Graduate Council Report
October 6, 2011

New Course Requests:

ANSC 621. Issues in the Equine Industry. (3-0). Credit 3. Integration of cumulative knowledge acquired in the equine science curriculum to demonstrate critical thinking and communication skills to address critical issues in the equine industry. Prerequisite(s): Approval of instructor or enrollment in Master of Equine Industry Management Program. Stacked with ANSC 423.

CHEM 640. Laboratory Methods in Biological Chemistry. (1-6) Credit 3. Chemical biology is an ever-expanding scientific field that involves the application of chemical techniques to the investigation and/or manipulation of biological systems. This laboratory will provide students with a hands-on opportunity to gain an understanding and appreciation for chemical biology techniques. Prerequisite(s): Graduate standing or approval of instructor.

CHEM 644. Natural Products Biosynthesis. (3-0). Credit 3. This course will present a survey of the chemical reactions occurring in living systems, describe the experimental methods used to study these reactions and examine the biosynthesis of the major families of natural products, with an emphasis on the mechanistic chemistry of the biosynthetic pathway. Prerequisite(s): Graduate standing or approval of instructor.

CVEN 765. Advanced Civil Engineering Systems. (3-0). Credit 3. Formulation of decision making problems at different hierarchical levels: strategic, planning and operational; includes application problems in project selection, networks, allocation, routing/scheduling, distribution, and multi-objective; introduction to exact and approximate solving techniques: optimization, heuristics, simulation, and decision analysis; solution interpretation and sensitivity analyses. Prerequisite(s): CVEN 322 or equivalent.

FINC 649. Financial Modeling. (3-0). Credit 3. Computer-based modeling of contemporary problems in investments and corporate finance including asset pricing, portfolio optimization, valuation, capital budgeting, cost of capital, risk assessment, and option pricing; using models to evaluate financial decision variables and alternative investment strategies. Prerequisite(s): Graduate classification; classification 6 students may not enroll in this course; FINC 421 or FINC 632; FINC 434 or FINC 629.

FINC 660. Fixed Income Analysis. (3-0). Credit 3. Characteristics of fixed income securities including Treasury issues, federal agency issues, corporate and municipal bonds, mortgage-backed and asset-backed securities; institutional features fixed income markets; risks of bond investing; fixed income valuation; term structure; trade strategies, modeling and assessing credit risks; hedging with fixed income derivatives. Prerequisite(s): Graduate classification, classification 6 students may not enroll in this course; FINC 421 or FINC 632; FINC 434 or FINC 629.

PETE 656. Advanced Numerical Methods for Reservoir Simulation. (3-0). Credit 3. Numerical simulation of flow in porous media based on numerical methods for partial differential equations; supplemented by published papers and research topics; development of a reservoir simulator. Prerequisite(s): Graduate classification; Basic Reservoir Simulation or equivalent class; Linear Algebra and Matrix Computations or equivalent class; Advanced Calculus or equivalent class; Programming experience.
SCSC 644. Forage Ecology and Management. (3-0). Credit 3. Investigation of multidisciplinary approaches toward the development of integrated forage, livestock, and wildlife production systems that are economically feasible and environmentally sustainable. Prerequisite(s): Approval of instructor and graduate classification. Stacked with 444.

VIBS 620. Cytogenetics. (3-0). Credit 3. Examination and analysis of variation in chromosome structure, behavior and number, developmental and evolutionary effects of this variation. Prerequisite(s): GENE 603. Cross-listed with GENE 620.

VLCS 622. Equine Disease & Epidemiology. (3-0). Credit 3. Principles and methods of epidemiology applied to equine health and prevention and control of selected equine infectious diseases. Prerequisite(s): Enrollment in Equine Certificate and Graduate Student Classification, or Approval of Instructor. Stacked with VLCS 422.
1. Request submitted by (Department or Program Name): Department of Animal Science

2. Course prefix, number and complete title of course: ANSC 621. Issues in the Equine Industry

3. Catalog course description (not to exceed 50 words): Integration of cumulative knowledge acquired in the equine science curriculum to demonstrate critical thinking and communication skills to address critical issues in the equine industry.

4. Prerequisite(s): Approval of instructor or enrollment in Master of Equine Industry Management program.

Cross-listed with: ANSC 423

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 programs(s) (e.g., B.A. in history)
      Master of Equine Industry Management
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)
      M.S. in equine science related degrees

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) ANSC 621 ISSUES EQUINE INDUSTRY
   Lec. Lab SCH CIP and Fund Code Admin. Unit Year, Year FICE Code
   0 3 0 0 0 3 0 1 0 3 0 7 0 0 0 5 0 2 7 0 1 2 - 1 3 0 0 3 6 3 2

Approval recommended by:

H. Russell Cross
Department Head or Program Chair (Type Name & Sign) Date

David Reed
Chair, College Review Committee Date

Mark Hussey
Dean of College Date

Chair, GC or UCC Date

Submitted to Coordinating Board by:

Associate Director, Curricular Services Date

Effective Date

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

3 of 44 B
Course title and number  ANSC 423/621 – Issues in the Equine Industry  
Term  Spring 2012  
Meeting times and location  TBD  
Credit Hours  3 (Lecture)  

Course Description and Prerequisites  
This course is designed to incorporate skills and information gained throughout the Equine Industry Leadership curriculum. Students will discuss current industry issues, and will participate in broad-ranging discussions led by industry leaders who will act as guest lecturers.  

Prerequisites: Junior or Senior classification; Approval of instructor OR Enrollment in the Master of Equine Industry Management program  

Learning Outcomes or Course Objectives  
Upon completion of this course, students will have demonstrated the ability to draw on skill sets and information from the whole of their undergraduate experience in order to think critically about a problem or topic, articulate well-formed opinions and arguments, and speak intelligently about the equine industry. Students will have demonstrated the ability to communicate in through oral and written exams and presentations.  

Instructor Information  
Name  Jim Heird, PhD (lead instructor); Eleanor Green, DVM (associate instructor)  
Telephone number  979-845-6098  
Email address  jimheird@tamu.edu  
Office hours  By appointment  
Office location  202B Centeq  

Textbook and/or Resource Material  
Class handouts.  

Grading Policies  
Additional Requirements for Graduate Level: Students will be required to complete an independent study project on a particular issue. Included in this will be interviews with supporters from both sides of the issue, a complete background evaluation and understanding of both sides of the issue, a professional paper and an oral report.  

For students enrolled in ANSC 423 exams will comprise 100% of the final grade. (Midterm Exam = 50%, Final Exam = 50%)  

For students enrolled in ANSC 621 the Midterm Exam, Final Exam and Project will comprise 35%, 35% and 30% of the final grade respectively.  

Grading Scale:  
Minus grades will not be used.  
A  = 90-100  
B  = 80-89  
C  = 70-79  
D  = 60-69  
F  = <60
Course Topics, Calendar of Activities, Major Exam Dates

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Exams</th>
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<tbody>
<tr>
<td>1</td>
<td>Overview: Graduating &amp; Entering the Industry</td>
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<tr>
<td>2</td>
<td>Overview: Issues Facing the Equine Industry</td>
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<td>3</td>
<td>Operating &amp; Managing Successful Equine Businesses</td>
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<td>4</td>
<td>Understanding &amp; Working With Legislatures &amp; Legislators</td>
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<td>5</td>
<td>Understanding &amp; Working With Industry Organizations &amp; Institutions</td>
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<td>6</td>
<td>Understanding &amp; Developing Investment Strategies</td>
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<td>7</td>
<td>Understanding Ethical Decision Making</td>
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<td>8</td>
<td>Critical Thought &amp; Professionalism in the Equine Industry</td>
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<td>9</td>
<td>Written &amp; Oral Communication in the 21st Century</td>
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<td>10</td>
<td><strong>Midterm Exam (Essay Format)</strong></td>
<td><strong>Midterm Exam – Essay Format</strong></td>
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<tr>
<td>11</td>
<td>Critical Industry Issues</td>
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<td>12</td>
<td>Critical Industry Issues</td>
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<td>13</td>
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<td>14</td>
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<td>15</td>
<td><strong>Final Exam (Essay Format)</strong></td>
<td><strong>Final Exam</strong></td>
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</tbody>
</table>

Other Pertinent Course Information

Some course information will be distributed through email or eLearning.

