New Course Requests

A671 AGRO 663 Applied Spatial Statistics (2-2) Credit 3. An introduction to the theory and practice of spatial statistics as applied to the natural resources. Spatial analyses focusing primarily on ordinary kriging, point processes, and the lattice data. Prerequisite(s): Math 141, 142, STAT 651, or equivalents; FRSC 651 preferred.

A672 ELEN 640 Thin Film Science and Technology (3-0) Credit 3. The course focuses on the thin film technology in semiconductor industry. Topics include the basic growth mechanisms for thin films (growth models, lattice matching epitaxy and domain matching epitaxy), the instrumental aspects of different growth techniques and advanced topics related to various applications. Prerequisite(s): ELEN or consent of instructor.

A670 FRSC 663 Applied Spatial Statistics (2-2) Credit 3. An introduction to the theory and practice of spatial statistics as applied to the natural resources. Spatial analyses focusing primarily on ordinary kriging, point processes, and lattice data. Prerequisite(s): MATH 141, 142, STAT 651; or equivalents; FRSC 651 preferred.

A668 MKTG 670 Marketing Leadership (1-0) Credit 1. Seminar on the application of marketing concepts and theories through guest lectures and discussions with marketing through leaders in business and academia. Prerequisite(s): MKTG 621 or equivalent.

A669 MKTG 687 Seminar in Marketing Models (3-0) Credit 3. Review and discussion of the foundations of modeling and recent developments in research using marketing models. The seminar is designed to provide participants with new ways to think about modeling marketing phenomena and enable them to generate new ideas, research topics, and modeling applications for marketing problems. Prerequisite(s): Doctoral classification.

A673 PETE 636 Horizontal, Multilateral and Intelligent Wells (3-0) Credit 3. Advanced well architectures, primarily horizontal, multilateral and intelligent wells, all aspects of these types of wells, including well completions, reservoir flow, and wellbore flow conditions, and well deliverability; optimization of well design and field applications will be demonstrated with field cases. Prerequisite(s): PETE 662, graduate classification.
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  Soil & Crop Sciences

2. Course prefix, number and complete title  AGRO 663 Applied Spatial Statistics

3. Course description (not more than 50 words)  An introduction to the theory and practice of spatial statistics as applied to the natural resources. Spatial analyses focusing primarily on ordinary kriging, point processes, and lattice data.

4. Prerequisite(s)  Math 141, 142; Stat 651; or equivalents; FRSC 651 preferred  Cross-listed with FRSC 663

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?  once  Indicate the number of students enrolled for each academic period it was taught. 6 students

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) M.S. or Ph.D. in Soil Science, Agronomy, MEPS, Plant Breeding and Natural Sciences degree, GIS certificate

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)

| AGRO | 663 | Applied Spatial Statistics |

<table>
<thead>
<tr>
<th>Lect.</th>
<th>Lab</th>
<th>SCH</th>
<th>Subject Matter Content Code</th>
<th>Admin. Unit</th>
<th>Acad. Year</th>
<th>FICE Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>02</td>
<td>03</td>
<td>27.05.01.1</td>
<td>2</td>
<td>20</td>
<td>06 - 07</td>
</tr>
</tbody>
</table>

Do not complete shaded area.

Approval recommended by:

Head of Department  Date  Chair, College Review Committee  Date

Head of Department (if cross-listed course)  Date  Dean of College  Date

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-584
SYLLABUS

Instructors:  Dr. Marian Eriksson, Centeq 230 or HFSB 320, Phone: 845-6638
             m-eriksson@tamu.edu
             Dr. Cristine Morgan, Heep Center 545, Phone: 845-3603
             cmorgan@ag.tamu.edu

Office Hours: By appointment

Course Description: An introduction to the theory and practice of spatial statistics as applied to the
natural resources. Spatial analyses focusing primarily on kriging; point processes; lattice data.
Prerequisites: MATH 141, 142; STAT 302; FRSC 461, or the equivalent.

Objectives: The specific objectives of this course are to introduce the student to the field of spatial
statistics and to give the student an opportunity to analyze and interpret data sets associated with the
natural sciences. Spatial statistics and other spatial modeling techniques are being used at an increasing
rate in the natural resources fields and are often misunderstood. Practitioners often want to use the “push-
button” approach to analyzing spatial data and lack an understanding of the tools they are using. As such,
assumptions underlying the statistical tools may not be met and/or an intuitive and thorough
understanding of the results is lacking. The objective of this course is toward the application of spatial
statistics. But proper application of the tools and understanding of the results requires some basic
knowledge of the theory behind the tools. Students will not leave this course as experts in the field of
spatial statistics, but with a sufficient understanding of the tools and their use so that they are equipped to
build on their knowledge as their careers, academic and professional, demand.

Students should leave this course with:

(1) An appreciation of the difference between spatial smoothing and spatial interpolation and
    between stochastic and deterministic fitting of models to spatial data.

(2) An understanding of the foundations upon which simple and ordinary kriging models are built.

(3) An understanding of spatial correlation, spatial covariance, variograms, and the relationships
    between these quantities.

(4) An appreciation of how covariance/variogram models are fitted, the use of computer software to
    fit variogram models, and an awareness of some of the differences between spatial statistical
    computer programs.

(5) An appreciation of the effects of trend and how to deal with trend and an awareness of other
    kriging and spatial regression models.

(6) An awareness of characteristics of point processes, contagion, and of various tests for spatial
    randomness and distribution.

(7) An awareness of the characteristics lattice data that differentiate it from “geostatistical” data and
    the existence of spatial regression models based on BW configurations.

