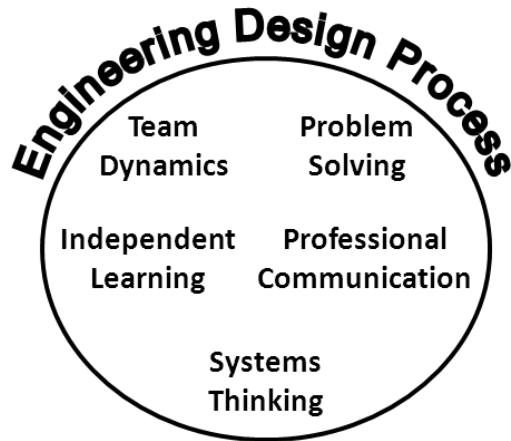


# Engineering Strategies and Practice

## Syllabus

Engineering Strategies and Practice (ESP) is a foundational design course sequence that uses the engineering design process as a context for developing skills essential to the practice of engineering:



This two-course sequence – ESP I in the fall term and ESP II in the winter term - will introduce

Figure 1: ESP Skills

you to these five skills. By designing a solution to a problem for a client you will learn to problem solve with creativity, methodology and credibility. In conducting background research for your project you will practice independent learning skills. You will be required to take into account factors outside of the technical such as environmental, societal, ethical, and human factors and in doing so you will develop a systems thinking approach in your work. In reporting your solution you will make use of effective written, oral, and graphical professional communication. Finally you will achieve all of this while working efficiently in a team.

In summary the primary course objective is to encourage you to start synthesizing and integrating your knowledge to make you a better engineer.

### ***ESP I***

ESP I introduces the design process through a common design project given to all teams. In your assigned team you will grapple with the challenges of an engineering design problem while working efficiently in a team. Writing and reading, as engineering activities, are introduced. You will also learn how to identify and take into account factors such as economics, environment, society, and human factors, as frontline design considerations. In the second half of the course, you will participate in a seminar. In small groups you will discuss a topic unique to your seminar that in addition to engineering content requires broader considerations when making a professional recommendation. You will be assigned readings on the topic and required to express your opinion through an oral presentation.

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## ***ESP II***

Now that you have experience with the engineering design process you will be assigned your own unique design project completed with a real client. You will learn the basics of project management, how to approach a complex problem and break it down into solvable parts, and how to acquire and use information in the design process. Working in a team with a real client, you will go through a complete design process to develop an initial workable solution to meet a client's need. The end result will be a written final design specification, an oral presentation, and for teams that excel a prototype, proof-of-concept model, or simulation.

## ***Lectures***

Tuesday 9:10 – 10:00 am, Convocation Hall

Thursday 9:10 – 10:00 am, Convocation Hall

Friday 9:10 – 10:00 am, Convocation Hall

Attendance at lectures is mandatory. The first lecture is on Tuesday, January 6, 2015 in Convocation Hall.

## ***Tutorials***

Attendance at tutorials is mandatory. Check ROSI for the day, time and location of your tutorial. There is no tutorial in Week 1 (January 5-9), however there is a tutorial agenda that lists things you are expected to have completed before your Week 2 tutorial. Tutorials start in Week 2 (January 12-16). On Blackboard, check the course schedule for details about tutorial activities and the tutorial agendas for specific expected deliverable for each tutorial. Consult with your ROSI schedule to see which one of the following tutorial sections you are to attend:

T01 – T06	Monday	4:10 p.m. to 6:00 p.m.
T07 – T12	Tuesday	4:10 p.m. to 6:00 p.m.
T13 – T18	Wednesday	4:10 p.m. to 6:00 p.m.
T19 – T24	Thursday	4:10 p.m. to 6:00 p.m.
T25 – T30	Friday	4:10 p.m. to 6:00 p.m.
APS113 T01	Friday	2:10 p.m. to 4:00 p.m.

In addition to this weekly tutorial you are encouraged to arrange a weekly meeting with your team to discuss project progress, conduct team business, to make project decisions, and to work on team written documents. Regular meetings with your Communications Instructor would also be beneficial.

## ***Textbook***

In ESP II we use the same e-textbook that was used in ESP I (APS111 and APS113 Fall 2014). If you already purchased it for ESP I, then you do not need to purchase any other book. You are responsible for readings assigned from the e-book and any additional readings posted on

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Blackboard. Content from these readings will be evaluated even if the material was not covered directly in lecture. It is important to keep up with the readings. Consult the course schedule for the assigned reading list.

