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

1. This request is submitted by the Department of AEROSPACE ENGINEERING
   Course prefix, number and complete title of course: AERO 630 Introduction to Random Dynamical Systems

3. Course description (not more than 50 words): Building on basic probability theory, course covers theory and applications of discrete and continuous random processes. Particular attention shall be paid to the response of dynamical systems (discrete, linear and nonlinear), to random input processes and their application to Engineering Systems.

4. Prerequisite(s) graduate student status
   Cross-listed with
   Cross-listed courses require the signature of both department heads.
   If yes, from _______ to ________.

5. Is this a variable credit course? ☐ Yes ☑ No
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 289/489/689? ☑ Yes ☐ No
   If yes, how many times? ______
   Indicate the number of students enrolled for each academic period it was taught. 8-06A, 5-07A

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)

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 (excluding punctuation)
    AERO 630 INTRO RANDOM DYN SYS
    Lect. Lab SCH Subject Matter Content Code Admin. Unit Acad. Year FICE Code
    0 3 0 0 0 3 1 4 0 2 0 1 0 0 0 6 0 1 0 0 0 8 0 3 6 3 2
    09-10
    Level 6
    Approval recommended by: 12-3-07
    Head of Department Date
    Head of Department (if cross-listed course) Date

    Submitted to Coordinating Board by:
    Director of Academic Support Services
    Date Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8836.
OAR/AS – 04/07
AERO 630: Introduction to Random Dynamical Systems
Credit 3: (3-0)

Instructor: Dr. Suman Chakravorty, Assistant Professor, Aerospace Engineering Dept., 611 B HRBB, (979) 458-0064, scchakrav@aero.tamu.edu

Spring 2008

Textbook Required:
Mostly from Lecture Notes
Recommended reading:

Prerequisites: Graduate Standing, no prior knowledge of Probability is required.

Attendance Policy: Students are expected to attend class.

Course Description: Building on basic probability theory, the course will cover the theory and applications of discrete and continuous random processes. Particular attention shall be paid to the response of dynamical systems, (discrete, linear and nonlinear), to random input processes and their application to Engineering Systems.

<table>
<thead>
<tr>
<th>Topics</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Probability Theory</td>
<td>4</td>
</tr>
<tr>
<td>Random Variables and Functions</td>
<td>4</td>
</tr>
<tr>
<td>Random Processes and their applications</td>
<td>12</td>
</tr>
<tr>
<td>Linear Dynamical Systems with application to Engineering</td>
<td>8</td>
</tr>
<tr>
<td>Nonlinear Dynamical Systems with application to Engineering</td>
<td>12</td>
</tr>
<tr>
<td>Exams</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
</tr>
</tbody>
</table>

Method of Evaluation:

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project/ Seminar</td>
<td>30%</td>
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<tr>
<td>Final Exam</td>
<td>30%</td>
</tr>
<tr>
<td>Mid-term Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Homework</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Relationship to Program Outcomes:

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Assessment Method</th>
<th>ABET Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand fundamentals of random variables and processes</td>
<td>Homework, Quizzes, Major Examinations, Final Examination.</td>
<td>3 (a), 3(e)</td>
</tr>
<tr>
<td>Apply the theory of random processes to the modeling and analysis of stochastic engineering systems</td>
<td>Homework, Quizzes, Major Examinations, Final Examination.</td>
<td>3 (a), 3(e)</td>
</tr>
<tr>
<td>Understand the fundamentals of the response of dynamical systems to stochastic perturbations, in particular, the stability of such systems</td>
<td>Homework, Quizzes, Major Examinations, Final Examination.</td>
<td>3 (a), 3(e)</td>
</tr>
<tr>
<td>Apply the knowledge gained to a real-world (Aerospace) engineering problem in the form of an extended class project</td>
<td>project, Final Examination.</td>
<td>3 (a), 3(e)</td>
</tr>
</tbody>
</table>
**Americans with Disabilities Act**
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 Cain Hall, or call 845-1637.

**Copyrights**
The handouts used in this course are copyrighted. By "handouts" we mean all materials generated for this class, which include but are not limited to syllabi, 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 the author expressly grants permission.

**Scholastic Integrity**
As commonly defined, plagiarism consists of passing off as one's own the ideas, work, 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 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 questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules [http://student-rules.tamu.edu/], under the section "Scholastic Dishonesty."
This looks ok to us. We would like the AERO students to know that there are several more advanced courses available around the campus: including ISEN 609, 602, and 618, Stat 625 and Math 619, and 625.

Guy L. Curry, Ph.D., P.E.
Professor and Director of Graduate Programs Industrial and Systems Engineering Department
Texas A&M University g-curry@tamu.edu
979-845-5576

-----Original Message-----
From: Teresa Wright [mailto:t-wright@tamu.edu]
Sent: Friday, February 01, 2008 3:39 PM
To: Guy Curry
Cc: N.K. Anand; Judy Meeks
Subject: Status of AERO 630

Hi Dr. Curry,
In December I circulated a course request for AERO 630 - Introduction to Random Dynamical Systems to GIC members electronically. You asked for a chance for your faculty to review. I am attaching a PDF of the course request. Can you please let me know what the status is? Thanks for your help!
Teresa

Teresa Wright '01
Senior Coordinator for Graduate Studies
Engineering Student Services and Academic Programs Texas A&M University t-wright@tamu.edu
204 Zachry Engineering Center | 3127 TAMU | College Station, TX 77843-3127
Tel. 979.845.6883 | Fax. 979.847.8654
http://essap.tamu.edu
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