New Courses
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
Submit original form and attach a course syllabus.

Form Instructions:

1. Request submitted by (Department or Program Name): Computer Science and Engineering

2. Course prefix, number and complete title of course: CSCE 630 Speech Processing

3. Catalog course description (not to exceed 50 words): Speech production and perception (speech apparatus, articulatory/auditory phonetics); mathematical foundations (sampling, filtering, probability, pattern recognition); speech analysis and coding (short-time Fourier analysis, linear prediction, cepstrum); speech recognition (dynamic time warping, hidden Markov models, language models); speech synthesis (front-end, back-end); speech modification (overlap-add, enhancement, voice conversion).

4. Prerequisite(s): ECEN 314 or equivalent or approval of instructor. Basic knowledge of signals and systems, linear algebra, probability and statistics. Programming experience in a high-level language is required

Cross-listed with: 

Stacked with: Cross-listed courses require the signature of both department heads.

5. Is this a variable credit course? ☐ Yes ☒ No If yes, from _____ to _____

6. Is this a repeatable course? ☐ Yes ☒ No If yes, this course may be taken _____ times.

Will this course be repeated within the same semester? ☐ Yes ☒ No

7. This course will be:

a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)

b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

MS and PhD in Computer Science and Computer Engineering

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

9. Prefix Course # Title (excluding punctuation)

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Course #</th>
<th>Title (excluding punctuation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCE</td>
<td>630</td>
<td>SPEECH PROCESSING</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lect.</th>
<th>Lab</th>
<th>SCH</th>
<th>CIP and Fund Code</th>
<th>Admin. Unit</th>
<th>Acad. Year</th>
<th>HUC Code</th>
</tr>
</thead>
<tbody>
<tr>
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<td>3</td>
<td>0</td>
<td>0 0 3 1 1 0 1 0 2</td>
<td>0 0 0 6</td>
<td>1 3 - 0 0</td>
<td>3 6 3 2</td>
</tr>
</tbody>
</table>

Approval recommended by: Ricardo Gutierrez-Osuna
Department Head or Program Chair (Type Name & Sign) 2/17/12

Robin Autenrieth
Chair, College Review Committee 4/12/12

Robin Autenrieth
Dean of College 4/11/12

Mark Zoran
Chair, GC or UCC 5/15/12

Submitted to Coordinating Board by:
Associate Director, Curricular Services

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@ tamu.edu.
Curricular Services – 3/10
Course title and number: CSCE 630 Speech Processing
Term (e.g., Fall 200X): Fall 2012
Meeting times and location: TBA

Course Description and Prerequisites

Objective: The main objective of this course is to provide computer scientists with an introduction to basic concepts in speech processing, including speech and speaker recognition, speech synthesis, and speech transformation. The course will also familiarize students with tools that can be used to analyze, manipulate and process speech signals.

Catalog description: Speech production and perception (speech apparatus, articulatory/auditory phonetics); mathematical foundations (sampling, filtering, probability, pattern recognition); speech analysis and coding (short-time Fourier analysis, linear prediction, cepstrum); speech recognition (dynamic time warping, hidden Markov models, language models); speech synthesis (front-end, back-end); speech modification (overlap-add, enhancement, voice conversion).

Prerequisites: ECEN 314 or equivalent, or permission of the instructor. Basic knowledge of signals and systems, linear algebra, probability and statistics. Programming experience in a high-level language is required.

Learning Outcomes or Course Objectives

Course Objectives: This course seeks to familiarize students with
- Fundamental concepts of speech production and speech perception
- Mathematical foundations of signal processing and pattern recognition
- Computational methods for speech analysis, recognition, synthesis, and modification

Course Outcomes: Upon satisfactory completion of the course, the student will be able to:
- Manipulate, visualize, and analyze speech signals
- Perform various decompositions, codifications, and modifications of speech signals
- Build a complete speech recognition system using state of the art tools

Instructor Information

Name: Ricardo Gutierrez-Osuna
Telephone number: (979) 845-2942
Email address: rguiter@cse.tamu.edu
Office hours: After class or by appointment
Office location: HRBB 520A

Textbook and/or Resource Material

The course will not have an official textbook and instead will be based on lecture slides developed by the instructor from several sources, including the following references:

**Grading Policies**

The course grade will be the weighted sum of four grades. Grading will be straight scale (90-100 A, 80-89 B, 70-79 C, 60-69 D, below 60 F). These numeric thresholds may be lowered due to clustering, but will not be raised.

- **Homework (40%)**: There will be three homework assignments, distributed every 2-3 weeks during the first part of the semester. Homework assignments will emphasize the implementation (programming) of material presented in class. Homework assignments must be done individually.
- **Tests (30%)**: There will be a midterm exam and a final exam. All tests will be closed-books, closed-notes. One double-sided, hand-written sheet (8.5"x11") will be allowed. Tests will have an emphasis on new material from the class notes.
- **Project (30%)**: The last part of the semester will be dedicated to a term project. Students are encouraged to propose projects related to their own research. The projects must be performed in groups of up to three people. Projects may emphasize the application of existing tools, the development of new tools, or the design of new algorithms. Projects will be graded by their content (75%) and the quality of a classroom presentation (25%) at the end of the semester.

**Homework submissions.** Homework assignments are due at the starting class time on the due date. Electronic material will be submitted with the "turnin" utility at [https://csnet.cs.tamu.edu](https://csnet.cs.tamu.edu); hardcopies will be submitted directly to the instructor. Email submissions will not be accepted. Note that "turnin" has a maximum file size that can be submitted.

**Late submissions.** Late submissions will receive a 15% penalty on the total grade of the assignment; the penalty will increase by an additional 15% every 24 hours. These penalties will not be applied in cases of excused absences; please refer to student rule 7: [http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07).

**Missed Tests**: Missed tests can only be made up in case of emergency or work conflicts, and will require supporting documentation. For additional details on excused absences, please refer to student rule 7: [http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07). Whenever possible, these issues should be discussed with the instructor prior to the conflicting date.

**Collaboration vs. Academic Dishonesty**: Students are encouraged to exchange ideas and form study groups to discuss the course material, and prepare for homework assignments and tests. However, discussions regarding homework assignments should be kept at the conceptual level (i.e., sharing code is not allowed). Scholastic dishonesty will not be tolerated in homework assignments, tests or projects. For a list of examples of scholastic dishonesty see Section 20 of the TAMU Student Rules ([http://student-rules.tamu.edu/](http://student-rules.tamu.edu/)).