- ***Designing Engineers: An Introductory Textbook (S. McCahan, P. Anderson, M. Kortschot, P. Weiss, and K. Woodhouse )***

This textbook is a pre-publication version of a design textbook being written by members of the ESP teaching team and other experts in the field. This textbook will not be available in hard copy and instead an e-book version will be available for purchase for a nominal fee. Purchasing the textbook online requires a credit card. If you do not have access to a credit card then you can purchase an a redemption code from the U of T Bookstore. The e-book version is downloadable to a single computer (PC or MAC). After the initial download the book is available offline. The book file is only viewable through the VitalSource viewing software, which can be downloaded from this link:

<http://www.vitalsource.com/index/wiley>

This viewing software allows for highlighting text and notations. If you buy a new computer, you can contact VitalSource Technical Support who can help you move the e-book to your new computer. Copy protection restricts you to printing 10 pages at a time or copying up to two pages at a time. Those who have purchased the e-book will also be able to access it via a browser from any computer with internet access. Finally there are free apps for both iOS and Android that allow mobile access to purchased books.

To purchase the e-book online, please go to this direct link for the correct textbook:

<http://store.vitalsource.com/show/9781118843956>

If you go to the general Vital Source website and search for the e-book instead of using the direct link above, you might encounter older versions of the e-book that are different and incomplete. The current correct version of the e-book is: ***Designing Engineers: An Introductory E-Text by McCahan for \$39.95 US E-ISBN: 9781118843956***

If you had purchased a redemption code from the U of T Bookstore, please note that you will need to first install the VitalSource Bookshelf software. After you have successfully installed the software, do the following to redeem and download the textbook:

1. Launch the VitalSource Bookshelf.
2. Under the “Help” menu (at top), select “activate new content.”
3. Login (or register if this is your first time)
4. Enter your redemption code.

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5. Click "Redeem."
6. Go to "All Titles. Select the title you just redeemed.
7. Click "Download"

Once downloaded, your Wiley E-Text will appear in the VitalSource Bookshelf on your computer. You can access your digital text anytime since an internet connection is not required.

Note: If you have purchased a redemption code from the Bookstore, it takes 24 hours from the time of purchase for the code to be activated. You must wait for the 24 hours to pass before you can redeem your code on VitalSource.

## ***Special Supplies***

Besides your textbooks and standard stationary there are some special supplies required for ESP. These are described below.

## **Engineering Notebook**

You must document your progress on your project. Standard practice in industry is to use a hardcover notebook. It is recommended you use a standard bound lab notebook such as a black or blue physics or chemistry lab book. The size, color, and/or page format (ruled or quad) does not matter. A loose-leaf binder or spiral bound notebook is not acceptable. An example of a notebook is available here: <http://bit.ly/engnotebook>

If you always have your laptop / tablet with you, you may prefer to use a digital solution for your engineering documentation. If you opt for this you should have some organizational structure such as OneNote, Evernote, Google Docs, etc. You should also have a means of capturing sketches for inclusion in your documentation. This could be a stylus on a tablet or a cell phone camera with high enough resolution.

You may reuse your engineering notebook from APS111 if it has sufficient pages left. Clearly indicate in the book where APS111 ends and APS112 begins.

## **Google Account**

Assignments in this course are required to be written using Google Docs (Google Drive). This requires you to have a Google account. A Google account is different from a Gmail account. If you already have a Google account using your Gmail address, please set your mail.utoronto.ca address as your alternate email address in your Google account, or sign up for another Google account with your mail.utoronto.ca address. If you don't have a Google account, sign up free of charge using the link below. (Click on "I prefer to use my current email address" to set up an account using your mail.utoronto.ca address.)

<http://tinyurl.com/6s6vya>

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## Top Hat (TH) Account

Your Professional Development grade requires you to answer in-lecture course concept questions using the TH system. You must be registered with Top Hat (<http://www.tophat.com>) to earn these marks. The registration fee has already been paid for you by the Faculty. Course instructors will ask course concept questions in lecture to gauge students' understanding of course material. As well, students may ask instructors questions via TH in lecture. See the Top Hat Instructions posted on Blackboard for more information on registration. See the Professional Development grade section below for more details about the marking.

