPER)</td>
<td>TQ7 due 10/25/17 by 9 AM</td>
</tr>
<tr>
<td>Week 9: 10/23/17</td>
<td>Disaster Mental Health and Special Needs and Vulnerable Populations</td>
<td>TQ8 due 11/08/17 by 9 AM</td>
</tr>
<tr>
<td>Week 10: 10/30/17</td>
<td>Crisis &amp; Emergency Risk Communication</td>
<td>Adobe Connect Session Two 11/07/17  9:30 am  Individual Press Release due 11/10/17 by 9:00 AM</td>
</tr>
<tr>
<td>Week 11: 11/06/17</td>
<td>Public Information Officer Awareness</td>
<td>TQ9 due 11/15/17 by 9 AM</td>
</tr>
<tr>
<td>Week 12: 11/13/17</td>
<td>Emergency Responder Health Monitoring and Surveillance (ERHMS)</td>
<td>Final Exam Distributed: TTX After Action Review (AAR) December 1, 2017 at 2:00 PM</td>
</tr>
<tr>
<td>Week 13: 11/20/17</td>
<td>Thanksgiving Week</td>
<td></td>
</tr>
<tr>
<td>Week 14: 11/27/17</td>
<td>Public Health Emergency Table Top Exercise (TTX)</td>
<td></td>
</tr>
</tbody>
</table>

Week: 11/28/2017  Class Introductions Intro to Public Health Emergency Preparedness

Assignment/Due Date & Time:
- Adobe Connect Session One 09/05/17  9:30 am  Abstract 1 due 09/08/17 by 9:00 AM
- TQ1 due 09/13/17 by 9 AM
- TQ2 due 09/20/17 by 9 AM
- TQ3 due 09/27/17 by 9 AM
- TQ4 due 10/04/17 by 9 AM
- TQ5 due 10/11/17 by 9 AM
- TQ6 due 10/18/17 by 9 AM
- TQ7 due 10/25/17 by 9 AM
- TQ8 due 11/08/17 by 9 AM
- Adobe Connect Session Two 11/07/17  9:30 am  Individual Press Release due 11/10/17 by 9:00 AM
- TQ9 due 11/15/17 by 9 AM
- Final Exam Distributed: TTX After Action Review (AAR) December 1, 2017 at 2:00 PM
Week 15: 12/04/17  12/06/17 is last day of classes for fall semester classes. No online module this week.  
**TTX After Action Review (AAR) due**  12/06/17 no later than 9:00 AM

*Weekly reading assignments can be found in Weekly Module folders via TAMHSC Blackboard.*

### Grading Policies

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation/Attendance (includes completion of online modules and certificate submission)</td>
<td>20</td>
</tr>
<tr>
<td>Abstracts (10 points each)</td>
<td>20</td>
</tr>
<tr>
<td>Thought Questions (10 points each)</td>
<td>90</td>
</tr>
<tr>
<td>Individual Press Release</td>
<td>10</td>
</tr>
<tr>
<td>Public Health Emergency Table Top Exercise/Group Press Release/News Conference</td>
<td>10</td>
</tr>
<tr>
<td>Final Exam: TTX After Action Review (AAR)</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
</tr>
</tbody>
</table>

### Grading Scale

- **A** 200 – 181 Points
- **B** 180 – 161 Points
- **C** 160 – 141 Points
- **D** 140 – 121 Points
- **F** 120 – 0 Points

### Attendance and Make-up Policies

The University views class attendance as the responsibility of an individual student. Attendance is essential to complete the course successfully. University rules related to excused and unexcused absences are located on-line at [http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07).

As mentioned previously, you will be required to register a user account and create a login on the USA Center for Rural Health Preparedness website. You will use this login the rest of the semester for the T-TIER Modules. Additional instructions on how to set up your account are included in the Module 1 folder on eCampus. Go to: [http://www.rural-preparedness.org/campus/](http://www.rural-preparedness.org/campus/) to begin the registration process.

