1. Approval of September 2012 Minutes

2. Discussion Items:
   a. Signature Requirements on Thesis and Dissertation Forms

3. New Course Requests:
   a. BAEN 617 Fundamentals of Nanoscale Biological Engineering
   b. BMEN 672 Introduction to Diagnostic Radiology Physics
   c. ECEN 751 Computational Methods for Integrated System Design
   d. ECEN 752 Advances in VLSI Circuit Design
   e. LAND 635 Concepts in Ecological Planning and Design
   f. NUEN 672 Introduction to Diagnostic Radiology Physics
   g. PLAN 635 Concepts in Ecological Planning and Design
   h. RPTS 655 Applied Biodiversity Science I
   i. WFSC 655 Applied Biodiversity Science

4. Course Change Requests:
   a. ESSM 651 Geographic Information Systems
   b. RPTS 666 Tourism and the Natural Environment
   c. SCSC 654 Genome Analysis

5. Special Consideration Items:
   a. Request from the Department of Marine Sciences to allow undergraduate Ocean and Coastal Resources (OCRE) majors to enter the Master of Marine Resources Management program at the beginning of their fourth year at Texas A&M University at Galveston, resulting in a 5-year degree program.
Minutes
In attendance: Mark Burris, Sam Kirkpatrick, Taylor Smith, Jane Welsh, Nancy Duran, Adam Seipp, Patricia Hurley, George Cunningham, Karen Butler-Purry, Leslie Feigenbaum, Dave Reed, Dick Haney, Carmelita Pickett, Sandra Williams, David Martin, Mark Zoran, Kevin Heinz, Jana Corley

1. **Discussion Items:**
   a. Graduate Council Membership: The Graduate Council Committee Profile and Roster was handed out. Note that some terms have expired, and formal appointments will need to be made. Volunteers for Vice-Chair should e-mail Dr. Zoran. There are 2 years left on this term.
   b. Fall Meeting Schedule and Deadline: The schedule has been posted to the Graduate Council website.
   c. Request for Change in Curriculum Form: This form has been created to accompany all requests for change in curriculum. Please take this form back to your college GIC and send any comments or concerns to Mark Zoran or Sandra Williams.
   d. Minimum Syllabus Requirements (Learning Outcomes): Learning Outcomes are no longer “recommended” and are now required on syllabi.
   e. Syllabus and Statements on Faculty Research: This is not a requirement but can be helpful.
   f. Possible THECB Changes to Underproducing Graduate Program Policy: Changes are most likely coming down from THECB which will change the current minimum of 10 doctoral degrees or 15 master’s degrees in 5 years to a minimum of 15 doctoral degrees or 25 master’s degrees in 5 years. As a group we need to think proactively about how to deal with this. The change could become official as early as 2015.

2. **New Course Requests:**
   The following new courses were approved by the Graduate Council:
   a. BIOL 661 Antimicrobial Agents
   b. CSCE 621 Language, Library, and Program Design Using C++
   c. ECON 684 Professional Internship
   d. HIST 624 Readings in Race, Ethnicity, and Migration
   e. HIST 625 Research Seminar in Race, Ethnicity, and Migration
   f. HIST 639 Readings in Asian History
   g. HIST 640 Readings in Atlantic World and Caribbean History
   h. HIST 641 Research Seminar in Atlantic World and Caribbean History
   i. HIST 648 Readings on Topics in Modern European History
   j. HIST 674 Readings in Chicano-Latino History
   k. HIST 675 Research Seminar in Chicano-Latino History
   l. VIBS 613 Evolutionary Bioinformatics
   m. VLCS 681 Seminar

The following new course requests were tabled:
   a. NRSC 630 Health Psychology & Behavioral Medicine
   b. NRSC 633 Neuropsychopharmacology
   c. WFSC 655 Applied Biodiversity Science
3. **Course Change Requests:**

The following course change requests were approved by the Graduate Council:

a. HIST 645  Research Seminar in War and Society
b. HIST 646  Readings in War and Society
c. NUEN 611  Radiation Detection and Measurement
d. NUEN 612  Radiological Safety and Hazards Evaluation
e. NUEN 613  Principles of Radiological Safety
f. NUEN 673  Radiation Biology
g. NUEN 676  Health Physics Instrumentation
h. NUEN 681  Seminar
i. NUEN 684  Professional Internship

The following course change request was tabled:

a. SCSC 654  Genome Analysis

4. **Special Consideration Items:**

The following Special Consideration Item was approved by the Graduate Council:

a. Request to change the names of the Master of Agriculture, Master of Science, and Doctor of Philosophy degrees in Rangeland Ecology & Management
New Courses
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. Request submitted by (Department or Program Name):
Department of Biological and Agricultural Engineering

2. Course prefix, number and complete title of course:
BAEN 617 - Fundamentals of Nanoscale Biological Engineering

3. Catalog course description (not to exceed 50 words):
The course will primarily cover nanostructures, nanofabrication methods, instrumentation and applications pertinent to Biological, Food and Bioenergy systems and will provide students an opportunity to identify and utilize key tools available for fabricating, manipulating and analyzing of nanostructures used in Biological Engineering applications.

<table>
<thead>
<tr>
<th>Graduate classification in engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-listed with: BAEN 417</td>
</tr>
<tr>
<td>Stacked with:</td>
</tr>
<tr>
<td>Cross-listed courses require the signature of both department heads.</td>
</tr>
</tbody>
</table>

4. Prerequisite(s):

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)

BAEN, any engineering 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)
--- | --- | ---
BAEN | 617 | FUND NANO SCALE BIO ENGR

<table>
<thead>
<tr>
<th>Lect</th>
<th>Lab</th>
<th>STH</th>
<th>CIP and Email Code</th>
<th>Admin. Last</th>
<th>Year</th>
<th>HSC Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<td>0</td>
<td>031403010006</td>
<td>043313</td>
<td>14003632</td>
<td></td>
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</tbody>
</table>

Approval recommended by:

- Stephen W. Searcy
  Department Head or Program Chair (Type Name & Sign) Date

- David Reed
  Dean of College Date

Submitted to Coordinating Board by:

- Chair, GC or UCC Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Curricular Services – 3/10
BAEN 617, Fundamentals of Nanoscale Biological Engineering  
Fall 2012  
Biological and Agricultural Engineering

Instructor: Dr. Sandun Fernando

Lecture: Tuesday and Thursdays 2:20-3:35 PM, Scoates 215

Office: Room 303C Scoates Hall;

Office Hours: By Appointment

Phone: 979-845 9793

Email: sfernando@tamu.edu

Text: None. Handouts will be distributed at the beginning of each class

Laboratory: None

Technology: Students are encouraged to bring their laptops to each meeting

Prerequisites: Graduate classification in engineering

Catalog Description:
The course will primarily cover i) Nanostructures, ii) Nanofabrication methods, iii) Instrumentation and iv) Applications pertinent to Biological, Food and Bioenergy systems and will provide students an opportunity to identify and utilize key tools available for fabricating, manipulating and analysis of nanostructures used in Biological Engineering applications.

Course Objectives:
Engineers like you who deal with biological chemical systems need to have a basic understanding of contemporary technologies like nanoscience and nanoeengineering. In a world where technology is changing at a fast pace, you should possess at least a basic understanding of how to engineer systems at a molecular level to solve problems as it pertains to your areas of research/interest. Nanoeengineering is a fast growing discipline that is permeating to just about every discipline you can think of. As a result, you should possess an understanding on not only what this technology is all about, but also, the whole gamut of consequences that could arise as a result of widespread adoption of nanoeengineering. Accordingly, the key objective of this course is to equip you with the basic tools necessary to manipulate systems at a molecular level (the how?s) as well as give you a background of the fundamentals (the why?s) behind selected technologies.

At the beginning of the course we will learn the fundamental concepts of nanoscience and nanoeengineering. Then we will quickly delve in to learning more about specific applications pertinent to your specific area of research.

When you finish this course, my hope is that you will have a confident grasp of the major concepts of Nanoscale Biological and Energy Systems Engineering including fundamentals and applications. You will be able to answer questions like: What is nanotechnology? What are nanostructures? How do you
fabricate them? What instruments are used to analyze nanoscale systems? and where could you apply such nanotechnological tools?

**Learning Outcomes:** At the end of the course, you will develop the knowledge, be able to comprehend, apply, analyze, synthesize and evaluate key concepts of nanotechnology to solve a specific problem of your choice. More details on what you should be able to do are given below:

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define key nanotechnological concepts i.e., nanostructures, fabrication methods and analysis tools and identify when and where you could apply these concepts to solve a given technological problem.</td>
<td>Given the opportunity, you should be able to describe and summarize the underlying principles behind key nanoengineering concepts.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>You should be able to use the knowledge gained in the class to solve real world problems.</td>
<td>Out of several possibilities, you should be able to compare and point out which tool would be most appropriate for a given situation/problem.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Synthesis</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Given a problem, you should be able to plan and design a targeted solution using the knowledge you gathered during the course.</td>
<td>You should be able to appraise and make judgments on the feasibility of the proposed solution when applied to solve the targeted problem.</td>
</tr>
</tbody>
</table>

Learning is much more than listening to the instructor, reading a textbook, copying equations and solving them. It is about **YOU acquiring** necessary knowledge and skills to get a job done! So, a big part of this course falls onto your shoulder.......LEARN. Be excited to learn. Nanotechnology primarily deals with penetrating to the root of the problem.......manipulating systems at the molecular level. So, this is a concept that you will encounter nearly in any field. Though some concepts may seem abstract..... here is my bias.... it is FUN! I am looking forward to getting to know each of you this semester and working with you as we accomplish these objectives.

At the end, I expect that each of you will be able to identify and define a problem of your choice, perform a critical review of literature pertinent to the current status of that problem, establish the state of the art status of the technologies available, define research objectives, formulate sound research hypothesis, and design methodologies to test your hypothesis using available nanotechnological tools. You should be able to write a succinct research proposal and defend it in front of your peers.
Course Requirements and Grading

Written reports on assigned activities will be required. Reports should be double spaced and printed on one side of paper only. Formats will be described in class. A term-project will be given and will be due on the date of the final exam.

Grades for this course are based on ability to master specific skills, participation in individual and team projects, and learning fundamental principles required in engineering design and analysis. The different activities will be weighted as follows in determining semester grades:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage of Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams (3)</td>
<td>45</td>
</tr>
<tr>
<td>Assignments (4)</td>
<td>20</td>
</tr>
<tr>
<td>Semester Project Proposal</td>
<td>25</td>
</tr>
<tr>
<td>Oral Presentation (1)</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Attendance:** Because most activities will be team activities, class participation is essential. For each unexcused lecture absence, 3 points will be deducted from your overall total. If you have an excused absence, please email the details to me prior to the absence if possible. If you have a short-term illness (one or two class days), you do not need to get a note from the doctor but you do need to notify me as soon as possible by email.

Final course grades will be assigned as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Grade Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90 - 100% outstanding competence in the skills taught in the course and exceptional understanding of the applicability and limits of those skills</td>
</tr>
<tr>
<td>B</td>
<td>80 - 89% competence in the skills taught in the course, and good understanding of the applicability and limits of those skills</td>
</tr>
<tr>
<td>C</td>
<td>70 - 79% competence in most skills taught in the course and understanding of the applicability and limits of those skills</td>
</tr>
<tr>
<td>D</td>
<td>60 - 69% minimal competence in some skills taught in the course and limited understanding of the applicability and limits of those skills</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 60%</td>
</tr>
</tbody>
</table>
Additional Requirements for Graduate Students:

Graduate students are required to write a research proposal to a selected granting agency (such as the National Science Foundation, National Institute of Health, US Department of Agriculture etc.) on a selected topic. The proposal format should be Times New Roman 12 font single-spaced with one-inch margins and a minimum of six pages in length.