**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."
Attendance Policy and Grading Scale Examples

Attendance Policy:

Class attendance and participation is vital to success in this course. As such, attendance will be taken at lecture meetings. If planning to miss lecture sessions, students are encouraged to contact the instructor prior to the absence. Unexcused absence from more than two sessions will result in the lowering of the student's final course grade by one letter grade per session missed. Unexcused absence from 6 or more sessions will result in a grade of "F" for the course.

"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."
**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):  
   Zachry Department of Civil Engineering

2. Course prefix, number and complete title of course:  
   CVEN765 Advanced Civil Engineering Systems

3. Catalog course description (not to exceed 50 words):  
   Formulation of decision making problems at different hierarchical levels: strategic, planning and operational; includes application problems in project selection, networks, allocation, routing/scheduling, distribution, and multi-objective; introduction to exact and approximate solving techniques: optimization, heuristics, simulation, and decision analysis; solution interpretation and sensitivity analyses.

4. Prerequisite(s):  
   CVEN322 or equivalent

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

6. Is this a repeatable course?  
   Yes [x]  
   No  
   If yes, this course may be taken _______ times.  
   Will this course be repeated within the same semester?  
   Yes [x]  
   No

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

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

9. Prefix | Course # | Title (excluding punctuation)  
---|---|---  
CVEN765 | ADV CIVIL ENG SYSTEMS  
| Levt. | Lab | SCH | CIP | Fund Code | Admin Unit | Acad. Year | FTE Code |  
| 0 | 3 | 0 | 0 | 0 | 3 | 1 | 4 | 0 | 8 | 0 | 1 | 0 | 0 | 0 | 6 | 0 | 6 | 3 | 0 | 1 | 2 | 1 | 3 | 0 | 0 | 3 | 6 | 3 | 2  

Approval recommended by:  
Dr. John Niedzwiedzi  
Department Head or Program Chair (Type Name & Sign)  
Date

Dr. Robin Autenrieth  
Chair, College Review Committee  
Date

Dr. Robin Autenrieth  
Dean of College  
Date

Mark Zoran  
Chair, GC or UCC  
OCT 06

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

JUL 27 2011
R. AUTENRIETH
Course title and number  CVEN 765: Advanced Civil Engineering Systems
Term (e.g., Fall 200X)  Spring 2012
Meeting times and location  TR (time TBD)

Course Description and Prerequisites
Formulation of decision making problems at different hierarchical levels for Civil engineering Systems: strategic, planning and operational; includes application problems in project selection, networks, allocation, routing/scheduling, distribution, and multi-objective; introduction to exact and approximate solving techniques: optimization, heuristics, simulation, and decision analysis; solution interpretation and sensitivity analyses.
Prereq: CVEN322 or equivalent

Learning Outcomes or Course Objectives
Course Objectives: Provide students with an overview of CE Systems’ decision making tools and methodologies
Learning outcomes: Students will be able to identify, formulate and solve decision problems of CE Systems

Instructor Information
Name  Luca Quadrifoglio
Telephone number  979-458-4171
Email address  quadrifo@tamu.edu
Office hours  TBD
Office location  CE/TTI 3011

Textbook and/or Resource Material
Instructor’s notes

Grading Policies
Evaluation:  60% Exams
             40% Term Paper
Grading:    A = 90+; B = 80 to 89.9; C = 70 to 79.9; D = 60 to 69.9; F = below 60.

Course Topics, Calendar of Activities, Major Assignment Dates

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Required Reading</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>System thinking</td>
<td>Instructor’s notes</td>
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<tr>
<td>2</td>
<td>Problem Formulations</td>
<td>Instructor’s notes</td>
</tr>
<tr>
<td>3</td>
<td>Linear Programming review</td>
<td>Instructor’s notes</td>
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<tr>
<td>4</td>
<td>Multi-OF Problems – Pareto Optimality</td>
<td>Instructor’s notes</td>
</tr>
<tr>
<td>5-6</td>
<td>Network Problems</td>
<td>Instructor’s notes</td>
</tr>
<tr>
<td>7-8</td>
<td>IP/MIP Problems</td>
<td>Instructor’s notes</td>
</tr>
</tbody>
</table>
CPLEX
CE Systems Examples
Midterm Exam
Simulation
Decision trees' analyses
Term Paper Presentations
Final Exam (take home)

Other Pertinent Course Information

Homework: Assignments will be distributed bi-weekly and will be the basis for Exam questions.

Term Paper: A large portion of your grade for this course will be based on the preparation of a substantial individual research paper. You must devote a significant effort to this paper throughout the course, not just at the end! The objective is to train your individual and independent research capabilities. The topic must be up to you, but you must get instructor’s approval. The paper will be graded on research quality and contribution (25%), organization and format (25%), readability (25%) and your presentation (25%).

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.

Americans with Disabilities Act (ADA)
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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.

Form Instructions

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

2. Course prefix, number and complete title of course: FINC 649 Financial Modeling

3. Catalog course description (not to exceed 50 words): Computer-based modeling of contemporary problems in investments and corporate finance including asset pricing, portfolio optimization, valuation, capital budgeting, cost of capital, risk assessment, and option pricing; using models to evaluate financial decision variables and alternative investment strategies.

4. Prerequisite(s): Graduate classification; classification 6 students may not enroll in this course; FINC 421 or FINC 632; FINC 434 or FINC 629

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

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

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

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

     Any master's program in business

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)
   FINC 649 FINANCIAL MODELING

   Lect. Lab SCH CIP and Fund Code Admin. Unit Acad. Year FICE Code
   0 3 0 0 0 3 5 2 3 0 4 0 1 6 1 1 1 0 1 2 1 3 0 0 3 6 3 2

   Approval recommended by:
   R. T. Dye 9/9/11
   Chair, College Review Committee

   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

   Date Effective Date

   Dean of College
   Chair, GC or UCC

   OCT 06 2011

   12 of 44 B
Finance 649: Financial Modeling
Course Syllabus
Spring 2012

Professor: TBD
Office: TBD
Phone: TBD
Email: TBD
Office hours: TBD
Class meets: Twice per week, either TR or MW (exams cover two days) in Reliant Trading Center
Required Text: Excel Modeling in Investments, 3rd edition, by C. Holden
Excel Modeling in Corporate Finance, 3rd edition, by C. Holden

TAMU eLearning http://elearning.tamu.edu/

COURSE DESCRIPTION: Financial Modeling. (3-0). Credit 3. Computer-based modeling of various contemporary problems in investments and corporate finance; asset pricing, portfolio models and valuation; net present value and cost of capital; option pricing; building models to evaluate financial decision variables and alternative investment strategies. Emphasis on theoretical underpinnings necessary to build useful models.

PREREQUISITE: Graduate classification; classification 6 students may not enroll in this course; FINC 421 or FINC 632; FINC 434 or FINC 629. Students should have a strong grasp of concepts from introductory finance, accounting, statistics, and economics. The class is a combination of problem solving labs, discussions, and lectures. Theoretical concepts are emphasized in building applications, which are tested by collecting and analyzing "real world" data.