Course Conduct: The course will be divided into four distinct sections. In the first section, lasting about
four weeks, we will review matrix algebra, constrained and unconstrained minimization of polynomials,
simple linear regression and multiple linear regression as motivated by geographically weighted
regression. In the second section, about two weeks, we will focus on measures of spatial dependence and
will introduce analysis tools for lattice-type data; the third section, lasting about five weeks will introduce
the concepts of covariance/variogram modeling and spatial interpolation using kriging. In the final
section, we will consider tests for spatial distribution of regular, random, and clustered point processes.
Formally the course is comprised of two hours of lecture and two hours of lab each week. Weekly or biweekly homework will be assigned. All materials will be downloadable from the course website at http://tapc.tamu.edu. You will also use this website to upload digital solutions; written solutions may, of course, be given to the instructors. Your initial login password will be your first initial, dash, last name (all lower case) as in m-eriksson. YOU SHOULD CHANGE this password the first time you log in.

The importance of homework assignments cannot be overemphasized. Almost all of your learning will take place while working on the assigned problems and studying for exams. You are encouraged to work together if that is how you believe you best learn, but the work is expected to be your own. In the case of "hand" calculations, you must show all of your work in order to receive full credit.

Literature review: Toward the end of the semester each student will choose a peer-reviewed journal article that covers a topic addressed in class. We ask each student to read and write a summary synthesizing their chosen article. Each student will present their summary to the class.

Exams: There will be two exams. The format will be open-book and open-notes and may consist all or in part of a take-home component. You will be informed as to format at least one week prior to each exam. Strict time-limits will be placed on take-home components and the date-stamp of submission to the website will be monitored.

Grading:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Homework/Labs</td>
<td>70%</td>
</tr>
<tr>
<td>Exams</td>
<td>20%</td>
</tr>
<tr>
<td>Article Summaries</td>
<td>10%</td>
</tr>
</tbody>
</table>

No “special” extra credit will be made available. Bonus points may be specified for particular homework, quiz, or exam questions. If a discrepancy or disagreement should arise over the grading of any material in this course, the student should write an explanation of the problem and why he or she believes some adjustment should be made, attach the explanation to the material in question, and present the material to the instructor within one week of when the material was returned to the student. The instructor will evaluate all written requests of grading reviews, make any necessary adjustments, and return the material as quickly as possible.


Aggie code of honor: “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. Students 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 TAMU community from the requirements or the processes of the Honor System. For additional information please visit: www.tamu.edu/aggiehonor/

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 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.
## Tentative Schedule

<table>
<thead>
<tr>
<th>Wk</th>
<th>Lect #</th>
<th>Date</th>
<th>Topic</th>
<th>Lab/Homework Exercise*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Jan. 17</td>
<td>Housekeeping; Review Matrices</td>
<td>R and Octave basics; Matrices</td>
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<td></td>
<td>2</td>
<td>Jan. 19</td>
<td>Matrix algebra; Review calculus;</td>
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<td></td>
<td>Constrained and unconstrained minimization</td>
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<tr>
<td>2</td>
<td>3</td>
<td>Jan. 24</td>
<td>Review simple linear regression;</td>
<td>Regression in R and Octave</td>
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<td></td>
<td>4</td>
<td>Jan. 26</td>
<td>Correlation</td>
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<tr>
<td>3</td>
<td>5</td>
<td>Jan. 31</td>
<td>Multiple linear regression; Models</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Feb. 02</td>
<td>Generalized least squares</td>
<td>OLS; GLS; ANOVA</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Geographically weighted regression</td>
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<tr>
<td>4</td>
<td>7</td>
<td>Feb. 07</td>
<td>Continue GLS; GWS; Assumptions</td>
<td>GLS; GWR; Neighborhood Structures</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Feb. 09</td>
<td>Lattice: Neighborhood Structures</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>9</td>
<td>Feb. 14</td>
<td>FIRST EXAM</td>
<td>Analyzing data using Geary’s C</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Feb. 16</td>
<td>Moran’s I, Geary’s C</td>
<td>and Moran’s I</td>
</tr>
<tr>
<td>6</td>
<td>11</td>
<td>Feb. 21</td>
<td>SAR CAR</td>
<td>Using CAR and SAR Models</td>
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<tr>
<td></td>
<td>12</td>
<td>Feb. 23</td>
<td>SAR CAR</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>13</td>
<td>Feb. 28</td>
<td>Kriging as an interpolator; MSPE;</td>
<td>Intro kriging in R and Octave;</td>
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<tr>
<td></td>
<td>14</td>
<td>Mar. 02</td>
<td>Kriging equations;</td>
<td>Visualizing surfaces</td>
</tr>
<tr>
<td>8</td>
<td>15</td>
<td>Mar. 07</td>
<td>Minimization of the Lagrangian</td>
<td></td>
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<tr>
<td></td>
<td>16</td>
<td>Mar. 09</td>
<td>Equivalence of covariance and</td>
<td>Variogram models; Generating</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>variogram versions; Simple kriging</td>
<td>covariance (variogram) matrices; Turn in</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>discussion of</td>
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<td></td>
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<td></td>
<td><em>lattice-data paper</em></td>
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<tr>
<td>9</td>
<td>17</td>
<td>Mar. 21</td>
<td>Spring Break</td>
<td></td>
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<td></td>
<td>18</td>
<td>Mar. 23</td>
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<tr>
<td>10</td>
<td>19</td>
<td>Mar. 28</td>
<td>Mike Sherman: Assuming isotropy</td>
<td>Variogram modelling; Fitting options</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>Mar. 30</td>
<td>Exploratory data analysis; Removal of</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>trend; Universal kriging</td>
<td></td>
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<tr>
<td>11</td>
<td>21</td>
<td>Apr. 04</td>
<td>Other interpolators; Other kriging models</td>
<td>Transformsations and anisotropy</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>Apr. 06</td>
<td>(indicator, disjunctive, etc)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>23</td>
<td>Apr. 11</td>
<td>Introduce point processes</td>
<td>Presentation and discussion of</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>Apr. 13</td>
<td>SECOND EXAM</td>
<td>geostatistics application papers</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td>SSP: Random, Regular, cluster, quadrants</td>
<td>Testing Quadrant Data</td>
</tr>
<tr>
<td>14</td>
<td>Apr. 18</td>
<td>Apr. 20</td>
<td>SSP: quadrant, Lhat</td>
<td>Analyzing Point Processes,</td>
</tr>
<tr>
<td></td>
<td>Apr. 25</td>
<td>Apr. 27</td>
<td>Ghat, F and K tests</td>
<td>L,G, K, H tests</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mike Sherman: applied problems with SSP</td>
<td>Presentation and discussion of</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Catch up; Review</td>
<td>point process papers</td>
</tr>
</tbody>
</table>

* One lab per week, lab lasts 2 hours
Cristine

Thank you for your email. I am happy to endorse your course

AGRO/FRSC 653 Applied Spatial Statistics.

