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 approved by the Department of Electrical & Computer Engineering
   Electrical & Computer Engineering

2. Course prefix, number and complete title of course: ECEN 730 CMOS RFIC Engineering

3. Course description (not to exceed 50 words): Introduction to CMOS radio-frequency integrated circuits (RFICs) and wireless systems and networks; theory, analysis and design of RFICs using CMOS technologies; CMOS fundamentals (device, principle, models); scattering parameters, transmission lines, Distributed structures, lumped elements, impedance matching, RFIC layout, processing, test, amplifiers, oscillators, mixers; CAD programs for CMOS RFIC design.

4. Prerequisite(s): ECEN 322 and graduate classification
   Cross-listed with:

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

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

7. Has this course been taught as a 489/689? ☐ Yes □ No If yes, how many times? 3
   Indicate the number of students enrolled for each academic period it was taught. Fall'07-15, Fall'08-6.

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

   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)
      M.S., M.E., M.Eng., M.S. in Electrical & Computer 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 (excluding punctuation)

<table>
<thead>
<tr>
<th>ECEN</th>
<th>730</th>
<th>CMOS RFIC ENGINEERING</th>
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<tbody>
<tr>
<td>Lec.</td>
<td>Lab</td>
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Approval recommended by:

Head of Department Date

Head of Department Date

Submitted to Coordinating Board by:

Associate Director, Curricular Services Date

Questions regarding this form should be directed to Sandra Williams at 845-8201.
Curricular Services – 11/07
Department of Electrical & Computer Engineering  
Texas A&M University  
ECEN 730 CMOS RFIC Engineering  
Fall 2010

Instructor: Dr. Cam Nguyen  
Office: Room 208 B, Zachry Building  
E-Mail: cam@ece.tamu.edu  
Tel. No.: 979-845-7469  
Office Hour: 3:00 - 4:00 P.M. Tues. and Thurs.

TEXT: Instructor's Notes and Technical Papers  
C. Nguyen, CMOS RFIC Engineering, John-Wiley & Sons (to be published).

PREREQUISITES: ECEN 322 and Graduate Classification.

DESCRIPTION: Introduction to CMOS radio-frequency integrated circuits (RFICs) and wireless system and networks; theory, analysis and design of RFICs using CMOS technologies; CMOS fundamentals (device, principle, models); scattering parameters, transmission Lines, Distributed structures, lumped elements, impedance matching, RFIC layout, processing, test, amplifiers, oscillators, mixers; CAD programs for CMOS RFIC design.

CONTENT:  
Introduction to CMOS RFICs and wireless systems and networks  
Transmission lines and distributed structures  
Lumped elements  
Smith chart  
Scattering parameters  
CMOS fundamentals (device, principle, models)  
Matching  
Passive components  
Biasing  
CAD programs  
Amplifiers, oscillators, mixers, other CMOS RFICs  
Layout, processing and testing

GRADING SYSTEM: Grade will be determined according to the following rules:

Mid-Term Exam 25%, Project (presentation and report) 50%, Homework 25%

Your grades will be calculated on the basis of total points earned. The points can be curved based on class average and may lower the following standard.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Points</th>
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<tbody>
<tr>
<td>A</td>
<td>90-100</td>
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<tr>
<td>B</td>
<td>80-89</td>
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<tr>
<td>C</td>
<td>70-79</td>
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<tr>
<td>D</td>
<td>60-69</td>
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<tr>
<td>F</td>
<td>59 and lower</td>
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ACADEMIC DISHONESTY AND PLAGIARISM

The handouts used in this course are copyrighted. The definition of "handouts" is all materials generated for this class, which include but are not limited to syllabi, homework assignments, in-class materials, and additional printed materials except published scientific papers for personal use. Because these materials are copyrighted, you do not have the right to make additional copies of the handouts unless the instructor of this course expressly grants permission. As commonly defined, plagiarism consists of passing off the ideas, words, writings, etc., of another as one's own. In accordance with this definition, you are committing plagiarism if you copy the work of another person without proper citation and acknowledgement, and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic offenses, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. Paraphrasing without proper citation and acknowledgement is one form of plagiarism. 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". Any forms of dishonesty including, but not limited to, cheating on any examinations and plagiarism on the Review project will be handled according to the procedures outlined by the Aggie Honor System Office. Please check the following websites for further information: University Regulations Student Handbook: http://student-rules.tamu.edu Aggie Honor System Office: http://www.tamu.edu/aggiehonor/Definition of Academic Misconducts: http://www.tamu.edu/aggiehonor/acadmisconduct.htm

AMERICANS WITH DISABILITIES ACT (ADA) POLICY STATEMENT

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu.

Tentative Class Schedule (subject to change)

9/1 Introduction to CMOS RFICs and wireless systems and networks
9/3 Transmission lines and distributed structures
9/8 Transmission lines and distributed structures
9/10 Transmission lines and distributed structures
9/15 Lumped elements
9/17 Lumped elements
9/22 Lumped elements
9/24 Lumped elements
9/29 Scattering parameters
10/1 Scattering parameters
10/6 CMOS fundamentals (device, principle, models)
10/8   CMOS fundamentals (device, principle, models)
10/13  Matching
10/15  Matching
10/20  Passive components
10/22  Passive components
10/27  Mid-term Exam
10/29  CAD programs
11/3   Amplifiers, oscillators, mixers, other CMOS RFICs
11/5   Amplifiers, oscillators, mixers, other CMOS RFICs
11/10  Amplifiers, oscillators, mixers, other CMOS RFICs
11/12  Amplifiers, oscillators, mixers, other CMOS RFICs
11/17  Amplifiers, oscillators, mixers, other CMOS RFICs
11/19  Amplifiers, oscillators, mixers, other CMOS RFICs
11/24  Amplifiers, oscillators, mixers, other CMOS RFICs
11/26  No Class (Thanksgiving)
12/1   Amplifiers, oscillators, mixers, other CMOS RFICs
12/3   Amplifiers, oscillators, mixers, other CMOS RFICs. Project due
12/8   Layout, processing and testing
12/14  Final Exam