COURSE OBJECTIVES: Students who complete FINC 649 should be able to build computerized financial models useful for investment management and corporate financial decision making. Constructing theoretically sound models requires students to apply principles and practice of financial management, enhancing understanding of these concepts. This course provides students with comprehensive training in financial modeling primarily using, but not limited to, Excel. Class exercises will mix explanation with implementation, allowing a deeper and more heavily computational examination of financial principles.

COURSE EVALUATION PROCESS:
There will be two major exams and a comprehensive final. Students will also create and submit numerous spreadsheet models as homework assignments. The course grade will be computed as follows:

\[ \text{course grade} = \frac{0.4 \times \text{homework average}}{\text{exam average}} \]

The maximum homework average and exam average are both 100, so course grades will follow the usual 90/80/70/60 scale: 90-100 = A, 80-89 = B, 70-79 = C, 60-69 = D, 0-59 = F.

There will be no early finals or other examinations given for any reason.

If and only if you have a university-approved reason to miss one of the exams, you may take an essay make-up exam. You may review the list of excused absences on the TAMU web site at http://student-rules.tamu.edu/rules7.htm. Students must provide appropriate documentation to verify the absence. It is the student's responsibility to request permission to take the make-up exam and make the necessary arrangements with the instructor.
ACADEMIC HONESTY: Students are expected to follow the Aggie honor code: An Aggie does not lie, cheat or steal or tolerate those who do. Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning and to follow the philosophy and rules of the Honor System. Ignorance of the rules does not exclude any member of the Texas A&M University community from the requirements or the processes of the Honor System. For additional information please visit: www.tamu.edu/aggiehonor/.

ATTENDANCE POLICY: Strict attendance in this class is expected in accordance with University policy. Those who miss classes may penalize themselves by missing material that will be discussed in class, that may not appear in the texts, and over which the class will be tested.

If an absence is excused, the student will be allowed to make up work within 30 calendar days from the last day of the absence. To be excused the student must notify his or her instructor in writing (acknowledged e-mail message is acceptable) prior to the date of absence, and provide appropriate documentation for the absence. In cases where advance notification is not feasible (e.g. accident or emergency) the student must provide notification by the end of the second working day after the absence, including an explanation of why notice could not be sent prior to the class. The reasons absences are considered excused by the university are listed in Student Rule 7(http://student-rules.tamu.edu/rule7.htm). The fact that these are university-excused absences does not relieve the student of responsibility for prior notification and documentation. Failure to notify and/or document properly may result in an unexcused absence. Falsification of documentation is a violation of the Honor Code.

DISABILITY: If you are entitled to special accommodations because of a disability, please see me within the first two weeks of class. 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.

MAYS FOOD & BEVERAGE POLICY: We have beautiful, state-of-the-art classrooms in the Wehner Building. We want to maintain the high quality conditions of these classrooms for students in future years. Thus, it is necessary for you to adhere to the established policy of no beverages, food, or tobacco products or animals (unless approved) in WCBA classrooms. Thank you for observing this policy.
<table>
<thead>
<tr>
<th>Week</th>
<th>Subject</th>
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<tbody>
<tr>
<td>1</td>
<td>Building good models: documenting and debugging</td>
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<td></td>
<td>Excel’s financial functions</td>
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<tr>
<td>2</td>
<td>Bond pricing, duration, and convexity</td>
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<td>3</td>
<td>The yield curve</td>
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<tr>
<td>4</td>
<td>Unconstrained and constrained portfolio optimization</td>
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<td>5</td>
<td>Asset Pricing: CAPM and APT using the Fama-MacBeth method</td>
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<tr>
<td>6</td>
<td>CAPM and SML</td>
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<td>7</td>
<td>• <strong>EXAM 1: Class days 13 and 14</strong></td>
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<td>8</td>
<td>Data tables and VBA modules</td>
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<td>International diversification</td>
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<td>9</td>
<td>Black-Litterman portfolio optimization</td>
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<tr>
<td>10</td>
<td>Crystal Ball portfolio models and Value at Risk</td>
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<td>Term Structure</td>
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<tr>
<td>12</td>
<td>• <strong>EXAM 2: Class days 23 and 24</strong></td>
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<td>Millionaire Monte Carlo</td>
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<td>Binomial option pricing</td>
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<td>14</td>
<td>Option strategies</td>
</tr>
<tr>
<td>15</td>
<td>Final Exams: See official University Schedule</td>
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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.

Form Instructions

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

2. Course prefix, number and complete title of course: FINC 660 Fixed Income Analysis

3. Catalog course description (not to exceed 50 words): Characteristics of fixed income securities including Treasury issues, federal agency issues, corporate and municipal bonds, mortgage-backed and asset-backed securities; institutional features fixed income markets; risks of bond investing; fixed income valuation; term structure; trade strategies; modeling and assessing credit risks; hedging with fixed income derivatives.

4. Prerequisite(s): Graduate classification; classification 6 students may not enroll in this course; FINC 421 or FINC 632; FINC 434 or FINC 629

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

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

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

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

9. Prefix Course # Title (excluding punctuation) FINC 660 FIXED INCOME ANALYSIS

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

Approval recommended by:

R. T. Dye
Department Head or Program Chair (Type Name & Sign) Date 9/19/11
Chair, College Review Committee Date 9/12/11

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

Dean of College Date OCT 06 2011

Submitted to Coordinating Board by:

Chair, UMSS 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

17 of 44 B
FINC 660 Fixed Income Analysis
Spring 2012
Hwagyun (Hagen) Kim
hagenkim@tamu.edu

Class Meets: TBD
Class Website: http://elearning.tamu.edu and use Vista Logins, TAMU (NetID)
Office Hours: TBD Office: Wehner 360P
Phone: 979.862.3267 (voice), 979.845.3884 (fax), 979.845.3514 (FINC Department)

Course Description: Finance 660 Fixed Income Analysis examines the determinants of price and yield for fixed income securities including Treasury issues, federal agency issues, corporate bonds, municipal bonds, mortgage-backed and asset-backed securities. Topics include features of fixed income securities, risks of bond investing, fixed income valuation, term structure, trade strategies, fixed income derivatives and credit risk. Coverage of all topics will emphasize conceptual theoretical foundations. Students who complete this course will be able to

- value each type of security covered in class;
- develop models of term structure, duration, and convexity and use them to devise profitable trading strategies and to manage interest rate risk;
- value fixed income derivatives and use them to hedge risk;
- model and evaluate credit risk.

Prerequisites
Graduate classification; classification 6 students may not enroll in this course; FINC 421 or FINC 632; FINC 434 or FINC 629.

Required Material

You will need a financial calculator to solve the bond pricing problems in this course. Students will not be allowed to share a calculator during exams.

Suggested Material
For more explanations on the institutional details of bond markets, students are referred to


In addition, you are expected to read, on a daily basis, the Wall Street Journal or the financial section of a major newspaper.

Academic Integrity

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

The Aggie Honor Code affirms that honesty, truthfulness, trust, fairness, respect, moral conduct, and individual responsibility guide the conduct of the Texas A&M community. Commitment to these ideals...
produces in each of us integrity, which fosters the will to make difficult choices, to accept responsibility for and consequences of our actions, even at great personal cost.

It is the responsibility of both students and instructors to maintain academic integrity by refusing to participate in or tolerate academic misconduct. Committing any of the following acts constitutes academic dishonesty. This list is not exclusive of any other acts that may reasonably be said to constitute scholastic dishonesty.