Please let me know if you require anything else.

Regards

Simon

Simon Sheather
Professor and Department Head
Department of Statistics
Texas A&M University
3143 TAMU
College Station, TX 77843-3143
E-Mail: sheather@stat.tamu.edu
Telephone: 1 979 845 3141
Fax: 1 979 845 3144

Assistant: Jennifer S. Reyes
Telephone: 1 979 845 3191
E-mail: jennifer@stat.tamu.edu

Dear Simon,
Marian and I are applying for a number for the applied spatial stats class we taught this past spring. The class went very well and Mike Sherman gave an excellent guest lecture for the course.

We want to give it a AGRO/FRSC 653 number and call the class Applied Spatial Statistics. If you prefer a different name for the class, we can change it. I would like to have your approval of this request to make this a numbered class.

I have attached the syllabus for your information. Would you please send me an email acknowledging your support for our class? I will then forward the email to Lynette Hovel to accompany our request for a number.

Sincerely,
Cristine

=================================================
Cristine Morgan, Ph.D.
Assistant Professor, Dept. of Soil & Crop Sciences
Texas A&M University
Phone: 979.845.3603
E-mail: cmorgan@ag.tamu.edu
Texas A&M University

Departmental Request for a New Course

Submit original form and 25 copies. Attach a course syllabus to each.*

1. This course is submitted by the Department of Electrical Engineering.

2. Course prefix, number and complete title of course: ELEN 640 Thin Film Science and Technology

3. Course description (not more than 50 words):
   The course focuses on the thin film technology in semiconductor industry. Topics include the basic growth mechanisms for thin films (growth models, lattice matching epitaxy and domain matching epitaxy), the instrumental aspects of different growth techniques and advanced topics related to various applications.

4. Prerequisite(s) ELEN or consent of instructor Cross-listed with
   Cross-listed courses require the signature of both department heads.

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

6. Is this a repeatable course? □ Yes X No If yes, this course may be taken X times.
   Will the course be repeated within the same semester/term? □ Yes X No

7. Has the course been taught as a 489/689? X Yes □ No If yes, how many times? 1
   Indicate the number of students enrolled for each academic period it was taught 12

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)
      M.S., MENG, Ph.D. in electrical engineering

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)
    E L E N Thin Film Science and Technology

    Lect. Lab SCH Subject Matter Content Code Admin. Unit Academic Year FICE Code
    0 3 0 0 0 3 1 4 1 0 0 1 0 0 0 6 0 9 4 0 0 7 - 0 8 0 1 0 3 6 6
    Do not complete shaded area.

Approval recommended by:

Head of Department Date

Chair, College Review Committee Date

Dean of College Date

Submitted to Coordinating Board by:

Director of Academic Support Services Date

Effective Date

*Attach a syllabus according to the guidelines on the web site www.tamu.edu/courseforms. To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737
Syllabus - ELEN XXX
Thin Film Science and Technology

Instructor: Dr. Haiyan Wang
Course is to be offered in every Spring semester

Prerequisite
In general, you need to be a graduate student to register this class.

Frequency: The course will be offered twice a week with 75 min long lecture in each class.

Course topics:
This graduate course focuses on thin film science and technology widely applicable in electronic and semiconductor industry. Topics include, but are not limited to, crystal structures and defects in thin films, the basic nucleation and growth mechanisms of thin films (growth models, lattice matching epitaxy and domain matching epitaxy), thin film processing techniques (CVD, MOCVD, MBE, PLD, Laser-MBE etc.), thin film growth instrumentation aspect (energy source, chamber configurations, vacuum systems and growth controllers), and several advanced topics related to defect and dislocation control during the growth of thin films for electrical and optical devices. The following table provides a tentative guideline for course subjects.

<table>
<thead>
<tr>
<th>Sequence</th>
<th>Topic</th>
<th>No. of lectures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overview of thin film technology in semiconductor industry</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Crystal structures of thin films Defects in thin films (vacancies and interstitials, dislocations, grain boundaries etc.) Nanocrystalline, polycrystalline and epitaxial thin films</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Interface and surface of thin films</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Thin film nucleation and growth models (2D, 3D, and 2D-3D combination)</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Epitaxy Homoepitaxy and heteroepitaxy; Lattice matching epitaxy and domain matching epitaxy; Superlattice structures and quantum wells</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>Diffusions: inter-diffusion, grain boundary diffusions, reaction, and phase transformation,</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Thin film growth techniques (Physical Vapor Deposition-</td>
<td>6</td>
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<tr>
<td>8</td>
<td>Thin film growth techniques (Chemical Vapor Deposition-CVD, PECVD, MOCVD)</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>Solution based deposition techniques-Sol-Gel, PAD.</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>Liquid phase epitaxy-LPE and other deposition techniques</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>Defect generation and control in thin films for electrical and optical devices-doping and dislocations.</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>General overview of thin film characterization techniques (structural, chemical, and electrical characterizations)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Course textbooks**

I will use multiple books as references for this course. A partial list of references is listed below. Handouts and journal papers will also be distributed to serve as course references.


**Student Requirements**

- Take responsibility for individual learning
- Take responsibility for other individual’s learning through participation in team activities

**Grading Policy**

Midterm exam (25%)
Homework and quizzes (20%)
Team project on design of thin film deposition system or term paper (20%)
Final exam (35%)

**Absences**

I handle absences as required by the student rules.

