ECE496 Design Project
Final Proposal, End-of-term meetings,
Next Semester's Deliverables

Thursday, Nov. 14, 2019

Agenda
- Developing your technical design
- Finalizing your Project Proposal
  - Refining your project proposal document
  - Funding Requests
  - Safety & Ethics Review
- End-of-term meeting
- Progress report / progress review
- Oral Presentation
- Final Report
- Design Fair
- Beyond ECE496 ... Entrepreneurship at UofT [Paradi]

Developing your technical design
- Work closely with your supervisor
  - Address any technical concerns about the project
  - Understand their expectation of your technical progress by the end of this semester
Finalizing Your Project Proposal

- Final Proposal due Tue. Dec. 3rd, 3pm
- Strive to document your work, effort, and knowledge clearly and concisely
- Generous use of diagrams, tables, and lists
  Benefits: enforces organization, reveals holes in material, reduces writing, increases readability
  (but you must have some explanation of each to draw it into the flow of the document)
- Appendices for longer items that disrupt the flow and are support for your arguments. Refer to in the main body!

Writing vs. Communication

This is not about writing. This is about communication.

- Figures & Charts
- Lists & Tables & Bullets
- Screen shots

Representing your technical design

- Start with a System Block Diagram
Module-level descriptions

- Describe the modules individually so that their function, inputs, and outputs are clear
- Understand what are the key aspects of the design that your supervisor expects you to capture in the document

<table>
<thead>
<tr>
<th>Module</th>
<th>7-bit State Machine</th>
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</table>
| Inputs | - A Signal to reset the counter.  
          - B Signal to toggle the states between run and stop modes  
          - Clock: The clock signal. |
| Outputs| - Start Signal to reset the counter to zero.  
          - Control Signal that enables or disables the counter. |

Safety & Ethics Review

Safety Review

- Determine whether safety measures are needed

Ethics Review

- Required if testing on human or animal subjects
- Required if gathering personal information about people
- To be reviewed and approved by a Research Ethics Board (REB) before the work is started
- Informal assistance in this course:
  - Administrator/Professor Hans Kunov, h.kunov@utoronto.ca

Funding Requests

- Request for Design Centre support must be made separately by email to ask496@eecg
- Indicate what you want funding for – reusable items will be kept by the Design Centre if funded by them.
- You should include quote or similar information for all large pieces.

Funding notification around end of November

Ethics Review

This is the top of the 7-page form that you download from U of T’s Research Office.
It is in Word format for you to complete.
End-of-term meeting

- Different schedules for every section: Watch your email
- **Bad**: Nothing much to report since the Proposal Review
- **Good**: Progress made with supporting documentation
- **Best**: Do a show and tell – working code, user interface (layout only, perhaps), circuit on a proto board, etc. of a significant part of your project.

- Not marked but prepares you for progress report in Jan.
  - Follow up on issues raised during Proposal Review

Individual Progress Report/ Progress Review

- Progress report (due Tue Jan 14th)
  - marked by administrator
- First term progress review by supervisor

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Deliverable Guidelines

**Document Guidelines** – general guidelines that apply to all written deliverables

**Remaining deliverables** -- Guidelines specific to each one

Contains examples & suggestions – read through carefully

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Individual Progress Report

- A group progress summary plus individual reports
  - Group Progress Summary (Test Information In appendix)
  - Individual reports (for each student)

- Your individual accomplishments to date
Hints for the Progress Report

- Update on accomplishments (completed & underway)
  - Must be supported by tangible evidence or documentation
- Indicate problems you’ve encountered and overcome through your creativity and hard work.
  - This is why you have been told repeatedly to have an engineering notebook!!!
- FIX THE PROBLEMS FROM THE PROPOSAL (or continue to lose marks for the same things)

ECE496 alumni tip:

Keep an “evidence trail” on the work you do. We took too much time on our progress reports because we had to recreate evidence and remember what we had done.

- Ted Herman (ECE0T9+PEY)

Oral Presentation

- 2 Evenings (Tue or Thu)
- Evaluated by administrator and CI but unmarked dry run
  THEN
- Marked final presentation
  - (by administrator)
- Bring your own laptop
- Presentation length depends on team size
  - Team of 2 – 11 minutes
  - Team of 3 – 14 minutes
  - Team of 4 – 17 minutes
- Questions from audience in final presentation

ECE496 Deliverable Weighting

- Start
- Decide What you must Do
- Do It
- End

fall

spring

Proposal Review
Project Proposal
December review
Progress Review
Oral Report
Final Report & Design Fair

December review

Proposal Review

Project Proposal

Proposal Review

Oral Report

Final Report & Design Fair

- 8%
- 15%
- 17%
- 5%
- 55%
Final Report

■ Due before the Design Fair

Show you have followed the plan and reached the goal, satisfied the objectives and delivered the deliverables

---- or ----

Tell us what the problems were!