Cheating: Intentionally using or attempting to use unauthorized materials, information, notes, study aids, or other devices or materials in any academic exercise.

Complicity: Intentionally or knowingly helping (or attempting to help) another to commit an act of academic dishonesty.

Plagiarism: Failing to give appropriate credit for or presenting as your own another person’s words, ideas, results, or processes.

Multiple Submission: Submitting substantial portions of the same work (including oral reports) for credit more than once without authorization from the second instructor.

Falsification: Changing or omitting data or results, or manipulating research materials, equipment, or processes such that the research is not accurately represented in the research record.

Fabrication: Recording or reporting made up data or results, or submitting fabricated documents.

I will proactively promote academic integrity and adhere to the Aggie Honor System Office’s policies pertaining to reporting and adjudication of violations of the Aggie Honor Code. For detailed definitions of academic misconduct and complete Honor Council Rules and Procedures, please visit http://www.tamu.edu/aggiehonor.

Classroom Care
We have beautiful, state-of-the-art classrooms in the Wehner Building. We want to maintain the high quality conditions of these classrooms for students in future years. Thus it is necessary for you to adhere to the established policy of no beverages, food, or tobacco products or animals (unless approved) in WCBA classrooms. Please do not leave trash in the room. If you bring newspapers, etc., to class, either carry them out again or put them in the trash containers. Thank you for observing this policy.

Attendance
You are expected to attend class regularly, in accordance with university policy. I will routinely check attendance. You will be held responsible for any assignments, material covered, amendments to the syllabus, or announcements made in class, whether you are present or not.

If you miss any graded exercise without a valid, documented university excuse, you will receive a grade of zero. According to university policy, there are exactly eight types of excused absences. These are listed in Texas A&M University Regulations and on the TAMU website at http://studentrules.tamu.edu/rule07

You can make up a graded exercise only if an absence is excused. To be considered excused, you must notify the instructor in writing (acknowledged e-mail message is acceptable) prior to the date of absence and provide appropriate documentation for the absence. In cases where advance notification is not
feasible (for example, accident or emergency) you must provide notification by the end of the second working day after the absence, including an explanation of why notice could not be sent prior to the class. The fact that these are university-excused absences does not relieve you of responsibility for prior notification and documentation. Failure to notify and/or document properly may result in an unexcused absence.

Falsification of documentation is a violation of the Honor Code.

It is noteworthy that job interviews are not considered excused absences. It’s never too soon to begin practicing managing your calendar in a professional manner. Arrange your job interviews and any necessary travel on dates other than those on which class meets.

**Grading**

A total of 350 points is possible for the semester. We will have three exams, worth 100 points each, plus several assignments to be handed out and graded, worth 50 points. When planning unexcused absences, remember that the following exam dates will not be changed.

Exam 1: TBD, approximately 10th class day (assuming class meets two days per week)
Exam 2: TBD, approximately 20th class day (assuming class meets two days per week)
Exam 3: TBD, university final exam schedule.

Your course grade will be determined as follows. Let SCORE represent the total number of points you collect during the semester.

\[
\begin{align*}
\text{SCORE} & \geq 315 \quad A \\
315 & > \text{SCORE} \geq 280 \quad B \\
280 & > \text{SCORE} \geq 245 \quad C \\
245 & > \text{SCORE} \geq 210 \quad D \\
210 & > \text{SCORE} \quad F
\end{align*}
\]

The Finance Department expects grades to accurately reflect the University’s published grading system: Excellent = A, Good = B, Satisfactory = C, Passing = D, and Failing = F. To implement this philosophy and to promote a culture of excellence among finance majors, the department has adopted a target overall GPA of 3.20-3.50 for FINC 660. The complete departmental grading guideline document has been disseminated to all finance majors.

Late submissions of assignments are subject to the following penalties:

<table>
<thead>
<tr>
<th>If the project is submitted...</th>
<th>Penalty Maximum</th>
<th>Possible Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>before deadline</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>1st 24 hours after deadline</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>2nd 24 hours after deadline</td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>3rd 24 hours after deadline</td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>4th 24 hours after deadline</td>
<td>80%</td>
<td>20%</td>
</tr>
<tr>
<td>5th 24 hours after deadline</td>
<td>100%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Even if you have a documented excused absence, please arrange to have your assignment delivered to me by its due date unless an emergency situation makes this impossible. Late assignments accompanied by a documented university excuse will not be subject to penalty.
When any graded work is returned to you, you have one week from the date it is returned to bring any grading errors to the instructor's attention. After the one-week deadline has passed, no further grade changes will be made for that particular item. The purpose of this deadline is not to discourage grade changes due to errors, but to assure that any necessary ones are promptly made.

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.

Course Agenda

<table>
<thead>
<tr>
<th>Module</th>
<th>Week</th>
<th>Topic</th>
<th>Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Bond Myths, Security Types, Arbitrage Principle, Prices vs. Yield to Maturity</td>
<td>1, 2</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Zeros (Strips), Spot Rates, Forward Rates</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Term Structure, Empirical Yield Curves, Yield Spreads</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Macaulay Duration, Modified Duration, Convexity</td>
<td>5, 6</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Barbell vs. Bullet, EXAM 1</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>Risk-neutral Probability, Interest Rate Trees</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Binomial Bond Pricing, Ho-Lee Model</td>
<td>10, 11</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>Vasicek Model, BDT Model</td>
<td>11, 12</td>
</tr>
<tr>
<td>4</td>
<td>9</td>
<td>Continuous Time Models</td>
<td>13, 14</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>CIR Model, EXAM 2</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
<td>Lab Sessions</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>Common Mortgages, Mortgage Backed Securities, PSA Model</td>
<td>21</td>
</tr>
<tr>
<td>7</td>
<td>13</td>
<td>Credit Ratings, KMV Model, Credit Derivatives (Credit Default Swaps)</td>
<td>Notes</td>
</tr>
<tr>
<td>8</td>
<td>14</td>
<td>Advanced Pricing Techniques for Fixed Income Derivatives</td>
<td>Notes</td>
</tr>
<tr>
<td>9</td>
<td>15</td>
<td>Final Exam</td>
<td></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.

Form Instructions

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

2. Course prefix, number and complete title of course: PETE 656 - Advanced Numerical Methods for Reservoir Simulation

3. Catalog course description (not to exceed 50 words): Numerical simulation of flow in porous media based on numerical methods for partial differential equations; supplemented by published papers and research topics; development of a reservoir simulator.

4. Prerequisite(s): Graduate classification; Basic Reservoir Simulation or equivalent class; Linear Algebra and Matrix Computations or equivalent class; Advanced Calculus or equivalent class; Programming experience.

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

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

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

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

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

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

M.S., M.E., Ph.D. in Petroleum Engineering or related Engineering.