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

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Required Reading</th>
</tr>
</thead>
</table>
| 1    | Course introduction  
Speech production and perception | Lecture slides 1 and 2 |
| 2    | Organization of speech sounds  
Signals and transforms | Lecture slides 3 and 4 |
| 3    | Digital filters  
Short-time Fourier analysis/synthesis | Lecture slides 5 and 6 |
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Relevant Lecture Slides</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Linear prediction of speech Source estimation</td>
<td>Lecture slides 7 and 8</td>
</tr>
<tr>
<td>5</td>
<td>Cepstral analysis Probability, stats, estimation theory</td>
<td>Lecture slides 9 and 10</td>
</tr>
<tr>
<td>6</td>
<td>Pattern recognition principles I</td>
<td>Lecture slides 11</td>
</tr>
<tr>
<td></td>
<td>Pattern recognition principles II</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Template matching Hidden Markov models</td>
<td>Lecture slides 12 and 13</td>
</tr>
<tr>
<td>8</td>
<td>Review/catch up day Midterm exam</td>
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</tr>
<tr>
<td>9</td>
<td>Refinements for HMMs Large vocabulary continuous speech recognition</td>
<td>Lecture slides 14 and 15</td>
</tr>
<tr>
<td>10</td>
<td>HTK speech recognition system Speaker recognition</td>
<td>Lecture slides 21 and 16</td>
</tr>
<tr>
<td>11</td>
<td>Speech synthesis (front-end) Speech synthesis (back end)</td>
<td>Lecture slides 17 and 18</td>
</tr>
<tr>
<td>12</td>
<td>Prosodic modification of speech Voice conversion</td>
<td>Lecture slides 19 and 20</td>
</tr>
<tr>
<td>13</td>
<td>Project presentations</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Review/catch up day Final exam</td>
<td></td>
</tr>
</tbody>
</table>

**Other Pertinent Course Information**

To the best of my knowledge, there is not a single course at Texas A&M that covers speech-related topics for computer science and engineering students. As a result, and unlike other areas of research such as computer vision, robotics or physical human-computer interfaces, students interested in speech have little choice but to take several courses and complement that material with a great deal of self-study. This lack of speech-specific courses is surprising considering that speech is the main form of communication among humans, and also one of the most natural forms of interaction between humans and computers.

A handful of courses across campus cover material that is somewhat related to speech. A search through the 2009-2010 graduate catalog returns the following classes that mention the topic of "speech":

- **COMM 651**: Presidential Rhetoric. [...] Rhetorical discourse of American presidents, including principal genres of presidential communication, speechwriting and media strategies [...]
- **CSCE 636**: Neural Networks. [...] selective applications of neural networks to vision, speech, motor control and planning [...]
- **ECEN 663**: Data Compression with Applications to Speech and Video. This course only covers low-level aspects of speech processing, namely coding and modulation of speech waveforms.
- **VIZA 617**: Advanced Animation. [...] may include story development, expressive character design, motivation, acting, speech animation, choreography [...]

In terms of fundamentals, the closest class in Computer Science and Engineering would be CSCE 666 (Pattern Analysis), which contains one lecture on Fourier analysis and two lectures on hidden Markov models. In the department of Psychology, PSYC 603 (Sensation and Perception) covers some basic aspects of speech perception, though speech is not a major topic (Takashi Yamauchi, personal communication). Finally, the ECEN Department offers several foundational courses in digital signal processing, including ECEN 603 (Time-frequency Analysis and Multirate Signal Processing) and the
aforementioned ECEN 663, both of which are unsuited for students with a traditional computer science background and still do not cover techniques that are specific to speech.

**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](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."
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

Form Instructions

1. Request submitted by (Department or Program Name): Educational Administration & Human Resource Development

2. Course prefix, number and complete title of course: EDAD 628, Advanced Legal Issues in Higher Education

3. Catalog course description (not to exceed 50 words): Legal issues associated with student affairs and higher education administration; understand establishment and maintenance of relationship with university attorneys and office of general counsel.

4. Prerequisite(s): EDAD 610 or equivalent, Graduate Classification

5. Is this a variable credit course? ☐ Yes ☒ No  If yes, from ______ to ______

6. Is this a repeatable course? ☐ Yes ☒ No  If yes, this course may be taken ______ times.
   Will this course be repeated within the same semester? ☐ Yes ☐ No

7. This course will be:
   a. required for students enrolled in the following degree programs(s) (e.g., B.A. in history)
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

   PhD in educational administration; MS in educational administration

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

9. Prefix Course # Title (excluding punctuation)

   EDAD 628 ADV LEGAL ISS HIGH EDUC

   Lect. Lab SCH CIP and Fund Code Admin. Unit Acad. Year FICE Code
   0 3 0 0 0 3 1 3 0 4 0 6 0 0 4 0 8 7 6 1 3 1 4 0 0 3 6 3 2

   Approval recommended by:

   Frederick M. Nafukho  Date
   Department Head or Program Chair (Type Name & Sign)
   (if cross-listed course)

   Chair, College Review Committee  Date
   Dean of College  Date
   Chair, GC or NCC  Date

   Submitted to Coordinating Board by:

   Associate Director, Curricular Services  Date  Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services – 3/10
Course title and number  EDAD 628, Advanced Legal Issues in Higher Education
Term (e.g., Fall 200X)   Summer, 2013
Meeting times and location  TBA/TBA

Instructor Information
Name  David Parrott
Telephone number  979-845-4728
Email address  davep@tamu.edu
Office hours  By appointment
Office location  Rm. 117, Koldus Building

Course Description and Prerequisites
Legal issues associated with student affairs and higher education administration; understand establishment and maintenance of relationship with university attorneys and office of general counsel.

Prerequisites: EDAD 610 or equivalent; graduate classification

Learning Outcomes or Course Objectives
The general objectives of this course are:

To explore in depth several pertinent topics in Higher Education Law.

To understand the establishment and maintenance of the relationship with university attorneys and the Office of General Counsel.

To become familiar with the jurisdiction of the courts and the implications of judicial opinions for postsecondary administrators.

To develop the ability to identify legal issues related to students, Student Affairs, and Higher Education.

To understand the parameters of the law relate to:
(a.) OCR Dear Colleague Letter
(b.) Sexual harassment
(c.) Free speech
(d.) Forum Analysis
(e.) Other pertinent topics as time permits
Textbook and/or Resource Material

The Constitution of the United States of America, (2009), (provided by the instructor)


Other readings as assigned.