**Supplemental Reading Materials**

1. For students who have very limited materials science background, I recommend the following textbook as a starting point: Materials Science and Engineering: An Introduction 6th Edition. William D. Callister, Jr. 2003, John Wiley & Sons, Inc.
6. Handouts and reference distributed during class.

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

**Aggie Honor Code:** *"An Aggie does not lie, cheat, or steal, or tolerate those who do."*

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 (*Student Rule 20. Scholastic Dishonesty*, [http://student-rules.tamu.edu](http://student-rules.tamu.edu)). New procedures and policies have been adopted effective September 1, 2004. Details are available through the Office of the Aggie Honor System ([http://www.tamu.edu/aggiehonor/](http://www.tamu.edu/aggiehonor/)). An excerpt from the Philosophy & Rationale section states: "Apathy or acquiescence in the presence of academic dishonesty is not a neutral act -- failure to confront and deter it will reinforce, perpetuate, and enlarge the scope of such misconduct. Academic dishonesty is the most corrosive force in the academic life of a university."
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: Forest Science

2. Course prefix, number and complete title: FRSC 663 Applied Spatial Statistics

3. Course description (not more than 50 words): An introduction to the theory and practice of spatial statistics as applied to the natural resources. Spatial analyses focusing primarily on ordinary kriging, point processes, and lattice data.

4. Prerequisite(s): Math 141, 142; Stat 651; or equivalents. FRSC 651 preferred

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? ________ Indicate the number of students enrolled for each academic period it was taught. 6 students

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)
   M.S. or Ph.D. in Forest Science, Range and ecology or any of the Agricultural or Natural Sciences, GIS certificate

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)
    --- | --- | ---
    FRSC 663 | Applied Spatial Statistics |

    Lect. | Lab | SCH | Subject Matter Content Code | Admin. Unit | Acad. Year | FICE Code
    --- | --- | --- | --- | --- | --- | ---
    0 | 2 | 0 | 2 | 0 | 3 | 0 | 2 | 7 | 0 | 5 | 0 | 1 | 1 | 0 | 2 | 1 | 1 | 8 | 0 | 0 | 6 | 0 | 7 | 0 | 0 | 3 | 6 | 3 | 2

    Do not complete shaded area.

Approval recommended by:

Carol Kopecha 8/4/06
Chair, College Review Committee 8/11/06
Dean of College 8/21/06

Head of Department (if cross-listed course) Date

Submitted to Coordinating Board by:

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-504
SYLLABUS

Instructors: Dr. Marian Eriksson, Centeq 230 or HFSB 320, Phone: 845-6638
m-eriksson@tamu.edu

Dr. Cristine Morgan, Heep Center 545, Phone: 845-3603
cmorgan@ag.tamu.edu

Office Hours: By appointment

Course Description: An introduction to the theory and practice of spatial statistics as applied to the natural resources. Spatial analyses focusing primarily on kriging; point processes; lattice data. Prerequisites: MATH 141, 142; STAT 302; FRSC 461, or the equivalent.

Objectives: The specific objectives of this course are to introduce the student to the field of spatial statistics and to give the student an opportunity to analyze and interpret data sets associated with the natural sciences. Spatial statistics and other spatial modeling techniques are being used at an increasing rate in the natural resources fields and are often misunderstood. Practitioners often want to use the “push-button” approach to analyzing spatial data and lack an understanding of the tools they are using. As such, assumptions underlying the statistical tools may not be met and/or an intuitive and thorough understanding of the results is lacking. The objective of this course is toward the application of spatial statistics. But proper application of the tools and understanding of the results requires some basic knowledge of the theory behind the tools. Students will not leave this course as experts in the field of spatial statistics, but with a sufficient understanding of the tools and their use so that they are equipped to build on their knowledge as their careers, academic and professional, demand.

Students should leave this course with:

1. An appreciation of the difference between spatial smoothing and spatial interpolation and between stochastic and deterministic fitting of models to spatial data.
2. An understanding of the foundations upon which simple and ordinary kriging models are built.
3. An understanding of spatial correlation, spatial covariance, variograms, and the relationships between these quantities.
4. An appreciation of how covariance/variogram models are fitted, the use of computer software to fit variogram models, and an awareness of some of the differences between spatial statistical computer programs.
5. An appreciation of the effects of trend and how to deal with trend and an awareness of other kriging and spatial regression models.
6. An awareness of characteristics of point processes, contagion, and of various tests for spatial randomness and distribution.
7. An awareness of the characteristics lattice data that differentiate it from “geostatistical” data and the existence of spatial regression models based on BW configurations.

Course Conduct: The course will be divided into four distinct sections. In the first section, lasting about four weeks, we will review matrix algebra, constrained and unconstrained minimization of polynomials, simple linear regression and multiple linear regression as motivated by geographically weighted regression. In the second section, about two weeks, we will focus on measures of spatial dependence and will introduce analysis tools for lattice-type data; the third section, lasting about five weeks will introduce the concepts of covariance/variogram modeling and spatial interpolation using kriging. In the final section, we will consider tests for spatial distribution of regular, random, and clustered point processes.
Formally the course is comprised of two hours of lecture and two hours of lab each week. Weekly or biweekly homework will be assigned. All materials will be downloadable from the course website at http://tapc.tamu.edu. You will also use this website to upload digital solutions; written solutions may, of course, be given to the instructors. Your initial login password will be your first initial, dash, last name (all lower case) as in m-eriksson. YOU SHOULD CHANGE this password the first time you log in.

The importance of homework assignments cannot be overemphasized. Almost all of your learning will take place while working on the assigned problems and studying for exams. You are encouraged to work together if that is how you believe you best learn, but the work is expected to be your own. In the case of “hand” calculations, you must show all of your work in order to receive full credit.

**Literature review:** Toward the end of the semester each student will choose a peer-reviewed journal article that covers a topic addressed in class. We ask each student to read and write a summary synthesizing their chosen article. Each student will present their summary to the class.