The proposal should, in general, contain following sections:

1. Abstract (1 page – written after the whole proposal is compiled)
2. Overview and objectives (overall objective(s), research hypothesis (or need)) section (~1 page) – Before writing this section have a clear idea about all the independent and dependent variables affecting your research problem. Clearly depict what variables you are planning to study and which ones you are planning to keep constant. Also, be sure to include controls to compare your data.
3. Rationale and Significance (~0.5 page)
4. Literature Review (~1 pages)
5. Research Methods (~2 pages) – Do not forget to discuss characterization methods that will be used.
6. Expected outcomes (~0.5 page)

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 the Department of Student Life, Disability Services in Room B118 of Cain Hall. The phone number is 845-1637. Also, as a courtesy, please advise me as soon as possible if you need accommodations for a disability.

For additional information visit http://disability.tamu.edu

Academic Integrity Statement

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

http://aggiehonor.tamu.edu
<table>
<thead>
<tr>
<th>Topic</th>
<th>Sub-topic</th>
<th>Meeting</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nanomaterials</td>
<td>Aerogels, Carbon Nanotubes</td>
<td>Meeting 1</td>
<td>Assign: 1</td>
</tr>
<tr>
<td>(As supports for catalysts in fuel and chemical conversions)</td>
<td>Dendrimers, Metallic Nanoparticles,</td>
<td>Meeting 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Zeolites, Nanoclays,</td>
<td>Meeting 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nanowires</td>
<td>Meeting 4</td>
<td>Assign: 2</td>
</tr>
<tr>
<td>Nanophysics</td>
<td>Particle Shape, Surface and Volume</td>
<td>Meeting 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Atomic Structure</td>
<td>Meeting 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Surface energy</td>
<td>meeting 7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exam 1</td>
<td>Meeting 8</td>
<td></td>
</tr>
<tr>
<td>Nano-measurement Tools</td>
<td>Atomic force microscopy, Scanning tunneling microscopy, EFM, MFM, KFM</td>
<td>Meeting 9</td>
<td>Assign: 3</td>
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<tr>
<td></td>
<td>Scanning electron microscopy</td>
<td>Meeting 10</td>
<td></td>
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<tr>
<td></td>
<td>Transmission electron microscopy, AFM</td>
<td>Meeting 11</td>
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<tr>
<td></td>
<td>GC, GCMS, Zetasizer</td>
<td>Meeting 12</td>
<td></td>
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<tr>
<td>Nanofabrication</td>
<td>Electron beam lithography, Nanoimprint lithography, Chemical Vapor deposition</td>
<td>Meeting 13</td>
<td>Assign: 4</td>
</tr>
<tr>
<td></td>
<td>Exam 2</td>
<td>Meeting 14</td>
<td></td>
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<tr>
<td>Course Topic</td>
<td>Meeting</td>
<td>Assign.</td>
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<td>----------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Surface Interactions - Self Assembly Principles (for Engineering Biological Fuel Cells/Biosensors)</td>
<td>Meeting 15</td>
<td>5</td>
<td></td>
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<tr>
<td>Surface Interactions - Self Assembly Principles (for Engineering Biological Fuel Cells/Biosensors)</td>
<td>Meeting 16</td>
<td></td>
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<tr>
<td>Surface Interactions - Self Assembly Principles (for Engineering Biological Fuel Cells/Biosensors)</td>
<td>Meeting 17</td>
<td></td>
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<tr>
<td>Surface Interactions – Micelles, Bilayers, Vesicles, Biological Membranes (Energy and Food Applications)</td>
<td>Meeting 18</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Surface Interactions – Micelles, Bilayers, Vesicles, Biological Membranes (Energy and Food Applications)</td>
<td>Meeting 19</td>
<td></td>
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<tr>
<td>Surface Interactions - Molecular Recognition/Fuel cell (Demonstration)</td>
<td>Meeting 20</td>
<td></td>
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<tr>
<td>Surface Interactions – Catalysis (hydrogen production)</td>
<td>Meeting 21</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Surface Interactions – Catalysis (biomass to fuels)</td>
<td>Meeting 22</td>
<td></td>
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<tr>
<td>Surface Interactions – Catalysis (biodiesel)</td>
<td>Meeting 23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface Interactions – Algae Bioseparation using nanocagents (Demonstration)</td>
<td>Meeting 24</td>
<td></td>
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<tr>
<td>Exam 3</td>
<td>Meeting 25</td>
<td></td>
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<tr>
<td>Project Presentations</td>
<td>Meeting 26-28</td>
<td></td>
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</tbody>
</table>
Texas A&M University
Departmental Request for a New Course
Undergraduate + Graduate + Professional
• Submit original form and attach a course syllabus.

1. Request submitted by (Department or Program Name):
   Department of Biomedical Engineering

2. Course prefix, number and complete title of course:
   BMEN 672 Introduction to Diagnostic Radiology Physics

3. Catalog course description (not to exceed 50 words):
   This course presents the concepts of radiation physics used in diagnostic radiology by providing an introduction to the theory behind the different imaging modalities as it relates to mammography, planar X-ray imaging, computed tomography (CT), single photon emission tomography (SPECT), and positron emission tomography (PET).

4. Prerequisite(s):
   NUEN 611, NUEN 613 or approval from academic advisor

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

6. Is this a repeatable course?
   ☑ No
   If yes, this course may be taken _____ times.
   Will this course be repeated within the same semester?
   ☑ 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)

   M.S., Ph.D. in nuclear engineering or health physics

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)
   BMEN 672 DIAG RADIOL OGY PHYS I C S
   Lect. Lab SCI CH 10 and Fund Code Admin. Unit Acad. Year FICE Code
   0 2 0 3 0 3 1 4 0 5 0 1 0 0 6 0 4 5 0 1 3 - 1 4 0 0 3 6 3 2

   Approval recommended by:
   Gerard Cote
   Department Head or Program Chair (Type Name & Sign) Date 8/16/12
   Chair, College Review Committee Date 9/12/12

   Yassin Hassan
   Department Head or Program Chair (Type Name & Sign) Date
   (if cross-listed course)
   Dean of College Date 9/12/12

   Submitted to Coordinating Board by:
   Chair, GC or UCC
   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: BMEN 672-600 Introduction to Diagnostic Radiology Physics
Term: Fall 2012
Meeting times and location: Texas A&M Institute for Preclinical Studies (TIPS), Tuesdays and Thursdays, 3:00 PM to 5:00 PM

Course Description and Prerequisites

This course presents the concepts of radiation physics used in diagnostic radiology by providing an introduction to the theory behind the different imaging modalities as it relates to mammography, planar X-ray imaging, computed tomography (CT), single photon emission tomography (SPECT), and positron emission tomography (PET).

Prerequisites: NUEN 611 and NUEN 613 and/or approval from course instructor.

Learning Outcomes or Course Objectives

1. The course objective is to apply the basic principles of radiation physics in radiological imaging.
2. To assess the design characteristics of diagnostic radiology equipment for the safe and effective use in radiological imaging.
3. To demonstrate the importance of dosimetry and equipment calibration and quality control within diagnostic radiology and implications in image quality, disease diagnosis, and long-term risk for secondary cancers.
4. To develop an understanding of the basic principles used in quality control using current AAPM and ACR standards.
5. To examine current advances in equipment design and hybrid imaging modalities.
6. To allow the student to use this knowledge to work effectively within a professional team responsible for the safe and effective use of radiological equipment.
7. To understand the environment of a radiology facility, its workflow and radiation safety aspects.

Instructor Information

Name: Gamal Akabani, PhD / Mark W. Lenox, PhD
Telephone Number: 979-458-1699
Email address: akabani@tamu.edu / markwlenox@tamu.edu
Office Hours: Monday through Friday, 9:00 AM to 5:00 PM by appointment only
Office Location: Texas A&M Institute for Preclinical Studies

Electronic Textbooks and/or Resource Materials


### Grading Policies

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percent Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>8</td>
<td>20%</td>
</tr>
<tr>
<td>Practicum</td>
<td>4</td>
<td>80%</td>
</tr>
</tbody>
</table>

A≥90%
90%>B≥80%
80%>C≥70%
70%>D≥60%
60%>F
Course Topics, Calendar of Activities, Major Assignment Dates

Weekly Lectures:

**Basic Concepts**

1. Homework Assignment 1 (September 2\textsuperscript{nd}).
2. Introduction to Medical Imaging (August 28\textsuperscript{th}).
3. Computers in Medical Imaging (August 30\textsuperscript{th}).
4. Digital Imaging and Communications in Medicine (DICOM) (September 4\textsuperscript{th}).

**Diagnostic Radiological Imaging**

1. Homework Assignment 2
2. X-ray Production, Tubes, Generators and Emission Spectra (September 6\textsuperscript{th}).
3. Screen Film Radiography (September 11\textsuperscript{th}).
4. Homework Assignment 3
5. Mammography (September 13\textsuperscript{th}).
6. Fluoroscopy (September 21\textsuperscript{st}).
7. Image Quality and AAPM Standards (September 23\textsuperscript{rd}).
8. Digital Radiography (September 25\textsuperscript{th} and 27\textsuperscript{th}).
9. Homework Assignment 4
10. Computed Tomography, Quality Control and Standards (October 9\textsuperscript{th} and 11\textsuperscript{th}).

**Nuclear Medicine Imaging**

1. Homework Assignment 6
2. Radium Production and Radiopharmaceuticals (October 23\textsuperscript{rd}).
3. Radiation Detection and Measurements in Nuclear Medicine (October 25\textsuperscript{th}).
4. Homework Assignment 7
5. Basic Physics of Radionuclide Imaging (October 30\textsuperscript{th}).
6. Imaging Theory and Statistics in Nuclear Medicine (November 1\textsuperscript{st}).
7. Homework Assignment 8
8. Single Photon Emission Computed Tomography (SPECT) (November 6\textsuperscript{th}).
9. Positron Emission Tomography (PET) and PET-CT (November 13\textsuperscript{th} and 15\textsuperscript{th}).
10. Review (December 4\textsuperscript{th}).

**Laboratories:**

1. Basic Diagnostic Radiology Laboratory, DICOM (October 2\textsuperscript{nd} and 4\textsuperscript{th}).
2. Computed Tomography Laboratory (October 16\textsuperscript{th} and 18\textsuperscript{th}).
3. Radiopharmacy Laboratory (November 9\textsuperscript{th}).
4. PET/CT Imaging Laboratory (November 20\textsuperscript{th}, 27\textsuperscript{th} and November 29\textsuperscript{th}).

**Other Pertinent Course Information**

The student is expected to have knowledge of a high-level computer programming such as C++, or FORTRAN 95, 2003, and operating system such as UNIX or LINUX environment.

**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://www.tamu.edu/aggiehonor](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.*

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

2. Course prefix, number and complete title of course: ECEN 751 Computational Methods for Integrated System Design

3. Catalog course description (not to exceed 50 words):
Integrated circuit and system design in a computational standpoint; VLSI circuit simulation, interconnect modeling and analysis, design and analysis of IC subsystems, parallel computing techniques for complex system design.

4. Prerequisite(s):

Cross-listed with: ECEN454, ECEN 474 or equivalent

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
   Will this course be repeated within the same semester? □ Yes □ No
   If yes, this course may be taken _______ times.