Grading Policies

Scale:
A= 90 points and above
B=80-89 points
C=70-79 points
F=69 and below

Assignment value:
Reaction papers = 20 points
Case studies = 25 points
Class participation = 25 points
Final project = 30 points

Reaction papers: Evaluation based on teamwork (when applicable), application of pertinent case law and legal concepts, identification and resolution of issues contained in case, presentation of position and outcome.

Case studies: Evaluation based on thoroughness of response, citation of appropriate cases and concepts, clarity of thought, clear and concise expression of ideas, and other pertinent factors.

Class participation: Evaluation based on student's attendance, involvement, engagement in discussions and debates, prior reading of material, obvious preparedness, contribution to the class, professional demeanor and other factors deemed appropriate by the instructor.

Final project: Evaluation based on topic pertinence, clarity of thought, conciseness, thoroughness, and application of legal concepts and case law.

Class Attendance

Students are responsible for providing satisfactory evidence to the instructor to substantiate the reason for an excused absence. The reasons absences are considered excused by the university can be found at the following website: http://student-rules.tamu.edu/rule07.
### Course Topics, Calendar of Activities, Major Assignment Dates

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Items to be Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introductions and Overall Review</td>
<td>History of University/Student Relationship; Review of Basic Legal Concepts and Ethical Principles</td>
</tr>
<tr>
<td>2</td>
<td>Overall Review (cont’d)</td>
<td>Review of Basic Legal Concepts and Ethical Principals</td>
</tr>
<tr>
<td>3</td>
<td>Presentation Discussion</td>
<td>Selection of Presentation Groups and Topic Selection</td>
</tr>
<tr>
<td>4</td>
<td>Freedom of Speech</td>
<td>Freedom of Speech/Marketplace of Ideas/Interplay of First Amendment and Federal Statutes</td>
</tr>
<tr>
<td>5</td>
<td>Freedom of Speech (cont’d)</td>
<td>Freedom of Speech/Marketplace of Ideas/Interplay of First Amendment and Federal Statutes</td>
</tr>
<tr>
<td>6</td>
<td>Overview</td>
<td>Freedm of Speech Forum Analysis</td>
</tr>
<tr>
<td>7</td>
<td>Case Study</td>
<td>Students provided case studies to analyze in regards to freedom of speech/marketplace of ideas/interplay of first amendment and federal statutes</td>
</tr>
<tr>
<td>8</td>
<td>Preview of OCR Dear Colleague Letters</td>
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<tr>
<td>9</td>
<td>Sexual Harassment</td>
<td>Sexual Harassment/OCR Dear Colleague Letters</td>
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<tr>
<td>10</td>
<td>Case Study</td>
<td>Guest Speaker</td>
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<tr>
<td>11</td>
<td>Working with General Counsel</td>
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</tr>
<tr>
<td>12</td>
<td>Class Presentations</td>
<td></td>
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<tr>
<td>13</td>
<td>Class Presentations</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Class Presentations</td>
<td></td>
</tr>
</tbody>
</table>

Case Law to be researched, read and briefed. Headings coincide with the topics listed in the calendar. Please read in advance and be prepared to lead discussion on each.

**History of the University/Student Relationship:**

- *Steinberg v. Chicago Medical College*, 371 N. E. 2d 634 (Ill. 1977).
- *Healy v. James*, 92 S Ct. 2338 (1972); 33 L.Ed. 226.

**Free Speech:**

- *Iota Xi Chapter of Sigma Chi Fraternity v. George Mason University*, 993 F. 2d 386 (4th Cir. 1993).

Joyner v. Whiting, 477 F. 2d 456 (4th Cir. 1978).
Rosenberger v. Rector and Visitors of the University of Virginia, 63 L. W. 4702 (June 27, 1995).
Sword v. Fox, 446 F. 2d 1091 (4th Cir. 1971).

Forum Analysis:


Sexual Harassment:

Davis v. Monroe County Board of Education, 74 F. 3d 1186 (11th Cir. 1996).

Department of Education, OCR Dear Colleague Letter, April 11, 2011, from Assistant Secretary for Civil Rights, Russlynn Ali. The letter provides guidance and examples about Title IX requirements and how they relate to sexual harassment and sexual violence, discusses proactive efforts schools can take to prevent sexual violence and educate employees and students, and provides examples of the types of remedies schools and OCR may use to respond to sexual violence.

Department of Education OCR Dear Colleague Letter, July 28, 2003, reaffirming that OCR's regulations and policies do not require or prescribe speech, conduct or harassment codes that impair the exercise of rights protected under the First Amendment.

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."
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

Form Instructions

1. Request submitted by (Department or Program Name): Genetics

2. Course prefix, number and complete title of course: GENE 677 Genes and Diseases

3. Catalog course description (not to exceed 50 words): Molecular and genetic basis for human disease; structure, function and evolution of chromosomes; epigenetics; gene mapping; complex genetic traits; cancer genetics; neurodegenerative disorders; animal models (yeast, mouse, worms, fruitflies); ethics

4. Prerequisite(s): GENE 603, GENE 631, or MSCI 601 or approval of instructor

Cross-listed with: MCMD 677

Sacked with:

Cross-listed courses require the signature of both department heads.

5. Is this a variable credit course? ☐ Yes ☒ No

If yes, from _____ to _____

6. Is this a repeatable course? ☐ Yes ☒ No

If yes, this course may be taken _____ times.

Will this course be repeated within the same semester? ☐ Yes ☒ No

7. This course will be:

a. required for students enrolled in the following degree programs(s) (e.g., B.A. in history)

b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in Genetics or Medical Sciences)

M.S., Ph.D. in Genetics or Medical Sciences

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

9. Prefix | Course # | Title (excluding punctuation) | Lect. | Lab | SCH | CIP and Fund Code | Admin. Unit | Acad. Year | FICE Code
---|---|---|---|---|---|---|---|---|---
GENE 677 | GENES AND DISEASES | 0 | 3 | 0 | 0 | 3 | 2 | 6 | 0 | 8 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 4 | 2 | 0 | 1 | 2 - 1 | 3 | 0 | 0 | 3 | 6 | 3 | 2

Approval recommended by:

Craig Coates
Department Head or Program Chair (Type Name & Sign) Date: 4-B-12

Mark Zoran
Chair, GC of UCC Date: 5-15-12

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Curricular Services – 3/10
Genes and Diseases  
MCM 677/GENE 677  
Spring 2013  
Instructors: Geoffrey Kapler and Hubert Amrein

CLASS SESSIONS  
Tu/Th, 9:35- 10:50 AM  
College Station: 162 Reynolds Medical Building  
Temple: R207 Medical Education Center

COURSE DIRECTORS  
Geoffrey Kapler, Ph.D.  
email: gkapler@tamhsc.edu  
phone: 979-847-8690  
office: 440 Reynolds Medical Building  
office hours: 11:00 am to 12:00 pm or by appointment

Hubert Amrein, Ph.D.  
email: amrein@medicine.tamhsc.edu  
phone: 979-845-6742  
office: 242 Reynolds Medical Building  
office hours: 11:00 am to 12:00 pm or by appointment

COURSE DESCRIPTION  
The course examines the molecular and genetic basis for human disease. Emphasis is placed on current  
approaches that exploit human genome sequence information, molecular genetic tools, and animal model  
systems to identify disease genes and elucidate disease mechanisms. Reading assignments consist of primary  
literature research and review articles, with handout and textbook support.

