Circuit Analysis
ENGR2460
Department of Engineering
SPRING 2017

A. COURSE INFORMATION

Course number/section: ENGR-2460_001
Class meeting time: Lec: MWF 11:00-11:50,
Lab: TR 12:30-01:45PM
Lab: TR 03:30-04:45PM
Class location: EN107, EN220 (Lab)
Course Website: https://bb9.tamucc.edu/webapps/login

B. INSTRUCTOR INFORMATION

Instructor: Cosmina Nicula
Office location: EN316K
Office hours: MW 12:30-2pm, TR 2:30-3:00pm, F10:30-12:00pm
Telephone: 361-825-5849
E-mail: Cosmina.Nicula@tamucc.edu
Appointments: send an e-mail request for appointment, with proposed time.

C. COURSE DESCRIPTION

Catalog Course Description
This course covers principles of electrical circuits: charge, voltage, resistance, current, and power; Ohm’s Law; Kirchhoff’s voltage and current laws; RC and LC circuits; periodic functions, average and RMS measurements; transformers, electrical measurement instruments. The laboratory provides hands-on experience with devices and circuits discussed in the classroom.

Extended Course Description
Some basics covered in your Physics course(s) will be reviewed but the focus is circuit analysis as it pertains to electrical engineering. As time permits, discussions on applications will be exposed (in addition or supplemental to book applications).

D. PREREQUISITES AND COREQUISITES

Prerequisites: None
Corequisites: PHYS 2426

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Apply Ohm’s law, Kirchhoff’s voltage and current laws to analyze common electric circuits.
2. Understand and apply the concepts of charge, current, voltage, resistance and power.
3. Apply the concepts to series, parallel and combination circuits.
4. Use ammeter, voltmeter, oscilloscope, power supply and other instruments to measure voltage, current and resistance and analyze electric circuits.
5. Understand and apply the concepts of capacitance, magnetism and inductance to electrical circuits.
6. Perform transient analysis in RC and RL circuits manually and using software tools (MULTISIM, PSPICE, etc.)
7. Apply AC Analysis to Series/Parallel Circuits with resistors, capacitors and inductors.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

Methods and activities for instruction include the following: lectures, homework assignments, laboratory exercises, and examinations.

H. MAJOR COURSE REQUIREMENTS AND GRADING

Assessment is based on two midterm exams, lab reports, lab test(s), homework, pop quizzes, and a final exam. Expect a quiz when homework is due. The final exam is comprehensive. You may examine the final exam within four weeks after the final grades are assigned.

Lab work will be assigned every week as related to the topics in class. Each lab has background information at the beginning, and pre-lab work may be done at home to save lab time. A due date will be assign and late assignments will NOT be accepted.
Homework is due at the beginning of class on the classroom desk on the due date. Any time thereafter is considered late and will need to be accepted by instructor. A deduction of points may be given. Leaving it on my inbox does not guarantee it will be accepted. If submitting it early the assignment needs to be labeled clearly on front of it.

<table>
<thead>
<tr>
<th></th>
<th>Points</th>
<th>Total Score</th>
<th>Tentative Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>10</td>
<td>90 ≤ total</td>
<td>A</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10</td>
<td>80 ≤ total &lt; 90</td>
<td>B</td>
</tr>
<tr>
<td>Lab reports/Exercise/</td>
<td>25</td>
<td>70 ≤ total &lt; 80</td>
<td>C</td>
</tr>
<tr>
<td>lab comprehension tests</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Midterm Exam I</td>
<td>15</td>
<td>60 ≤ total &lt; 70</td>
<td>D</td>
</tr>
<tr>
<td>Midterm Exam II</td>
<td>15</td>
<td>total &lt; 60</td>
<td>F</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attendance*</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course Folder**</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100</td>
<td></td>
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</tbody>
</table>

**Course Folder**

This consists of a simple letter size two pocket folder where all graded and returned assignments will be placed. On the left side place Exams (1 & 2) followed by Quizzes (1 to ?), then HW (1 to ?). On the right side place your labs (1 to ?). It must be complete and organized for full credit.
# I. CONTENT/SCHEDULE

