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

1. This request is submitted by the Department of Electrical & Computer Engineering.

2. Course prefix, number and complete title of course: ECEN 625 Millimeter-wave Integrated Circuits

3. Course description (not to exceed 50 words): Applications of millimeter-wave integrated circuits for wireless transceiver; principles of operation, modeling, design and fabrication of the most common millimeter-wave CMOS, SiGe and RF MEMS circuits.

4. Prerequisite(s): Graduate standing; approval of instructor

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. Has this course been taught as a 489/689? □ Yes □ No If yes, how many times? __________

9. 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., MEN, Ph.D. 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)  
    ECEN 625 MM - WAVE INTEGRATED CIRCUIT

    Lect. Lab SCH GP and Fund Code Admin. Unit Year Year UC Code
    0 3 0 0 0 3 1 4 1 0 1 0 0 2 0 9 3 6 0 9 - 1 0 0 3 6 3 2  

    Approval recommended by:

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

    Submitted to Coordinating Board by:

    Associate Director, Curricular Services Date

    Chair, College Review Committee Date
    Dean of College Date
    Dean of College Date

    Date Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201.  
Curricular Services – 11/07

1 of 4 B4
Texas A&M University
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1. This request is submitted by the Department of Electrical & Computer Engineering

2. Course prefix, number and complete title of course: ECEN 625 Millimeter-wave Integrated Circuits

3. Course description (not to exceed 50 words): This is a graduate level course on the principles and applications of millimeter-wave integrated circuits for wireless transceivers. The principles of operation, modeling, design and fabrication of the most common millimeter-wave CMOS, SiGe and RF MEMS circuits will be discussed.

4. Prerequisite(s): Graduate standing; approval of instructor

Cross-listed with: N/A

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. 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. Nine (spring 07) - Seven (spring 08)

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   a. required for students enrolled in the following degree programs(s) (e.g., B.A. in history)
   
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M.S., MEN, Ph.D. in Electrical & Computer Engineering

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10. Prefix Course # Title (excluding punctuation) ECEN 6 2 5 MM - WAVE INTEGRATED CIRCUIT

    Lect Lab SIC CP and Unit Code 0 3 0 0 0 3 1 4 1 0 0 1 0 0 6 0 9 3 6 0 9 - 1 0 0 0 3 6 3 2

Approval recommended by:

Head of Department Date
Head of Department (if cross-listed course) 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
ECEN 625 MILLIMETER-WAVE INTEGRATED CIRCUITS

• Instructor: Kamran Entesar
  Office Location: WERC 318A Phone: (979) 845 – 9586 E-mail: kentesar@ece.tamu.edu
  Web page: http://www.ece.tamu.edu/~kentesar

• Prerequisite: Graduate standing; Approval of the instructor


• Description:
  - Describing novel system and circuit ideas using highly integrated state-of-the-art CMOS and SiGe circuits for wireless transceivers at mm-wave frequencies.
  - Investigating reconfigurable wireless architectures at mm-wave based on RF MEMS technology as a viable solution for versatile integrated circuits.

• Learning Outcomes:
  - Familiarity with the state-of-the art device technologies and circuit techniques employed in millimeter-wave integrated systems
  - Learning commercial software including Sonnet for electromagnetic simulations and Candence for circuit simulation
  - Thorough literature review based on numerous research papers distributed among graduate students on each topic.

• Grading Policy: 1) Homework: 60%, 2) Final Project: 40%
  Project paper and presentation will be graded based on how good of a review you provide for your selected topic, how logical, innovative, and feasible your proposed idea is, and how well you present your work to the class.

  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.
  A  90-100 (out of 100)
  B  80-89 (out of 100)
  C  70-79 (out of 100)
  D  60-69 (out of 100)
  F  59 and lower (out of 100)

Late Submissions
Late submissions of assignments will be accepted only in the case of University excused absences.

• Topics to be covered:
  1 An overview of mm-wave integrated systems    Lectures: 3*
  2 Lumped and distributed passive elements at mm-wave    Lectures: 5
  3 Tunable elements and switches at mm-wave    Lectures: 5
  4 CMOS/SiGe mm-wave device modeling    Lectures: 4
  5 RF MEMS and CMOS/SiGe phase shifters    Lectures: 5
  6 RF MEMS tunable filters    Lectures: 6
  7 CMOS/SiGe mm-wave front ends    Lectures: 5
  8 CMOS/SiGe distributed amplifiers    Lectures: 4
9 CMOS/SiGe oscillators and frequency multipliers at mm-wave
10 Examples of mm-wave commercial integrated systems

*Total number of 50 minutes lectures: 45

• 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.

• An Aggie does not lie, cheat, or steal or tolerate those who do.
Honor Council Rules and Procedures: http://www.tamu.edu/aggiehonor