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

9. Prefix | Course # | Title (excluding punctuation)
---|---|---
P| ET E 6 5 6 | ADV NUM METHOD RES SIM

<table>
<thead>
<tr>
<th>Lect.</th>
<th>Lab</th>
<th>SCH</th>
<th>CIP and Fund Code</th>
<th>Admin. Unit</th>
<th>Acad. Year</th>
<th>FICE Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 3</td>
<td>0 0</td>
<td>0 3</td>
<td>1 4 2 5 0 1 0 0 0</td>
<td>6 2 2 1 0 1 2 - 1 3 0 0 3 6 3 2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Approval recommended by:

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

Chair, College Review Committee Date

Dean of College Date

Mark Zoran, Chair, GC or UCC Date

Submitted to Coordinating Board by:

Associate Director, Curricular Services Date Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Curricular Services – 3/10
Course title and number
PETE 656: Advanced Numerical Methods for Reservoir Simulation
Term (e.g., Fall 200X)
Spring 2012
Meeting times and location
MWF, 1:50-2:40 p.m., RICH 208

Course Description and Prerequisites
This class covers the numerical simulation of multiphase flow in heterogeneous porous media with
emphasis on advanced techniques based on numerical methods for discretization of partial differential
equations combined with state-of-the-art linear and nonlinear solvers and well modeling; The students
are expected to develop a numerical reservoir simulator and benchmark against commercial-of-the-shelf
software;
Prerequisites: Basic Reservoir Simulation or equivalent class; Linear Algebra and Matrix Computations
or equivalent class; Advanced Calculus or equivalent class; Programming experience.
Graduate classification. Attendance will be limited to a maximum of 20 students.

Learning Outcomes or Course Objectives
The objectives of the course are for students to:
1. Develop an in-depth understanding of current approaches to building models of flow in porous
   media and their numerical simulation.

Instructor Information
Name
Dr. Eduardo Gildin
Telephone number
(979) 862-4578
Email address
eduardo.gildin@pe.tamu.edu
Office hours
TR @ 1:30pm (or by appointment – send e-mail)
Office location
401J Richardson Building

Textbook and/or Resource Material
The main source of material for the course will be a series of notes and slides handed out to the
students. Complementary textbooks are:
Understanding and Implementing the Finite Element Method by Mark S. Gockenbach, SIAM, 2006.
Theory and Practice of Finite Elements by Alexandre Ern and Jean-Luc Guermond, Springer, 2004
Finite Volume Methods for Hyperbolic Problems, Randall LeVeque, 2004

Grading Policies
Homework.................................................................................................................. (30%)
Mid-Term Exam........................................................................................................ (30%)
Final Project............................................................................................................. (40%)
Total..................................................................................................................(100%)
Grading Scale

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

Course Topics, Calendar of Activities

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to reservoir simulation and partial differential equations</td>
</tr>
<tr>
<td></td>
<td>o Research issues</td>
</tr>
<tr>
<td></td>
<td>o Understanding the overall iterative workflow</td>
</tr>
<tr>
<td></td>
<td>o Introduction to partial differential equations</td>
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<td></td>
<td>o PDE's solution methods</td>
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<tr>
<td>2-3</td>
<td>Porous Media Flow and Transport Equation</td>
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<tr>
<td></td>
<td>o Single-phase flow</td>
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<td></td>
<td>o Two-phase flow</td>
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<td></td>
<td>o Rock and Fluid Properties</td>
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<td></td>
<td>o Multiphase flow</td>
</tr>
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<td></td>
<td>o Black-oil model</td>
</tr>
<tr>
<td>4-9</td>
<td>Numerical Methods - Discretization</td>
</tr>
<tr>
<td></td>
<td>o Finite difference methods → Mid Term Project: Two-Phase Finite Differences</td>
</tr>
<tr>
<td></td>
<td>o Standard Finite Element Methods</td>
</tr>
<tr>
<td></td>
<td>o Control Volume Methods – TPFA and MPFA</td>
</tr>
<tr>
<td></td>
<td>o Mixed Finite Element Methods</td>
</tr>
<tr>
<td></td>
<td>o IMPES and AIM</td>
</tr>
<tr>
<td></td>
<td>o Convergence, Accuracy, and Stability</td>
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<tr>
<td>10-12</td>
<td>Solution to Linear and Nonlinear Systems</td>
</tr>
<tr>
<td></td>
<td>o Gaussian Elimination</td>
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<td>o CG</td>
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<td></td>
<td>o GMRES</td>
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<td></td>
<td>o Preconditioning</td>
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<td></td>
<td>o Multigrid Methods</td>
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<tr>
<td>13-14</td>
<td>Special Topics</td>
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<tr>
<td></td>
<td>o Linear Hyperbolic equations</td>
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<td></td>
<td>o Conservation laws - Finite Volume Methods</td>
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<td></td>
<td>o Upwind and Godunov's Methods</td>
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<td></td>
<td>o High resolution methods (TVD)</td>
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<td></td>
<td>o Convergence, Accuracy, and Stability</td>
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<td></td>
<td>o Model Reduction</td>
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<tr>
<td></td>
<td>o Gridding</td>
</tr>
<tr>
<td></td>
<td>o Other requests</td>
</tr>
<tr>
<td>15</td>
<td>Class Projects → Final Project: Two-Phase Finite Volume/Elements</td>
</tr>
<tr>
<td></td>
<td>o Simulator Results</td>
</tr>
</tbody>
</table>
Course Projects

Mid Term Project → usually assigned at the 7th-8th week
Representation of a single and two-phase (oil-water) partial differential equations;
Finite Differences discretization;
Well Modeling;
Direct Solvers (Gaussian Elimination)
Project Report: mathematical formulation and discretization; codes and results

Final Project → usually assigned at the 13th. week
Representation of a two-phase (oil-water or oil-gas) partial differential equations;
Finite Volumes/Elements discretization;
Well Modeling;
Iterative Solvers (GMRES, CG, BiCGSTAB)
Project Report: mathematical formulation; codes and results; comparison of iterative and direct solvers

Other Pertinent Course Information
Since general reservoir simulation concepts will be discussed with no emphasis on specific areas, all engineering majors are welcome to attend the class. Also, mathematics and applied mathematics students are well suited to attend this course, although there will be no specific emphasis on the numerical algorithms and theorems proofs. The prerequisites for the class are the following: Basic Reservoir Simulation or equivalent class; Linear Algebra and Matrix Computations or equivalent class; Advanced Calculus or equivalent class; Programming experience. Although Matlab will be emphasized in this class, any other language that the student is familiar with (Fortran, C, C++, etc) will be fine as well.

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): Soil and Crop Sciences

2. Course prefix, number and complete title of course: SCSC 644 Forage Ecology and Management

3. Catalog course description (not to exceed 50 words):
   Investigation of multidisciplinary approaches toward the development of integrated forage, livestock, and wildlife production systems that are economically feasible and environmentally sustainable.

4. Prerequisite(s): SCSC 444

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 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 agronomy

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. Approval recommended by:
   David D. Ballew         7/1/11
   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

   28 of 44 B
Course prefix and number: SCSC 444 / 644
Term: Fall
Meeting times and location: TBA
Course Credit: (3-0) Credit 3

Course Description and Prerequisites

This course investigates multidisciplinary approaches towards the development of integrated forage, livestock, and wildlife production systems that are economically feasible and environmentally sustainable.

Prerequisites: Approval of instructor and graduate classification

Learning Outcomes

Demonstrate comprehensive knowledge of crop resources, adaptation, management, and improvement.
- Describe the physiology, symptoms and management of water, temperature, light, and nutrient stress in plants.
- Name and relate changes in morphological structure, phenological stages, yield, and quality of crops to spatial variation of soil, temperature, photoperiod, and management conditions.
- Describe and explain the effects of soil chemical, physical, and microbiological properties on plant nutrient, water, and carbon cycling.
- Describe and explain selection of an appropriate crop species based on intended use, plant genetics and adaptation, as well as soil, climatic and resource constraints.

Demonstrate comprehensive knowledge of water movement in soils and plants and the resulting impacts on water yield and quality.
- Describe and explain interactions among soil, plants, water and the atmosphere.