Upon completion of the selected e-learning modules via the USA Center site, you will receive a certificate of completion. You will be required to submit the certificates of completion via Blackboard. Further instructions will be provided via the TAMHSC Blackboard course website. Your participation/attendance grade for the semester (10% of your total grade) will be based on completion of the e-learning modules, participation in the Adobe Connect sessions, and participation in the in-person public health emergency table top exercise and mock news conference on **Friday, December 1, 2017, at TAMHSC SPH in College Station, Texas.**

### Other Pertinent Course Information

Every effort will be made to ensure files, notes, articles, and assignments are available online in a timely manner. Written assignments will be delivered thru the Blackboard course website. Handouts, changes in assignments, or changes to the schedule of class modules will be announced on the Bb course webpage. E-mail contact will be initiated with all students the first week of class. If you do not have access to your assigned TAMHSC e-mail account, it is your responsibility to make the instructor aware of that fact, so other arrangements may be made. You are expected to use your TAMHSC e-mail address for all official correspondence.
Within the course’s eCampus site you will access the learning materials, tutorials, and syllabus; discuss issues; submit assignments; take quizzes; email other students and the instructor; participate in online activities; and display your projects.

In order to access the course material you will need to go to login into Howdy and then click the eCampus button on the top right or look for Quick Links on the bottom of the School’s homepage or go to http://ecampus.tamu.edu Please do not contact your instructor with technical problems. If you are having a technical problem with the course, review the Blackboard Learn Tutorials (at the top-right of School’s Office of Academic Assessment and Instructional Technology website). For login issues (password not working), please contact TAMU Help Desk at helpdesk@tamu.edu via E-mail, or phone to (979) 845-8300. Your eCampus login is the same as your Howdy login (NetID).

Computer Requirements for Online Courses
For this and all online courses we recommend the minimum technical requirements outlined on our “SPH Computer Requirements for Online Courses” web page, located at http://www.sph.tamhsc.edu/assessment-instructional/com-requirement.html

All computing problems or other technical issues not related to eCampus, please contact:

- TAMHSC related account: helpdesk@tamhsc.edu via E-mail, or phone to (979) 862-8029
- TAMU related account: helpdesk@tamu.edu via E-mail, or phone to (979) 845-8300

Important!!! Save your work as you go along. Nothing is more discouraging than to lose an assignment due to a computer hang ups! You may want to also make hard copies of your work to have "proof" and save yourself time and trouble!

Plagiarism Virtual Course
Plagiarism is the leading form of academic dishonesty that the School of Public Health has to address. As a SPH student, you are responsible for knowing what plagiarism is and how to avoid it. All SPH students are automatically enrolled in Plagiarism Virtual Course on eCampus. This virtual course provides you with information and examples related to plagiarism in an effort to reduce the number of reported incidents. Please find a tutorial and resources under "Content." In addition, please find Turnitin, a software package that allows you to check whether you may have plagiarized your document. Please see Phuong Huynh: phuong@sph.tamhsc.edu for additional information.

Course Evaluation
Constructive feedback from students on course evaluations is taken very seriously at the School of Public Health. I am asking for your assistance in helping the School in its assessment of courses and faculty through your participation in the evaluation of your courses. As public health professionals you will one day have the responsibility to evaluate colleagues and health initiatives. The School views providing feedback on the School’s courses as part of your professional responsibility.

SPH Mission
The Texas A&M School of Public Health is committed to transforming health through interdisciplinary inquiry, innovative solutions, and development of leaders through the Aggie tradition of service to engage diverse communities worldwide.

Americans with Disabilities Act (ADA)
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides
comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit http://disability.tamu.edu.

### Academic Integrity

Academic integrity is the pursuit of scholarly activity free from fraud and deception and is an educational objective of this institution. Students are expected to adhere to all TAMUS, TAMU, HSC, and School policies regarding academic integrity and classroom conduct. Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used, or tampering with the academic work of another student. Individuals found guilty of academic dishonesty may be dismissed from the degree program, and at a minimum will receive an F for the course. It is the student’s responsibility to have a clear understanding of how to reference other individuals’ work, as well as having a clear understanding in general as to the various aspects of academic dishonesty. A tutorial on this issue is available at: http://SPH.tamhsc.edu/academic-affairs/academic-integrity.html. A plagiarism tutorial can be found in Blackboard. Information on the Aggie Honor Code can be found at http://aggiehonors.tamu.edu.

Remember:

“An Aggie does not lie, cheat, or steal, or tolerate those who do.”

### Copyright Statement

The materials used in this course are copyrighted. These materials include but are not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless permission is expressly granted by the instructor.