7. This course will be:
   a. __________
   b. __________

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: ECEN
    Course # 751
    Title (excluding punctuation): Computational Methods for Integrated System Design

   Lect. Lab SCH CIP, and Fund Code
   0 3 0 0 0 3 1 4 1 0 0 0 6

   Admin. Unit Acad. Year HCC Code
   0 9 3 6 1 3 1 4 0 0 3 6 3 2

   Approval recommended by:

   Dr. C. Singh
   Department Head or Program Chair (Type Name & Sign) Date

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

   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  ECEN 751: Computational Methods for Integrated System Design
Term (e.g., Fall 200X)  TBA
Meeting times and location  TBA

Course Description and Prerequisites

Integrated circuit and system design in a computational standpoint; VLSI circuit simulation, interconnect modeling and analysis, design and analysis of IC subsystems, parallel computing techniques for complex system design.

Learning Outcomes or Course Objectives

Upon the complete of this course, students are expected to get exposed to a broad introduction of advanced computational techniques and algorithms that may be used to analyze and design complex integrated circuits and systems. Students will be trained on basic theoretical principles, algorithm design and hands-on implementations.

Instructor Information

Name  Peng Li
Telephone number  5-1612
Email address  pli@tamu.edu
Office hours  TBA
Office location  333M WERC

Textbook and/or Resource Material

Relevant research papers and texts
Grading Policies

Grade assignment and weighting:

Assignments: 30%
Midterm exam: 25%
Final class project: 45%

Late assignment submission:

20% penalty per day (tentative)

Attendance:

"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."

Letter Grading Scale (will be adjusted according to student performance distribution):

A = 85-100
B = 75-84
C = 70-74
D = 60-69
F = <60

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>Introduction</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Basic circuit analysis</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Introduction to fundamental numerical</td>
<td></td>
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<tr>
<td></td>
<td>methods</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Device modeling in integrated circuit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>analysis</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Circuit simulation</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Circuit simulation</td>
<td></td>
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<tr>
<td>7</td>
<td>Interconnect modeling</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Model order reduction</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Design and analysis of IC subsystems</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Process variation and manufacturability</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Introduction to parallel computing</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Introduction to parallel programming</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Parallel VLSI CAD applications</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Modeling and computational techniques for biological applications</td>
<td></td>
</tr>
</tbody>
</table>
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

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

1. This request is submitted by the Department of

   Electrical and Computer Engineering

2. Course prefix, number and complete title of course:

   ECEN 752  Advances in VLSI Circuit Design

3. Catalog course description (not to exceed 50 words):

   Gate and wire delays, CMOS transistors, DC and AC characteristics, VLSI fabrication, Static, Dynamic, Pass-gate and PLA implementation styles, SOI and GaAs technology, DRAM, SRAM and FLASH memory design, leakage and dynamic power, sub-threshold computation, clocking, transmission lines, packaging, off-chip IO, process variation and compensation, radiation tolerance.

4. Prerequisite(s):

   Cross-listed 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

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

   C

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)

   ECEN  752  ADV IN VLSI CKT DESIGN

   Encl.  Lab  SCH  CIP and Fund Code  Admin. Unit  Acct. Year  HCL Code

   03 00 03 14 10 01 00 06 09 36 13 - 14 00 36 32

   Approval recommended by:

   Dr. C. Singh  Narayanan

   Department Head - Type Name & Sign  Date

   Chair, College Review Committee  Date

   Department Head - Type Name & Sign
   (If cross-listed course)

   Date

   Dean of College  Date

   Submitted to Coordinating Board by:

   Date

   Effective Date

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

   Curricular Services – 3/09
Course title and number  Advances in VLSI Circuit Design, ECEN 752  
Term (e.g., Fall 200X)  Fall 2013  
Meeting times and location  2 times a week (MW preferred)

Course Description and Prerequisites

This course covers several aspects of digital circuit design. Starting with device equations, we will delve into several areas of digital circuit design, including recent changes in circuit design styles and future trends in digital circuit design. These recent developments stem from IC fabrication limitations that are being faced in the industry today. The focus is on custom digital VLSI design. Specific topics include: Gate and wire delays, CMOS transistors, DC and AC characteristics, VLSI fabrication, Static, Dynamic, Pass-gate and PLA implementation styles, SOI and GaAs technology, DRAM, SRAM and FLASH memory design, leakage and dynamic power, sub-threshold computation, clocking, transmission lines, packaging, off-chip IO, process variation and compensation, radiation tolerance.

Prerequisites: Graduate classification or Instructor approval

Learning Outcomes or Course Objectives

[Recommended]

The goal of the class is to take the student through a tour of the issues a typical deep sub-micron circuit designer in industry deals with, and the design techniques they utilize. At the end of this class, the
student would have at their disposal an understanding of the analysis techniques and tools that are required for a VLSI circuit designer to effectively function in today's industry. In particular, a student will become familiar with the custom circuit design of digital VLSI circuits, and learn about different circuit design styles for combinational and sequential circuits, memories and clocking circuits. The student will learn about radiation and variation resilient circuit design approaches as well.

Instructor Information

Name        Prof. Sunil P Khatri
Telephone number  (979) 845-8371
Email address  sunilkhatri@tamu.edu
Office hours  MW 10am – 11am
Office location  WERC 333F

Textbook and/or Resource Material

No textbook will be used. Class notes will be available on the course website. The notes are synthesized from various contemporary sources such as textbooks and research papers. The class website is http://www.ece.tamu.edu/~sunil/courses/ee689-circuit

Grading Policies

The weighting of the different parts of the course is as follows:

Homework assignments: 20%
2 midterm exams: 40%
Class project: 40%

The letter grade will be assigned according to the following standard:

A: 90-100%
B: 80-89%
C: 70-79%
D: 60-69%
F: below 60%

Late assignments will be penalized 50%, and will receive no credit if late by more than one week past the due date. Attendance will not be taken during the lectures. A student may make up an exam if they have official supporting documentation to indicate the reason they could not attend the regular exam.

Course Topics, Calendar of Activities, Major Assignment Dates

Each lecture below is 1.5 hrs long. There are 30 lectures listed below, resulting in a total of 45 lecture hours. The lecture units are listed in chronological order below. The number of lectures for each topic are indicated in parentheses.

Gate and wire delays and their shift in importance (2)
Overview of CMOS device fundamentals (5)
   DC Characteristics
   AC Characteristics
   Processing overview
Different circuit design styles (5)
   NMOS
   Static CMOS
   Dynamic CMOS
   Pass Transistor design
   PLAs
   SOI implications
GaAs implications

Memory design fundamentals (3)
  Types of memory cells
  Design considerations for memory
  3-Dimensional capacitive parasitics.

Leakage and Power (4)
  Leakage control approaches
  Computing with leakage currents

Transmission lines and their modeling (2)
  On-chip clock nets
  Board nets

Packaging issues (3)
  Inductive effects
  Different packaging technologies.
  Economic considerations of different package styles

Off-chip I/O drivers design considerations (2)

On-chip clock distribution schemes (2)
  H-tree clock distribution
  Dynamic de-skewing of a clock network

Processing variations and their control (2)
  On-the-fly variation compensation


Other Pertinent Course Information

The course will have a final project. Students will be given a list of class projects 45 days before the end
of the semester. Each student will choose one project from this list, and this will serve as their final class project.

Americans with Disabilities Act (ADA)

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Academic Integrity

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

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

1. Request submitted by (Department or Program Name): Department of Landscape Architecture and Urban Planning

2. Course prefix, number and complete title of course: LAND 635 Concepts in Ecological Planning and Design

3. Catalog course description (not to exceed 50 words):
   Reviews selected ecological concepts and explores integration into ecological/landscape planning, design using a historical perspective, historical and contemporary approach to provide an in-depth understanding of how they can better mediate between human actions and natural process.

4. Prerequisite(s):
   Graduate Standing
   Cross-listed with: PLAN 635
   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)
   any

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)
    LAND  635 CONCEPTS OF ECO PLAN DSN

   Lect. Lab SCH CRIP and Credit Code: Admin. Unit  Year  HFL Code
   0 3 0 0 0 3 0 4 0 3 0 1 0 0 0 6 1 6 9 4 1 2 - 1 3 0 0 3 6 3 2

   Approval recommended by:
   Forster Ndubisi
   Department Head or Program Chair (Type Name & Sign) Date
   Chair, College Review Committee Date
   Dean of College Date
   Department Head or Program Chair (Type Name & Sign) Date
   (if cross-listed course)

   Submitted to Coordinating Board by:
   Associate Director, Curricular Services Date

   Chair, GC or UCC Date

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

   RECEIVED
   CURRICULAR SERVICES
   SEP 14 2012
LAND 635/PLAN 635  Concepts in Ecological Planning and Design
Spring, 2011
Tuesday/Thursday, 3:55-5:10 ARCA 303.
Dr. Forster Ndubisi

Course Description
Ecological concepts and their integration into ecological/landscape planning and design; historical and contemporary approaches to ecological planning; understanding the mediation between human actions and natural processes.

Introduction and Course Objective
As an interface between natural and human processes, the landscape reflects the dialogue that occurred between these processes over time. Landscapes change over time as people mold natural processes, sometimes in tune with the rhythms of natural processes and other times altering them. Insights regarding how we design, plan, and manage landscapes to be in tune with the rhythms of natural processes can be gleaned from Alexander Pope's advice: "to consult the genius of place" or the character of the landscape.

Of all the natural and social sciences, the science of ecology provides one of the most beneficial insights into understanding the character of the landscape. It deals with the reciprocal relationship of all living things to each other [including humans] and to their physical and biological environments. But ecological knowledge has to be supplemented with an understanding of aesthetic form to truly appreciate, understand, and create landscapes that work and are sustainable.

Course Objectives
This course reviews selected ecological concepts and explores their integration into ecological/landscape planning and design using a historical perspective. Additionally, historical and contemporary approaches to ecological planning will be studied to provide students with the opportunity to develop an in-depth understanding of how they can better mediate between human actions and natural processes. The following themes will be explored in this course:

- Historical trends in ecological planning
- Emerging paradigms in landscape architecture and planning
- Overview of selected ecology concepts (ecosystem structure and function, population ecology, and landscape succession)
- Ecological planning approaches (Landscape Suitability, Applied Ecosystem, Applied Landscape Ecology, Landscape Perception and Values)
- Contemporary ecological design and planning issues
- Ecology, Aesthetics, and Planning: Integration?

Course Structure and Requirements
This course will be achieved through a combination of lectures, assigned readings, field trips, and critique of designed environments especially in landscape architecture. Assignments will involve both team and individual projects. All students are expected to attend all lectures, participate in workshops and discussions, and complete all assignments satisfactorily. There will be weekly lectures and presentations by the instructor and students.

Evaluation
Final course grade will be based on the satisfactory completion of all phases of the courses. Grades for various components of the courses are allotted tentatively as follows:
Assigned readings focused on ecological concepts, integration of ecological concepts into planning and design, as well as on historic and contemporary approaches to ecological/landscape planning (30%);
- Paper on ecological concepts (15%);
- Critiques of ecological planning approaches and important executed works in ecological design and planning (40%);
- Participation and professionalism: Strict regular attendance, active participation in class discussions, and mastery of the subject matter (15%).

