Contact Information

- **Instructor:** Daniel Costinett
  - Office: MK504
  - OH: W 2:30-4:00, R 10:30-12:00, by appointment
  - E-mail: Daniel.Costinett@utk.edu
  - Please use [ECE 202] in the subject line
  - Email questions will be answered within 24 hours (excluding weekends)

Textbook and Materials

**Textbook**
  - ISBN: 0073545511
  - required
- Course covers Chapters 10-17

**Course Website**
- [http://web.eecs.utk.edu/~dcostine/ECE202](http://web.eecs.utk.edu/~dcostine/ECE202)

**Software**
- MATLAB
- LTSpice
Course Website

ECE 202: Circuits II

Course Schedule

Updated 11:51 August 16, 2021. Tentative lecture schedule, including links to lecture slides and notes, and links to assignments. The schedule is subject to change, please check frequently.

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
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</thead>
<tbody>
<tr>
<td>Aug. 16</td>
<td>L2 - Aug. 20</td>
<td>L1 - Aug. 18</td>
<td>L3 - Aug. 23</td>
<td>L5 - Aug. 27</td>
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<td></td>
<td></td>
<td>Course Introduction</td>
<td>Coupling Coefficient</td>
<td>Transformer Equivalent Circuits</td>
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<td>The Transformer</td>
<td>Intro to Sinusoidal Analysis</td>
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<td></td>
<td>Sections 13.3-13.4 (ignore ‘phasor’ notation)</td>
<td>Section 10.1 - 10.2</td>
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<td>Homework 1 Due</td>
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Grading

- **Homework: 20%**
  - Weekly, due on Fridays before the start of lecture
  - The one lowest homework grade will be dropped
- **Quizzes: 10%**
  - In-class, open-book, open-note & calculator
- **Labs: 15%**
  - Completed outside of class (by scheduling with TA)
- **Midterms: 30%**
- **Final: 25%**
  - All exams open-book, open-note & calculator
Assignments

• Submission
  − Homeworks and Labs should be submitted by uploading a pdf to canvas
    ▪ Physical copy submitted prior to the due date/time loses 5% credit
    ▪ https://www.eecs.utk.edu/resources/it/eecs-it-knowledge-base/using-the-scanner/
    ▪ https://libanswers.utk.edu/faq/103187

Course Policy

• No late work will be accepted except in cases of documented medical emergency
• Collaboration encouraged on Labs and Homework
  − Must submit your own work on all assignments
  − Adhere to Student Code of Conduct
• Attendance is required in all lectures and scheduled lab time
Fall 2021: UTK Coronavirus Precautions

https://www.utk.edu/coronavirus/guides/requirement-to-wear-face-coverings

• The best way to be protected from serious illness from COVID-19 is to **get vaccinated**, which the university strongly recommends.

• Students, staff, and faculty will be **required to wear masks** in classrooms and labs, and for indoor academic events required for students.

• The need for masks will be **continually re-evaluated** based on COVID-19 case counts in our community.

• Masks are expected to be worn in health care facilities and on public transportation, including the T.

• Any individual can choose to wear a mask anywhere on campus, regardless of their vaccination status.

Course Slack

• http://utk-ece202.slack.com/

• Invitation link:
  - [https://join.slack.com/t/utk-ece202/signup](https://join.slack.com/t/utk-ece202/signup)
  - Can signup without invitation from @vols.utk.edu e-mail address

• Collaboration, Q&A, OH video call
How to Succeed in ECE202

• Attend all lectures
• Read associated sections in the book, as listed on the course schedule
• Work collaboratively (in person or through Slack, etc.) to understand homework assignments
  – Complete your own work
  – Review any incorrect answers
• Actively participate in lab sessions
• Review material in advance of quizzes and tests
• Ask questions in lecture / office hours / e-mail after having made an attempt at the material on your own

INTRODUCTION TO ECE202
ECE 201 Review

- KCL, KVL, Series/Parallel Circuits (Chapter 3)
- Nodal and Mesh Analysis (Chapter 4)
- Linearity/Superposition, Source Transform (Chapter 5)
- Ideal Op-amps (Chapter 6)
- Capacitors and Inductors (Chapter 7)
- RLC Circuits, Resonance, Damping (Chapter 8-9)
  - Differential Equations approach

End of ECE201

\[ L \frac{d^2i}{dt^2} + R \frac{di}{dt} + \frac{1}{C} i = 0 \]

\[ v(t) = A_1 e^{s_1 t} + A_2 e^{s_2 t} \]

\[ s_1, s_2 = -\frac{R}{2L} \pm \sqrt{\left(\frac{R}{2L}\right)^2 - \frac{1}{LC}} \]
Example Application: Wireless Power Transfer

Wireless Power Transfer (WPT)
Wireless Power Transfer (WPT)
Wireless Power Transfer (WPT)
WPT System Design

\[ i_{tx} \]

WPT System Design

\[ i_{tx} \]
Receiver Side

A Slightly More Complicated System
A Slightly More Complicated System

Course Content

- Magnetically Coupled Circuits (Ch 13)
- Sinusoidal Steady-State Analysis (Ch 10)
- AC Circuit Power Analysis (Ch 11)
- Fourier Circuit Analysis (Ch 17)
- Circuit Analysis in the s-Domain (Ch 14)
- Frequency Response (Ch 15)
- Two-Port Networks (Ch 16)
- Polyphase Circuits (Ch 12) [ECE 325]
Transform-Based Solutions