■ Be honest, don’t pad
  – administrator and supervisor familiar with work, just need to know what you finally accomplished

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Final Report

■ Key additions
  – Documentation and assessment of final design
  – System testing and results
  – A clearer, better articulated goal and requirements

■ Accomplishments need to be concrete tied to goals and requirements

■ The report is a shared, team responsibility
  – everyone contributes and makes clear which portion they write

■ Generous use of Diagrams!!!! Tables!! Lists!!!

■ Follow final report guidelines

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Leveraging your past work

Preparing your final report, poster, and demo from the start

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<th>Section</th>
<th>Draft A</th>
<th>Draft B</th>
<th>Final Draft</th>
<th>Individual Report</th>
<th>Group Presentation</th>
<th>Final Report</th>
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Design Fair Nights (Tue-Thu, Mar 31 – Apr 2)
Final Design Showcase  (Fri Apr 3, 12-2:30pm)

View 2015 Design Fair at https://youtu.be/tOHWeWEfHl0

Preparing a Design Fair Demonstration

- Think through its impact on a visitor
- Provide a fluid connection to the poster
- Highlight accomplishments
- Leveraging past work
  - Review the acceptance test from your Project Proposal
    - Example: cataract diagnosis
- Consider both live and static or constructed demonstrations

  *What will you need in terms of resources to do this?*

Design Fair

Components

1. Poster
2. Presentation / Demo / Questions

Your message to visitors:

"Here is the problem and why it's important. Here is what we accomplished, and proof that it works."

Resources for the Design Fair

- Some stations are simply a table (i.e. without a power outlet, network connections, computer, etc.)
- If your demonstration requires special equipment or facilities, you must notify Mike Mehramiz
Design Fair – grading

- Supervisors often grade outside the Design Fair to have more time to better assess what you finally accomplished.
- Your individual grade from the administrator will be based on the following criteria:
  - the quality of the poster
  - the ability to explain your work
  - the ability to provide correct responses to questions posed by the administrator
  - project progress and complexity
  - a successful demonstration

Time Conflicts (Oral Presentation or Design Fair)

If your presentation conflicts with evening midterms or other courses:
- If partially overlapping, group usually presents after the test.
- Ask instructor of other course to move the test date or allow you to write your test earlier.
- Inform your administrator as soon as possible!

Awards / Programs

- Gordon Slemon Design Award ($1000)
- CNIB Hochhausen Prize ($1500)
- Centennial Thesis Awards (2: top CPE & top ELE)
- Certificates of Recognition/Invitation to Final Showcase

Many students get jobs based on their project!

Claiming Project Expenses

- All expenses must be based on the budgets that were submitted, reviewed and approved by teams.
- Original receipts required.
- Some items purchased with support from us to be returned as indicated in initial approval of request.
- See ‘Budget Funding’ page for details.
Updating your project profile

- Keep your project title and description up-to-date
- Must be done by team leader

To do Checklist

To do:
- Complete Safety and Ethics review (if required)
- Watch for emails for scheduling end-of-term meetings and for the assignment of Oral presentation nights
- Talk to your supervisor to understand
  1. Their expectations of your technical progress by the end of this semester and
  2. The key aspects of the design that should be included in the technical design section of the Final Proposal

Beyond ECE496 ...

- Inspiring tomorrow’s entrepreneurs by Prof. Paradi

Questions......
First a bit about me
- My family and I arrived as refugees from Hungary in 1957, May 7.
- I finished my high school and entered the UofT Engineering in 1961.
- Completed my BASc in 1965 and PhD in 1975 all in Chem Eng
- I left the UofT in 1969 and founded a company, Dataline Systems Ltd. We IPOd in March 1969. I lead the firm for 20 years and it grew well.
- I joined FASE in 1989-90 in Industrial Engineering and moved to Chem Eng in 2000. An explicit requirement was that I could start an Entrepreneurship program – this was supported by the 4 Deans since.
- My research interests are focused on the financial services industry.