Grading scale
Grading Scale
A=90%-100%
B=80%-89%
C=70%-79%
D=60%-69%
F= 59% and below

Text and Readings

Required


Selected References

Selected articles from key journals

ADA and Academic Integrity Statements

- Americans with Disabilities Act (ADA) Policy Statement

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- Academic Integrity Statement and Policy

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http://www.tamu.edu/aggiehonor
TAMU Code of Honor
*An Aggie does not lie, cheat or tolerate those who do*

Upon accepting admission to Texas A & M University, as 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. Student will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the Texas A & M University community from the requirements of the processes of the Honor System. For additional information please visit: [www.tamu.edu/aggiehonor/](http://www.tamu.edu/aggiehonor/)

On all course work, assignments, and examinations at Texas A & M University, the following Honor Pledge shall be preprinted and signed by the student:

“On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work.”
# LAND/PLAN 635
Concepts in Ecological Design and Planning
## Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan 19, 21</td>
<td>Introduction</td>
</tr>
<tr>
<td>2</td>
<td>Jan 26, 28</td>
<td>History of Ecological Planning and Design</td>
</tr>
<tr>
<td>3</td>
<td>Feb. 2, 4</td>
<td>Contemporary Exemplary Papers/Works in Ecological Planning</td>
</tr>
<tr>
<td>4</td>
<td>Feb. 9, 11</td>
<td>Ecological Concepts</td>
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<tr>
<td>5</td>
<td>Feb. 16, 18</td>
<td>Ecological Concepts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assignment #1: Literature Review on contemporary ecological planning papers/ works</td>
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<tr>
<td>6</td>
<td>Feb. 23, 25</td>
<td>Ecological Concepts</td>
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<tr>
<td>7</td>
<td>March 2, 4</td>
<td>Ecological Concepts/Assignment #1 due: Presentations</td>
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<tr>
<td>8</td>
<td>March 9, 11</td>
<td>March 8: Mid semester grade due</td>
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<tr>
<td></td>
<td></td>
<td>Case Study and Term paper assignments</td>
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<tr>
<td></td>
<td>Spring Break</td>
<td>March 15-19</td>
</tr>
<tr>
<td>9</td>
<td>March 23, 25</td>
<td>Landscape Suitability I</td>
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<tr>
<td>10</td>
<td>March 30, April 1</td>
<td>Landscape Suitability II</td>
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<tr>
<td></td>
<td>Week 10</td>
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<tr>
<td>11</td>
<td>April 6, 8</td>
<td>Applied Ecosystem</td>
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<tr>
<td>12</td>
<td>April 13, 15</td>
<td>Applied Landscape Ecology</td>
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<tr>
<td></td>
<td>Week 12</td>
<td>Term Paper due</td>
</tr>
<tr>
<td>13</td>
<td>April 20, 22</td>
<td>Climate Change</td>
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<tr>
<td></td>
<td>Week 13</td>
<td>Work on Case study</td>
</tr>
<tr>
<td>14</td>
<td>April 27, 29</td>
<td>Landscape perception</td>
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<td></td>
<td>Week 14</td>
<td>Case Study due</td>
</tr>
<tr>
<td>15</td>
<td>May 2, 6</td>
<td>Presentations</td>
</tr>
</tbody>
</table>
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. Request submitted by (Department or Program Name): Department of Nuclear Engineering

2. Course prefix, number and complete title of course: NUEN 672 Introduction to Diagnostic Radiology Physics

3. Catalog course description (not to exceed 50 words):
This course presents the concepts of radiation physics used in diagnostic radiology by providing an introduction to the theory behind the different imaging modalities as it relates to mammography, planar X-ray imaging, computed tomography (CT), single photon emission tomography (SPECT), and positron emission tomography (PET).

4. Prerequisite(s):
NUEN 611, NUEN 613 or approval from academic advisor
Cross-listed with: BMEN 688-672
Stacked with: 

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)
   M.S., Ph.D. in nuclear engineering or health physics

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>NUEN</th>
<th>672</th>
<th>DIAG RADIOL OGY PHYSICS</th>
</tr>
</thead>
</table>

Lect. Lab SCH CIP and Fund Code Admin. Unit Acad. Year HICE Code
0 2 0 3 0 3 1 4 2 3 0 1 0 0 0 6 2 0 9 0 1 2 1 3 0 0 3 6 3 2

Approval recommended by:
Yassin Hassan Date 9/12/12
Gerard Cote Date 8/16/12

Submitted to Coordinating Board by:
Chair, GC or UCC Date

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: BMEN 672-600 Introduction to Diagnostic Radiology Physics
Term: Fall 2012
Meeting times and location: Texas A&M Institute for Preclinical Studies (TIPS), Tuesdays and Thursdays, 3:00 PM to 5:00 PM

Course Description and Prerequisites

This course presents the concepts of radiation physics used in diagnostic radiology by providing an introduction to the theory behind the different imaging modalities as it relates to mammography, planar X-ray imaging, computed tomography (CT), single photon emission tomography (SPECT), and positron emission tomography (PET).

Prerequisites: NUEN 611 and NUEN 613 and/or approval from course instructor.

Learning Outcomes or Course Objectives

1. The course objective is to apply the basic principles of radiation physics in radiological imaging.
2. To assess the design characteristics of diagnostic radiology equipment for the safe and effective use in radiological imaging.
3. To demonstrate the importance of dosimetry and equipment calibration and quality control within diagnostic radiology and implications in image quality, disease diagnosis, and long-term risk for secondary cancers.
4. To develop an understanding of the basic principles used in quality control using current AAPM and ACR standards.
5. To examine current advances in equipment design and hybrid imaging modalities.
6. To allow the student to use this knowledge to work effectively within a professional team responsible for the safe and effective use of radiological equipment.
7. To understand the environment of a radiology facility, its workflow and radiation safety aspects.

Instructor Information

Name: Gamal Akabani, PhD / Mark W. Lenox, PhD
Telephone Number: 979-458-1699
Email address: akabani@tamu.edu / markwlenox@tamu.edu
Office Hours: Monday through Friday, 9:00 AM to 5:00 PM by appointment only
Office Location: Texas A&M Institute for Preclinical Studies

Electronic Textbooks and/or Resource Materials


Grading Policies

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percent Weight</th>
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<tr>
<td>Assignments</td>
<td>8</td>
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</tr>
<tr>
<td>Practicum</td>
<td>4</td>
<td>80%</td>
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</tbody>
</table>

A≥90%
90%>B≥80%
80%>C≥70%
70%>D≥60%
60%>F
Course Topics, Calendar of Activities, Major Assignment Dates

Weekly Lectures:

Basic Concepts
Homework Assignment 1 (September 2nd).
1. Introduction to Medical Imaging (August 28th).
2. Computers in Medical Imaging (August 30th).
3. Digital Imaging and Communications in Medicine (DICOM) (September 4th).

Diagnostic Radiological Imaging
Homework Assignment 2
4. X-ray Production, Tubes, Generators and Emission Spectra (September 6th).
5. Screen Film Radiography (September 11th).
6. Mammography (September 13th).
7. Fluoroscopy (September 21st).
8. Image Quality and AAPM Standards (September 23rd).
10. Computed Tomography, Quality Control and Standards (October 9th and 11th).

Nuclear Medicine Imaging
Homework Assignment 6
11. Radionuclide Production and Radiopharmaceuticals (October 23rd).
13. Basic Physics of Radionuclide Imaging (October 30th).
16. Positron Emission Tomography (PET) and PET-CT (November 13th and 15th).
17. Review (December 4th).

Laboratories:
1. Basic Diagnostic Radiology Laboratory, DICOM (October 2nd and 4th).
2. Computed Tomography Laboratory (October 16th and 18th).
3. Radiopharmacy Laboratory (November 8th).
4. PET/CT Imaging Laboratory (November 20th, 27th and November 29th).

Other Pertinent Course Information

The student is expected to have knowledge of a high-level computer programming such as C++, or FORTRAN 95, 2003, and operating system such as UNIX or LINUX environment.

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.

1. Request submitted by (Department or Program Name):
   Department of Landscape Architecture and Urban Planning

2. Course prefix, number and complete title of course:
   PLAN 635 Concepts in Ecological Planning and Design

3. Catalog course description (not to exceed 50 words):
   Reviews selected ecological concepts and explores integration into ecological/landscape planning, design using a historical perspective; historical and contemporary approach to provide an in-depth understanding of how they can better mediate between human actions and natural process.

4. Prerequisite(s):
   Graduate Standing
   Cross-listed with: LAND 635
   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
   Will this course be repeated within the same semester? □ Yes ☑ No
   If yes, this course may be taken ________ times.

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)
   any

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)
   PLAN 635 CONCEPTS OF ECO PLAN DSN
   Levl. Lab SCH GIP and Land Code Admin. Unit Acad. Year HCE Code
   0 3 0 0 0 3 0 4 0 3 0 1 0 0 0 6 1 6 9 4 1 2 - 1 3 0 0 3 6 3 2
   Approval recommended by:
   Forster N. Ndisi
   Department Head or Program Chair (Type Name & Sign) Date

   Chair, College Review Committee Date
   Dean of College Date

   Submitted to Coordinating Board by:
   Chair, GC or UCC 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
LAND 635/PLAN 635  Concepts in Ecological Planning and Design
Spring, 2011
Tuesday/Thursday, 3:55-5:10 ARCA 303.
Dr. Forster Ndubisi

Course Description
Ecological concepts and their integration into ecological/landscape planning and design; historical and contemporary approaches to ecological planning; understanding the mediation between human actions and natural processes.

Introduction and Course Objective
As an interface between natural and human processes, the landscape reflects the dialogue that occurred between these processes over time. Landscapes change over time as people mold natural processes, sometimes in tune with the rhythms of natural processes and other times altering them. Insights regarding how we design, plan, and manage landscapes to be in tune with the rhythms of natural processes can be gleaned from Alexander Pope's advice: "to consult the genius of place" or the character of the landscape.

Of all the natural and social sciences, the science of ecology provides one of the most beneficial insights into understanding the character of the landscape. It deals with the reciprocal relationship of all living things to each other [including humans] and to their physical and biological environments. But ecological knowledge has to be supplemented with an understanding of aesthetic form to truly appreciate, understand, and create landscapes that work and are sustainable.

Course Objectives
This course reviews selected ecological concepts and explores their integration into ecological/landscape planning and design using a historical perspective. Additionally, historical and contemporary approaches to ecological planning will be studied to provide students with the opportunity to develop an in-depth understanding of how they can better mediate between human actions and natural processes. The following themes will be explored in this course:

- Historical trends in ecological planning
- Emerging paradigms in landscape architecture and planning
- Overview of selected ecology concepts (ecosystem structure and function, population ecology, and landscape succession)
- Ecological planning approaches (Landscape Suitability, Applied Ecosystem, Applied Landscape Ecology, Landscape Perception and Values)
- Contemporary ecological design and planning issues
- Ecology, Aesthetics, and Planning: Integration?

Course Structure and Requirements
This course will be achieved through a combination of lectures, assigned readings, field trips, and critique of designed environments especially in landscape architecture. Assignments will involve both team and individual projects. All students are expected to attend all lectures, participate in workshops and discussions, and complete all assignments satisfactorily. There will be weekly lectures and presentations by the instructor and students.

Evaluation
Final course grade will be based on the satisfactory completion of all phases of the courses. Grades for various components of the courses are allotted tentatively as follows:
- Assigned readings focused on ecological concepts, integration of ecological concepts into planning and design, as well as on historic and contemporary approaches to ecological/ landscape planning (30%);
- Paper on ecological concepts (15%);
- Critiques of ecological planning approaches and important executed works in ecological design and planning (40%);
- Participation and professionalism: Strict regular attendance, active participation in class discussions, and mastery of the subject matter (15%).