**Note: You must enroll in the ESP II Winter 2015 Top Hat class to receive grades in Winter 2015. Please use the Top Hat Instructions posted on Blackboard to enroll correctly.**

## SMS Text-Capable Cell Phone

To participate in the in lecture course concept questions via Top Hat you will need an SMS text-capable cellular phone. Currently, Convocation Hall does not have WiFi access for you to connect to TH on your laptop. Regular SMS text costs will apply. You can expect to send approximately 60-180 text messages in total for ESP I and ESP II. If you do not have an SMS text-capable cellular phone, you may contact the ESP Office for assistance.

## Marking

The marks for ESP II are broken down as indicated in Table 1.

Table 1 - ESP II mark breakdown

Evaluation	% of final mark
Team Documents: Project Requirements & Project Management Plan Conceptual Design Specification Final Design Specification	30%
Presentations: Design Review Gateway in-tutorial presentation: 3% Final presentation: 20%	23%
Quizzes (2)	24%
Individual Assessments: Lessons Learned & Strategy Project Manager Report	20%
Professional Development (PD grade consists of lecture participation and safety training. Other PD activities are bonus. )	3%
Total	100%

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## Project Manager Report

This is an individual mark assigned by your Project Manager (PM). Your PM will be assessing the overall quality and quantity of your participation in the design project from his/her perspective, including your weekly contributions to the progress of the project, your attendance and participation at the weekly meeting with your PM, and your team dynamic skills. Your PM may use peer evaluations as one source of information in determining the above criteria. See the PM Report document for additional details.

## Quizzes

There are two quizzes in ESP II. The first takes place roughly midterm, the second takes place at the end of the term. See the course schedule for specific date, time, and location. Quiz logistics will be posted in Blackboard closer to the evaluation date.

Both of the quizzes are Type A exams as defined in the Faculty Calendar. This means that no printed materials can be used as an aid during the tests with the exception of a translation-only paper dictionary. The quizzes are closed book and closed notes. No electronic dictionaries are permitted at the exams.

Instead of writing a final exam in ESP II, you will be conducting your final oral presentations on your design project.

## Professional Development (PD)

Professional behaviour is a series of habits that you must start developing immediately. You will not be able to “switch on” professionalism once you graduate. It is just as important for you to project a professional image in your lectures and tutorials as it is in client meetings and interviews. A portion of your course grade will be allocated based on indicators of your professional behaviour.

The greatest input into this grade is your ability to attend and follow along in ESP lectures. In most lectures the instructor will ask multiple course concept questions through the Top Hat system. For each question, 0.5 mark will be for answering correctly and 0.5 for participating. At the end of the term, the total number of the Top Hat questions plus the point for the Health & Safety Training (posted on Blackboard) will be the total possible marks for Professional Development.

*NOTE: To answer in lecture questions you must be physically present. Attempting to answer without being physically present is an academic offense.*

Throughout the term there will be opportunities to earn “bonus PD points.” These opportunities will be announced. Bonus points will be posted on Blackboard at the end of the term. The bonus points will be added to your PD grade on our spreadsheet when we calculate your overall course grade at the end of term. It is possible to exceed 100% for your PD grade if you amass enough PD bonus points.

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Your ability to collect PD marks will depend on registering for a TH account and having access to an SMS capable cell phone (see the Special Supplies section above and the Top Hat Instructions posted on Blackboard).

## **Attribution Table**

For all team assignments an attribution table must be completed and signed by all team members. The attribution table must be reviewed by all of the team members prior to the document debrief session to make sure that all members agree on the information given in the table. The information must be fair and accurate.

If the table indicates a substantial discrepancy in contribution (i.e. a large difference in the contributions among the team members) then the marks assigned to individual team members may be reduced to reflect this discrepancy. The TA will give an overall “team mark” on the assignment. The TA will then use the attribution table, the document revision history, and the assignment debrief meeting to ascertain the contribution of each member to the development of the document. If the TA determines an imbalance in contribution, he or she will decide on a reduced mark for the under-contributing team member(s). These marks are simply lost. They are NOT redistributed to the other team members. This is because one of the learning objectives of these team assignments is to manage to work effectively in a team. Under-contributing team members mean that the team has failed to achieve this learning objective.

## ***Course Communication Mechanisms***

It is important that you keep in contact with the ESP Teaching Team. These lines of communication are maintained in a number of different ways:

### **Blackboard**

This site can be accessed through the U of T portal. Go to the U of T homepage and click on “Portal.” You will need your UTOR ID and password to login.