Apply knowledge of science and technology for precision management of sustainable agricultural, natural, urban, and engineered ecosystems.
- Design and defend plans for plant management systems that incorporate best management practices and maximize value for relevant stakeholders based on the environment and availability of other resources.
- Develop and deliver multi-crop pest management programs that are environmentally sensitive and address resistance management.
- Synthesize knowledge on government policies, stakeholder’s interests, current events and new technology to derive sustainable actions.
- Evaluate and apply current and new technologies to improve a problematic situation including environmental and socio-economic constraints.

Apply knowledge of soil, plant, and water interactions to manage water resources and mitigate impacts on water yield and quality.
• Develop and defend a management plan for sustainable production that benefit the producer, soil, water, air, native species, and other aspects important to stakeholders.

Communicate effectively in speaking and writing.
• Deliver a convincing presentation and/or paper, with critical analysis and develop the ability to accept and positively respond to criticism.

Solve problems using scientific reasoning and critical thinking.
• Apply theoretical concepts to solve real-world problems.
• Think critically and make sound decisions with incomplete information.

Instructor Information

Name                Dr. Larry Redmon
Telephone number    979-845-4826
Email address       l-redmon@tamu.edu
Office hours        By appointment
Office location     Heep 349

Textbook and/or Resource Material

Forages: An introduction to grassland agriculture (v. 1; 5th Ed.) R.F. Barnes, D.A. Miller, and C.J. Nelson (eds.)

Grading Policies

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Undergraduates</th>
<th>%</th>
<th>Graduates</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams</td>
<td>3 major exams</td>
<td>70</td>
<td>3 major exams</td>
<td>50</td>
</tr>
<tr>
<td>Oral Presentation</td>
<td>1 presentation</td>
<td>10</td>
<td>2 presentations</td>
<td>10</td>
</tr>
<tr>
<td>Reaction Papers</td>
<td>2 written summaries of instructor-approved, peer-reviewed journal articles</td>
<td>20</td>
<td>4 written summaries of instructor-approved, peer-reviewed journal articles</td>
<td>20</td>
</tr>
<tr>
<td>Team Project</td>
<td>None</td>
<td></td>
<td>Problem case investigation and summarization</td>
<td>20</td>
</tr>
</tbody>
</table>

Oral presentations and reaction papers will be graded using a rubric that will be handed out in class.

Letter grades will be assigned as follows:
A = 90 % and above
B = 80 to 89 %
C = 70 to 79 %
D = 60 to 69 %
F = 59 % and below

No late work is accepted except in the case of a University Excused Absence. Missed exams, and laboratory assignments can only be made up in the case of a University Excused Absence.
Attendance Policy

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

No late work is accepted except in the case of a University Excused Absence. Missed exams, and laboratory assignments can only be made up in the case of a University Excused Absence.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tr>
<td>1</td>
<td>Introduction:</td>
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<td></td>
<td>- Forages defined</td>
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<td></td>
<td>- The importance of forages in society</td>
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<td>- Grassland agriculture and ecosystems</td>
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<td>o Rangelands versus introduced species</td>
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<td>Forages as a component of sustainable agriculture</td>
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<td>2</td>
<td>Important forages of the United States</td>
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<td></td>
<td>- Grasses</td>
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<td>o Warm and cool season grasses</td>
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<td>o Perennial versus annual species</td>
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<td>Characteristics of important forage grasses</td>
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<td>3</td>
<td>Important forages of the United States:</td>
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<tr>
<td></td>
<td>- Legumes</td>
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<td>o The utilization of legumes in forage-livestock systems</td>
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<td></td>
<td>Characteristics of important forage legumes</td>
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<td>Reaction paper 1 (undergraduate and graduate students)</td>
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<td>4</td>
<td>Important forages of the United States:</td>
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<tr>
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<td>- Biological di-nitrogen fixation</td>
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<td>o Legume inoculation</td>
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<td></td>
<td>o Plant growth promoting rhizobacteria</td>
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<td></td>
<td>Differences in nutritive value among various forage groups</td>
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<td>5</td>
<td>Exam 1</td>
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<td>6</td>
<td>Grass growth and development</td>
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<td>Forage establishment</td>
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<td></td>
<td>- Goals, timing, companion crops</td>
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<td></td>
<td>- Species selection</td>
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<td>Abiotic factor considerations (climate, soil texture, upland versus bottomland)</td>
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<td>Reaction paper 2 (graduate students only)</td>
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<td>7</td>
<td>Forage Establishment</td>
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<td></td>
<td>- Seedbed preparation</td>
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<td></td>
<td>Crop land versus existing forage base, soil test, fertility, equipment</td>
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<tr>
<td>8</td>
<td>Forage nutritive value</td>
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<tr>
<td></td>
<td>- What is forage nutritive value?</td>
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<td></td>
<td>- What factors effect forage nutritive value?</td>
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<tr>
<td></td>
<td>o Species, fertility, stage of maturity</td>
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<tr>
<td></td>
<td>- Methods of determining nutritive value</td>
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</table>
Exam 2
- Carbohydrate dynamics, storage organs, & reserves
- Endophytes
- Antiquity factors
- Forage toxicity issues
  - Nitrites, prussic acid, bloat, toxic plants

10 Reaction paper 3 (undergraduate and graduate students)
Forage Management
- Forage fertilization
  - Soils: NRCS soil survey, appropriate use, pH
  - The importance of soil fertility and the appropriate use of fertilizers
  - Nutrient cycling in forage systems: Nitrogen, Phosphorus, Potassium
- Hay
  - Production, storage, feeding

11 Forage Management:
- Silage
  - Definition, production, advantages/disadvantages relative to hay
- Weed management
- Use of prescribed fire
- Economics

12 Livestock production
- Ruminant nutrition versus monogastrics
- Beef, dairy, sheep, goats, horses, wildlife
- Stocking rate
- Reducing winter feeding costs

13 Reaction paper 4 (graduate students only)

13 Environmental constraints and stresses
- Soil
- Climate
- Water quality as impacted by livestock production
- Soil erosion, lack of water capture, nutrient loss, bacterial contamination of waterbodies

14 Exam 3
Synthesis
- Sustainable cropping systems
- Genetically-modified forages

15 Final Exam

**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://aggiehonor.tamu.edu

"An Aggie does not lie, cheat, or steal, or tolerate those who do."
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
Submit original form and attach a course syllabus.

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

2. Course prefix, number and complete title of course: VIBS 620 - Cytogenetics

3. Catalog course description (not to exceed 50 words):
Examination and analysis of variation in chromosome structure, behavior and number, developmental and evolutionary effects of this variation.

4. Prerequisite(s):
Cross-listed with: GENE 620
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)
PhD and MS in Genetics

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>VIBS 620</th>
<th>CYTOGENETICS</th>
</tr>
</thead>
</table>

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

Level 6

Approval recommended by:
Evelyn Tiffany-Castiglioni Department Head or Program Chair (Type Name & Sign) Date
Craig Coates Department Head or Program Chair (Type Name & Sign) 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
**VIBS 620 (Cytogenetics)**

Instruction provided by Dr. David Stelly & Dr. Torje Raudsepp. **REVISED 6/23/2011 3:46:00 PM**

**Course Description:** Examination and analysis of variation in chromosome structure, behavior and number; developmental and evolutionary effects of this variation.

**Prerequisite:** GENE 603

**VIBS 620 is a graduate-level introductory survey course on cytogenetics.** In this course, students will be introduced to salient topics in cytogenetics, primarily of plants and animals, but also other taxonomic groups. Coverage is both historical and contemporary. The “survey” nature of the course will be evident from an examination of the course syllabus. A detailed discussion of any one topic could easily occupy a whole semester, so while the main goal is to “hit the main points” and convey key phenomena, we hope to also sprinkle in enough detail to instill appreciation and intrigue.