Entrepreneurship at UofT
Professor Emeritus Joseph C. Paradi

Entrepreneurship Courses I started since then
- APS234 ENTREPRENEURSHIP AND SMALL BUSINESS
- APS432 ENTREPRENEURSHIP AND BUSINESS MANAGEMENT
- CHE488, MIE488, CIV488 and ECE488 the last 2 are not running now
- ENTREPRENEURSHIP AND BUSINESS FOR ENGINEERS. These courses are the identical except the instructors, all practitioners, no academics
- APS1033 BUSINESS INNOVATION LEADING TO THE FUTURE, BASED ON IMAGINEERING
- APS1088 ENTREPRENEURSHIP AND BUSINESS FOR ENGINEERS

The Engineering Hatchery
- I started and Founded it in 2012.
- The Entrepreneurship Hatchery provides a comprehensive suite of programs and services designed to help students with entrepreneurial ambitions form teams, develop new competencies and launch their companies.
- To date we had guided over 90 startups – some successful, some not.
- The problems you send us will be shared with U of T students at the Hatchery Idea Market. When a team finds a solution, we will get in touch with you.
- From there it is all fun and learning!!
Startups

• The Entrepreneurship Hatchery provides a comprehensive suite of programs and services designed to help students with entrepreneurial ambitions form teams, develop new competencies and launch their companies.
• Over the last seven years, The Hatchery has helped to launch 94 new startups, as of last Sunday, which collectively have raised close to $40 million in seed funding.
• Students start by attending events throughout the school year — the Hatchery offers Idea Markets, Speaker Series, Coffee Days, Co-founders Day, Hatchery Circle, Accelerator Weekend — events that nurture a strong culture of entrepreneurship on campus.

There are four processes

• Teams apply to one of the Hatchery’s four processes:
  • Hatchery NEST, designed for all current U of T undergraduate students, but in all teams an Engineer must be a partner
  • Hatchery LaunchLab caters to graduate-level research driven startups looking to commercialize their discoveries. Typically the grad student’s supervisor also gets involved in the group.
  • Hatchery Social, which enables social impact startups such as non-for-profit and socially critical challenges
  • Start@UTIAS+Hatchery, designed for UTIAS students or recent grads with the goal of feeding into either the NEST or LaunchLab stream.

The Process

• First, a project is identified and either through the Idea Market or by the team, members are unified into teams
• Through the summer, they work on their ideas
• These are done by the end of the summer and about a dozen of the best groups are selected to participate in the "Demo Day"
• Early September the big event is to show of the projects
• The audience is VC’s lawyers, angel investors, industry experts, etc.
• A Judging Panel is formed from Hatchery alumni, VCs, financiers, etc.
• Prices are 1st $20,000, 2nd and 3rd $10,000 Peoples Choice $2,500

What is Demo Day?

• Demo Day is the culmination of The Hatchery NEST
• The teams are judged by senior people from banks, VCs, lawyers and other experienced entrepreneurs. Prize money is there too.
• This a four-month process where student teams in pairs are matched up with experienced mentors — including executives, lawyers, entrepreneurs etc. - to develop their businesses.
• They receive detailed feedback on their business plans, explore their proposed market, learn about patents and marketing
• With the facilities available they build prototypes using 3D printers and other fabrication resources.
Other UofT Entrepreneurship Programs
Incubators & Accelerators

Creative Destruction Lab (CDL)
Focus: Tech companies ready to launch, scalable business models, equity value creation
Features: Mentorship, Education, Funding Opportunities, Growth Acceleration, Impact, Solutions

Department of Computer Science Innovation Lab (DCSIL)
Focus: Computer vision, artificial intelligence, data science, computational vision, security, augmented reality, virtual reality
Features: Mentorship, Education, Funding, Collaboration, Entrepreneurship, Innovation, Solutions

Health Innovation Hub (Hi2)
Focus: Creative solutions for health makers
Features: Mentorship, Collaboration, Education, Funding, Entrepreneurship, Innovation, Solutions

ICUBE UTM
Focus: Early-stage business development and commercialization
Features: Mentorship, Collaboration, Education, Funding, Entrepreneurship, Innovation, Solutions

More of other initiatives

Impact Centre
Focus: Physical technologies
Features: Mentorship, Collaboration, Education, Funding, Entrepreneurship, Innovation, Solutions

InnovEd
Focus: Early stage business development and communication
Features: Mentorship, Collaboration, Education, Funding, Entrepreneurship, Innovation, Solutions

The BRIDGE
Focus: E-commerce planning and creative provision in the design and development, research and innovation
Features: Mentorship, Collaboration, Education, Funding, Entrepreneurship, Innovation, Solutions

The Hub at UTSB
Focus: Early-stage innovation and entrepreneurship
Features: Mentorship, Collaboration, Education, Funding, Entrepreneurship, Innovation, Solutions

UTEST
Focus: Creation of startup companies based on research created at the University of Toronto
Features: Mentorship, Collaboration, Education, Funding, Entrepreneurship, Innovation, Solutions