PREREQUISITES  
One of the following: MSCI 601, GENE 603, GENE 631 or Approval of Instructor

COURSE REQUIREMENTS  
Students are expected to attend class and participate in class discussions. All written assignments must be  
original work by the student unless properly cited. Homework assignments must be submitted electronically  
*prior to the start of class* to jchmiel@tamu.edu.

COURSE LEARNING OBJECTIVES  
Students should obtain proficiency in the application of basic genetic principles and molecular biology  
techniques to the identification of human disease genes and the functional analysis of their products. Students  
should understand how model organisms have been developed to study the genetic and epigenetic basis for  
hereditary diseases, including the elucidation of molecular and biochemical pathways that are altered in the  
disease state. Students should understand how different genes contribute to disease in common polygenic  
disorders, and how environmental factors contribute to manifestation of the disease state.

COURSE FORMAT  
This team-taught course consists of lectures and journal club presentations/discussions by students on papers  
related to the lecture material. Student grades are based on performance on three non-cumulative written  
exams, oral journal club presentations, written homework assignments and class participation. Officially  
excused absences are required for the submission of late homework assignments or scheduling of makeup  
exams in accordance with Texas A&M policy. See student rule 7 at http://student-rules.tamu.edu/rule07 for  
more details.
Assessment and Grading Policy
Student grades will be based on:
Exam I .................................................. 100 points
Exam II .................................................. 100 points
Final Exam ............................................. 100 points
Journal Club ........................................... 50 points
Homework ............................................ 25 points
Participation ......................................... 25 points
Total .................................................. 400 points

Grading Scale:
Or we can do points
A = 360-400 points
B = 320-359 points
C = 280-319 points
D = 240-279 points
F = <240 points

Attendance is mandatory.

Required Text: none

Other Required Readings: Peer-reviewed primary research journal papers, review articles, handouts and limited materials from textbook sources will be provided to students in an electronic format during the course

Course Schedule for “Genes & Diseases”

<table>
<thead>
<tr>
<th>Date/Day</th>
<th>Topic</th>
<th>Remarks</th>
<th>Lecturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Tue 1-15-2013</td>
<td>Human Chromosomes</td>
<td>Structure, function and evolution of human chromosomes</td>
<td>Kaplan</td>
</tr>
<tr>
<td>2 Thu 1-17-2013</td>
<td>Genome Instability</td>
<td>Trinucleotide repeat disorders, telomeres and telomerases</td>
<td>Kaplan</td>
</tr>
<tr>
<td>3 Tue 1-22-2013</td>
<td>Genetic Model System I: Saccharomyces cerevisiae Paper/Discussion 1: Genome Instability</td>
<td>Primer in yeast genetics Assigned journal club paper</td>
<td>Kaplan</td>
</tr>
<tr>
<td>4 Thu 1-24-2013</td>
<td>Genetic Basis of Human Disease</td>
<td>Mendelian and non-Mendelian Inheritance</td>
<td>Kaplan</td>
</tr>
<tr>
<td>Tue 1-29-2013</td>
<td>Mapping Disease Genes</td>
<td>Next generation sequencing, comparative genome hybridization, microarray analysis of transcriptomes, PCR</td>
<td>Kaplan</td>
</tr>
<tr>
<td>Week</td>
<td>Date</td>
<td>Topic</td>
<td>Instructor(s)</td>
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<tr>
<td>6</td>
<td>Thu 1-3-2013</td>
<td>Genetic Model Systems II and III: Mouse, C. elegans</td>
<td>Liu</td>
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<tr>
<td></td>
<td></td>
<td>Reverse genetics in the mouse, forward genetics in the worm</td>
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<tr>
<td>7</td>
<td>Tue 2-5-2013</td>
<td>Signal Transduction Pathways and Disease</td>
<td>Liu</td>
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<td>Mice and worms</td>
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<td>8</td>
<td>Thu 2-7-2013</td>
<td>Paper/Discussion 2: Signal Transduction and Development</td>
<td>Liu</td>
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<td>9</td>
<td>Tue 2-12-2013</td>
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<td>Multifactorial Inheritance and Complex Diseases</td>
<td>Ji</td>
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<td>11</td>
<td>Tue 2-19-2013</td>
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<td>12</td>
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<td>Tue 3-26-2013</td>
<td>Paper/Discussion 5: Cancer</td>
<td>Zimmer</td>
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<td>Date</td>
<td>Event</td>
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<td>Genetics</td>
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<td>Zimmer</td>
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<tr>
<td>21</td>
<td>Tue 4-2-2013 Genetic Model System IV: Drosophila</td>
<td>Amrein</td>
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<tr>
<td>22</td>
<td>Thu 4-4-2013 Neurodegenerative Disease I</td>
<td>Amrein</td>
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<td>Amrein</td>
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<tr>
<td>26</td>
<td>Thu 4-18-2013 Environmental Effects on Birth Defects</td>
<td>Bix</td>
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<tr>
<td>27</td>
<td>Tue 4-23-2013 Environmental Effects on Genetic Diseases</td>
<td>Bix</td>
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<td>Bix</td>
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<td>Bix</td>
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<tr>
<td>30</td>
<td>Thu 5-2-2013 Final Examination</td>
<td>Amrein/Bix</td>
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</tr>
</tbody>
</table>

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Revised 3/6/12
## Basic Course Information

- **College:** College of Medicine
- **Course Prefix:** MCMOD
- **Course #:** 677
- **Effective Term:** Spring 2013
- **Course Title:** Genes and Diseases
- **Title Abbreviation:** Genes and Diseases

## Schedule Information

- **Schedule Type:**
  - (Choose all that apply)
  - A
  - B
  - C
  - D
  - F
  - L
  - N
  - P
  - R
  - S
  - T
  - W

- **Instructional Method:**
  - (Choose all that apply)
  - CLAS
  - CLIN
  - DE
  - FELL
  - INDI
  - LAB
  - LECT
  - LELA
  - PRACT
  - RSCH
  - SEM
  - VIDO
  - WEB

- **Grade Mode:**
  - Standard
  - S/U

## Course Detail

- **Hours**
  - Contact Hours: 45
  - Lecture: 45
  - Lab: ____________
  - Other: ____________
  - Credit Hours: 3
  - Variable Credit Hours?
  - From: ____________
  - To: ____________
  - Hours

- **Course Description:**
  - Molecular and genetic basis for human disease; structure, function and evolution of chromosomes; epigenetics; gene mapping; complex genetic traits; cancer genetics; neurodegenerative disorders; animal models (yeast, mouse, worms, fruitflies); ethics
  - Course cross-listed with GENE 677.