**Relevance to all biological fields involving eukaryotic organisms:**
Eukaryotes rely on chromosomes, the primary means of biologically organizing and manipulating nuclear DNA -- in the cell, across cell generations, and across organismal generations. A knowledge of cytogenetic principles and variation is essential if a student aims to become an accomplished eukaryotic geneticist or biologist, whether for basic science or applied research.

Although much is known, we still strive to unravel the roles chromosomes play as dynamic “megamolecules” that vary in form, constitution. Their behavior and effects continue to command our attention in the rapidly evolving area of genomics. Not only do they undergo a well-choreographed biological ballet each cell generation, they exhibit many other peculiar and novel behaviors. Chromosomes are central to the maintenance, recombination and transmission of genetic material across sexual generations, while chromatin mediates and affects various epigenetic phenomena. Cytogenetic manipulations can provide powerful means of genomic analysis and genetic manipulation for basic and practical applications. Thus, genomes, chromosomes, chromosome behavior, dynamic molecular constitution and many other topics remain areas of intense contemporary research. By mastering the topics in the syllabus, students will gain unique insights into multiple sub-disciplines of genetics, including transmission; reproductive; population, comparative and evolutionary genetics. The course also provides a backdrop to certain aspects of quantitative genetics, breeding, structural genomics, functional genomics and bioinformatics.

**We are strongly committed to providing a balanced and maximally informative class.**
The balance is reflected by the expertise in our teaching team -- plant and animal cytogeneticists. Presentations and discussions balance classical concepts and present-day research. Textbook and web-accessible literature, including review articles are used. Students that master the material will acquire a sound understanding of the structure, organization and function of the chromosome, and an appreciation of the context of contemporary research. Their philosophical framework will thereby be strengthened.

**Involvement and participation is encouraged.**
Participation in classroom discussions is very important – from several regards. First, the engagement helps create a dialogue that is very conducive to teaching and learning – for all students, not just the individuals who as the questions. Questions are not only relatively entertaining, they are valuable “feedback”, and constitute a means to assess communication, understanding and assimilation of ideas and information. To develop a willingness to ask questions is also a highly beneficial habit to develop. Lastly, when semester grades are borderline, it is sometime feasible to use a student’s habit of making classroom contributions as a basis for nudging that student’s grade upwards.
## VIBS 620 (Cytogenetics)

Instruction provided by Dr. David Stelly & Dr. Terje Raudsepp. **REVISED 6/23/2011 3:46:00 PM**

Occasional evening or weekend meetings for review or examination – see syllabus.

<table>
<thead>
<tr>
<th>Week</th>
<th>Ch.</th>
<th>Theme(s)</th>
<th>Review</th>
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<tbody>
<tr>
<td>1</td>
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<td>No Class</td>
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<td></td>
<td>&amp;</td>
<td>Schedule, expectations, references, handouts, literature, grades, introductions, goals.</td>
<td>Syllabus – (Subject to amendment, depending on class progress, travel etc.)</td>
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<tr>
<td></td>
<td>S</td>
<td>History – events leading to Chr. Theory</td>
<td>Handouts (email and/or hardcopy)</td>
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<td></td>
<td>S</td>
<td>History – post-Chr. Theory developments</td>
<td>Handouts (email and/or hardcopy)</td>
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<tr>
<td>2</td>
<td>R</td>
<td>Mitosis, cell cycle, life cycles, Chr. replication</td>
<td>Review: Mitosis (NCB 3: E17, 2001)</td>
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<td></td>
<td>R</td>
<td>Chromosome chemistry &amp; packaging</td>
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<td>3</td>
<td>S</td>
<td>Telomeres and NORTs</td>
<td>Review: Junk DNA</td>
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<td>R</td>
<td>Centromeres</td>
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<td>4</td>
<td>R</td>
<td>Karyotypes and chr. analysis</td>
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<td>R</td>
<td>Karyotypes and chr. analysis</td>
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<td>Heterochromatin, chr. bands &amp; molecular correlates</td>
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<td>Variations of DNA content, numbers of chromosomes &amp; genomes (ploidy)</td>
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<td>Q&amp;A (I) – classroom</td>
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<td>R</td>
<td>Meiosis (pt. I) – classroom, class period</td>
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<td>S</td>
<td>Meiosis (pt. I)</td>
<td>Review: Meiosis</td>
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<td>Meiosis (pt. II)</td>
<td>Review: Meiosis</td>
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<td>S</td>
<td>Meiotic abnormalities</td>
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<td>Meiotic configuration analysis</td>
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<td>S</td>
<td>Sexual polyploidization, 2n gametes</td>
<td>Review: Polyploidy and polyploidization</td>
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<td>S</td>
<td>2n gametes: modes, mechanisms, ramifications</td>
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<td>7</td>
<td>S</td>
<td>Polyploidy</td>
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<td>S</td>
<td>Polyploidy. Aneuploidy</td>
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<td>S</td>
<td>Aneuploidy</td>
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<td>8</td>
<td>R</td>
<td>Molecular methods in cytogenetics</td>
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<td>S</td>
<td>Q&amp;A (II) – classroom</td>
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<td>***** EXAM II – classroom</td>
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<td>9</td>
<td>R</td>
<td>Sex determination systems</td>
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<td>10</td>
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<td>Sex determination in mammals and the Y chromosome</td>
<td>Review: FISH, cytometry, DNA content</td>
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<td>R</td>
<td>Mammalian X-chromosome dosage regulation</td>
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<td></td>
<td>R</td>
<td>Mammalian X-chromosome inactivation, epigenetics</td>
<td>Review: X and Y chromosome</td>
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<td>11</td>
<td>R</td>
<td>Sex chromosome imbalance</td>
<td><a href="http://www.texasgeneticsociety.org/">http://www.texasgeneticsociety.org/</a></td>
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<td>R</td>
<td>Sex chromosome imbalance</td>
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<td></td>
<td>R</td>
<td>Human autosomal conditions and phenomena</td>
<td>UPD, imprinting, instabilities (ch. 24), cancer (ch. 27), fragile sites</td>
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<td>12</td>
<td>S</td>
<td>Structural aberrations - inversions</td>
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<td>Structural aberrations – translocations pt-1</td>
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<td>S</td>
<td>Structural aberrations – translocations pt-2</td>
<td>Cell differentiation; DNA amplification (ch 22,25) Somatic cell hybridization (ch. 23, +)</td>
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<td>13</td>
<td>S</td>
<td>B-chromosomes</td>
<td>Jones et al., 2007 Annals Bot</td>
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<td>R</td>
<td>***** EXAM III</td>
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<td>S</td>
<td>Flow cytometry, flow sorting, laser scanning cytometry, micro-dissection, optical mapping</td>
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<td>Cell cycle modifications. Bizarre eukaryotic sexual systems</td>
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<td>14</td>
<td>S</td>
<td>READING DAY</td>
<td>READING DAY</td>
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<td></td>
<td>S</td>
<td>Plant asexual reproduction</td>
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<td>S</td>
<td>Animal asexual reproduction</td>
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<td>Cytogenetic manipulations at the organismal level</td>
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<td>Contempoary Animal Cytogenetics</td>
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<td>Q &amp; A SESSION (SITE/DAY/TIME TBA)</td>
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<td>FINAL EXAM – TBA</td>
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</table>
VIBS 620 (Cytogenetics)

Instruction provided by Dr. David Stelly & Dr. Terje Raudsepp. REVISED 6/23/2011 3:46:00 PM

TEXTBOOK: Human Chromosomes, Orlando J. Miller and Eeva Therman, ISBN: 038795046X. Springer-Verlag. Pp.: 501. This is a very inexpensive text, and while it is not comprehensive, it will suffice as a skeleton for teaching the main features of cytogenetics. The material will be complemented with reasonably large number of handouts and review articles.