**Exams:** There will be two exams. The format will be open-book and open-notes and may consist all or in part of a take-home component. You will be informed as to format at least one week prior to each exam. Strict time-limits will be placed on take-home components and the date-stamp of submission to the website will be monitored.

**Grading:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Regular Homework/Labs</td>
<td>70 %</td>
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<tr>
<td>Exams</td>
<td>20 %</td>
</tr>
<tr>
<td>Article Summaries</td>
<td>10 %</td>
</tr>
</tbody>
</table>

No “special” extra credit will be made available. Bonus points may be specified for particular homework, quiz, or exam questions. If a discrepancy or disagreement should arise over the grading of any material in this course, the student should write an explanation of the problem and why he or she believes some adjustment should be made, attach the explanation to the material in question, and present the material to the instructor within one week of when the material was returned to the student. The instructor will evaluate all written requests of grading reviews, make any necessary adjustments, and return the material as quickly as possible.


**Aggie code of honor:** “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. Students 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 TAMU community from the requirements or the processes of the Honor System. For additional information please visit: www.tamu.edu/aggiehonor/

**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 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.
<table>
<thead>
<tr>
<th>Wk</th>
<th>Lect #</th>
<th>Date</th>
<th>Topic</th>
<th>Lab/Homework Exercise*</th>
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<tr>
<td>1</td>
<td>1</td>
<td>Jan. 17</td>
<td>Housekeeping; Review Matrices</td>
<td>R and Octave basics; Matrices</td>
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<tr>
<td></td>
<td>2</td>
<td>Jan. 19</td>
<td>Matrix algebra; Review calculus; Constrained and unconstrained</td>
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<td>minimization</td>
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<td>2</td>
<td>3</td>
<td>Jan. 24</td>
<td>Review simple linear regression; Correlation</td>
<td>Regression in R and Octave</td>
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<td></td>
<td>4</td>
<td>Jan. 26</td>
<td>Multiple linear regression; Models</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>Jan. 31</td>
<td>Generalized least squares</td>
<td>OLS; GLS; ANOVA</td>
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<tr>
<td></td>
<td>6</td>
<td>Feb. 02</td>
<td>Geographically weighted regression</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>Feb. 07</td>
<td>Continue GLS; GWS; Assumptions</td>
<td>GLS; GWR; Neighborhood Structures</td>
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<tr>
<td></td>
<td>8</td>
<td>Feb. 09</td>
<td>Lattice: Neighborhood Structures</td>
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</tr>
<tr>
<td>5</td>
<td>9</td>
<td>Feb. 14</td>
<td><strong>FIRST EXAM</strong></td>
<td>Analyzing data using Geary’s C and</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Feb. 16</td>
<td>Moran’s I, Geary’s C</td>
<td>Moran’s I</td>
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<tr>
<td>6</td>
<td>11</td>
<td>Feb. 21</td>
<td>SAR CAR</td>
<td>Using CAR and SAR Models</td>
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<tr>
<td></td>
<td>12</td>
<td>Feb. 23</td>
<td>SAR CAR</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>13</td>
<td>Feb. 28</td>
<td>Kriging as an interpolator; MSPE; Kriging equations;</td>
<td>Intro kriging in R and Octave; Visualizing</td>
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<td>14</td>
<td>Mar. 02</td>
<td>Minimization of the Lagrangian</td>
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<tr>
<td>8</td>
<td>15</td>
<td>Mar. 07</td>
<td>Equivalence of covariance and variogram versions; Simple kriging</td>
<td>Variogram models; Generating covariance</td>
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<td>16</td>
<td>Mar. 09</td>
<td>Variogram models</td>
<td>(variogram) matrices; Turn in discussion</td>
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<td>Spring Break</td>
<td>of lattice-data paper</td>
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<td>Varioigram modelling; Assumptions and Implications; Local vs global;</td>
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<td></td>
<td>17</td>
<td>Mar. 21</td>
<td>Window specifications</td>
<td>Variogram modelling; Fitting options</td>
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<td>18</td>
<td>Mar. 23</td>
<td>Anisotropy; “Conversion to isotropic”; Nuggets; Stationarity</td>
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<tr>
<td>9</td>
<td>19</td>
<td>Mar. 28</td>
<td>Mike Sherman: Assuming Isotropy</td>
<td>Transformations and anisotropy</td>
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<tr>
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<td>20</td>
<td>Mar. 30</td>
<td>Exploratory data analysis; Removal of trend; Universal kriging</td>
<td></td>
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<tr>
<td>10</td>
<td>21</td>
<td>Apr. 04</td>
<td>Other interpolators; Other kriging models (indicator, disjunctive,</td>
<td>Presentation and discussion of</td>
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<tr>
<td></td>
<td>22</td>
<td>Apr. 06</td>
<td>Other kriging models (indicator, disjunctive, etc)</td>
<td>geostatistics application papers</td>
</tr>
<tr>
<td>11</td>
<td>23</td>
<td>Apr. 11</td>
<td><strong>SECOND EXAM</strong></td>
<td>Testing Quadrant Data</td>
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<tr>
<td></td>
<td>24</td>
<td>Apr. 13</td>
<td>SSP: Random, Regular, cluster, quadrants</td>
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<tr>
<td>12</td>
<td>25</td>
<td>Apr. 18</td>
<td>SSP: quadrant, Lhat</td>
<td>Analyzing Point Processes, L,G, K, H tests</td>
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<tr>
<td></td>
<td>26</td>
<td>Apr. 20</td>
<td>Ghat, F and K tests</td>
<td></td>
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<tr>
<td>13</td>
<td>27</td>
<td>Apr. 25</td>
<td>Mike Sherman: applied problems with SSP</td>
<td>Presentation and discussion of</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>Apr. 27</td>
<td>Catch up; Review</td>
<td>point process papers</td>
</tr>
</tbody>
</table>

* One lab per week, lab lasts 2 hours
Cristine

Thank you for your email. I am happy to endorse your course

AGRO/FRSC 653 Applied Spatial Statistics.