**Grading scale**

Grading Scale
A=90%-100%
B=80%-89%
C=70%-79%
D=60%-69%
F= 59% and below

**Text and Readings**

**Required**


**Selected References**

Selected articles from key journals


**ADA and Academic Integrity Statements**

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

- **Academic Integrity Statement and Policy**

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TAMU Code of Honor

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

Upon accepting admission to Texas A & M University, as 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. Student will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the Texas A & M University community from the requirements of the processes of the Honor System. For additional information please visit: www.tamu.edu/aggiehonor/

On all course work, assignments, and examinations at Texas A & M University, the following Honor Pledge shall be preprinted and signed by the student:

"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."
LAND/PLAN 635  
Concepts in Ecological Design and Planning  
Course Schedule

Week 1:  
Jan 19, 21  
Introduction

Week 2:  
Jan 26, 28  
History of Ecological Planning and Design

Week 3:  
Feb. 2, 4  
Contemporary Exemplary Papers/Works in Ecological Planning

Week 4:  
Feb. 9, 11  
Ecological Concepts

Week 5:  
Feb. 16, 18  
Ecological Concepts  
Assignment #1: Literature Review on contemporary ecological planning papers/ works

Week 6:  
Feb. 23, 25  
Ecological Concepts

Week 7:  
March 2, 4  
Ecological Concepts/Assignment #1 due: Presentations

Week 8:  
March 9, 11  
March 8: Mid semester grade due  
Case Study and Term paper assignments

Spring Break:  
March 15-19

Week 9:  
March 23, 25  
Landscape Suitability I

Week 10:  
March 30, April 1  
Landscape Suitability II

Week 11:  
April 6, 8  
Applied Ecosystem

Week 12:  
April 13, 15  
Applied Landscape Ecology  
Term Paper due

Week 13:  
April 20, 22  
Climate Change  
Work on Case study

Week 14:  
April 27, 29  
Landscape perception  
Case Study due

Week 15:  
May 2, 6  
Presentations
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. Request submitted by (Department or Program Name):
   Department of Recreation, Park and Tourism Sciences

2. Course prefix, number and complete title of course:
   RPTS 655 - Applied Biodiversity Science I

3. Catalog course description (not to exceed 50 words):
   Students will study in the areas of Conservation genetics, metapopulations, landscape ecology, and ecosystem management.

4. Graduate Classification

5. Prerequisite(s):
   WFSC 655

6. Is this a variable credit course? □ Yes ☑ No
   If yes, from _________ to _________

7. Is this a repeatable course? □ Yes ☑ No
   Will this course be repeated within the same semester? □ Yes ☑ No
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8. 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)

M.S., Ph.D. in RPTS and WFSC departments

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

<table>
<thead>
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<th>Prefix</th>
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<td>APPLIED BIODIVERSITY SCIENCE</td>
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Approval recommended by:

Dr. Gary Ellis
Department Head or Program Chair (Type Name & Sign) Date

Chair, College Review Committee Date

Dean of College Date

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
APPLIED BIODIVERSITY SCIENCE I
RPTS 655/WFSC 655

Dr. Amanda Stronza
astronza@tamu.edu
600 John Kimbrough Boulevard, 410
(979) 845-8931

Dr. Lee Fitzgerald
lfitzgerald@tamu.edu
210 Nagle Hall
(979) 845-5777

"Conservation cannot be achieved without the soundest information from the natural and social sciences." Jose Sarukhan, Institute of Ecology, National University of Mexico

OVERVIEW
Efforts to halt the loss of biodiversity must be based on integration between science and practice. Linking theory with conservation requires the engagement of many different actors, including biologists and social scientists, universities and museums, governments and nongovernmental organizations, industries, interest groups, and communities. Such collaboration is critical for establishing conservation priorities, developing ecologically and socially acceptable management plans, building local capacity for stewardship, and guiding effective policy. Currently, a great deal of conservation research is based in universities with few linkages between scientists and practitioners, or between theory and on-the-ground work. Moreover, research on patterns and processes that underlie the loss of biodiversity are often conceptual and discipline specific, with few lessons shared among researchers from diverse disciplines.

Our goal in this course is to build cross-disciplinary understanding of biodiversity science. We ask:

1) What is biodiversity? How is it perceived, valued, measured, monitored, and protected?
2) What are the main concerns surrounding biodiversity? Who voices these concerns and why?
3) What are current perspectives about biodiversity conservation from evolutionary and community ecology, conservation biology, environmental anthropology, and political ecology?
4) What can we learn from popular and academic case studies?

REQUIREMENTS
Participation (20 points): The class is a seminar, facilitated by an anthropologist and a biologist. We will draw on our disciplinary backgrounds as we discuss various conservation issues and paradigms. We are relative beginners in each other’s field. Each of you too will be a novice in some things, an expert in others. This is the nature of multidisciplinary collaboration. We encourage you to speak up about what you know well and listen carefully to the things that are new. Please prepare for each class by reading the assigned articles, taking notes, and bringing questions, analyses, and critiques.
Facilitation of discussion (30 points): Each of you will be responsible for facilitating one of the weekly topics. You will work in pairs. Preparation will include reading and synthesizing the main messages from that week’s readings, building a discussion plan, and guiding our conversation.

Team Project (50 points): We will assemble groups of 3-4 people to carry out a team project. The aim is to provide an academic response to a recent popular media piece on conservation. The project has three parts: a) White Paper, b) Presentation, and c) Reading Selection.

a) White Paper
- Please address the following questions in relation to the popular media piece:
  - What is the conservation concern or challenge?
  - What are the proposed solutions?
  - What is your informed perspective? What theoretical frameworks, scientific research, empirical data, and/or case studies can you bring to bear on this topic? You may include a conceptual framework, a literature review, data tables, and so forth.
  - What are the implications of your perspective for policy?
- Limited to 10 pages, double-spaced, not including literature cited.
- The series of “Working Papers” produced by the Wildlife Conservation Society may serve as a model for what you will write (http://archive.wcs.org/wcspubs/science.html) The first half of the following example may be especially useful: Casting for Conservation actors: people, partnerships and wildlife (http://archive.wcs.org/media/file/weswp28.pdf)

b) Presentation
Each team has two class periods to cover the topic. You may devote some of the time to teaching the class about your conservation issue or presenting the topic generally. Be sure to allow enough time for seminar discussion as well.

c) Reading Selection
Two weeks before your team’s presentation, please provide the class with 2-3 articles we should read in preparation for the discussion.

Grading: A=90-100 points, B=80-89 points, C=70-79 points, D=60-69 points, F=below 60 points

REQUIRED TEXTS
- Additional journal articles, chapters, web links, and reports will be posted to website.
SCHEDULE

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<tr>
<th>INTRODUCTION</th>
<th>Applied Biodiversity Science</th>
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<td>Defining and Measuring Biodiversity</td>
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<th>STUDENT-LED SEMINARS</th>
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<td>From Genes to Landscapes</td>
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<td>Political Ecology</td>
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<td>Crisis of Loss</td>
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<td>Questioning the Commons</td>
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<td>Setting Priorities</td>
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<th>TEAM PANELS AND DISCUSSIONS</th>
<th>Paying Farmers for Conservation</th>
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<td>Climate Change and Extinction</td>
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<td>Conservation: Popular and</td>
<td>African Mammals in North</td>
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<td>Black Markets for Wildlife</td>
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<th>GUEST LECTURE</th>
<th>Market-Based Conservation</th>
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<th>BOOK FORUM</th>
<th>Dodos and Refugees</th>
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| EVALUATION                   | Insights, lessons, new questions |

TOPICS and READINGS

**APPLIED BIODIVERSITY SCIENCE** In the first week, we set the stage for our discussions about biodiversity, culture, ecology, governance, and conservation. We will discuss the intersections between ecosystems and social systems, and we will define as a group what we mean by Applied Biodiversity Science.

*Readings:*
- Schwartz, M. 2008. The importance of stupidity in scientific research
- Sutherland, W.J., et al. One Hundred Questions of Importance to the Conservation of Global Biological Diversity.

**DEFINING AND MEASURING BIODIVERSITY** Here we learn and discuss definitions of biodiversity, species diversity, and patterns of biological diversity (including species-area relationship, island biogeography, latitudinal gradient in species richness, local and regional richness, species-elevation relationship, and macroecological rules).

*Readings:*

CULTURAL DIVERSITY Relationships between humans and nature vary cross-culturally, over time, in different social and economic settings, and by ecosystem. This week, we explore the interface between human populations and ecosystems, viewing culture as something that influences the natural environment and is, in turn, shaped by it.
Readings:

FROM GENES TO LANDSCAPES: This week, we examine why genetic diversity became part of the foundation of conservation biology, how conservation genetics has changed, how genetic information has been useful (and useless) to on-the-ground conservation, and how genetic and phylogenetic approaches are being applied to integrative conservation issues today. We will focus on case studies of sea turtles, sand dune lizards, cheetahs, and others.
Readings:
• Spielman et al. (2004) Most species are not driven to extinction before genetic factors impact them. PNAS 101(42):15261-15264.

POLITICAL ECOSYSTEM People make decisions about their environment in the context of many factors. These include policies and institutions, economic incentives, and social relations of power at different scales, from the local to the regional and the global. This week, we examine these dimensions of biodiversity loss and conservation with the help of an analytical framework known as political ecology.
Readings:

CRISIS OF LOSS: Throughout your careers you have been led to believe that our planet is experiencing the 6th major extinction event, equal in magnitude to the mass extinctions in the geologic past. The 6th extinction is caused by human activities. To understand something so important at a scientific level, we will review the processes that result in the generation of biodiversity and some causes of extinction. We will take a scientific look at the logic and evidence for the extinction crisis.

Readings:

QUESTIONING THE COMMONS: How should society manage resources like water, air, wildlife, and fish that belong to everyone? In 1968, Garrett Hardin addressed this question in an essay that became one of Science’s most popular articles. Hardin argued that humans seek to maximize their individual gains and thus deplete the common resources on which everyone depends. He called this the “tragedy of the commons.” Hardin’s article spawned a great deal of policy, controversy, new theory, and research on “common property resource management.” This week, we read the original essay and ideas that emerged in subsequent years about sustainable governance of common resources.

Readings:

SETTING PRIORITIES Ideally, conservationists would have the wherewithal to protect all biodiversity everywhere effectively and with high levels of investment and effort. Of course, this is impossible as political, economic, and social capital for conservation is limited. Thus
priorities must be established to determine where to focus first and most intensively. The identification of biodiversity "hotspots" has been one approach to prioritization. This week, we examine how "hotspots" have been defined and critiqued, and we discuss the implications for conservation.

Readings:
- Orme et al. 2005. ...hotspots not congruent with endemism or threat. Nature. (includes news and views feature by Possingham and Wilson)

**CONSERVATION: POPULAR AND ACADEMIC**

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<tr>
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<th><strong>New York Times</strong></th>
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<tr>
<td>1</td>
<td>In Brazil, Paying Farmers to Let the Trees Stand by Elisabeth Rosenthal</td>
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<td>2</td>
<td><strong>Time Magazine</strong></td>
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<td>Vanishing Act: How Climate Change is Causing a New Age of Extinction by Bryan Walsh</td>
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<td><a href="http://www.time.com/time/covers/0,16641,20090413,00.html">http://www.time.com/time/covers/0,16641,20090413,00.html</a></td>
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<td>3</td>
<td><strong>National Public Radio (NPR)</strong></td>
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<td>African Mammals May Immigrate to North America, Interview with Josh Donlan by Robert Siegel</td>
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<td>4</td>
<td><strong>MediaStorm.com</strong></td>
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<td>Project: Black Market by Patrick Brown</td>
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<td><a href="http://www.mediasmorm.com/0015.htm">http://www.mediasmorm.com/0015.htm</a></td>
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**MARKET-BASED CONSERVATION** From the certified sustainable wood on the shelves at Home Depot, to the certified organic, shade grown coffee served at the local Starbucks, market-based conservation strategies have become the latest panacea for the globe’s environmental woes. Combining the trend in environmental management towards social sustainability and the trend in global economic management towards free-market liberalism, these programs attempt to address both conservation and development goals. This week, we discuss the basic principles behind market-based conservation, its environmental and social impacts and some critiques against it.