GRADING:
Primarily based on exam grades as indicated.

Exam Grades (approximate value based on numbers of lectures covered, plus extra for the final, given that it will be comprehensive (about 50% will be on material not covered by previous exams, and 50% will be comprehensive across all of the course)

- Exam I = ~15%
- Exam II = ~20%
- Exam III = ~25%
- Final = ~40% (mate) (~5/8 on last material, ~3/8 = other sections or comprehensive)

FINAL GRADE: Exam grades, as noted above, where degree of class participation (asking questions; contributing information; strengthening the learning environment) will be considered as a positive factor in case of borderline grades. We will not demote anyone for not contributing, but we reserve the right to nudge up a borderline case, if deemed appropriate. We cannot over-emphasize that we strongly encourage your contributions to the class — it will be more fun and we all will learn more.

<table>
<thead>
<tr>
<th>Instructors</th>
<th>David Stelly</th>
<th>Bhanu Chowdhary</th>
<th>Terje Raudsepp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office tele.</td>
<td>979-845-2745</td>
<td>979-458-0519</td>
<td>862-2879</td>
</tr>
<tr>
<td>Office email</td>
<td><a href="mailto:stelly@tamu.edu">stelly@tamu.edu</a></td>
<td><a href="mailto:bchowdhary@cvm.tamu.edu">bchowdhary@cvm.tamu.edu</a></td>
<td><a href="mailto:traudsepp@cvm.tamu.edu">traudsepp@cvm.tamu.edu</a></td>
</tr>
<tr>
<td>Office site</td>
<td>Blg 965, Agronomy Rd. (see map above)</td>
<td>Room 306, Vet Res Bldg (VRB) see map above</td>
<td>Room 310, Vet Res Bldg (VRB) see map above</td>
</tr>
</tbody>
</table>

OFFICE VISITS: We encourage these, but please arrange by telephone or email.

ATTENDANCE: Attendance is highly recommended, but not mandatory. If you can, please arrange for a peer to pick up handouts for you. 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.

ELECTRONIC COMMUNICATION:
We will rely on emails for quickly disseminating information about the course. We will also make use of digitally available publications for review articles. Unpublished information will be distributed in hardcopy and/or at a class-accessible web site (to be named).
VIBS 620 (Cytogenetics)

Instruction provided by Dr. David Stelly & Dr. Torje Raudsepp. REVISED 6/23/2011 3:46:00 PM

OTHER INFORMATION:

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

It has been suggested by the administration that that we share this with students in the class:

- The handouts used in this course are copyrighted. By "handouts," I mean all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I expressly grant permission.
- As commonly defined, plagiarism consists of claiming the ideas, words, writings, etc, of another person as your own work. This means you are committing plagiarism if you copy work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated.
- If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty."
Attachment B

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

Form Instructions

1. Request submitted by (Department or Program Name): Department of Veterinary Large Animal Clinical Sciences

2. Course prefix, number and complete title of course: VLCS 622, Equine Disease & Epidemiology

3. Catalog course description (not to exceed 50 words): Principles and methods of epidemiology applied to equine health and prevention and control of selected equine infectious diseases.

4. Prerequisite(s): Enrollment in Equine Certificate and Graduate Student Classification, or Approval of Instructor

Cross-listed with: Stacked with: VLCS 422

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

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? ☑ 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)

   Graduate Programs in Equine Science related degrees

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>Lect</th>
<th>Lab</th>
<th>SCH</th>
<th>CIP and Fund Code</th>
<th>Admin. Unit</th>
<th>Acad. Year</th>
<th>FICE Code</th>
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</table>

Approval recommended by:

Allen Rousse
Department Head or Program Chair (Type Name & Sign) Date 8/24/11

Bhanu Chowdhary
Chair, College Review Committee Date

Bhanu Chowdhary
Dean of College Date Oct 06 2011

Chair, GC or UCC Date

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: VLCS 422/622 – Special Topics in Equine Disease/Epidemiology
Term: Spring 2012
Meeting times and location: LAH
Credit Hours: 3 (Lecture)

Course Description and Prerequisites

This course provides an introduction to the following: 1) epidemiological principles and methods as they apply to equine health; 2) principles of evidence-based animal science; and, 3) selected equine infectious diseases, including their control and prevention.

Prerequisites: Junior or Senior Classification, Approval of instructor

Learning Outcomes or Course Objectives

Upon completion of this course, students will have demonstrated a thorough understanding of the basic principles of equine epidemiology and selected equine infectious disease.

Instructor Information

Name: Noah Cohen, VMD, MPH, PhD
Telephone number: 979-845-0741
Email address: ncohen@cvm.tamu.edu
Office hours: By appointment
Office location: Large Animal Hospital

Textbook and/or Resource Material

Class handouts

Grading Policies

Additional Requirements for Graduate Level: Students will be required to complete an additional project on a topic and in a format approved by the instructor. Potential formats include paper, oral presentation, individual or group project.

For students enrolled in VLCS 422 exams will comprise 100% of the final grade. (Midterm Exam = 50%, Final Exam = 50%)

For students enrolled in VLCS 622 the Midterm Exam, Final Exam and Project will comprise 35%, 35% and 30% of the final grade respectively.
### Course Topics, Calendar of Activities, Major Assignment Dates

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>Introductions, Expectations, Motivations</td>
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<td>History of Epidemiology</td>
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<td>Epidemiology: What Is It? Why Does It</td>
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<td>matter? (Applications to Equine Science)</td>
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<td>2.</td>
<td>Measuring Disease: Incidence, Prevalence,</td>
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<td>Morbidity and Mortality</td>
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<td>Surveillance and Monitoring</td>
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<td>Epidemiological Measures of Association</td>
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<td>Introduction to Study Designs</td>
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<td>Case-Control Study Design</td>
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<td>Cohort Study Design</td>
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<td>Clinical Trial Study Design</td>
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<td>Case-only Designs</td>
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<td>Study Design Review</td>
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<td>Bias versus Random Error</td>
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<td>Bias – Information Bias</td>
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<td>Bias – Confounding Bias</td>
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<td>Bias – Misclassification</td>
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<td>Sensitivity and Specificity</td>
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<td>Predictive values and likelihood ratios</td>
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<td>Evidence-Based Medicine /Evidence-Based</td>
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<td>Equine Science</td>
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<td>8.</td>
<td>EXAMINATION</td>
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<td>9.</td>
<td>Principles and Practice of Biosecurity</td>
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<td>Farm-based Biosecurity</td>
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<td>Show/Fair Biosecurity</td>
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<td>10.</td>
<td>Investigating an Outbreak of Disease</td>
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<td>Biosecurity Case Study</td>
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11. *Streptococcus equi* subsp. *equi*

12. *Rhodococcus equi*

13. Equine Salmonellosis
   Equine Clostridial Diarrhea
   Equine Leptospirosis

14. Equine Herpesvirus 1
   Equine Protozoal Myeloencephalitis

15. FINAL EXAMINATION

**Other Pertinent Course Information**
Some course information may be distributed through email or eLearning.

**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."

**Attendance Policy and Grading Scale Examples**

**Attendance Policy:**
Attendance will not be taken at lecture meetings. However, attendance of lectures will drastically increase a student’s ability to perform well on course assignments and exams. If planning to miss lecture sessions, students are encouraged to contact the instructor prior to the absence.

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

**Grading Scale:**

*Minus grades will not be used.*

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