TENAS STATE UNIVERSITY
COURSE ADDITION FORM

1. Effective Semester: Fall 2016

2. College: Science & Engineering

3. Department/School/Program: Ingram School of Engineering

4. Prefix/Subject Number
   E   E   5 3 9 8 A

5. Course Title:
   Proposed Long: Antenna Theory, Design and Applications
   Abbreviated (18 characters only including spaces): ANTE THEO DES I A P P

6. Course Description (complete sentences in 50 words or less): This course covers the basic theory, design and applications of antennas. The topics include antenna radiation, fundamental parameters of antennas, linear wire antennas, loop antennas, antenna arrays, long-periodic antennas, horn antennas, microstrip antennas and modern nano-antennas.

7. Prerequisites (Including Minimum Grade Required): EE3340 with C or higher, EE3370 with C or higher; or Instructor’s approval.

8. Co-Requisites (Including Concurrent Enrollment Allowed): None

9. Restrictions: Restricted to students enrolled in MS Engineering, MS Physics, MS Mathematics, MS Computer Science, or MS Technology Management.

10. Course Data
    CIP Code (10 digits - no spaces or periods)
    1 4 1 0 0 1 0 0 0 6
Instruction Type | Lecture Contact Hours | Lab Contact Hours | Credit Hours | Repeatable for Credit? | Maximum Credit Hours Allowed
---|---|---|---|---|---
1-Lecture | 3 | 0 | 3 | Yes | 3
2-Lab | | | | No | 3
3-Practicum/Internship/Student Teaching | | | | | 3
4-Seminar | | | | | 3
5-Independent Study | | | | | 3
6-Private Lesson | | | | | 3
8-Thesis | | | | | 3
9-Dissertation | | | | | 3
0-Individualized | | | | | 3
C-Clinical | | | | | 3

Writing Intensive? | Topics Course?
---|---
Yes | Yes
No | No

Valid Grade Mode
(choose only one)
(See PPS 4.07 for definitions.)
- Standard Letter
- Credit/ No Credit
- Leveling/Assistantships/ESL
- Developmental

Course Equivalency(s)
PREFIX and NUMBER
None

11. Justification for the course action:

Degree: MASTER OF SCIENCE
Major: ENGINEERING
Minor: Certificate:

Explain why the new course is needed in the curriculum and how this course may or may not affect the above degree/major/minor/certificate program. If necessary please submit the appropriate Program Addition or Change Form along with this Course Addition Form.

With the recent great advances in electronics and information technology, it is very important to advance antenna technology at the same time. Traditional antennas can no longer meet our communication demands. However, in our graduate program, we do not have a course to respond to this demand. This course will teach students basic antenna theory, design tools, and applications, which will establish a solid foundation for the students to understand and design a new generation of antennas.
12. Course Goals and Objectives:
   - Must be specific and unique to each course.
   - Must be stated in measurable terms.
   - Must have distinct differences between a graduate level course and an undergraduate course (in case of stacked courses).
   - Please refer to Bloom's Taxonomy of Measurable Verbs.
   - Introduce antenna types and radiation theory.
   - Introduce fundamental parameters of antennas.
   - Review various kinds of antennas.
   - Design modern printed antennas and nano-antennas.
   - Discuss antenna applications.

13. Description of Instructional Methodologies:
   - Examples include lecture, discussions, group projects, role playing, simulations, modeling, field-based activities, writing, cooperative learning, inquiry, experimentation, product design, creative activities, case studies, seminars, internship activities, coaching, etc.
   - Lecture: Two sessions of 80 min weekly.
   - Two projects involving antenna design.
   - Homework and tests.

14. Assessment of Student Learning:
   - Examples include tests, projects, presentations, performances, creative works, papers, etc.
   - Above examples of assessment must include percentages of total grade assigned.
   - Must have distinct differences between a graduate level course and an undergraduate course (in case of stacked courses).

Assessment will be performed by the course instructor. The course grade will depend upon performance in the tests (40%), homework (30%), and projects (30%). The final letter grade will be determined by the student's raw score as well as by the performance of the class (class average and standard deviation) as a whole. Additionally, attendance policies may have an impact on the letter grade.
15. Course Outline:
- Provide a weekly outline as appropriate for an example semester in which the course will be taught.
- Must distinguish the course clearly from similar offerings in the same or other programs.
- Must indicate specific topics.

<table>
<thead>
<tr>
<th>Week 1: Introduction: antenna types</th>
<th>Week 9: Microstrip antenna - II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 2: Fundamental parameters of antennas - I</td>
<td>Week 10: Modern nano-antenna</td>
</tr>
<tr>
<td>Week 3: Fundamental parameters of antennas – II</td>
<td>Week 11: Antenna array - I</td>
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<tr>
<td>Week 4: Line wire antenna</td>
<td>Week 12: Antenna array - II</td>
</tr>
<tr>
<td>Week 5: Loop antenna</td>
<td>Week 13: Antenna fabrication/printed antenna</td>
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<td>Week 6: Log-periodic antenna</td>
<td>Week 14: Antenna applications - I</td>
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<tr>
<td>Week 7: Horn antenna</td>
<td>Week 15: Antenna applications - II</td>
</tr>
<tr>
<td>Week 8: Microstrip antenna - I</td>
<td>Week 16: Final</td>
</tr>
</tbody>
</table>

16. Suggested Textbook(s) and Other Learning Resources:
- Must list the required and recommended (if any) resources (e.g., relevant textbooks, course packets, websites), with complete bibliographical data (author, title, date and other publication data) in a standard academic format (e.g., CBE, APA, MLA, Chicago, etc.)


17. Bibliography:
- Must include literature other than required textbooks and other learning resources.
- Must demonstrate familiarity with current research. Ordinarily, the bibliography should include scholarship published during the last five years.
- Must conform to a standard academic format (e.g., CBE, APA, MLA, Chicago, etc.) Each bibliography will use only one format.

Page 5 of Course Addition Form:
Prefix/Subject and Number: EE 5398A

18. Approvals:

Department Chair/Program Director/School Director

Chair of College Curriculum Committee

Dean of College

Dean of The Graduate College (if applicable)

Chair of University Curriculum Committee (if applicable)

Date

1/29/15

Date

3/3/2015

Date

3/4/15

Date

7/7/2015