### FERPA

The Federal Education Rights & Privacy Act requires that we advise students that by registering for this course, their HSC assigned e-mail address will be revealed to classmates and the instructor. By continuing your enrollment in the course you acknowledge your understanding of this policy. By enrolling in this course you agree to the following statement: “I understand that as a result of registering for this course, my HSC/Blackboard assigned e-mail address will be revealed to classmates and the instructor.”

### Equal Opportunity Statement

The Texas A&M Health Science Center is an Equal Opportunity/ Affirmative Action employer. Inquiries regarding nondiscrimination policies may be directed to the Human Resources Officer by phone at (979) 436-9208, email hr@tamhsc.edu, or by mail at 200 Technology Way, College Station, TX 77845.

### DISCLAIMER

This syllabus is representative of materials that will be covered in this class; the schedule and topics list are subject to change. These changes will be discussed in class and subsequently communicated via email or posted as announcements. If you have any problems related to this course, please feel free to discuss them with the instructor.
Title IX of the Education Amendments of 1972 protects people from sex discrimination in educational programs and activities at institutions that receive federal financial assistance. Texas A&M University and the Texas A&M Health Science Center are committed to maintaining a learning environment that is free from discriminatory conduct based on gender. As required by Title IX, the University does not discriminate on the basis of sex in its education programs and activities, and it encourages any student or non-student who thinks that he or she has been subjected to sex discrimination, sexual harassment (including sexual violence) or sexual misconduct by another student, member of the faculty or staff, or campus visitor or contractor, to immediately report the incident to any of the individuals persons or offices listed below.

WHERE TO REPORT:
James Nachlinger,
Executive Director, Payroll and HR Services
Title IX Coordinator
979-436-9207
nachlinger@tamhsc.edu

The University encourages students to immediately consult with or report incidents of sex discrimination, sexual harassment (including sexual violence) or sexual misconduct to the TAMHSC Title IX Coordinator. Students may also report incidents of sex discrimination, sexual harassment (including sexual violence) or sexual misconduct to any School of Public Health administrator, university administrator, official or unit supervisor, who is then responsible for promptly notifying any of the above Title IX coordinators of the reported incident.
APPENDIX A: CEPH COMPETENCIES

D1. MPH & DrPH Foundational Public Health Knowledge

**Profession & Science of Public Health**
D1.1. Explain public health history, philosophy and values
D1.2. Identify the core functions of public health and the 10 Essential Services
D1.3. Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population’s health
D1.4. List major causes and trends of morbidity and mortality in the US or other community relevant to the school or program
D1.5. Discuss the science of primary, secondary and tertiary prevention in population health, including health promotion, screening, etc.
D1.6. Explain the critical importance of evidence in advancing public health knowledge

**Factors Related to Human Health**
D1.7. Explain effects of environmental factors on a population’s health
D1.8. Explain biological and genetic factors that affect a population’s health
D1.9. Explain behavioral and psychological factors that affect a population’s health
D1.10. Explain the social, political and economic determinants of health and how they contribute to population health and health inequities
D1.11. Explain how globalization affects global burdens of disease
D1.12. Explain an ecological perspective on the connections among human health, animal health and ecosystem health (e.g., One Health)

D2. MPH Foundational Competencies

**Evidence-based Approaches to Public Health**
D2.1. Apply epidemiological methods to the breadth of settings and situations in public health practice
D2.2. Select quantitative and qualitative data collection methods appropriate for a given public health context
D2.3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
D2.4. Interpret results of data analysis for public health research, policy or practice

**Public Health & Health Care Systems**
D2.5. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings
D2.6. Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and societal levels

**Planning & Management to Promote Health**
D2.7. Assess population needs, assets and capacities that affect communities’ health
D2.8. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs
D2.9. Design a population-based policy, program, project or intervention
D2.10. Explain basic principles and tools of budget and resource management
D2.11. Select methods to evaluate public health programs

**Policy in Public Health**
D2.12. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence
D2.13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes
D2.14. Advocate for political, social or economic policies and programs that will improve health in diverse populations
D2.15. Evaluate policies for their impact on public health and health equity
Leadership
D2.16. Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making
D2.17. Apply negotiation and mediation skills to address organizational or community challenges

Communication
D2.18. Select communication strategies for different audiences and sectors
D2.19. Communicate audience-appropriate public health content, both in writing and through oral presentation
D2.20. Describe the importance of cultural competence in communicating public health content

Interprofessional Practice
D2.21. Perform effectively on interprofessional teams

Systems Thinking
D2.22. Apply systems thinking tools to a public health issue