Readings:

THANKSGIVING HOLIDA Y

- 6 -
BOOK FORUM: Song of the Dodo and Conservation Refugees

EVALUATION

Americans with Disabilities Act (ADA) Policy Statement

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Academic Integrity
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Know the Aggie Honor Code: http://www.tamu.edu/aggiehonor/.

Academic Misconduct
Texas A&M University student rules Section 20 outlines official policies on scholastic dishonesty and academic misconduct (http://www.tamu.edu/aggiehonor/). Section 20 declares, "It is the responsibility of students and instructors to help maintain scholastic integrity at the University by refusing to participate in or tolerate scholastic dishonesty." Further, Section 20 defines a variety of categories of academic misconduct. I strongly encourage you to read the rules and definitions; they are a good resource of critical information http://www.tamu.edu/aggiehonor/Student%20Rules/definitions.html. You are responsible for complying with them; ignorance of these rules is not an acceptable excuse for not doing so
Texas A&M University  
Departmental Request for a New Course  
Undergraduate • Graduate • Professional

Submit original form and 2 copies. Attach a course syllabus to each.

1. This request is submitted by the Department of Wildlife & Fisheries Sciences  
2. Course prefix, number and complete title WFSC 655 - Applied Biodiversity Science

3. Course description (not more than 50 words) Students will study in the areas of  
Conservation genetics, metapopulations, landscape ecology, and ecosystem management.

4. Prerequisite(s) graduate classification Cross-listed with RPTS 655  
Cross-listed courses require the signatures 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 the course be repeated within the same semester/term? □ Yes ☑ No

7. Has this course been taught as a 489/689? □ Yes ☑ No  
If yes, how many times? ______ 2 ______  
Indicate the number of students enrolled for each academic period it was taught. Fall 2008-10; Fall 2008-10

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)  
   MS WFSC, PhD WFSC, MS RPTS, PhD RPTS

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

10. Prefix | Course # | Title (exclude punctuation) |
      | WFSC 655 | APPLIED BIODIVERSITY SCI |

      Lect. | Lab | SCH | Subject Matter Content Code | Admin. Unit | Acad. Year | FICE Code |
      | 030003 | 030101 | 0002 | 295109 - 10 | 003632 |

Do not complete shaded area.

Approval recommended by:  
Head of Department  
Signed ____________________________ Date 8/29/12  
Chair College Review Committee  
Signed ____________________________ Date 8/29/12

Head of Department (if cross-listed course)  
Date 8/29/17

Submitted to Coordinating Board by:  
Dean of College  
Date  

Director of Academic Support Services  
Date  
Effective Date

To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737.
OAR/AS-5/04
APPLIED BIODIVERSITY SCIENCE
RPTS 655/WFSC 655
(FALL 2012) TR 11:10-12:25 pm, Nagle 207

Dr. Amanda Stronza
astronza@tamu.edu
308 Francis Hall
(979)845-8931

Dr. Lee Fitzgerald
lfitzgerald@tamu.edu
110H Heep
(979) 8625-7480

"Conservation cannot be achieved without the soundest information from the natural and social sciences." Jose Sarukhan, Institute of Ecology, National University of Mexico

OVERVIEW
Efforts to halt the loss of biodiversity must be based on integration between science and practice. Linking theory with conservation requires the engagement of many different actors, including biologists and social scientists, universities and museums, governments and nongovernmental organizations, industries, interest groups, and communities. Such collaboration is critical for establishing conservation priorities, developing ecologically and socially acceptable management plans, building local capacity for stewardship, and guiding effective policy. Currently, a great deal of conservation research is based in universities with few linkages between scientists and practitioners, or between theory and on-the-ground work. Moreover, research on patterns and processes that underlie the loss of biodiversity are often conceptual and discipline specific, with few lessons shared among researchers from diverse disciplines.

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1) What is biodiversity? How is it perceived, valued, measured, monitored, and protected?
2) What are the main concerns surrounding biodiversity? Who voices these concerns and why?
3) What are current perspectives about biodiversity conservation from evolutionary and community ecology, conservation biology, environmental anthropology, and political ecology?
4) What can we learn from popular and academic case studies?

REQUIREMENTS
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     o What are the proposed solutions?
     o What is your informed perspective? What theoretical frameworks, scientific research, empirical data, and/or case studies can you bring to bear on this topic? You may include a conceptual framework, a literature review, data tables, and so forth.
     o What are the implications of your perspective for policy?
b) Presentation
Each team has two class periods to cover the topic. You may devote some of the time to teaching the class about your conservation issue or presenting the topic generally. Be sure to allow enough time for seminar discussion as well.

c) Reading Selection
Two weeks before your team’s presentation, please provide the class with 2-3 articles we should read in preparation for the discussion.

Grading: A=90-100 points, B=80-89 points, C=70-79 points, D=60-69 points, F=below 60 points

REQUIRED TEXTS
- Additional journal articles, chapters, web links, and reports will be posted to website.

SCHEDULE

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<thead>
<tr>
<th>INTRODUCTION</th>
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<tr>
<td>Biodiversity Science</td>
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<td>Defining and Measuring Biodiversity</td>
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<td>Cultural Diversity</td>
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<td>From Genes to Landscapes</td>
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<td>Political Ecology</td>
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<td>Crisis of Loss</td>
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<td>Questioning the Commons</td>
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<td>Setting Priorities</td>
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<td>Conservation: Popular and Academic</td>
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<td>Paying Farmers for Conservation</td>
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<td>Climate Change and Extinction</td>
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<td>African Mammals in North America</td>
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<td>Dodos and Refugees</td>
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<th>EVALUATION</th>
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<td>Insights, lessons, new questions</td>
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TOPICS and READINGS

BIODIVERSITY SCIENCE I. In the first week, we set the stage for our discussions about biodiversity, culture, ecology, governance, and conservation. We will discuss the intersections between ecosystems and social systems, and we will define as a group what we mean by Applied Biodiversity Science.

Readings:
- Schwartz, M. 2008. The importance of stupidity in scientific research
- Sutherland, W.J., et al. One Hundred Questions of Importance to the Conservation of Global Biological Diversity.

DEFINING AND MEASURING BIODIVERSITY Here we learn and discuss definitions of biodiversity, species diversity, and patterns of biological diversity (including species-area relationship, island biogeography, latitudinal gradient in species richness, local and regional richness, species-elevation relationship, and macroecological rules).

Readings:

CULTURAL DIVERSITY Relationships between humans and nature vary cross-culturally, over time, in different social and economic settings, and by ecosystem. This week, we explore the interface between human populations and ecosystems, viewing culture as something that influences the natural environment and is, in turn, shaped by it.

Readings:

FROM GENES TO LANDSCAPES: This week, we examine why genetic diversity became part of the foundation of conservation biology, how conservation genetics has changed, how genetic information has been useful (and useless) to on-the-ground conservation, and how genetic and phylogenetic approaches are being applied to integrative conservation issues today. We will focus on case studies of sea turtles, sand dune lizards, cheetahs, and others.

Readings:

**POLITICAL ECOLOGY** People make decisions about their environment in the context of many factors. These include policies and institutions, economic incentives, and social relations of power at different scales, from the local to the regional and the global. This week, we examine these dimensions of biodiversity loss and conservation with the help of an analytical framework known as political ecology.

**Readings:**

**CRISIS OF LOSS:** Throughout your careers you have been led to believe that our planet is experiencing the 6th major extinction event, equal in magnitude to the mass extinctions in the geologic past. The 6th extinction is caused by human activities. To understand something so important at a scientific level, we will review the processes that result in the generation of biodiversity and some causes of extinction. We will take a scientific look at the logic and evidence for the extinction crisis.

**Readings:**

**QUESTIONING THE COMMONS:** How should society manage resources like water, air, wildlife, and fish that belong to everyone? In 1968, Garrett Hardin addressed this question in an essay that became one of *Science*’s most popular articles. Hardin argued that humans seek to maximize their individual gains and thus deplete the common resources on which everyone depends. He called this the “tragedy of the commons.” Hardin’s article spawned a great deal of policy, controversy, new theory, and research on “common property resource management.” This week, we read the original essay and ideas that emerged in subsequent years about sustainable governance of common resources.

**Readings:**

SETTING PRIORITIES Ideally, conservationists would have the wherewithal to protect all biodiversity everywhere effectively and with high levels of investment and effort. Of course, this is impossible as political, economic, and social capital for conservation is limited. Thus priorities must be established to determine where to focus first and most intensively. The identification of biodiversity “hotspots” has been one approach to prioritization. This week, we examine how “hotspots” have been defined and critiqued, and we discuss the implications for conservation.

Readings:
• Jepson and Canney 2001. Hot for what?
• Orme et al. 2005. …hotspots not congruent with endemism or threat. Nature. (includes news and views feature by Possingham and Wilson)

CONSERVATION: POPULAR AND ACADEMIC

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<tr>
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<tr>
<td>1</td>
<td>In Brazil, Paying Farmers to Let the Trees Stand</td>
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<td>by Bryan Walsh</td>
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<td>African Mammals May Immigrate to North America, Interview with Josh Donlan</td>
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<td>by Robert Siegel</td>
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<td>by Patrick Brown</td>
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MARKET-BASED CONSERVATION (special Guest Lecture by Elizabeth Shapiro) From the certified sustainable wood on the shelves at Home Depot, to the certified organic, shade grown coffee served at the local Starbucks, market-based conservation strategies have become the latest panacea for the globe’s environmental woes. Combining the trend in environmental management towards social sustainability and the trend in global economic management towards free-market liberalism, these programs attempt to address both conservation and development goals. This week, we discuss the basic principles behind market-based conservation, its environmental and social impacts and some critiques against it.

Readings:
• Economist (2005) Rescuing environmentalism. April 21, 2005
• GRAIN (2005) No, air, don't sell yourself... Seedling April: 34-41.

Further readings:

THANKSGIVING HOLIDAY

BOOK FORUM: Song of the Dodo and Conservation Refugees

EVALUATION

****

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 the Department of Student Life, Services for Students with Disabilities, in Room 126 of the Koldus Building or call 845-1637.

Academic Integrity
"An Aggie does not lie, cheat, or steal or tolerate those who do."
Know the Aggie Honor Code: http://www.tamu.edu/aggiehonor/

Academic Misconduct
Texas A&M University student rules Section 20 outlines official policies on scholastic dishonesty and academic misconduct (http://www.tamu.edu/aggiehonor/). Section 20 declares, "It is the responsibility of students and instructors to help maintain scholastic integrity at the University by refusing to participate in or tolerate scholastic dishonesty." Further, Section 20 defines a variety of categories of academic misconduct. I strongly encourage you to read the rules and definitions; they are a good resource of critical information (http://www.tamu.edu/aggiehonor/Student%20Rules/definitions.html). You are responsible for complying with them; ignorance of these rules is not an acceptable excuse for not doing so.
Course Changes
Texas A&M University
Departmental Request for a Change in Course
Undergraduate • Graduate • Professional
• Submit original form and attachments •

1. Request submitted by (Department or Program Name): Department of Ecosystem Science and Management

2. Course prefix, number and complete title of course: ESSM651 Geographic Information Systems

3. Change requested

   a. Prerequisite(s): From: GEOG 398 and RENR 444 or approval of instructor To: None

   b. Withdrawal (reason): 

   c. Cross-listed with:

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

   d. Change in course title and description. Enter complete current course title and current course description in item 5; enter proposed course title and proposed course description in item 6. Complete item 7 for change in title.

   e. Change in course number, contact hours (lab & lecture), and semester credit hours. Complete item 7. Attach a course syllabus.