Please let me know if you require anything else.

Regards

Simon

Simon Sheather
Professor and Department Head
Department of Statistics
Texas A&M University
3143 TAMU
College Station, TX 77843-3143
E-Mail: sheather@stat.tamu.edu
Telephone: 1 979 845 3141
Fax: 1 979 845 3144

Assistant: Jennifer S. Reyes
Telephone: 1 979 845 3191
E-mail: jennifer@stat.tamu.edu
Marian and I are applying for a number for the applied spatial stats class we taught this past spring. The class went very well and Mike Sherman gave an excellent guest lecture for the course.

We want to give it a AGRO/FRSC 653 number and call the class Applied Spatial Statistics. If you prefer a different name for the class, we can change it. I would like to have your approval of this request to make this a numbered class.

I have attached the syllabus for your information. Would you please send me an email acknowledging your support for our class? I will then forward the email to Lynette Hovel to accompany our request for a number.

Sincerely,

Cristine

==================================================
Cristine Morgan, Ph.D.
Assistant Professor, Dept. of Soil & Crop Sciences
Texas A&M University
Phone: 979.845.3603
E-mail: cmorgan@ag.tamu.edu
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  

   Marketing

2. Course prefix, number and complete title  MKTG 670- Marketing Leadership  

3. Course description (not more than 50 words)  

   Seminar on the application of marketing concepts and theories through guest lectures and discussions with marketing thought leaders in business and academia

4. Prerequisite(s) MKTG 621 or equivalent  

   Cross-listed with  

   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? ______  

   Indicate the number of students enrolled for each academic period it was taught. 25

8. This course will be:  

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

   M. S. in Marketing

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

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)

|MKTG 670 MARKETING LEADERSHIP|

<table>
<thead>
<tr>
<th>Lect.</th>
<th>Lab</th>
<th>SCH</th>
<th>Subject Matter Content Code</th>
<th>Admin. Unit</th>
<th>Acad. Year</th>
<th>FICE Code</th>
<th>Level</th>
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</tbody>
</table>

Do not complete shaded area.

Approval recommended by:  

Head of Department  7-31-2006  

Chair, College Review Committee  8/15/06

Head of Department (if cross-listed course)  

Dean of College  

Submitted to Coordinating Board by:  

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-5/94
MKTG 670 – Marketing Leadership

Semester: Spring 200*(1 hour credit)
Prerequisite: MKTG 621 or equivalent
Instructor: Dr. Stephen McDaniel, Professor of Marketing
Email: s-mcdaniel@tamu.edu Tel: (979) 845-5801

Course Description
Seminar on the application of marketing concepts and theories through guest lectures by and discussions with marketing thought leaders in business and academia.

Course Objectives
1. For students to have the opportunity to interact with top marketing leaders in the business world.
2. For students to have the opportunity to hear first-hand the strategic marketing issues being faced by marketing decision-makers.
3. For students to be able to ask questions and dialogue with marketing leaders.
4. For students to summarize their lessons learned from each marketing leader into a notebook for future reference in their coursework and marketing careers.

Course Requirements

1. Attendance at all presentations by guest speakers and other related functions. During the Fall '0* and Spring '0* semesters a total of approximately fifteen or so class sessions will be held in which marketing leaders from the business world and academia will be invited to address the class. Students are expected to attend each presentation, be on-time (preferably early), and stay for the duration of the class.

2. Dress requirements. Students will wear, at a minimum, business casual to all presentations. No jeans, t-shirts, etc.

3. Participation requirements. Students are expected to appropriately participate in the presentations and guest speaker visits. This will include the asking of appropriate questions during/after the presentation, attendance at social events associated with the guest speaker's campus visit, etc. In many cases there will be a luncheon to give you an opportunity to visit more with the guest speaker and ask him/her additional questions. There will also be other opportunities to interact with the guest speaker, such as hosting a tour of the campus, and taking him/her out to breakfast or dinner.

4. One-page Summaries. Students will take notes of each session and turn in to the Instructor, within a week of the presentation, a one page summary of the session (Double-spaced, 1” margins, 12 point font). One-half page will be a summary of the main points made by the speaker. The other half-page will be a creative assessment/application to your career of something the speaker touched on.
5. *Compilation of Summaries in Notebook.* At the end of the Spring '0* semester, students will turn in a notebook that contains all the one-page summaries previously completed during both semesters.