The site is where we will post class announcements and all course documents and where you can access your term marks as they become available. This is the primary mode of course communication outside of lecture and tutorial. It is expected that you will check Blackboard frequently for information.

### **Public Course Website**

The public ESP website ([www.esp.engineering.utoronto.ca](http://www.esp.engineering.utoronto.ca)) is for the general public, such as ESP II clients, and not students. All student information will be found on Blackboard as mentioned above.

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## Email

Do not email questions on course content, instead post the question on Piazza (see below). Only in exceptional cases will course content questions be answered via email.

If you do send an email to a member of the teaching team consider it a professional email. This means that you must adhere to the Professional Email Style Requirements posted on Blackboard. Failure to do so may result in no response to your email.

Do not put an automatic forward on your U of T email. We have had difficulty in the past with Hotmail and other providers filtering out U of T originated messages. If your email provider has this compatibility problem with the U of T system, you will miss important course information. A missed email will not be considered sufficient justification for the granting of petitions. Be sure you are getting all the course notices.

## Piazza

We will be using Piazza for class discussion. The system is intended help you get answers to your questions as fast and efficiently as possible. The tool allows you to post your question to all your peers and members of the teaching team. We can then collaboratively answer your question. If you are not satisfied with your peers answers you can keep the question unresolved and a member of the teaching team will either answer it themselves or endorse a student's answer.

If you prefer you can use the tool to send a question privately to the teaching team.

You are strongly encouraged to use this tool to ask your questions rather than email. Only in exceptional circumstances will a question be answered via email.

You can enroll in our class Piazza page at:

<https://piazza.com/utoronto.ca/winter2015/aps112>

## ***Cheating and Plagiarism***

This course has both team and individual assignments. Check the instruction sheet for each assignment to identify whether it is an individual assignment or a team assignment. When working collaboratively with other members of the class, as with all professional communication, reports must bear all of the names of all the people who contributed to them, and acknowledge their contribution. It is considered plagiarism to submit a paper solely under your own name (i.e. take credit for it) if the content was written all or in part by someone else. While it is acceptable to re-use your own material in the iterative process within a given project, it is considered plagiarism to re-use your own material for another project. If you are ever in doubt whether something constitutes plagiarism **ask a member of the teaching team**.

When submitting assignments that are to be written individually, you must never copy even a portion of another student's paper, or let another student copy yours. Failure to adhere to this



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rule is considered to be plagiarism – by both parties involved. Do not allow another student to borrow a draft of your assignment and do not leave a copy of your assignment where others may use it. **The University takes cheating of any kind very seriously.** Possible penalties for cheating include a negative mark on an assignment, zero in the course, annotations on your transcript, or even expulsion from the University. It is simply not a risk worth taking, no matter how desperate you may feel. It is far better to submit a substandard assignment than take the chance of incurring the kinds of academic penalties that the University will impose. For more information on the definition of academic and non-academic offences, procedures and penalties, please review the University of Toronto Faculty of Applied Science and Engineering Calendar.

If your workload is such that you are feeling totally overwhelmed, please talk to the Course Coordinator, the Course Administrator, First-Year Counsellor, or the Academic Success Centre (Koffler Centre). There are programs to assist you in learning how to cope with the University workload.

In this course you will be submitting your assignments to Turnitin.com, a software package licensed by the University of Toronto that is designed to detect plagiarism. Students agree that by taking this course, all required papers will be subject to submission for textual similarity review to Turnitin.com for detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com website.

Submitting a document to Turnitin that is different than the version you submit for grade evaluation is an academic offense.

## Sharing Work outside Your Team

Giving another team access to documents that you or your team has created constitutes academic offence (cheating):

- Because you are enabling plagiarism to occur;
- Because for team written documents you, individually, do not have sole ownership of the intellectual property (ideas and words) contained in the team document. It is unethical and illegal to give away intellectual property that does not belong to you without the permission of the owner, in this case the whole team.

## Sharing Work within Your Team

Assignment feedback from a member of the teaching team belongs to the entire team. It is not acceptable for a member of the team to refuse to share this feedback. Also, it is the responsibility of each team member to make available to their team-mates the written work they have prepared for the shared project. This includes meeting minutes, notes from client interviews, drafts of reports, etc. Withholding work that pertains to the team project, or

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feedback, from your team-mates is considered academic dishonesty and demonstrates poor team skills.