## Instructor of Record

- Geoffrey Kapler

## Restrict Courses to Students In (If Applicable)

<table>
<thead>
<tr>
<th>Major</th>
<th>Class</th>
<th>Level</th>
<th>Degree</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Graduate</td>
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</tr>
</tbody>
</table>

## Course Prerequisite(s)

- MSCI 601
- GENE 603
- GENE 631

## Course Co-Requisite(s)

- ____________
- ____________
- ____________

## Approved By

- Geoffrey Kapler
  - Department Head
  - Date
- Chair of College Curriculum Committee
  - Date
- Van Wilson
  - Associate Dean for Academic Affairs or Equivalent
  - Date
- Registrar
  - Date

## Administrative Use Only

- Web
- SCACRSE
- Sent to component contact
- Date: ____________
- By: ____________
Genes and Diseases  
MCMD 677/GENE 677  
Spring 2013  
Instructors: Geoffrey Kapler and Hubert Amrein

CLASS SESSIONS  
Tu/Th, 9:35-10:50 AM  
College Station: 162 Reynolds Medical Building  
Temple: R207 Medical Education Center

COURSE DIRECTORS  
Geoffrey Kapler, Ph.D.  
email: gkapler@tamhsc.edu  
phone: 979-847-8690  
office: 440 Reynolds Medical Building  
office hours: 11:00 am to 12:00 pm or by appointment

Hubert Amrein, Ph.D.  
email: amrein@medicine.tamhsc.edu  
phone: 979-845-6742  
office: 242 Reynolds Medical Building  
office hours: 11:00 am to 12:00 pm or by appointment

COURSE DESCRIPTION  
The course examines the molecular and genetic basis for human disease. Emphasis is placed on current  
approaches that exploit human genome sequence information, molecular genetic tools, and animal model  
systems to identify disease genes and elucidate disease mechanisms. Reading assignments consist of primary  
literature research and review articles, with handout and textbook support.

PREREQUISITES  
One of the following: MSCI 601, GENE 603, GENE 631 or Approval of Instructor

COURSE REQUIREMENTS  
Students are expected to attend class and participate in class discussions. All written assignments must be  
original work by the student unless properly cited. Homework assignments must be submitted electronically  
*prior to the start of class* to jchmiel@tamu.edu.

COURSE LEARNING OBJECTIVES  
Students should obtain proficiency in the application of basic genetic principles and molecular biology  
techniques to the identification of human disease genes and the functional analysis of their products. Students  
should understand how model organisms have been developed to study the genetic and epigenetic basis for  
inherited diseases, including the elucidation of molecular and biochemical pathways that are altered in the  
disease state. Students should understand how different genes contribute to disease in common polygenic  
disorders, and how environmental factors contribute to manifestation of the disease state.

COURSE FORMAT  
This team-taught course consists of lectures and journal club presentations/discussions by students on papers  
related to the lecture material. Student grades are based on performance on three non-cumulative written  
exams, oral journal club presentations, written homework assignments and class participation. Officially  
excused absences are required for the submission of late homework assignments or scheduling of makeup  
exams in accordance with Texas A&M policy. See student rule 7 at http://student-rules.tamu.edu/rule07 for  
more details.
Assessment and Grading Policy
Student grades will be based on:
Exam I .................................................. 100 points
Exam II .................................................. 100 points
Final Exam ............................................. 100 points
Journal Club ......................................... 50 points
Homework .......................................... 25 points
Participation ....................................... 25 points
Total .................................................... 400 points

Grading Scale:
Or we can do points
A= 360-400 points
B= 320-359 points
C= 280-319 points
D= 240-279 points
F=<240 points

Attendance is mandatory.

Required Text: none

Other Required Readings: Peer-reviewed primary research journal papers, review articles, handouts and limited materials from textbook sources will be provided to students in an electronic format during the course

Course Schedule for “Genes & Diseases”

<table>
<thead>
<tr>
<th>Date/Day</th>
<th>Topic</th>
<th>Remarks</th>
<th>Lecturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Tue 1-15-2013</td>
<td>Human Chromosomes</td>
<td>Structure, function and evolution of human chromosomes</td>
<td>Kapler</td>
</tr>
<tr>
<td>2 Thu 1-17-2013</td>
<td>Genome Instability</td>
<td>Trinucleotide repeat disorders, telomeres and telomerase</td>
<td>Kapler</td>
</tr>
<tr>
<td>3 Tue 1-22-2013</td>
<td>Genetic Model System 1: Saccharomyces cerevisiae Paper/Discussion 1: Genome Instability</td>
<td>Primer in yeast genetics Assigned journal club paper</td>
<td>Kapler</td>
</tr>
<tr>
<td>4 Thu 1-24-2013</td>
<td>Genetic Basis of Human Disease</td>
<td>Mendelian and non-Mendelian Inheritance</td>
<td>Kapler</td>
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<tr>
<td></td>
<td>Mapping Disease Genes</td>
<td>Next generation sequencing, comparative genome hybridization, microarray analysis of transcriptomes, PCR</td>
<td>Kapler</td>
</tr>
<tr>
<td>Date</td>
<td>Day</td>
<td>Topic</td>
<td>Instructor(s)</td>
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<tr>
<td>6 Thu 1-3-13</td>
<td></td>
<td>Genetic Model Systems II and III: Mouse, C. elegans</td>
<td>Liu</td>
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<tr>
<td>7 Tue 2-5-13</td>
<td></td>
<td>Signal Transduction Pathways and Disease</td>
<td>Liu</td>
</tr>
<tr>
<td>8 Thu 2-7-13</td>
<td></td>
<td>Paper/Discussion 2: Signal Transduction and Development</td>
<td>Liu</td>
</tr>
<tr>
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<td>13 Tue 2-26-13</td>
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<td>Ji</td>
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<td>14 Thu 2-28-13</td>
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<td>15 Tue 3-5-13</td>
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<td>Dindot</td>
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<tr>
<td>16 Thu 3-7-13</td>
<td></td>
<td>Paper/Discussion 4: Prader-Willi and Angelman Syndromes</td>
<td>Dindot</td>
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<td></td>
<td>Tue 3-12-13</td>
<td>Spring break</td>
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<td></td>
<td>Thu 3-14-13</td>
<td>Spring break</td>
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<tr>
<td>17 Tue 3-19-13</td>
<td></td>
<td>Cancer: Oncogenes and tumor suppressors</td>
<td>Zimmer</td>
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<td>Cancer Genomics</td>
<td>Zimmer</td>
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<td>19 Tue 3-26-13</td>
<td></td>
<td>Paper/Discussion 5: Cancer</td>
<td>Zimmer</td>
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<td>2013</td>
<td>Genetics</td>
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<td>20</td>
<td>Thu 3-28-2013</td>
<td>Exam 2</td>
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<tr>
<td>21</td>
<td>Tue 4-2-2013</td>
<td>Genetic Model System IV: Drosophila</td>
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<tr>
<td>22</td>
<td>Thu 4-4-2013</td>
<td>Neurodegenerative Disease I</td>
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<td>Tue 4-9-2013</td>
<td>Neurodegenerative Disease II</td>
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Revised 3/6/12
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