**Grading**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Class Attendance and Participation</td>
<td>50 percent</td>
</tr>
<tr>
<td>One-page Summaries</td>
<td>30 percent</td>
</tr>
<tr>
<td>Course Notebook</td>
<td>20 percent</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100 percent</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Date</th>
<th>Speaker</th>
<th>Company</th>
<th>Position</th>
<th>Time/Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wed. Feb. 14</td>
<td>Mr. Carl Bracy</td>
<td>Essilor</td>
<td>VP of Marketing</td>
<td>10:30 - 1:00 Coc. Ctr. (Lunch to be served)</td>
</tr>
<tr>
<td>Wed. Feb. 21</td>
<td>Mr. Victor Moran</td>
<td>Swift Energy</td>
<td>Senior V.P. - Chief Compliance Officer</td>
<td>10:30 - 1:00 Rm. 290 (Lunch to be served)</td>
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<tr>
<td>Wed. March 7</td>
<td>Mr. Steve Moore</td>
<td>Texas A&amp;M University</td>
<td>Chief Marketing Officer</td>
<td>10:30 - 1:00 Coc. Ctr. (Lunch to be served)</td>
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<tr>
<td>Wed. March 21</td>
<td>Richard Marcus</td>
<td>Neiman Marcus</td>
<td>Former CEO</td>
<td>11:10 - 12:25 Rm.184 (Ms. Bridges’ class)</td>
</tr>
<tr>
<td>Thur. March 29</td>
<td>Ms. Maxine Clark</td>
<td>Build-A-Bear Workshop</td>
<td>CEO</td>
<td>11:10 - 12:25, Rm. 113 12:30 - Pizza, soft drinks and water served outside room 108 before next class</td>
</tr>
<tr>
<td>Wed. April 4</td>
<td>Mr. Creed Ford</td>
<td>Fired-Up, Inc. (Johnny Carino’s, Rudy’s BBQ, Ozona, and others)</td>
<td>CEO</td>
<td>10:30 - 1:00 Coc. Ctr. (Lunch to be served)</td>
</tr>
<tr>
<td>Mon. April 9</td>
<td>a) Mr. Sam Duncan</td>
<td>Office Max</td>
<td>a) CEO</td>
<td>Mr. Duncan will be speaking in Dr. Szymanski’s class, 9:35-10:50, Rm. 184; Mr. Vero will be speaking in Ms. Bridges’ class, 11:10 12:25, Rm. 184. Attend either.</td>
</tr>
<tr>
<td></td>
<td>b) Mr. Ryan Vero</td>
<td></td>
<td>b) Chief Merchandising Officer</td>
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<tr>
<td>Fri. April 20</td>
<td>M.S.-Marketing Advisory Board</td>
<td>Panel Discussion: “Advice on Starting Your Marketing Career”</td>
<td>12:00 - 1:00 Rm. 205 Pizza, soft drinks, water served 1:00 - 2:30 Rm. 490 Panel discussion</td>
<td></td>
</tr>
</tbody>
</table>
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 Marketing

2. Course prefix, number and complete title MKTG 687: Seminar in Marketing Models

3. Course description (not more than 50 words)

Review and discussion of the foundations of modeling and recent developments in research using marketing models. The seminar is designed to provide participants with new ways to think about modeling marketing phenomena and enable them to generate new ideas, research topics, and modeling applications for marketing problems.

4. Prerequisite(s) Doctoral Classification Cross-listed with

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 497/697? □ Yes □ No If yes, how many times? _______ Indicate the number of students enrolled for each academic period it was taught.__________

8. This course will be:

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

Ph. D. in Marketing

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

Ph. D. any major

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) MKTG 687 Seminar in Marketing Models

<table>
<thead>
<tr>
<th>Lect.</th>
<th>Lab</th>
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<td>0 0 0 3 6 3 2</td>
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</tbody>
</table>

Do not complete shaded area.

Approval recommended by:

Head of Department ___________________________ Date ____________

Chair, College Review Committee ____________ Date ____________

Head of Department (if cross-listed course) ___________________________ Date ____________

Dean of College ___________________________ Date ____________

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-594
MKTG687: Seminar in Marketing Models

Seminar Overview

This seminar will review the foundations, major contributions and recent developments in marketing models. The emphasis will be on foundations of modeling and the most recent developments in research using marketing models. We will examine commonly used models in marketing, as well as emerging ones, and discuss their principles and implications. This review and discussion will provide participants with new ways to think about modeling marketing phenomena. In addition, a principal purpose is to generate new ideas, new research topics, and new modeling applications for existing marketing problems. The seminar is meant to provide an overview of marketing models and will only cover selective research using marketing models.

The seminar in itself will not teach participants research methodologies, but will facilitate their learning of methodologies. Participants are expected to learn research methodologies in depth from courses such as multivariate statistics, applied econometrics, and game theory. However, participants are expected to fully get into the research rigor of modeling in the readings, assignments, and research proposals. Participants are also expected to attend presentations involving marketing models by visiting speakers and candidates and be prepared to discuss the presentation material in class.

The seminar will require that each participant be actively involved in each session. Seminar participants will be assigned readings to present or to discuss. Regardless of assignment, all participants are expected to be fully prepared for every class. In addition, at least one assignment and one research proposal (20 pages, double-spaced) at the end of the semester, are required. All papers and proposals will be presented in the seminar. Further details will be announced in class. All deadlines are absolutely firm.

Required Book:


Recommended/Reference Books:


*Tentative Sessions and Readings*

**Wk1**  
**Introduction to and Overview of Modeling Approaches**

8/30

LKM, Chapter 1, “Theory and Models in Marketing.”


EL, Chapter 1, “Mathematical Marketing Models: Some Historical Perspectives and Future Projections.”


Reference: EL, Chapter 4, “Competitive Marketing Strategies: Game-Theoretic Models.”

**Wk2**  
**Models of Market Pioneering**

9/6


LKM, Chapter 11: “Strategy.”

**Wk3  Models of Late Mover Effects**

9/13


LKM, Chapter 11: “Strategy.”

**Wk4  Competitive Product Positioning Models**

9/20


**Wk5 Defensive Marketing Strategy Models**

9/27


Reference: EL, Chapter 9, "Econometric and Time-Series Market Response Models."
EL, Chapter 15, "Marketing-Mix Models."
LKM, Chapter 11: "Strategy."

**Wk6 New Product Marketing Models**

10/4 (One-page research proposal due)


EL, Chapter 15, “Marketing-Mix Models.”

**Wk7**  
**Assignment**

**10/11**  
(To be provided later)

**Wk8**  
**New Product Diffusion and Forecasting Models**

**10/18**  


Reference: EL, Chapter 8, “New Product Diffusion Models.”
LKM, Chapter 10, “New Product Planning.”

**Wk9**  
**Models of Brand Choice and Price Promotion**

**10/25**  


Reference: BN, Chapters 7 and 8, "Regression Analysis Applied to Sales Promotion," and "Choice and Purchase Timing Models."

**Wk10 Network Effects and e-Commerce Models**

11/1 (Five-page research proposal due)


**Wk11 Models of Advertising, Channels and Retail Pricing**

11/8


EL, Chapter 15, “Marketing-Mix Models.”
LKM, Chapter 6, “Advertising.”

