APS111 & APS113 Course Schedule Fall 2014 – Student Version

Date	Tuesday	Thursday	Friday	Tutorial Activities	Assignments[1] / Notes
WK 1 Sep 01 to Sep 05		**Plenary Lecture** • Guest speaker: Michael Branch 9 am to 10:30 am Convocation Hall	**Course Introduction** - SM[2] • Course overview • Intro design project & PSQ[3] • Course strategies *Readings[4]:* *Project Description posted on Blackboard* *M1. Introduction* *M2. Design process overview* *M3. Phases of the project*	**Tutorial 1** • No Tutorial	
WK 2 Sep 08 to Sep 12	**Design Process Overview** – SM • Overview engineering design process • Import. problem defn • Intro Problem Statement • Intro Functions, Objectives, & Constraints *Readings:* *M4. Communicating through the process* *M5. What Engineers design* *M7. Navigating the engineering design process* *M9. Introduction to requirements*	**Client Statement & Refrigeration** – SM • Analysis of client statement • Refrigeration *Readings:*	**Communication Intro & 1st Assignment** – MS[5] • Communication overview • PSQ assignment • Research *Readings:* *M79. Critical Thinking - Basic Concepts* *M83. Communication in Engineering*	**Tutorial 2** • No Tutorial	

[1] Documents and Turnitin submissions of all assignments are due by 12:10pm on the day of your tutorial in the designated week of the assignment deadline.
[2] Susan McCahan
[3] Problem Statement & Questions assignment
[4] It is recommended that you complete these readings before lecture. Readings from the *Designing Engineers* textbook are listed by the Module number, i.e. M1, M2, etc.
[5] Melanie Stevenson

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WK 3 Sep 15 to Sep 19	**Team Strategies** – SM • Stages in team organizing and producing • Forming an effective team • Deciding how to decide *Readings:* *M41. Working in Teams – Overview* *M42. Working in Teams – Organizing* *M44. Working in Teams – Producing* *M30. Decision Methods for Teams*	**Team Strategies & Adding Information** – SM • Dealing with team issues • Moving from client statement to requirements • Adding information *Readings:* *M45. Managing teams* *M46. Working in teams - Management strategies* *M21. Introduction to information gathering*	**Detailing the Requirements** – SM • Adding information • Functions • Functional basis *Readings:* *M10. Functions* *M18. Functional basis* *M22. Benchmarking*	**Tutorial 3** • Engineering notes • Project intro • Problem Statement activity	• **Online PSQ Help[6]:** Wed 17-Sep, 9pm-10pm
WK 4 Sep 22 to Sep 26	**Identifying all of the Functions** – SM • Functional basis • Black box method • Decomposition *Readings:* *M18. Functional basis* *M19. Black box method* *M20. Decomposition*	**Detailing Objectives & Constraints** – SM • Objectives • Organizing objectives • Prioritizing objectives • Measuring objectives • Constraints *Readings:* *M11. Objectives* *M12. Constraints* *M23. Pairwise comparison*	**PR & Credibility** – MS • PR[7] assignment • Credible communication in Engineering *Readings:* *M80. Critical thinking and your design documents* *M81 Making and supporting statements effectively* *M84 Organizing your communication*	**Tutorial 4** • Team introductions • Team rules • Team leader discussion • Decision making • Client statement dissection	• **Deadline:** Top Hat Registration Fri 26-Sep • **PSQ Due for all tutorials:** Tutorial day of Wk 4

[6] Online help sessions will be conducted on Blackboard Collaborate, accessible through the "Online Help Session" folder in the course Blackboard site. Students can access Bb Collaborate an hour before the start of the scheduled session time.
[7] Project Requirements