Form Instructions

1. Request submitted by (Department or Program Name): Marine Biology

2. Course prefix, number and complete title of course: MARB 605: Air Breathing Marine Vertebrate Research Techniques

3. Catalog course description (not to exceed 50 words): Introductory and advanced descriptions and hands-on learning of photo-identification, theodolite, radio, satellite, and video-enhanced tracking, underwater remote sensing, acoustics, and other cutting edge research techniques

4. Prerequisite(s): Graduate standing or permission from instructor

5. Is this a variable credit course?
   - Yes
   - No
   If yes, from _______ to _______

6. Is this a repeatable course?
   - Yes
   - No
   If yes, this course may be taken ______ times.
   Will this course be repeated within the same semester?
   - Yes
   - No

7. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)
   any master's or doctoral program

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

9. Prefix | Course # | Title (excluding punctuation)
  --- | --- | ---
  MARB | 605 | MARB 605: Air Breathing Marine Vertebrate Research Techniques

Lect. | Lab | SCH | CHP and Fund Code | Admin. Unit | Acad. Year | HCL Code
--- | --- | --- | --- | --- | --- | ---
0 | 3 | 0 | 0 | 3 | 2 | 6 | 1 | 3 | 0 | 0 | 2 | 1 | 8 | 0 | 5 | 1 | 2 | 1 | 3 | 0 | 1 | 0 | 2 | 9 | 8

Approval recommended by:

John Schwarz
Department Head or Program Chair (Type Name & Sign) Date

Chair, College Review Committee Date

Dean of College Date

(if cross-listed course)

Submitted to Coordinating Board by:

Associate Director, Curricular Services Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sardra-williams@tamu.edu.
Curricular Services – 3/10

27 of 38
Course title and number  Air Breathing Marine Vertebrate Research Techniques, MARB 606, 3 Cr.
Term  Fall 20XX
Meeting times and location  Tuesday 11-2 PM, or as decided for a particular year

Course Description and Prerequisites

Lectures, readings, hands-on learning, and discussions on basic and advanced research topics, as shown in course topics, below. Each grad student will be presenting a research techniques topic, plus a synopsis of their own research. Topics are on the days shown below, and will be by sign-up on Day #1.

Learning Outcomes or Course Objectives

Students will leave this course with knowledge of the mechanisms and application of research on air breathing marine vertebrates, including “bread-and-butter” techniques of natural identification, tagging and focal follows, and application of modern radio, theodolite, satellite, and other remote techniques. They will have developed the skills needed to investigate detailed topics of distributional and behavioral ecology, through library, internet web, “old fashioned” hard-copy, and other searches. They will be able to cogently speak and write about recent findings in topics of data gathering of air breathing marine vertebrates, and evaluate aspects of these findings from the peer review literature, news reports, chapter and other summaries, and search engines such as (but not limited to) Google Scholar, Web of Science, etc.

Instructor Information

Name  Bernd Würsig  
409-740-4413
Email address  wursigb@tamug.edu
Office hours  Tuesday/Thursday 8-930 AM; Thursday 11 AM – 2 PM
Office location  OCSB #243

Textbook and/or Resource Material

There is no textbook, but Powerpoints, handouts, websites, etc., will be provided

Grading Policies

Grades will be based on participation (20%), quizzes (20%), oral presentation of specific research topic (20%), and paper research/writing of chosen topic (40%). Late work is deducted 5% per day late, attendance is required with excused absences for valid reasons on a case-by-case basis, and make-up work for excused absences is accepted for 7 days after the end of the excused absence. The grading scale is 90+ = “A”, 80-89 = “B”, 70-79 = “C”, 60-69 = “D”, and below 60 = “F”.

Further to the above, 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
Course Topics, Calendar of Activities, Major Assignments

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Data gathering opportunities and pitfalls -- Wursig</td>
</tr>
<tr>
<td>2</td>
<td>Methods of quantifying behavior; Ethograms, focal animal and focal group sampling strategies -- Wursig and Student</td>
</tr>
<tr>
<td>3</td>
<td>Basic statistics for field behavior -- Wursig and Student</td>
</tr>
<tr>
<td>4</td>
<td>Photos and photo-identification, taking, archiving, retrieval -- Wursig and Student</td>
</tr>
<tr>
<td>5</td>
<td>Finscan and other photo analysis systems -- Wursig and Student</td>
</tr>
<tr>
<td>6</td>
<td>Ciné/video and movement data acquisition and analysis -- Wursig and Student</td>
</tr>
<tr>
<td>7</td>
<td>Motion analysis techniques -- Wursig and Student</td>
</tr>
<tr>
<td>8</td>
<td>Theodolite tracking, including basis of Pythagoras use and analyses -- Wursig and Student</td>
</tr>
<tr>
<td>9</td>
<td>Radio and satellite tracking -- Wursig and One Student, draft paper due</td>
</tr>
<tr>
<td>10</td>
<td>Downward and side-scan sonar and other remote sensing techniques -- Wursig and Student</td>
</tr>
<tr>
<td>11</td>
<td>Acoustic recording, hydrophones, pop-ups, and other systems -- Wursig and Student</td>
</tr>
<tr>
<td>12</td>
<td>Acoustic analysis procedures; Summary overview -- Wursig and Student</td>
</tr>
<tr>
<td>13</td>
<td>Final papers due; wrap up discussions and suggestions for new techniques</td>
</tr>
</tbody>
</table>

Other Pertinent Course Information

Whether or not students team up for particular topic presentations depends on number enrolled. All students present a written topic draft and final paper, and all have at least one topic to cover orally.

