ELEC 498 – Honours Thesis

Terms – Spring 2016 (201601), Summer 2016 (201605)

Instructor
Dr. Jens Bornemann
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Office Hours
Days: Mondays, Thursdays
Time: 15:00 – 16:00
Location: EOW 309

Title
Design and Linearization of a Power Amplifier for use in Earth Exploration Satellite Service Applications

Course Description

Part I
Investigation and analysis of various radio frequency power amplifier (RFPA) topologies and their applications. Understand the classification of RFPAs and the implication on trade-offs between power efficiency and linearity. Investigation and analysis of commonly employed linearization techniques including power back-off, pre-distortion, adaptive pre-distortion, feed-forward, envelope elimination and restoration (EER), linear amplification with non-linear components (LINC), and Cartesian feedback (CFB).

Part II
Design, prototype, and experimental verification of an RFPA for use in the S-band, Earth Exploration Satellite Service (EESS) using 16-QAM modulation scheme. Process includes:
- determination of requirements including link-budget calculation
- choice of transistor(s), driver(s), and basic topology
- model creation and simulation in software design tools
- creation of PCB layout and EM analysis
- fabrication of PCB
- experimental verification of prototype.

References: Literature, publications in journals and magazines

Assessment:
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<tr>
<th>Report</th>
<th>Weight</th>
<th>Date</th>
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<tbody>
<tr>
<td>Report I</td>
<td>40 %</td>
<td>01 Apr 2016</td>
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<tr>
<td>Presentation</td>
<td>20 %</td>
<td>TBA</td>
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<tr>
<td>Report II</td>
<td>40 %</td>
<td>29 July 2016</td>
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The final grade obtained from the above marking scheme for the purpose of GPA calculation will be based on the percentage-to-grade point conversion table as listed in the current Undergraduate Calendar.

**There will be no supplemental examination for this course.**

**Note to Students:**
Students who have issues with the conduct of the course should discuss them with the instructor first. If these discussions do not resolve the issue, then students should feel free to contact the Chair of the Department by email or the Chair's Secretary to set up an appointment.

**Accommodation of Religious Observance**
http://web.uvic.ca/calendar/GI/GUPo.html

**Policy on Inclusivity and Diversity**
http://web.uvic.ca/calendar/GI/GUPo.html

**Standards of Professional Behaviour**
You are advised to read the Faculty of Engineering document Standards for Professional Behaviour, which contains important information regarding conduct in courses, labs, and in the general use of facilities.
https://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult the entry in the current Undergraduate Calendar for the UVic policy on academic integrity.
http://web.uvic.ca/calendar/FACS/UnIn/UARe/PoAcI.html

**Course Lecture Notes**
Unless otherwise noted, all course materials supplied to students in this course have been prepared by the instructor and are intended for use in this course only. These materials are NOT to be re-circulated digitally, whether by email or by uploading or copying to websites, or to others not enrolled in this course. Violation of this policy may in some cases constitute a breach of academic integrity as defined in the UVic Calendar.