4. For informational purposes only, please indicate course number if this course will be stacked: 

5. Complete current course title and current catalog course description:

6. Complete proposed course title and proposed catalog course description (not to exceed 50 words):

7. a. As currently in course inventory:

   Prefix: ESSM  
   Course #: 651  
   Title (excluding punctuation): Geographic Information Systems

   Lect. Lab SCH CIP and Fund Code Admin. Unit ICE Code Level
   02 02 03 01 04 01 00 02 08 41 0 0 3 6 3 2 96

   b. Change to:

   Prefix: 
   Course #: 
   Title (excluding punctuation): 

   Lect. Lab SCH CIP and Fund Code Admin. Unit ICE Code Level
   

Approval recommended by:

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

Chair College Review Committee Date

Dean of College Date

Submitted to Coordinating Board by:

Associate Director, Curricular Services Date

Chair, GC or UCC Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Curricular Services – 02/11
ESSM 651

Current prerequisites are no longer needed to successfully complete this course. Also courses are no longer taught.
Texas A&M University
Departmental Request for a Change in Course
Undergraduate • Graduate • Professional
• Submit original form and attachments •

1. Request submitted by (Department or Program Name): Department of Recreation, Park and Tourism Sciences

2. Course prefix, number and complete title of course: RPTS 666. Tourism and the Natural Environment

3. Change requested
   Attach a brief supporting statement for changes made to items 3a thru 3d. and 6 below.
   a. Prerequisite(s): From: ___________________________ To: ___________________________
   b. Withdrawal (reason): ___________________________
   c. Cross-list with: ___________________________

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

   d. Change in course title and description. Enter complete current course title and current course description in item 5; enter proposed course title and proposed course description in item 6. Complete item 7 for change in title.

   e. Change in course number, contact hours (lab & lecture), and semester credit hours. Complete item 7. Attach a course syllabus.

4. For informational purposes only, please indicate course number if this course will be stacked:

5. Complete current course title and current catalog course description:
   Tourism and the Natural Environment.
   Environmental and natural resource issues in tourism development and travel activity; philosophical issues in natural based-and eco-tourism; sustainable development and tourism; assessment of environmental impacts at macro and micro scales; integrating values into allocation, planning and management of tourism use of natural resources; the role of tourism in the stewardship of ecosystems. Prerequisite: RPTS 606 or approval of instructor.

6. Complete proposed course title and proposed catalog course description (not to exceed 50 words):
   Parks, Tourism and the Natural and Cultural Environment. RPTS 666 – proposed new course description
   Analysis of natural and cultural resource management in the United States; emphasis on federal policy and the influence by political processes at the national, regional, and local levels; case studies to illustrate conceptual and legal frameworks in real world contexts, including the policy and politics of tourism and recreation, endangered species, contested history, and Native American traditions and sovereignty.

7. a. As currently in course inventory:

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   Approval recommended by:
   Dr. Gary Ellis
   Department Head or Program Chair (Type Name & Sign) Date 7/1/12

   Dr. David Reed
   Chair, College Review Committee Date 9/20/12

   Dr. David Reed
   Dean of College Date 9/20/12

   Submitted to Coordinating Board by:
   Chair, GC or UCC Date

   Effective Date

   Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu
   Curricular Services – 02/11
Course title and number: RPTS 666: Parks, Tourism and the Natural and Cultural Environment
Term: Spring 2013
Meeting times/location: TBA

Course Description and Prerequisites:
Analysis of natural and cultural resource management on public lands in the United States; emphasis on federal policy and the influence by political processes at the national, regional, and local levels; case studies to illustrate conceptual and legal frameworks in real world contexts, including the policy and politics of tourism and recreation, endangered species, contested history, and Native American traditions and sovereignty. Prerequisite: RPTS 602 or approval of instructor.

Course Objectives: At the completion of this course, you will be able to:
1. List the political, social, legal, and economic influences on development and management of recreation and tourism in protected areas;
2. Describe actual cases illustrating conceptual issues related to current policy in concession management, cultural resources management, endangered species recovery, the interpretation of contested history, and other issues related to tourism and recreation in protected areas.
3. Drawing upon the conceptual and policy background provided by the case studies, logically state and defend arguments and potential solutions to complex real-world problems.
4. Prepare a nomination package for the designation of a national natural or historic landmark.

Instructor Information:
Name: Jim Gramann
Telephone number: (979) 845-4920
Email address: jgramann@tamu.edu
Office hours: TBA
Office location: 409Q AGLS

Textbook and/or Resource Material:
2. Packet of readings available online.

Course Requirements and Grading Policies:
4 take-home case analyses (exams) 320 (80 pts. each)
7 individual quizzes over assigned readings 70 (10 pts. each)
7 team quizzes over assigned readings 70 (10 pts. each)
4 individual papers on case studies 60 (15 pts. each)
4 team “lessons learned” exercises 60 (15 pts. each)
Required field trip to Camp Hearne 20
Camp Hearne National Historic Landmark nomination (team assignment) 100
Peer helping grade for all team exercises 50
Total Points 750

The final letter grade is assigned as follows: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F=below 60%.

Academic Dishonesty (including plagiarism): Penalties are as follows: zero for the work if it is a first offense, and an F for the course if files indicate that this is a repeat offense. Rules of the AGGIE HONOR CODE are strictly enforced. Please refer to http://aggiehonor.tamu.edu/Students/Sanctions.aspx.
Course Calendar and Major Assignment Dates:

Week 1: Introduction to Course and Camp Hearne Project
Recreation, Tourism and Protected Areas: The Preservation-Use Dilemma
FIELD TRIP TO CAMP HEARNE

Week 2: CASE STUDY: Tourism and Protected Area Management at Carlsbad Caverns National Park
Readings:
"Executive Summary," Visitor Response to Concession Management Alternatives at Carlsbad Caverns National Park (1989)
1st individual and team quizzes on readings listed above.

Week 3: Class Discussion: Carlsbad Caverns National Park
1st paper due; 1st team lessons-learned exercise; 1st case analysis exam handed out (due beginning of next class)

Week 4: Legal and Ethical Issues in Endangered Species Recovery
Readings:
"Endangered Species, Endangered Act?" Environment (January/February 1999).
2nd individual and team quizzes on readings listed above.

Week 5: CASE STUDY: Endangered Species Recovery at Yellowstone National Park
Readings:
The Return of the Wolf to Yellowstone (excerpts).
Beyond Wolves: The Politics of Wolf Recovery and Management (excerpt).
3rd individual and team quizzes on readings listed above;
Videos: The Wolf: A Howling in America's National Parks; The Wolf Returns to Yellowstone

Week 6: Class Discussion: Yellowstone National Park
2nd paper due; 2nd team lessons-learned exercise; 2nd case analysis exam handed out (due beginning of next class)

Week 7: Political Issues in Interpreting Contested History
Readings:
(I'm still reviewing possible readings for this topic)
4th individual and team quizzes on readings listed above.

Week 8: CASE STUDY: Contested History at the Little Bighorn Battlefield
Readings:
Little Bighorn Battlefield (excerpts)
Sacred Ground: Americans and Their Battlefields (excerpts)
5th individual and team quizzes on readings listed above.
Video: Their Shots Quit Coming
**Week 9:**  **SPRING BREAK**

**Week 10:**  Class Discussion: Little Bighorn Battlefield  
- 3rd paper due; 3rd team lessons-learned exercise; 3rd case analysis exam handed out (due beginning of next class)

**Week 11:**  Recreation Management and Native American Sovereignty

**Readings:**  
- *The Indian Policy of the U.S.* (excerpts)  
- *American Indians and National Parks* (excerpts)  
- *Dispossessing the Wilderness: Indian Removal and the Making of the National Parks* (excerpts)

- 6th individual and team quizzes on readings listed above.

**Week 12:**  **CASE STUDY:**  Recreation Management at Devils Tower

**Readings:**  
- American Indian Religious Freedom Act of 1978  
- “Summary of the Conflict over the Site-Mato Tipi (Devils Tower).” Hamline University Law School website.  

- 7th individual and team quizzes on readings listed above.

**Video:**  *In the Light of Reverence*

**Week 13:**  Class Discussion: Devils Tower  
- 4th paper due; 4th team lessons-learned exercise; 4th case analysis exam handed out (due beginning of next class)

**Week 15:**  Work on Camp Hearne nomination as National Historic Landmark

**Week 16:**  Team presentations of Camp Hearne nomination

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**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)
Texas A&M University  
Departmental Request for a Change in Course  
Undergraduate • Graduate • Professional  
• Submit original form and attachments •

1. Request submitted by (Department or Program Name): Department of Soil and Crop Sciences

2. Course prefix, number and complete title of course: SCSC 654 Genome Analysis

3. Change requested
   a. Prerequisite(s): From: _________________________________ To: _________________________________
   b. Withdrawal (reason): _________________________________
   c. Cross-list with: _________________________________
   d. Change in course title and description. Enter complete current course title and current course description in item 5; enter proposed course title and proposed course description in item 6. Complete item 7 for change in title.
   e. Change in course number, contact hours (lab & lecture), and semester credit hours. Complete item 7. Attach a course syllabus.

4. For informational purposes only, please indicate course number if this course will be stacked: _________________________________

5. Complete current course title and current catalog course description:
   Genome Analysis
   Genome structure, organization and function of model organisms and higher eukaryotes; theory and methodology of genetic and physical mapping, comparative genomics, sequencing, sequence analysis and annotation; emphasis on understanding the function of complex genomes, genome-wide expression analysis, genetic and epigenetic mechanisms; X-inactivation, imprinting, gene silencing, transposons, genome duplication and evaluation. Prerequisite: GENE 603 or GENE 431. Cross-listed with GENE 654 and MEPS 654.

6. Complete proposed course title and proposed catalog course description (not to exceed 50 words):
   Analysis of Complex Genomes

7. a. As currently in course inventory:
   Prefix: SCSC  
   Course #: 654 
   Title (excluding punctuation): Genome Analysis 
   Lect: 0 3 0 0 0 3 2 6 0 8 0 4 0 0 2 2 6 2 0 
   Lab: 0 0 3 6 3 2  
   Level: 6

   b. Change to:
   Prefix: SCSC  
   Course #: 654 
   Title (excluding punctuation): Complex Genomes LEC 
   Lect: 0 3 0 0 0 3 2 6 0 8 0 4 0 0 2 2 6 2 0 1 3 
   Lab: 0 0 3 6 3 2  
   Level: 6

   Approval recommended by:
   Wayne Smith, (SCSC) 8/15/12
   Dirk Hays, (MEPS) 8/12
   Chair, College Review Committee 8/15/12
   Dean of College 8/15/12
   Chair, GC or UCC 8/15/12
   Effective Date _________________________________

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Curricular Services – 02/11
August 9, 2012

MEMO

RE: Request for Course Title Change for SCSC 654

FROM: Wayne Smith, Associate Department Head SCSC
       Hongbin Zhang, Professor of Plant Genomics and Systems Biology

SCSC 654 is currently titled “Genome Analysis”. It is cross-listed with MEPS 654 and GENE 654, both of which are titled “Analysis of Complex Genomes.” The cross-listed courses should have uniform course titles so we request that SCSC 654 be changed to “Analysis of Complex Genomes.”