**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](http://disability.tamu.edu)

**The Aggie Code of Honor & Academic Dishonesty:**

For many years Aggies have followed a Code of Honor, which is stated in this very simple verse:

"Aggies do not lie, cheat, or steal, nor do they 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. This code also applies in the classroom. For most, living under this code will be no problem, as it asks nothing of a person that is beyond reason. The Aggies code of honor and the scholastic dishonesty section in the TAMUG University Rules will be the standard upon which scholastic integrity is maintained.

**Student Rights, Responsibilities, and Regulations:**

Students should be familiar with the University Rules, which are available from the Office of Student Affairs. This handbook contains valuable information concerning attendance, academic dishonesty, appeals processes, incomplete grades, sexual harassment, and other topics that are important to you.

**Family Educational and Rights to Privacy Act (FERPA):**

FERPA is a federal law designed to protect the privacy of educational records, to establish the right of students to inspect and review their educational records and to provide guidelines for the correction of inaccurate and misleading data through informal and formal hearings. To obtain a listing of directory information or to place a hold
or any or all of this information, please consult the Admissions & Records Office. Items that can never be identified as public information are a student's social security number of institutional identification number, citizenship, gender, grades, GPR, or class schedule. All efforts will be made in this class to protect your confidentiality.
Texas A&M University

Departmental Request for a New Course
Undergraduate  Graduate  Professional
- Submit original form and attach a course syllabus. -

Form Instructions

1. Request submitted by (Department or Program Name): Department of Marine Biology

2. Course prefix, number and complete title of course: MARB 615 Coastal Marine Biology and Geology of Alaska

3. Catalog course description (not to exceed 50 words): The course gives students an opportunity to learn about the coastal marine biology and geology of south-central Alaska and to participate in a behavioral ecological study of sea otters for 12 days at a remote field station in north-eastern Prince William Sound.

4. Prerequisite(s): Graduate standing and permission from instructor

5. Is this a variable credit course? ☒ Yes  ☐ No  If yes, from _____ to _____

6. Is this a repeatable course? ☐ Yes  ☒ No  If yes, this course may be taken _____ times.

7. Will this course be repeated within the same semester? ☐ Yes  ☒ No

8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)

   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

   any master's or doctoral program

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

   Approval recommended by:

   John Schwarz
   Department Head or Program Chair (Type Name & Sign) Date

Chair, College Review Committee Date

Dean of College Date

Chair, OC or UCC Date

Submitted to Coordinating Board by:

Associate Director, Curricular Services Date

Questions regarding this form should be directed to Sandra Williams at 845-201 or sandra-williams@tamu.edu.
Curricular Services – 3/10
Summer 20XX  
MARB 615  
Coastal Marine Biology and Geology of Alaska

Instructors: Dr. Randall Davis - 409-740-4712  
281-250-7839 (cell)  
Dr. Tim Dellapenna- 409-740-4952  

Class Schedule: Summer 2012  

Office Hours: By appointment  

Meeting times and location: 12 full days at Alice Cove, Alaska  

Pre-requisites: Graduate standing or permission from instructor  

Textbook: None, but a suggested reading list will be provided

Course description and objectives: This 3 credit hour course will give students an opportunity to learn about the coastal marine biology and geology of south-central Alaska and to participate in a behavioral ecological study of sea otters for 12 days at a remote field station in north-eastern Prince William Sound. Students will learn field research techniques by collecting behavioral observations of sea otters, water samples for primary productivity, and benthic invertebrates. They will also learn about the local marine biology, geology and wildlife though hikes, tide-pooling and lectures.

Course Syllabus

This syllabus is what we plan to do, but changes may be necessary depending on weather and logistics.

May  
Introduction and briefing on campus  
June-Aug  
Each summer session is 12 days in duration. Five sessions are planned  
Day 1: Arrive Alice Cove  
Day 2: Introduction to Simpson Bay study area; overview of methods; safety briefing  
Day 3-10: Rotate through Project components (weather dependent)  
Collect behavioral observations of sea otters in Simpson Bay  
Collect water samples for primary productivity in Simpson/Sheep Bays  
Collect benthic samples for invertebrate survey in Simpson/Sheep Bays  
Visit tide pools to study algae and invertebrates  
Hikes for terrestrial wildlife observations  
Lectures on the biology of sea otters and local geology  
Day 11: Travel to Cordova to visit the Sheridan Glacier and Copper River Delta  
Day 12: Depart Cordova for Anchorage and return home  

August  
Final report due

Grading will be based on participation in the field course (50%) and the final report (50%). Participation will include learning field research protocols and assisting with data collection within the limits of each student's physical ability. We will also collect marine specimens for taxonomic identification as well as survey the local geology and glaciology. Most students enthusiastically participate in all aspects of the course. The grade for the final report will be based on the depth and understanding on a topic of the student's choice related to the field course as well as grammar and syntax in a 20 page report. If needed, late work or make-up is available. Grading will be: A 90-100%, B 80-89%, C 70-79%, D 60-69%, F 59% or less.

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 the director of counseling.

It is the responsibility of students and faculty members to help maintain scholastic integrity at the University by refusing to participate in or tolerate scholastic dishonesty. An Aggie does not lie, cheat or steal, or tolerate those who do.
**Texas A&M University**

**Departmental Request for a New Course**

**Undergraduate • Graduate • Professional**

- Submit original form and attach a course syllabus.

**Form Instructions**

1. Request submitted by *(Department or Program Name):* Department of Veterinary Integrative Biosciences

2. Course prefix, number and complete title of course: VIBS 688 Epidemiological Modeling of Infectious Diseases

3. Catalog course description (not to exceed 50 words): Concepts of mathematical modeling of infectious diseases; steps and methods for the development and analysis of models.

4. Prerequisite(s): Graduate classification

   Cross-listed with: None

   Stacked with: None

   Cross-listed courses require the signature of both department heads.

5. Is this a variable credit course? ☐ Yes ☒ No

   If yes, from _______ to _______

6. Is this a repeatable course? ☐ Yes ☒ No

   If yes, this course may be taken _______ times.