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WK 5 Sep 29 to Oct 03	**Service Environment & Stakeholders** – SM • Service environment • Stakeholders *Readings:* *M13. Documenting the context* *M14. Describing stakeholders* *M15. Describing users, operators and clients* *M16. Characteristics of good requirements* *M17. Requirements summary – putting it altogether*	**Moving into Conceptual Design** – SM • Moving from requirements to idea generation • Design space • Brainstorming *Readings:* *M24. Introduction to idea generation* *M25. Brainstorming*	**CDS** – MS • CDS[8] assignment *Readings:* *M85. Visual communication*	**Tutorial 5** • PR: Functions, Objectives, and Constraints • Librarians will be in Bahen lobby at 2pm after tutorials on Mon,Wed, & Thu (Ask librarian a good research question, receive 3 PD bonus points; max of 3 points per student)	• **PSQ Return:** Through Email • **Online PR Help:** Wed 01-Oct, 9pm-10pm • **Optional PR Draft[9] Due:** Thu 02-Oct for Mon tutorials and Sat 04-Oct for Wed tutorials
WK 6 Oct 06 to Oct 10	**Idea Generation** – SM • Decomposition • SCAMPER • Design by analogy *Readings:* *M26. Creativity methods* *M27. Morphological charts, analogy, and TRIZ*	**Idea Selection** – SM • Multi-voting • Graphical decision method • Weighted decision matrix *Readings:* *M29. Methods for selecting a design solution* *M30. Decision methods for teams*	**Design from the User Perspective** – SM • Describing users & operators • Current perspective on user-centered design • Types of user-centered design processes & terminology *Readings:* *M15. Describing users, operators and clients*	**Tutorial 6** • CDS: Idea Generation	• **Optional PR Draft Due:** Sun 05-Oct for Thu tutorials and Mon 06-Oct for Fri tutorial • **PR Due for all tutorials:** Tutorial day of Wk 6 • **Sketchup Workshop:** Thu 09-Oct 6pm-8pm, MB128

[8] Conceptual Design Specification

[9] If a team wishes to receive ungraded feedback from the TA on their team assignment prior to the assignment deadline so that they can correct important errors before grading, the team can submit one draft to the TA four days before the assignment deadline. The TA will only be checking the draft for any major errors – the TA will not read or comment on everything. The TA may instruct teams to submit a draft by a certain time. Submitting a draft is optional.

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WK 7 Oct 13 to Oct 17	**Design in industry** – SM • Spectrum of problem solving in practice • How project originate • Case study *Readings:* *M6. How design projects are initiated* *M96. Problem spectrum – Open, constrained and closed* *M97. Solving closed problems*	**Case Study** – SM • Team check up Case study of an industry design project	**PR Revision** – MS	**Tutorial 7** • PR debrief • CDS: Idea Selection • Mon Tutorial Cancelled. Reschedule Mon tutorials' debriefs either 10-Oct, 12pm-1pm OR 17-Oct, 12pm-1 pm (to be scheduled by TA)	• **PR Return:** In tutorial
WK 8 Oct 20 to Oct 24	**Introduction to Module B: Constraints and Other Considerations** – JO[10] • Constraints: economics, environment, society, sustainability, life cycle assessment and costs • Considerations: human factors, stakeholders, service environment, • Design for sustainability & resiliency *Readings:* *M12. Constraints*	**Legislation, Regulations, Policies & Standards –** JO • Purpose / why needed • Levels of government / standard setting organizations • Hierarchy of legislative instruments • Best practices and due diligence • Engineers and legislation *Readings:* *M65 – The role of codes in safety engineering* + http://www.engineerscanada.ca/sites/default/files/positions_demandside.pdf **EVENING MIDTERM EXAM**	**Economics 1–** JO • Macroeconomics versus microeconomics • Engineering economics • Costs and benefits, including types • Break even analysis • Payback period *Readings:* *M89. Economics Basics* *M92. Types of Costs and Revenues* *M93. Payback Period Case Studies*	**Tutorial 8** • CDS: Idea Selection • Librarians will be in Bahen lobby at 2pm after tutorials on Mon & Thu (Ask librarian a good research question, receive 3 PD bonus points; max of 3 points per student)	• **Online CDS Help:** Tue 21-Oct, 9pm-10pm • **Online Midterm Exam Help:** Wed 22-Oct, 9pm-10pm • **Midterm Exam:** Thu 23-Oct**,** 6:10pm to 7:20pm (Logistics to be announced) • **Optional CDS Draft Due:** Thu 23-Oct for Mon tutorials and Sat 25-Oct for Wed tutorials