## TENTATIVE WEEKLY SCHEDULE (subject to change)*

<table>
<thead>
<tr>
<th>WK</th>
<th>Week of</th>
<th>Reading</th>
<th>Lecture</th>
<th>LAB</th>
<th>Exams</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/18</td>
<td>Ch. 1</td>
<td>Review of Syllabus; Introduction: Units of measurement and conversion</td>
<td>Introduction to Laboratory Equipment, its usage and Safety; MSDS (Experiment 1dc – to do as HW)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1/23</td>
<td>Ch. 2</td>
<td>Voltage and Current</td>
<td>Lab 1 (Exp.2dc) Color code</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1/30</td>
<td>Ch 3</td>
<td>Resistance</td>
<td>Lab 2 (Exp. 3dc) Ohm’s Law</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2/6</td>
<td>Ch 4</td>
<td>Ohm’s Law, Power, Energy</td>
<td>Lab 3(Exp. 4dc) Series Resistance</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2/13</td>
<td>Ch 5</td>
<td>Series Circuits</td>
<td>Lab 4(Exp. 5dc) Series Circuits</td>
<td>LST #1</td>
</tr>
<tr>
<td>6</td>
<td>2/20</td>
<td>Ch 6</td>
<td>Parallel Circuits</td>
<td>Lab 5 (Exp. 7dc) Parallel Circuits</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>2/27</td>
<td>Ch 7</td>
<td>Series/Parallel dc Circuits</td>
<td>Lab 6 (Exp. 9dc) Series/Parallel Cir.</td>
<td>Mid 1</td>
</tr>
<tr>
<td>8</td>
<td>3/6</td>
<td>Ch 8</td>
<td>Mesh and nodal analysis</td>
<td>Lab 7 (Exp. 14dc) parts 2 to 4,Ex</td>
<td>LST #2</td>
</tr>
<tr>
<td>9</td>
<td>3/13</td>
<td>Ch 9</td>
<td>Network Theorems (selected)</td>
<td>Lab 8 (Exp. 12dc) Thevenin</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>3/20</td>
<td>Ch 10</td>
<td>Capacitors</td>
<td>Lab 9 (Exp. 15dc P1,2,4) Caps (Exp. 16dc P1,3,&amp;Ex1,2, Draw in AutoCAD fig. 16.3) R-C Transients</td>
<td>Mid 2</td>
</tr>
<tr>
<td>11</td>
<td>3/27</td>
<td>Ch 11</td>
<td>Inductors</td>
<td>Lab 10 (Exp. 17dc _Skip P4) RLC dc</td>
<td>LST #3</td>
</tr>
<tr>
<td>12</td>
<td>4/3</td>
<td>Ch 13</td>
<td>Introduction to AC</td>
<td>Lab 11(Exp. 2ac) Oscilloscope</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>4/10</td>
<td>Ch 14</td>
<td>Basic Elements and Phasors</td>
<td>Lab 12(Exp. 4ac) RLC ac</td>
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</tr>
<tr>
<td>14</td>
<td>4/17</td>
<td>Ch 15</td>
<td>Series/ Parallel ac Circuits</td>
<td>Lab 13(Exp. 5ac) Freq. (short week)</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>4/24</td>
<td>Ch 15/16</td>
<td>Open / Review</td>
<td>Lab Skills Test – LST <em>NOTE1</em></td>
<td>LST #4</td>
</tr>
<tr>
<td>16</td>
<td>5/1</td>
<td></td>
<td>Final Exam: Friday, May 5, 11:00a.m.–1:30p.m.</td>
<td>FINAL</td>
<td></td>
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</table>

*NOTE a*The students taking Lab Sessions on Friday will have The Lab Skill Test #4 on The Last Lab Session.

* Changes in this course schedule may be necessary and will be announced to the class by the Instructor.

* Exam 1, & 2 Dates are tentatively given within that week, not necessarily on Monday. Exact day of Exam is given one week in advance. No exam makeup is given unless for legitimate cause (a scheduled vacation, wedding, or airline flight is not a legitimate cause).

NOTE1: Last day to drop a class April 7
NOTE2: Holiday closings (March 13 and March 15)
NOTE3: The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.
J. COURSE POLICIES

Attendance/Tardiness
You must attend all lectures and laboratories. Grading for Attendance will be deducted after the first absence without a legitimate excuse/cause. Starting with the second absence a $\frac{1}{2}$ % deduction from attendance will apply.

You are responsible for any materials covered or handed out or announcements made in your absence, therefore make arrangements with classmates when this happens. Records of your attendance will be maintained. Tardiness without the prior consent of the instructor is not accepted and will be penalized. Being tardy consistently without consent can be basis to be removed from class or not be permitted to enter class. This is a disruption to other classmates, impolite and not of an ethical person.

Late Work and Make-up Exams
Late work, scheduled exam absences or No-show on lab/project are not accepted unless there exists legitimate excuse (illness, death in the immediate family, etc.) and adequate documentation is furnished. If a make-up were to be needed it could be a degree higher in difficulty.

Extra Credit
Any will be labeled as such on assignments, exams, and quizzes, etc. Other extra credit to be announced in class as needed.

Cell Phone Use
Cell phone use is prohibited once class begins. They are to be silenced and put away where they are not seen. If a call is expected take it out of the class. Anyone that interrupts class due to cell phone will be asked to leave.

Laptop Use
May be permitted if used for current class work; other uses other than this class is not permitted.

Food in Class
No food or drinks permitted. An exception is bottled water with a cap or sealable lid. Most coffee mugs are not sealable.

Missed Exam
You will receive a zero for a missed exam, unless you have accommodations with Instructor or have a legitimate excuse. You are to communicate any issues immediately.

Participation
To be announced in class when extra points are given.

Missed Laboratory
If you are not present during lab time session, you will be penalized. For example if you
are missing one session (you have scheduled 2 sessions during one week) you will get only 1/2 of the grade for that lab assignment.

**Lab Housekeeping**
You must keep your lab area clean after lab use.

### K. COLLEGE AND UNIVERSITY POLICIES

- **Academic Integrity (University)**
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade. During an assignment you are allowed to have only what is permitted by instructor, anything else (cell, notebook, book, etc) encounter in your possession will be considered cheating and a proceeding to penalized and document such an act will take place which could include removal from University.

- **Classroom/Professional Behavior**
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Statement of Civility**
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)**
  The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that **must** submitted. No student is eligible to receive a W without completing the official drop
process by this deadline. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  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 call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

  If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816. http://disabilityservices.tamucc.edu/

- **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. **OTHER INFORMATION**

- **Academic Advising**
The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

GENERAL DISCLAIMER

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.