Wayne Smith
Associate Department Head SCSC
SCSC, GENE and MEPS 654: Analysis of Complex Genomes (Lec)

Spring 2012

1. Instructor:

Name: Professor Dr. Hongbin Zhang       E-mail: hbz7049@tamu.edu
Office: 427A Heep Center               Office Phone: 862-2244
Office hours: 9:00 am – 11:00 am, Fridays, by appointment or at any time by e-mail.
Meeting times: TR 11:10 – 12:25 Heep 123X

2. Course Description:

"Changes that will have effects comparable to those of the Industrial Revolution and the Computer-based Revolution are now beginning. The next great era, a genomics revolution, is in an early phase" (Science, Vol. 279 p2019, 1998). This course is to teach students in technologies and methods in modern genomics and molecular research, from the basic to the state-of-the-art ones, and introduce their applications. Emphasis will be given to those widely used for DNA marker technology, genetic mapping, genome physical mapping, genome analysis, gene cloning, genome sequencing, gene expression analysis and molecular breeding.

At the end of the course, the following goals will be expected to reach:

• To understand the principles of major technologies and methods widely used in modern genomics research;
• To have knowledge and concepts in uses of the technologies and methods in modern genomics, molecular biology and plant/animal breeding; and
• To be able to design a research project in genomics, molecular biology and molecular breeding using the genome technologies and methods.

3. Course Prerequisite:

GENE 603 or GENE 431

4. Course Level:

Graduate students having majors in life sciences, including plants, animals, human, insects, and microbes.

5. Teaching Materials:

There is no textbook recommended for this course; however, relevant reading materials will be provided before each lecture.

6. Credits:

This is a 3-credit hour course, meeting on Tuesdays and Thursdays, from 11:10 – 12:25 PM.
7. Grading: Midterm 40%  
             Final 60%  
             100%  

Exams will be taken at home (1 week) or in class room (2 hours each exam).

Grading standard: A, ≥ 89.50%; B, 79.50 – 89.49%; C, 60.00 – 79.49%; failure, <60%.

8. Americans with Disabilities Act (ADA) Policy Statement:

The Americans with Disabilities Act (ADA) is a federal antidiscrimination 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 provide for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Cain Hall, Rm. B118, or call 845-1637.

9. Academic Integrity Statement and Policy:

"An Aggie does not lie, cheat or steal, or tolerant those who do."
http://aggiehonor.tamu.edu

10. Student Rule 7 Regarding Attendance and Late Work

http://student-rules.tamu.edu/rule07
## 10. Course Schedule:

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<td>Date</td>
<td>Hours</td>
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Special Consideration
Items
August 31, 2012

Dr. Donna Lang  
Texas A&M University at Galveston  
PO Box 1675  
Galveston, TX 77553

The department of Marine Sciences would like to offer a degree program that allows ocean and coastal resources (OCRE) majors to enter the graduate program for a master of marine resources management at the beginning of their fourth year at Texas A&M University at Galveston. This would enable students to receive their OCRE undergraduate degree (B.S.) and a Master of Marine Resources Management (MARM) graduate degree in five years.

Students admitted to the 5-year degree program will have completed 102 of the 120 hours of course work required to receive a bachelor’s degree. These courses must include the specific prerequisites for a Bachelor of Science degree in Ocean and Coastal Resources, as well as the core curriculum courses required by Texas A&M University for an undergraduate degree.

Our plan is to begin offering this pathway to the students as soon as possible. Please consider this request to facilitate this process.

Sincerely,

Patrick Louchoam  
Department Head, Marine Sciences
5 Year Degree Program: Ocean and Coastal Resources-Master of Marine Resources Management  
Texas A&M University at Galveston, Department of Marine Sciences

TAMUG's department of Marine Sciences will offer a degree program that allows ocean and coastal resources (OCRB) majors to enter the graduate program for a Master of Marine Resources Management at the beginning of their fourth year at Texas A&M University at Galveston. This enables students to receive their OCRB undergraduate degree (B.S.) and a Master of Marine Resources Management (MARM) graduate degree in five years.

**Description**

Students admitted to the 5-year degree program will have completed 102 of the 120 hours of course work required to receive a bachelor's degree. These courses must include the specific prerequisites for a Bachelor of Science degree in Ocean and Coastal Resources, as well as the courses required by Texas A&M University at Galveston for an undergraduate degree.

### Modified Ocean and Coastal Resources Bachelor of Science first 3 years

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<td>&amp; mars 426</td>
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| Hours to be completed prior to admission to the graduate courses | 102 |
Admitted students will be enrolled in Marine Resources Management graduate courses with an undergraduate classification (U4) during the fall of their fourth year and will be re-classified as degree-seeking master's students (G7) upon completing 120 credit hours. This will normally occur at the beginning of the fall semester of year five.

Students will be required to complete the same 2-year, 36-hour curriculum as other students admitted to the MARM program. The curriculum combines 9 core courses (24 cr) in resources management, policy, and economics with 12 credit hours of electives. At least one elective must be a science elective and at least one must be additional law/policy/management.

Note: If students are interested in the MARM thesis option, then there is additional flexibility to replace required graduate courses with up to 6 hours of 691 (research) and electives chosen with the approval of their thesis advisor and committee. To comply with the course and work requirements of the thesis option, this program may extend beyond the 5 years window. For specific requirements to comply with the thesis option curriculum, students are asked to consult the MARM section of the TAMUG catalog.

**Administration/Application**
Ocean and coastal resources majors who have at least a 3.25 GPA and who will have taken all of their prerequisite courses and otherwise completed 103 hours by the fall of their fourth year will be eligible to apply for the 5-year program during their junior year. Applicants to the 5-year program will submit the same materials (including GRE scores) as other MARM applicants, and those whose records are judged to be competitive by the mid-January deadline will be admitted. Admission criteria will be the same as for other MARM students.

Students who choose not to finish the MARM degree after being admitted to the 5-year program may exit the program at any time. Completed MARM coursework will be applied to their bachelor's degree in ocean and coastal resources, as appropriate. Failure to complete the MARM program will in no way impede their ability to attain a bachelor's degree in ocean and coastal resources when the requirements for that degree are completed.

Those who pursue the joint program will receive both degrees upon completion of the entire 5-year program. Students will not graduate with a bachelor's degree in year four, but rather will earn both their Bachelor of Science and Master of Marine Resource Management at the end of year five.

### Fifth Year Curriculum

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<th>Senior Year / First year of Fifth year program</th>
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<th>Spring</th>
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<tr>
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<td>MARS 620 marine biological resources</td>
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<td>MARS 676 Environmental Policy</td>
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<td>MARS 675 Environmental Mgmt Strategies for Scientists</td>
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<td>MARS 625 GIS Based Modeling for Coastal Resources</td>
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<td>3</td>
<td>MARS 680 Integrative Analyzes in Marine Resources</td>
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<td>MARM elective</td>
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<td>MARS 652 Sustainable Management of Coastal Margins</td>
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<tr>
<td>Total Hours</td>
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| Total Hrs for Combined OCRE/MARM as 5th Year | 144                                      |                                      |

(102 before starting grad school + 6 after = 108 undergraduate hours)

Graduate credit hours total = 36

Sub MARM electives (6) for free electives (6) and apply (6) hours of CBE = 150

As indicated above, students will take 12 fewer undergraduate credit hours. Graduate courses taken in the fifth year program will be counted as credit towards their MARM degree. (Credit by Exam credit will be awarded upon completion of examination in MARS 604 & MARS 625 for Econ 323 and MARS 325 respectively. Course adjustments will be allowed for 6 hours of undergraduate elective credit to use (6) hours of MARM elective credits.)

### Advising

Advising for the 5-year program is a coordinated effort by the Department of Marine Sciences undergraduate and graduate advisors and the Office of Graduate Studies. Advising by the department will help ensure that interested students have satisfied the prerequisite course requirements for the bachelor’s degree by the start of their senior year.

Ocean and coastal resources students can speak to Dr. Melanie Lesko, assistant department head of Marine Sciences and graduate advisor, at leskomi@tamug.edu or 409-740-4517. The MARM graduate advisor is Dr. Frederick Schlemmer (schlemmef@tamug.edu or 409-740-4518).
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**Elective (Advisement)**
- Professional Elective
- Humanities Elective

**Technical Elective**
- MALS 431: Introduction to Geophysical Oceanography
- MALS 431: Environmental Ethics

**Directed Studies**
- MALS 485: Directed Studies

**Seminar**
- MALS 481: Seminar

**Laboratory**
- MALS 425: Coastal Wetland Dynamics Laboratory Credit 1
- MALS 325: Introduction to GIS (Credit 3)

**Professional Elective**
- MALS 340 Field Methods in Marine Sciences
- MALS 300 Technical Writing
- ENGL 303: Statistical Methods
Donna Lang

From: Piers Chapman <piers.chapman@tamu.edu>
Sent: Friday, May 18, 2012 4:38 PM
To: Donna Lang
Cc: Sarah Bednarz, Dan Thornton
Subject: Re: 3+2 OCRe-MARM Curriculum

Donna,
We had a discussion about this and don’t believe it conflicts with anything we are doing up here, so please go ahead. I apologize for taking so long to get back to you.

Piers

On May 18, 2012, at 2:59 PM, Donna Lang wrote:

> Piers,
> Can you give me a timeframe when I can forward these documents?
> Appreciate it.
> Donna
> *
> *
> *
> Dr. Donna Callenius Lang
> Vice President
> Academic Affairs
> Texas A&M University at Galveston
> 409.740.4419
> *
> -----Original Message-----
> From: Donna Lang
> Sent: Thursday, May 10, 2012 6:24 PM
> To: Piers Chapman
> Subject: Re: 3+2 OCRe-MARM Curriculum
> > Yes. We will wait until it is convenient for you.
> >
> > ----- Original Message ------
> > From: Piers Chapman <piers.chapman@tamu.edu>
> > To: Donna Lang
> > Sent: Thu May 10 17:29:40 2012
> > Subject: Re: 3+2 OCRe-MARM Curriculum
> > > Donna,
> > > When do you need our response? I've been out of town and it's graduation tomorrow morning.
> > >
> > > Piers
On May 10, 2012, at 8:19 AM, Donna Lang wrote:

>> Piers,
>> If you are agreeable, it would be wonderful if you could reply to this email so I can attach it to the UCC packet. If you are not, we would be happy to discuss further.
>> Thank you.
>> Donna
>>
>> Dr. Donna Callenius Lang
>> Vice President
>> Academic Affairs
>> Texas A&M University at Galveston
>> 409.740.4419
>>
>> From: Patrick Louchouarn [mailto:loup@tamug.edu]
>> Sent: Wednesday, May 09, 2012 5:04 PM
>> To: Piers Chapman; Donna Lang; Melanie Lesko
>> Cc: Dan Thornton
>> Subject: 3+2 OCRE-MARM Curriculum
>>
>> Piers (and Dan0,
>>
>> Please find attached the curriculum we are proposing for the 3+2 program that combines our OCRE undergraduate and MARM graduate programs.
>>
>> Let us know if you have any concerns or want to discuss this.
>>
>> Cheers
>>
>> Pat
>> 
>> Patrick Louchouarn, Ph.D.
>> Head, Dept. of Marine Sciences
>> Professor
>> Dept. of Marine Sciences and Dept. of Oceanography Texas A&M
>> University Galveston/Texas A&M University
>> 1001 Texas Clipper Rd
>> Bldg 3029, OCSB 280D
>> Galveston, TX 77554
>> Phone: (409) 740-4710
>> Fax: (409) 740-4787
>> email: loup@tamug.edu
>> Web: http://loer.tamug.edu/people/louchouarn/index.html
>>
>> Piers Chapman
>> Head, Department of Oceanography
>> Texas A&M University
>> 3146 TAMU
>> College Station, TX 77845-3146