If you are frustrated by the dynamics within your team, and/or your team-mates' behaviour, it is important to address this in an appropriate and effective way. Your TA, CI, and PM (APS112 only) can help you resolve these issues and help you, as a team, develop strategies for working successfully with each other. Remember: most projects do NOT fail for technical reasons they fail because of planning and team problems.

## ***Late Assignments, Missed Activities and Requests for Re-Marks***

This course will give you an idea of the professional environment you will likely be working in when you join the workforce. As such we have strict policies in place to govern adherence to deadlines and re-marking of deliverables (i.e. assignments).

### **Late Assignments and Missed Activities**

Deadlines for course assignments are strictly enforced. Extra time to work on an assignment is not fair to others in the class who have not had the same opportunity.

For each portion of 24 hour period past the deadline there is a 10-mark (out of 100) penalty on that assignment. Late assignments will not be accepted beyond 72 hours past the deadline. After that point, a grade of "zero" will be assigned and the assignment will not be evaluated. The weekend counts toward these penalties.

*Example: If the deadline is Wed Sep 18 at 12:10pm and you submit your assignment on Fri Sep 20 at 12:11pm, your assignment will be accepted but with a 30-mark penalty. If you try to submit your assignment on Sat Sep 21 at 12:11pm, it will NOT be accepted and you will receive zero on the assignment.*

An assignment is only considered submitted once ALL components, as per the assignment instructions, of the assignment are submitted. An assignment with an incomplete submission will continue to accrue late penalties until the additional components are submitted or the 72 hour maximum late period passes.

Late penalties for team assignments apply to the entire team regardless of who was responsible for submitting the document. You are expected to have a team process in place so that all members of the team can verify that the assignment has been submitted.

If you have a reason for a late assignment, a missed quiz or presentation, etc., you must submit a Petition for Consideration in Course Work with supporting documentation to the ESP Office within a week of returning to class from illness, or a week from the assignment deadline.

If you know in advance that you will miss a deadline for a mandatory course activity, such as an assignment, quiz or presentation, you must submit the petition before the date of the activity. In addition, you must apply before the deadline or activity to determine if there is a possibility

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for you to make up the work, or if an extension can be granted. Note: a petition does not excuse you from work.

If you are missing mandatory course activity due to religious observances, you must submit a petition to the ESP office **at least three weeks** before the date of the activity. The three-weeks advance notice is in accordance with the University of Toronto's policy on Accommodations for Religious Observances as students would normally be aware of upcoming religious observances and course activities in advance.

## Course work petitions for ESP are submitted as follows:

- Fill out the *Petition for Consideration in Course Work – Fillable* PDF form posted in the Course Documents folder on the Blackboard course portal.
- Email the completed petition form to ESP: [esp@ecf.utoronto.ca](mailto:esp@ecf.utoronto.ca)
- Include supporting documentation as applicable:
  - Absence due to:
    - Illness: Email to ESP a completed petition form, and bring to the ESP Office in GB149 a *Verification of Student Illness* form (<http://www.illnessverification.utoronto.ca/>) signed by a registered medical physician.
    - Participation in athletic or other types of competition: Email to ESP a completed petition form, and bring to the ESP Office in GB149 an official letter from the coach.
  - Other types of supporting documentation may be submitted to ESP by email ([esp@ecf.utoronto.ca](mailto:esp@ecf.utoronto.ca)) or in the office (GB149) as appropriate.

## Re-marking of Assignments

Requests for a remark due to an error in the grading will be heard by one of the course coordinators within one week of the return of an assignment to all tutorial sections. Students may request a meeting in person at the ESP Office to give evidence of the error and to explain the problem. Potential errors could include:

- TA misinterpreted a course concept
- Disagreement between the rubric and the comments on the document

In the week of the return of an assignment, if there is an error in the marking, go to the ESP Office in GB149 to sign up for a meeting slot. Prior to the meeting, share your Google Docs assignment file with [esp@ecf.utoronto.ca](mailto:esp@ecf.utoronto.ca) (give us the “can edit” access to look at your revision history). Bring to the meeting the assignment's marked rubric; a note with your name, student number (and team mates' names and numbers if applicable) and brief descriptions of the marking errors; and any other supporting documentation/evidence to make your case.

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The results of the meeting will be provided to you by email. The results are final. Your grade may be raised OR lowered as a result of the remark request. For team assignments only one member of the team must attend, but all team members must have signed a letter indicating their desire to have a remark done.