[10] Jacinta O'Brien

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WK 9 Oct 27 to Oct 31	**Economics 2–** JO • Time value of money • Interest rate and calculations • Present value and net present worth • Estimated costs • Accounting for risks *Readings:* *M90. Time and Money Calculations*	**Environment 1** – JO • Definition of "environment" • Evolution of the "environmental movement" • Impacts on the environment • Pollution control and prevention • 3Rs *Readings:* *M59. Design for the Environment Introduction*	**Environment 2** – JO • Codes and best practices for designing for the environment • Life Cycle Assessment *Readings:* *M60. Life Cycle Assessment* *M61. LCA Goal Definition and Scoping* *M62. LCA Inventory Analysis* *M63.LCA Impact and Improvement*	**Tutorial 9** • Oral Presentations • TED Talks	• **Optional CDS Draft Due:** Sun 26-Oct for Thu tutorials and Mon 27-Oct for Fri tutorials • **CDS Due for all tutorials:** Tutorial Day of Wk 9
WK 10 Nov 03 to Nov 07	**Oral Communication –** MS • Oral communication *Readings:* *M86. Influencers of communication* *M87. Organising presentations* *M88. Effective slides*	**Human-tech – Physical & Psychological** – BD[11] • Defin / goals of HF[12] Eng • Human-tech ladder: design to support physical & psychological HF • Example applications *Readings:* *The Human Factor: Ch 1-5*	**Human-tech Team, Organizational & Political** – BD • Human-tech ladder: design to support team HF • Example applications *Readings:* *The Human Factor: Ch 1-5*	**Tutorial 10** • CDS debrief	• **CDS Return:** In tutorial • **Teaching Evaluations (TAs & CIs):** Online evaluations for TAs & CIs to be posted on Blackboard for students to fill out
WK 11 Nov 10 to Nov 14	**Social Considerations and Stakeholders** – JO • Social impacts on design • Design impacts on society • Stakeholders and the importance of stakeholder engagement *Readings:* *M14. Describing Stakeholders*	**Sustainability –** JO • Definition and evolution • Balancing economy, environment, society • Common terms • Designing for sustainability (industrial ecology *Readings:* *M64. Sustainability*	**Design Process 8 Implementation Strategies**– JO • Comparison of design alternatives • Evaluation methodologies • Conflicts between objectives and among stakeholders *Readings:* *M29. Methods for Selecting a Design Solution*	**Seminar 1**[13]	

[11] Birsen Donmez
[12] Human Factors
[13] TAs are not involved with seminars. Seminars for students are not in the same room as the tutorials, nor are they with the same tutorial groups. Students are to consult the ESP Office if they have not received an email in Week 10 with their assigned seminar's logistics.

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WK 12 Nov 17 to Nov 21	**Lecture Cancelled** • (Con Hall used for convocation 18-Nov)	**Engineering Leadership --** Leaders of Tomorrow • Leadership & Engineering • Leadership • Self-awareness & leadership • Values, talents & passions Leadership style	**Lecture Cancelled** • (Con Hall used for convocation 21-Nov)	**Seminar 2**	
WK 13 Nov 24 to Nov 28	**Professional Practice – Code of Ethics and Legal Responsibilities** – JO • What it means to be a licensed engineer / requirements for licensure • Code of ethics / ethical behaviour • Discipline and enforcement (Elliot Lake Mall Collapse) • Liability – personal and contractual *Readings:* *M82. Skeptical Thinking*	**Module B Review** – JO • Highlights of key concepts	**Final Exam Review** - JO/MS • Wrap up • Introduction to APS112 • Final Exam review	**Seminar 3**	
WK 14 Dec 01 to Dec 05	**Lecture Cancelled**	**Faculty Study Day**	**Final Exam Period starts**		• **Online Final Exam Help:** Thu 4-Dec, 9pm-10pm • **Final Exam:** TBD (Room assignments to be posted by Registrar's Office)
Dec 08 to Dec 19	**Final Exam Period (Dec 05-Dec 19)**				