**Wk 12 New Empirical Industrial Organization (NEIO) Models of Competition**
11/15


**Wk13 Course Review/Wrap-up**
11/22

**Wk14 Final Proposal Presentations**
11/29

12/13 Written Final Research Proposal (20 pages) Due
(by 10 am CST in my mailbox)

**Evaluation:**

- Class Contribution (Paper presentations and discussion) 30%
- Assignment(s) 20%
- Research proposal 50%
- Total 100%
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 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 B118 of Cain Hall or call 845-1637.

Academic Integrity Statement

Aggie Honor Code

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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 Petroleum Engineering

2. Course prefix, number and complete title PETE 636 Horizontal, Multilateral and Intelligent Wells

3. Course description (not more than 50 words) Advanced well architectures, primarily horizontal, multilateral and intelligent wells, all aspects of these types of wells, including well completions, reservoir flow, and wellbore flow conditions, and well deliverability; optimization of well design and field applications will be demonstrated with field cases.

4. Prerequisite(s) PETE 662, graduate classification Cross-listed with 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. 7 (05A); 13 (06A)

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

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) PETE 636 Horizontal, Multilateral and Intelligent Wells
    Lect. Lab SCH Subject Matter Content Code Admin. Unit Acad. Year FICE Code
    0 3 0 0 0 3 1 4 2 5 0 1 0 0 0 6 2 2 1 0 0 7 - 0 8 0 0 3 6 3 2
    Do not complete shaded area.

Approval recommended by: N.K. Anand
Date 8/18/06

Head of Department Chair, College Review Committee
Date 8/18/06

Head of Department (if cross-listed course) Dean of College
Date

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-594

AUG 09 2006
N.K. ANAND
Texas A&M University — Department of Petroleum Engineering
Proposed Course Syllabus

Number and Name of Course: PETE 636 Horizontal, Multilateral and Intelligent Wells

Hours:    Theory  3        Practice  0        Total  3        Credits  3

Prerequisites: PETE 662, graduate classification
Curricula requiring this course:  [x] None, this course will be an elective.

1.                                             2.                                             3. 

Description of Course: (Concise Statement of purpose of design)

This course will cover advanced well architectures, primarily horizontal, multilateral and intelligent wells. The course will discuss all aspects of these types of wells, including well completions, reservoir flow, and wellbore flow conditions, and well deliverability. Optimization of well design and field applications will be demonstrated with field cases.

Text Materials:

- Draft copy of chapters, Multilateral Wells, A. Daniel Hill, D. Zhu and M. J. Economides, SPE, 2005
- Supplemental papers from the literature

Course Outline: (by major topics, and approximate time for each topic)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
<th>Time</th>
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<tbody>
<tr>
<td>1</td>
<td>Purposes and Applications of Multilateral Wells</td>
<td>1.5 hrs</td>
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<td>2</td>
<td>Horizontal and Multilateral Completions:</td>
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<td>Junction completion techniques – TAML levels</td>
<td>3 hrs</td>
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<td></td>
<td>Lateral completions – openhole, slotted liner, cased-cemented, gravel pack</td>
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<td>Completion performance</td>
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<td></td>
<td>Horizontal lateral completion models</td>
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<td></td>
<td>Skin factors for laterals – formation damage, partial penetration, and perforation effects</td>
<td>4.5 hrs</td>
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<td>3</td>
<td>Horizontal and Multilateral Well Performance Prediction</td>
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<td></td>
<td>Reservoir Inflow Performance for Horizontal Well</td>
<td>9hrs</td>
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<td></td>
<td>Analytical models of horizontal wellbore inflow</td>
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<td>Point/Line source methods</td>
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<td>Reservoir simulation approach</td>
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<td>Gas reservoir performance</td>
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<td></td>
<td>Wellbore flow behavior</td>
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<td></td>
<td>Δp in laterals</td>
<td>6hrs</td>
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<td></td>
<td>Main wellbore pressure profile</td>
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<td></td>
<td>Multilateral well deliverability</td>
<td>6hrs</td>
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<td>Coupling of reservoir and wellbore flow behavior</td>
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<td>Wellhead performance prediction</td>
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<td>Determining crossflow conditions</td>
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<td>4</td>
<td>Intelligent (Smart) Wells</td>
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<td></td>
<td>Downhole monitoring</td>
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<td></td>
<td>Temperature</td>
<td>3 hrs</td>
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<td></td>
<td>Pressure</td>
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<td>Flow rate</td>
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<td>Fiber optic measurements</td>
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<td>Downhole control</td>
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<td>Sliding sleeves</td>
<td>3 hrs</td>
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<td></td>
<td>Downhole chokes</td>
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<td>5</td>
<td>Horizontal Well Stimulation</td>
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<td>total: 42 hrs</td>
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Course grading:
Midterm Exam ...................................................................................................................(30%)
Final Exam .........................................................................................................................(40%)
Class Projects/Homeworks ...............................................................................................(30%)
Total ................................................................................................................................(100%)

Course Instructor/Supervisor:
Dr. D. Zhu
Tel. (979) 4584522
Office: Rm. 401k Richardson Building
E-mail: dingzhu@tamu.edu

Miscellaneous:
ABET Classification: Science: _____ Design: _____ Math: _____ Other: _____
Laboratory Requirements: Yes: ______ No: ______ Equipment Required: None

ADA Policy Statement: (Texas A&M University Policy Statement)

Americans with Disabilities Act (ADA) Policy Statement

The following ADA Policy Statement (part of the Policy on Individual Disabling Conditions) was submitted to the UCC by the Department of Student Life. The policy Statement was forwarded to the Faculty Senate for information.

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Coursework Copyright Statement: (Texas A&M University Policy Statement)

Suggested for Inclusion in Your First Day Handout or Syllabus

The handouts used in this course are copyrighted. By "handouts," this means all materials generated for this class, which includes, but is not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copy-righted, you do not have the right to copy them, unless you are expressly granted permission.

As commonly defined, plagiarism consists of passing off as one’s own the ideas, words, writings, etc., that belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated.

If you have any questions about plagiarism and/or copying, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty."

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