   Will this course be repeated within the same semester? ☐ Yes ☒ No

7. This course will be:
   a. required for students enrolled in the following degree program(s) *(e.g., B.A. in history)*

      N/A

   b. an elective for students enrolled in the following degree program(s) *(e.g., M.S., Ph.D. in geography)*

      MS and PhD in Biomedical Sciences, Genetics, Virology, Toxicology, Microbiology, Pathology, Health Services Research; MS in Veterinary Public Health, Epidemiology, Laboratory Animal Medicine, Parasitology;

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

9. **Prefix** | **Course #** | **Title (excluding punctuation)**
   | VIBS | 6 | 8 | 8 | EPI | MODEL | INFECTIOUS | DIS |
   | Lect. | Lab | SCE | CIP and Fund Code | Admin. Unit | Acad. Year | HCL Code |
   | 0 | 2 | 0 | 2 | 0 | 3 | 5 | 1 | 2 | 5 | 1 | 0 | 0 | 0 | 2 | 2 | 8 | 7 | 3 | 1 | 3 | - | 1 | 4 | 0 | 0 | 3 | 6 | 3 | 2 |

   Approval recommended by:

   Evelyn Tiffany-Castiglioni
   Department Head or Program Chair *(Type Name & Sign)*
   Date

   Jane Welsh
   Chair, College Review Committee
   Date

   Eleanor Green
   Dean of College
   Date

   Mark Zoran
   Chair, GC of UCC
   Date

   Submitted to Coordinating Board by:

   Associate Director, Curricular Services

   Date

   Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.

Curricular Services – 3/10

35 of 38
COURSE: Epidemiological modeling of infectious diseases

VI 85 688  Fall Semester – 2012

Lecture: T 11:10am-12:25pm, Room TBD
Lab: R 11:10am-12:25pm, Computer Lab room 106 FAS Bldg. 1194

INSTRUCTOR: Dr. Renata Ivanek-Miojevic
Office: College of Vet. Med. and Biomedical Sci., Veterinary Teaching Hospital, Room #8.
Office phone: (979) 862-4819, Mailbox: in VMA Bldg., Rm. 107.
E-mail: rivanek@cvm.tamu.edu;
Office hours: After class or by appointment

Teaching Assistant: TBD
Office hours: After class or by appointment

CREDIT HOURS: 3 Hours

COURSE DESCRIPTION: The goal of this course is to introduce students from a biological/medical background (such as biology, epidemiology, medicine, veterinary medicine and public health) with limited mathematical training to calculus-based epidemiological modeling of infectious diseases.

Course is limited to a maximum of 10 students.


COURSE REQUIREMENTS: Access to e-Learning and Matlab software is required. e-Learning is an online Learning Management System that allows the development and delivery of educational courses using the Internet. It will be your responsibility to check this site regularly for course related announcements. Having access to e-Learning and Matlab software at home would be a plus; however, all students at Texas A&M have computing resources available to them through the Virtual Open Access Lab (https://voal.tamu.edu/) and on campus.

ADDITIONAL RESOURCES:
e-Learning orientation for students: http://elearning.tamu.edu/elearning-orientation/

LEARNING OUTCOMES: The course is intended to serve as an introduction to infectious disease modeling and will provide an overview of the concepts and underlying assumptions, as well as the importance and utility of mathematical modeling of infectious diseases. You will learn general information on the steps and methods for setting up and analysis of models. Models that have been employed in the past to understand the natural history of infectious diseases and in their control will be demonstrated. At the end of the course, you should be able to (i) explain the basic concepts and steps in modeling of infectious diseases, (ii) develop and analyze simple
models using differential equations in standard software, and (iii) appreciate the value of modeling in the epidemiology of infectious diseases.

I am looking forward to getting to know each of you and to working with you as we accomplish these learning outcomes.

**GRADING POLICY:** Your grade for this course will be based on the in-class quizzes, homework, and final project.

**In-class quizzes:** Prior to coming to the lecture/lab each week you will be expected to read pertinent text from the course textbook. The assigned reading will be tested by the in-class quizzes. In-class quizzes will be open-notes. If you have done the reading the questions should pose you no difficulty. For any missed in-class quiz, you will write a page long essay about the assigned reading; there will be no make-up quizzes except if absence was University Excused (http://student-rules.tamu.edu/rule07).

**Homework:** Assigned homework will be due a week from the day of assignment. Late homework will be marked down except if due to a University Excused Absence (http://student-rules.tamu.edu/rule07). Homework may involve writing a short essay, modeling and analysis by hand or using Matlab software and/or preparing a Powerpoint presentation.

**Final project:** For the final project, you will develop and analyze a model of an infectious disease of your choice. By mid semester, you should indicate your choice of a model and the rationale for your choice in a page long proposal. You will receive feedback on the proposal and will be consulted during model development and analysis. The final project will be due at the end of the semester. It will be in the form of a conference-like Powerpoint presentation describing objectives, methods, results and conclusions drawn from the performed modeling work.

**Grading:**
- In-class quizzes = 30%
- Homework = 35%
- Final project = 35%

**Grading scale:**
- 90-100% = A
- 80-89% = B
- 70-79% = C
- 60-69% = D
- Below 60% = F

**COURSE SCHEDULE***:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Steps in the development and use of mathematical models of infectious diseases</td>
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<tr>
<td>2</td>
<td>Simple epidemic models</td>
</tr>
<tr>
<td>3-4</td>
<td>Calculating R0</td>
</tr>
<tr>
<td>5</td>
<td>A vector-borne disease with lifelong immunity</td>
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<tr>
<td>6</td>
<td>A vector-borne disease with temporal immunity</td>
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<tr>
<td>7</td>
<td>What can we learn from the spread of measles</td>
</tr>
<tr>
<td>8</td>
<td>Fall Break</td>
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<td>9</td>
<td>Force of infection</td>
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<td>10</td>
<td>Introduction to stochastic modeling</td>
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<td>11</td>
<td>Heterogeneous mixing in spread of infectious diseases</td>
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<td>12</td>
<td>Fitting curves to data</td>
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<tr>
<td>13</td>
<td>Bifurcations/Guest lecture</td>
</tr>
<tr>
<td>13</td>
<td>Partial differential equations/Guest lecture</td>
</tr>
<tr>
<td>14</td>
<td>Revision</td>
</tr>
<tr>
<td>15</td>
<td>Final project presentations</td>
</tr>
</tbody>
</table>

* Subject to change to accommodate students’ learning process

**ATTENDANCE POLICY:** Attendance to lectures and laboratories is expected (http://student-rules.tamu.edu/rule07).


**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, in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu.