

Department of Electronics Program Orientation September 4, 2018 10:30-11:30 am



Prof. N. Tait: Chairman
Prof. R. Gauthier, Associate Chair (EE SREE Undergraduate)
Prof. T. Smy (Eng. Phys. Undergraduate)



Location
ME 4499 EE
ME 3269 SREE, Eng. Phys.

DEPARTMENT OF ELECTRONICS

doe.carleton.ca

- Main Office: Mackenzie Building 5170
- Departmental Chair: Niall Tait
- Associate Graduate Chair: Steven McGarry
- Associate Undergraduate Chair: [Robert Gauthier](#)
- Departmental Administrator: [Blazenska Power](#)
- Graduate Assistant: Anna Lee
- Administrative Assistant: Lisa Chiarelli
- 24 faculty members, ~800 full time undergraduate students

DEPARTMENT OF ELECTRONICS

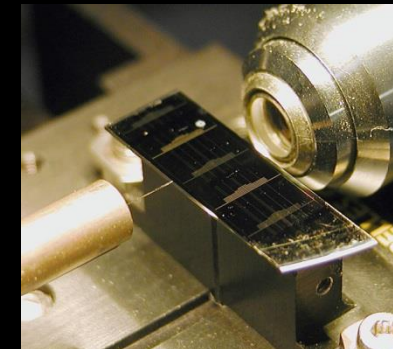
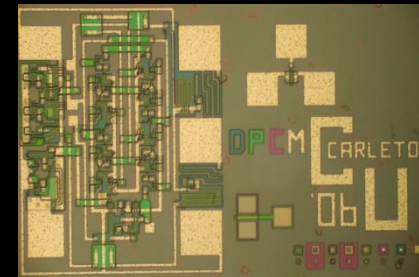
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- Programs are offered in collaboration with other academic units
- Electronics is the administrative lead or home department for:
 - Electrical Engineering
 - Engineering Physics
 - Sustainable and Renewable Energy Engineering A.
- For help or advice with these *programs* contact the Associate Undergraduate Chair (Prof. Gauthier). For help or advice with *specific courses*, you may need to contact the instructor or department offering the course.

DEPARTMENT OF ELECTRONICS

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- The Department of Electronics isn't just about undergraduate programs:
 - Student organizations
 - IEEE student branch
 - Carleton University Robotics Club
 - Carleton Student Engineering Society
 - <https://carleton.ca/engineering-design/community/clubs-and-societies/>
 - Research
 - Microfabrication
 - Integrated circuit design
 - Microwaves and electromagnetics
 - Optics and photonics
 - Power and Energy
 - Electronic Design Automation



WATCH OUT

• Can't study all the time!!!

• Can't party all the time!!!

• It is very difficult to find the right balance!!!



ADVICE FOR SUCCESS

- Be aware of important dates and deadlines
- Know the regulations of your program (read the appropriate sections of the undergraduate calendar)
- Stay “on-stream” (scheduling and prerequisites)
 - Pass all of your courses
 - Do not postpone courses (including complementary studies electives)
 - Hand in reports and assignments on time
- For each hour of lecture time, allocate one hour of study time (yes that’s a lot of hours – but you are in a tough engineering program that leads to eventual P. Eng. designation and rewarding career)
- Have fun as well -- get involved with Carleton clubs and join in student activities

Topic examined and explained in Faculty address

ACADEMIC INTEGRITY STANDARDS

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- See 14.0 of Academic Regulations (in calendar) for details
- Plagiarism (presenting another person's ideas or work as your own) (Internet, journals, books)
- Unauthorized cooperation or collaboration
- Misrepresentation (admission documents, medical certificates, etc.)
- Impersonation (student card, computer account, etc.)
- Obstruction and interference (tampering with equipment, data etc.)
- Disruption of classroom activities
- Improper access to- or dissemination of confidential information
- Assistance in violation of the standards of academic activity (eg. allowing another student to copy lab report, or assignment)
- Violation of regulations for tests and examinations (unauthorized memoranda or communication, copying)
- Will not be tolerated and there are a range of punishments if offence proven
- Engineering is a profession with a strong code of ethics.

Topic examined and explained in Faculty address

TODAY'S SESSION

- First year objectives
- The engineering method
- Important dates
- Program structure
- Common questions



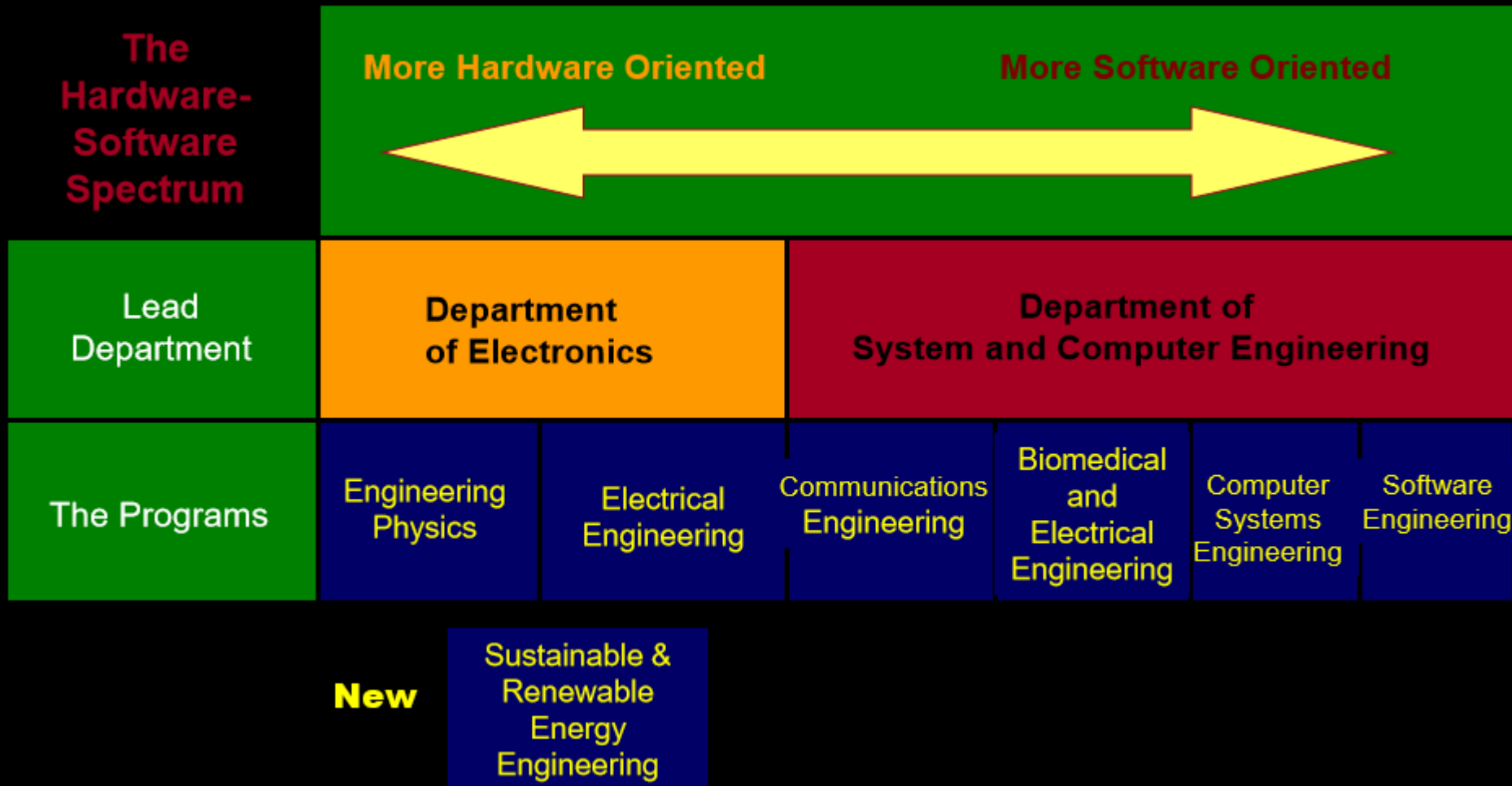
FIRST YEAR OBJECTIVES (CAPA)

- **C**ompletion: Must complete all required first year courses before you can take any second year courses!
- **A**ttendance: Students are expected to attend all classes and labs, but it's your responsibility and liability!
- **P**erformance: Aim for the highest achievement in all courses, get help early!
- **A**ttitude: Work first, then play, and at all times be Professional Engineers In training

THE ENGINEERING METHOD¹⁰

- Throughout all engineering programs, beginning in first year, you will be taught the engineering method or approach.
- The engineering method is a disciplined approach to problem solving which consists of:
 - 1) Defining the problem and solution requirements properly;
 - 2) Making any suitable and justifiable assumptions necessary to solve the problem;
 - 3) Proposing different solutions and evaluating their relative merit with regards to meeting requirements, cost, timeline, and safety;
 - 4) Solving the problem while assessing and mitigating against risk of failure and harm to the public.
- The engineering method differentiates engineering students from pure math and science students – you will be conditioned to become a professional who must take responsibility for your work and its consequences to the public

ELECTRICAL AND COMPUTER ENGINEERING



Program Coordinators

Electrical → R. Gauthier

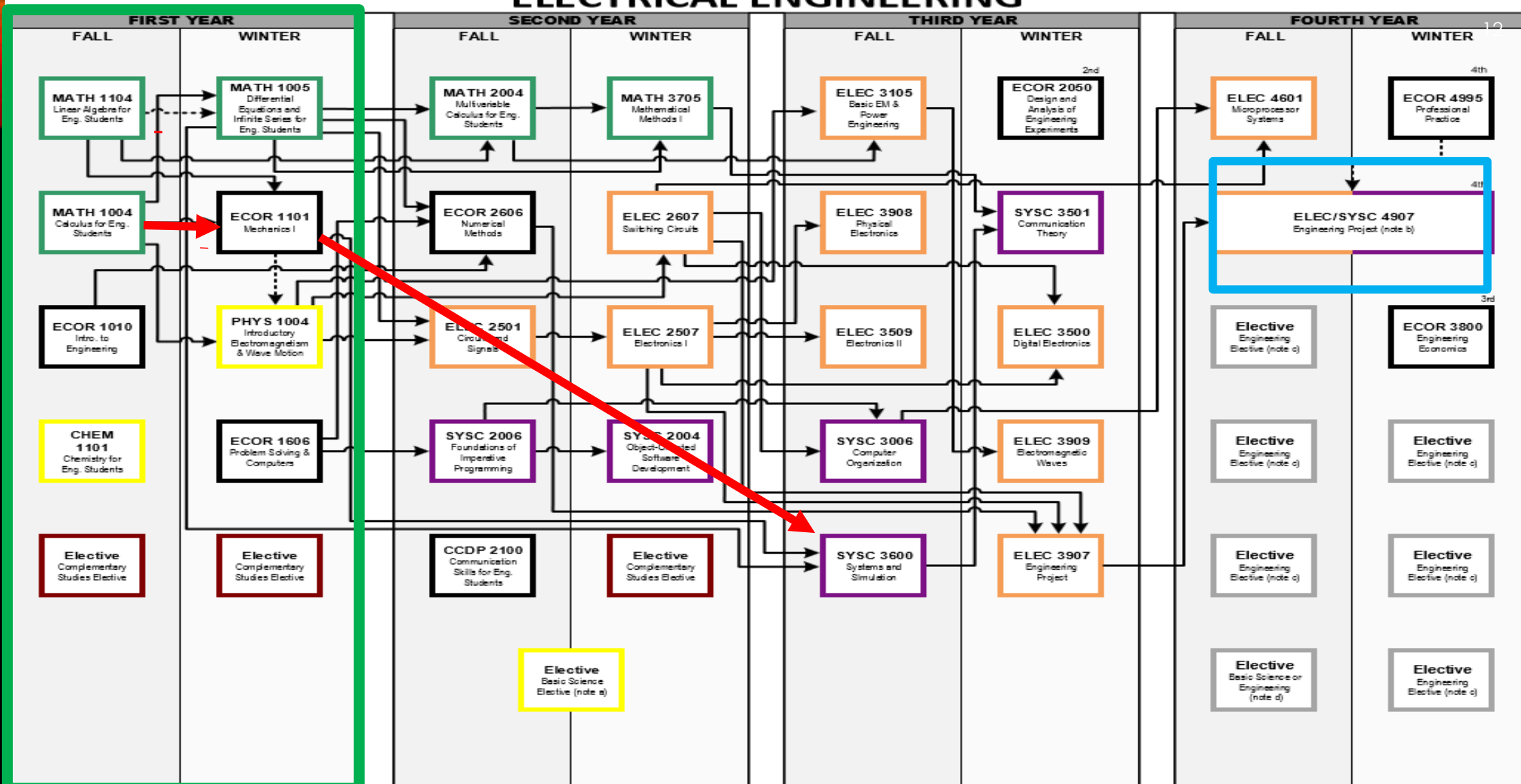
Eng.-Phys → T. Smy

SREE-A → R. Gauthier

Co-Op → S. Gupta

ELECTRICAL ENGINEERING

2018/06/05



Dashed line indicates concurrent prerequisite
*Pror or *4th year status also a prerequisite

PREREQUISITES

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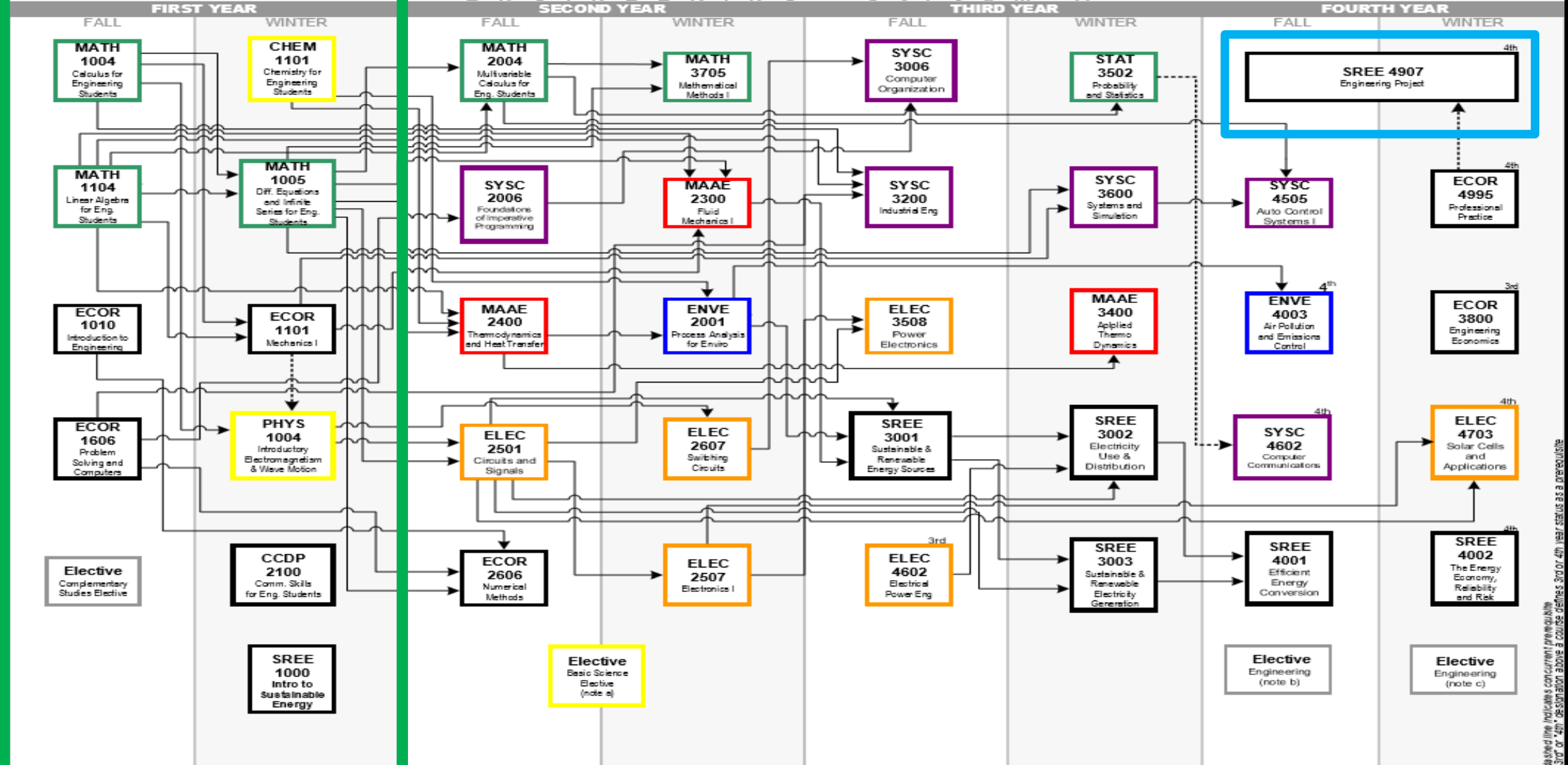
- **Prerequisite Consequences**

- **specified prerequisites must be completed before some courses can be taken; failure to complete prerequisite courses has consequences in timely completion of your program.**

In engineering, upper-year courses depend upon the knowledge you have acquired and developed from lower-level courses. This concept is applied through a system indicating which prerequisite courses must be successfully completed in order to be eligible for enrollment in your preferred upper-year courses

S U S T A I N A B L E & R E N E W A B L E E N E R G Y E N G I N E E R I N G S t r e a m A

As of May 25, 2017



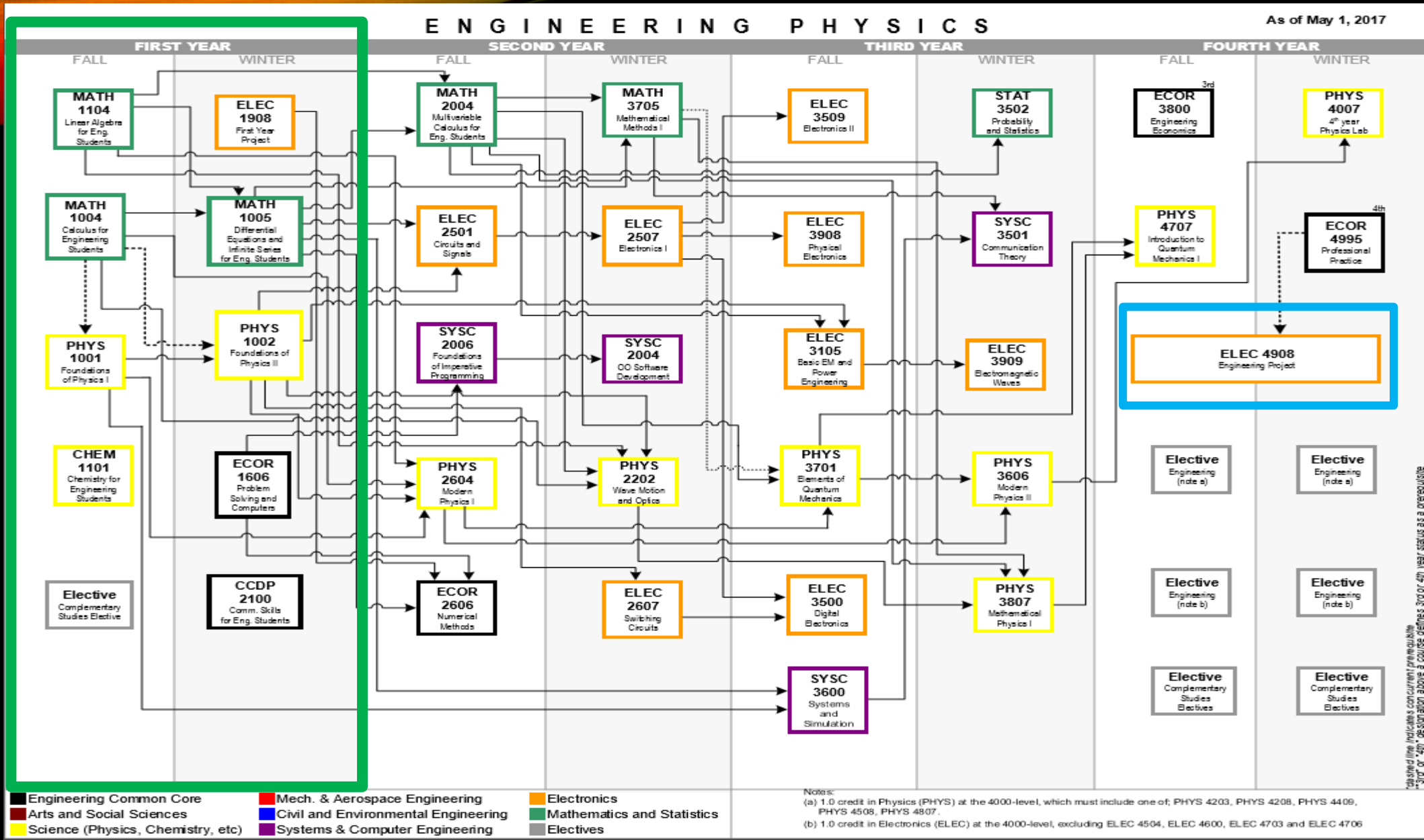
Engineering Common Core
 Mech. & Aerospace Engineering
 Electronics

Arts and Social Sciences
 Civil and Environmental Engineering
 Mathematics and Statistics

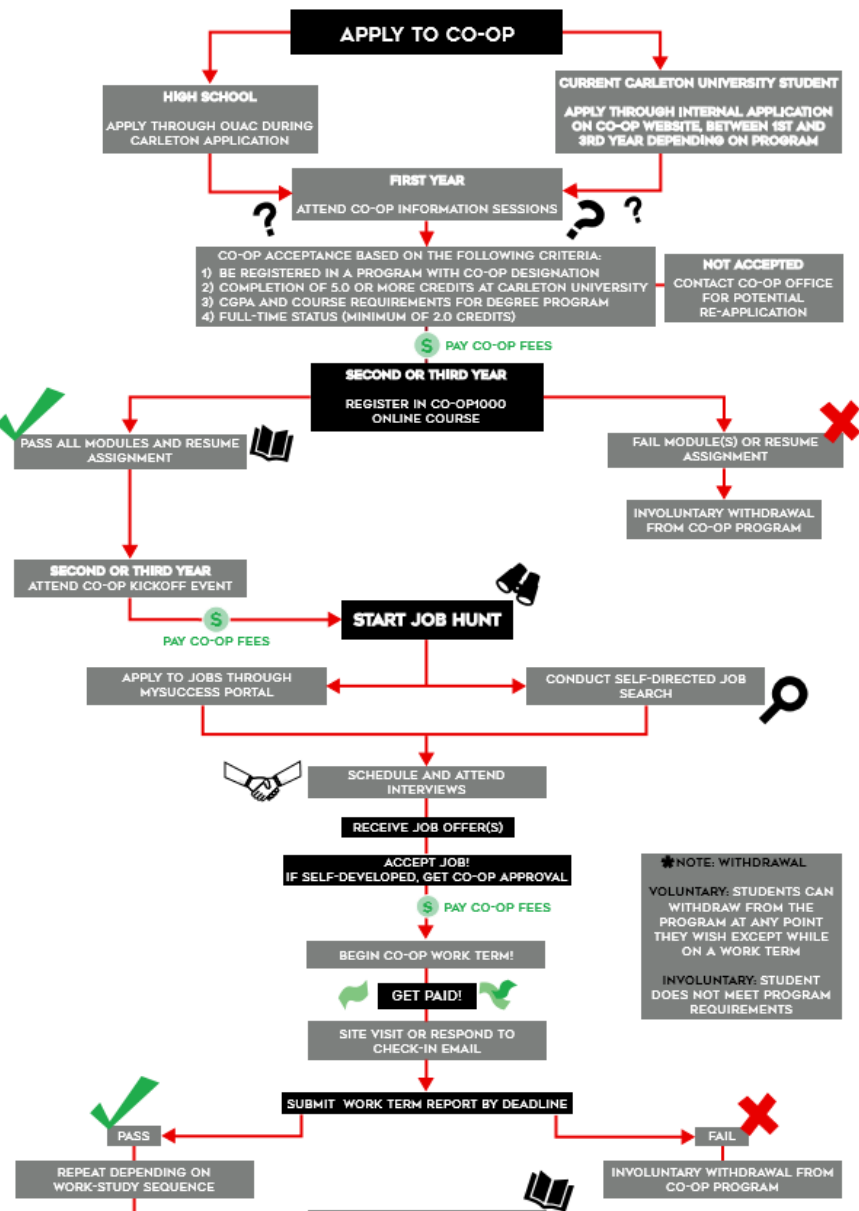
Science (Physics, Chemistry, etc)
 Systems & Computer Engineering
 Electives

Note: (a) 0.5 credit of Basic Science Electives; taken in fall or winter term.
 (b) 0.5 credit of any 3XXX or 4XXX level engineering course for which prerequisites have been satisfied.
 (c) 0.5 credit of any 4XXX level engineering course for which prerequisites have been satisfied.

Published line indicates current prerequisite
 **3rd or 4th designation above a course defines 3rd or 4th year status as a prerequisite



UNDERGRADUATE STUDENT CO-OP PROCESS



CO-OP PROGRAM

Early entry from high-school with > 85% in core math and science (can do work term 1) Late entry with B+ average in study terms 1,2, and 3 (do work terms 2-6)

	Fall	Winter	Summer
Year 1	Study Term 1	Study Term 2	Work Term 1 (optional)
Year 2	Study Term 3	Study Term 4	Work Term 2
Year 3	Work Term 3	Study Term 5	Study Term 6
Year 4	Work Term 4	Work Term 5	Work Term 6
Year 5	Study Term 7	Study Term 8	

<https://carleton.ca/co-op/wp-content/uploads/Undergraduate-Co-op-Process.pdf>

ACADEMIC PERFORMANCE EVALUATION ¹⁷

- **Occurs after each Winter term** (section 7.0 of University Regulations)
- Outcomes are Good Standing, Academic Warning, Continue in Alternate, or Dismiss from Program)
- Academic Warning means the cumulative grade point average (CGPA) is low. (need 5.0 to graduate)
- If the warning is not converted to good standing after the next evaluation a Continue in Alternate is assigned
- If CGPA < 1.0 then the decision will be Dismiss from Program

MINIMUM CGPA



Program credits completed	Honours	Architecture (Design), B.I.D. programs	Engineering programs	15.0 credit General	20.0 credit Major, B.I.T.
0.0 to 5.0	Overall 4.00	Overall 3.00	Overall 4.00	Overall 3.00	Overall 3.00
5.5 to 10.0	Overall 4.50 Major 5.50	Overall 3.50	Overall 4.50	Overall 3.50 Major 3.50	Overall 3.50 Major 3.50
10.5 to 15.0	Overall 5.00 Major 6.00	Overall 3.50	Overall 5.00	Overall 4.00 Major 4.00	Overall 3.50 Major 3.50
15.5 or more	Overall 5.00 Major 6.50	Overall 4.00	Overall 5.00		Overall 4.00 Major 4.00
Graduation	Overall 5.00 Major 6.50	Overall 4.00	Overall 5.00	Overall 4.00 Major 4.00	Overall 4.00 Major 4.00



HOW TO CALCULATE YOUR GPA

12	A+	90-100%	6	C+	67-69%
11	A	85-89%	5	C	63-66%
10	A-	80-84%	4	C-	60-62%
9	B+	77-79%	3	D+	57-59%
8	B	73-76%	2	D	53-56%
7	B-	70-72%	1	D-	50-52%

Calculate your GPA

- STEP 1: List all of the courses you've attempted, the corresponding credit values (0.5 credit or 1.0 credit), and your final grades
- STEP 2: Record the grade points earned for each course and add them up. **Remember** 0.5 credit courses are worth half of the point value (i.e. B+ are 9.00 points for a 1.0 credit, but 4.50 points for 0.5 credit course).
- STEP 3: Add up the number of credits that you've taken
- STEP 4: Divide the total number of grade points by the total number of credits

Course	Final Grade	Credit value	Corresponding grade point
INAF 5200	B+	0.5	4.5
INAF 5320	B-	0.5	3.5
INAF 5110	A-	0.5	5.0
INAF 5450	B	0.5	4.0
INAF 5560	B+	1.0	9
		Total credits: 3.0	Total grade pts: 26.0
		Overall CGPA	26.0/3.0 = 8.7

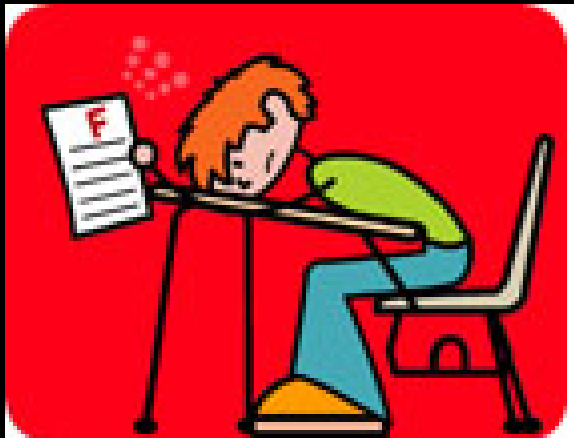
9/4/2018

POTENTIAL REWARDS

- **Graduating students in any undergraduate degree will have exceptional academic achievement recognized if the student:**
 1. Has completed at least 10.0 credits toward the degree at Carleton University, and
 2. For the designation High Distinction, has an Overall CGPA equal to or greater than 10.40.
 3. For the designation Distinction, has an Overall CGPA less than 10.40 and equal to or greater than 9.80.
- **These recognitions of exceptional merit will be recorded on the student's transcript and diploma.**
 - Co-op placements
- **To be admitted and remain in COOP the students CGPA must be 8.0 or higher**
- **Need at least B+ (9.0) for graduate studies (highly competitive)**

THREE FAILURES RULE

- In Engineering, a student who fails the same course three times must leave the degree with status Continue in Alternate or Dismissed from Program (see 7.1.2 of University Regulations)
- May still apply to other programs in Carleton University



DISCREDITS

When you're failing a class but so is your friend so it's really not that bad

Think again



- Discredits can be acquired in a number of ways
 - a course registration that results in a grade of F.
 - See regulation 6.3 in the undergraduate calendar
- Students are permitted **5.0 credits** of discredits. Upon reaching **5.5 discredits**, students are removed from their program and a "CA" Continue in Alternate decision will be applied to their records.

<https://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/acadregsuniv2/>

<https://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/acadregsuniv6/#6.3>

YOUR PROGRAM

- **Engineering is a 4-year program** – **You** can tailor it somewhat to your interests through choice of electives and possible minor area (math / business are popular)
- **You manage your own time.** You often have hours between classes; class times vary throughout the day and evening and you spend only 15 to 20 hours each week in class and labs...don't let that fool you– the work load out of class is heavy.
- **You** must balance your responsibilities and set priorities.
- **You must act ethically** – you are engineers-in-training – a profession with ethical and moral obligations to serve the public. Plagiarism and cheating are dealt with severely.
- **You** make your own schedule in the future semesters
- **Graduation requirements are complex.** **You** are expected to know those that apply to you. Read the calendar regulations and see your advisor for answers to questions

IMPORTANT DATES

Event	Fall Date
Classes begin	September 5
Last day to register	September 18
Last day to withdraw (full fee adjustment)	September 30
Fall Break	October 22 - 26
Last day to submit PMC [★] request	November 9
Classes end / last day to withdraw	December 7*
Final Examinations	December 9 - 21
University closed	December 25 – January 1/19
January 18 – 20 / 25 - 27	Deferred Examinations

★ PMC: Paul Menton Centre
<https://carleton.ca/pmc/>



* Classes follow Monday schedule

IMPORTANT DATES

Event	Fall Date
Classes begin	January 8
Last day to register	January 19
Last day to withdraw (full fee adjustment)	January 31
Winter Break	February 19 - 23
Last day to submit PMC [★] request	March 9
Classes end / last day to withdraw	April 8*
Final Examinations	April 14 - 26
Deferred Examinations	May 18 - 29

★ PMC: Paul Menton Centre
<https://carleton.ca/pmc/>



* Classes follow Friday schedule

COMMON QUESTIONS ²⁶

- **Program Transfer** - normally requires GPA of 8.0 (B) or better to transfer from one program to another + space in program
- **Complementary Studies** - ONLY those courses listed as **Approved** on the [Eng. Academic Support Website](#) for the year in which you take the course.

<https://carleton.ca/engineering-design/current-students/undergrad-academic-support/cse/>

- **Basic Science Elective** - ONLY those courses listed as **Approved** on the [Eng. Academic Support Website](#) for the year in which you take the course.

<https://carleton.ca/engineering-design/current-students/undergrad-academic-support/basic-science-elective/>

COMMON QUESTIONS ²⁷

- **Year Standing** - based on number of credits completed counting towards degree

One term course = 0.5 credits	
First year	Less than 4.0 credits
Second year	4.0 to 8.5 credits
Third year	9.0 to 13.5 credits
Fourth year	14 or more credits

<https://carleton.ca/academicadvising/your-academic-audit/year-standing/>

COMMON QUESTIONS ²⁸

- **Year Status** - status is based on number of specific courses that must be completed in each year of program

Status NOT the Year Standing in Engineering	
First year	Admission to program
Second year	completion of all Engineering science and math courses in first year + all ESL requirements, if an
Third year	completion of 4.0 credits from second year
Fourth year	completion of ALL second year + 3.5 credits from third year

INTERNET RESOURCES ²⁹

- University: www.carleton.ca
 - Undergraduate Calendar: <https://calendar.carleton.ca/undergrad/>
 - Electronics (DOE): www.doe.carleton.ca
 - Systems and Computer Engineering (SCE): www.sce.carleton.ca
 - Engineering Academic Support: <https://carleton.ca/engineering-design/current-students/undergrad-academic-support/>
-
- When contacting faculty and staff by e-mail ALWAYS use your **CMAIL** account and state your Carleton **student number**.

SUPPORT FOR FIRST YEAR ENG. STUDENTS

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- Elsie MacGill Learning Centre
 - Need help with first-year courses, language skills or general transition issues? Upper-year engineering students and staff from Linguistics and Language Studies are here to answer your questions.
 - The Elsie MacGill Learning Centre is a free service provided for all current 1st year Bachelor of Engineering students. The Scholars will assist you with transition to University issues, questions related to any of your core engineering, mathematics and science courses as well as CCDP 2100, and English Language written communication skills matters. This support service complements the normal course support, including PASS for certain courses, available to you.
- Location: 5030 Minto Centre

Leave a Reply

Your email address will not be published. Required fields are marked *

Comment

Name *

Email *

Website

HOW TO BECOME A P. ENG.?

- be at least 18 years old
- be of good character
- meet PEO's stipulated academic requirements for licensure (hold an undergraduate engineering degree from a **C**anadian **E**ngineering **A**ccreditation **B**oard (**CEAB**)-accredited program, or possess equivalent qualifications), and, if required, successfully complete any technical exams.
- fulfill the engineering work experience requirements (demonstrate at least 48 months of verifiable, acceptable engineering experience, at least 12 months of which must be acquired in a Canadian jurisdiction under a licensed professional engineer); and
- successfully complete PEO's Professional Practice Examination (PPE)

FINALLY

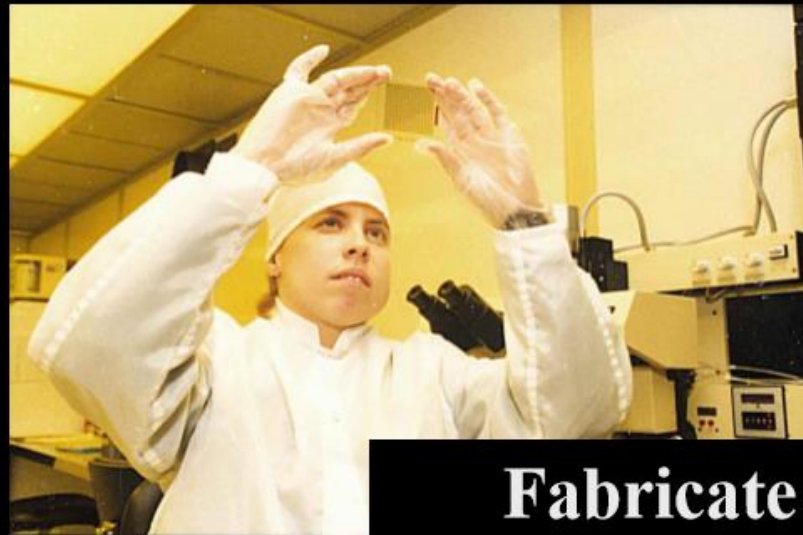
- Work hard and enjoy your studies!
- In your future engineering career, continue to study – we teach fundamentals
- Engineering is an exciting and rapidly evolving field. Grasp onto new concepts and ideas – use your engineering analysis skills to bring new designs to reality.
- Be prepared for a lifetime of learning!



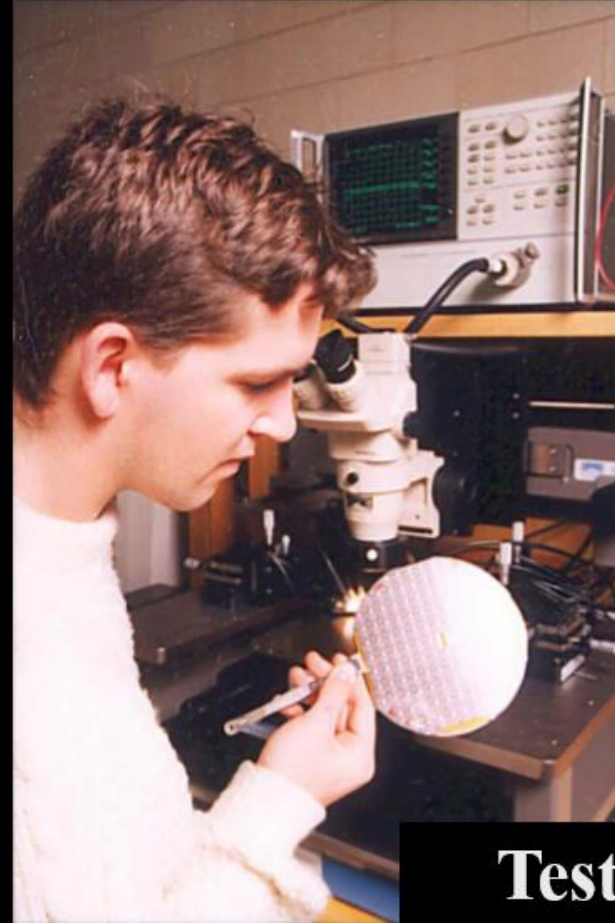
Electrical Engineering



Design



Fabricate



Test



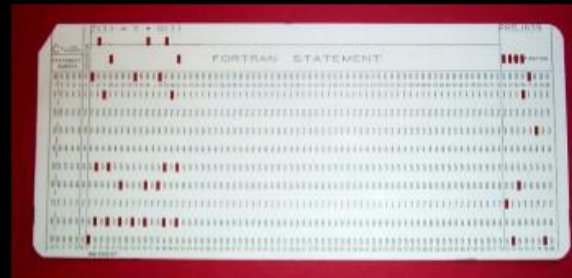
Carleton Engineering 1970



IBM1620 mainframe (1MHz clock)

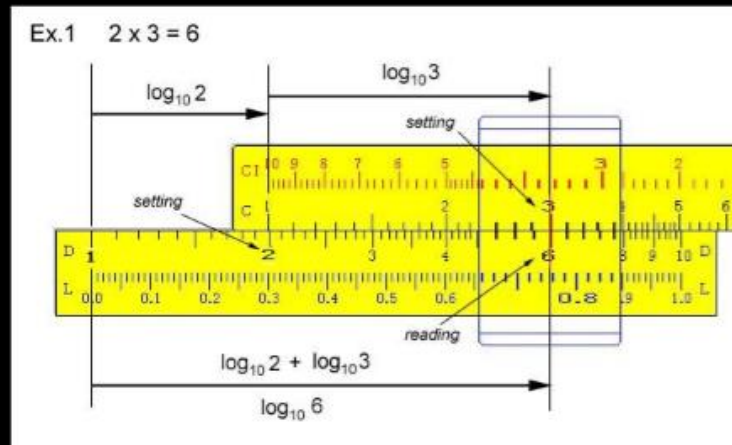


Card punch data input



FORTRAN statement on punched card

Carleton Engineering 1970



Slide rule
(mechanical analog computer)
Multiply and divide only

Wang calculator (4 available)





(Modern) Electrical Engineering

- 1958-First working integrated circuit (Jack Kilby)
- 1967-first handheld calculator invented by Texas Instruments (Jack Kilby)
- 1970-first CD-ROM patented (James Russel)
- 1972- first home video game system (Magnavox Odyssey)
- 1973 – first modern cell phone (Motorola)
- 1994 – first GPS system working (US DoD)
-

All invented and developed by electrical engineers

Your contribution as EE?

Information Technology Device



www.shutterstock.com · 39407308



Sustainable & Renewable Energy Engineering (SREE)



Stream A: Smart Technologies for Power Generation and Distribution.



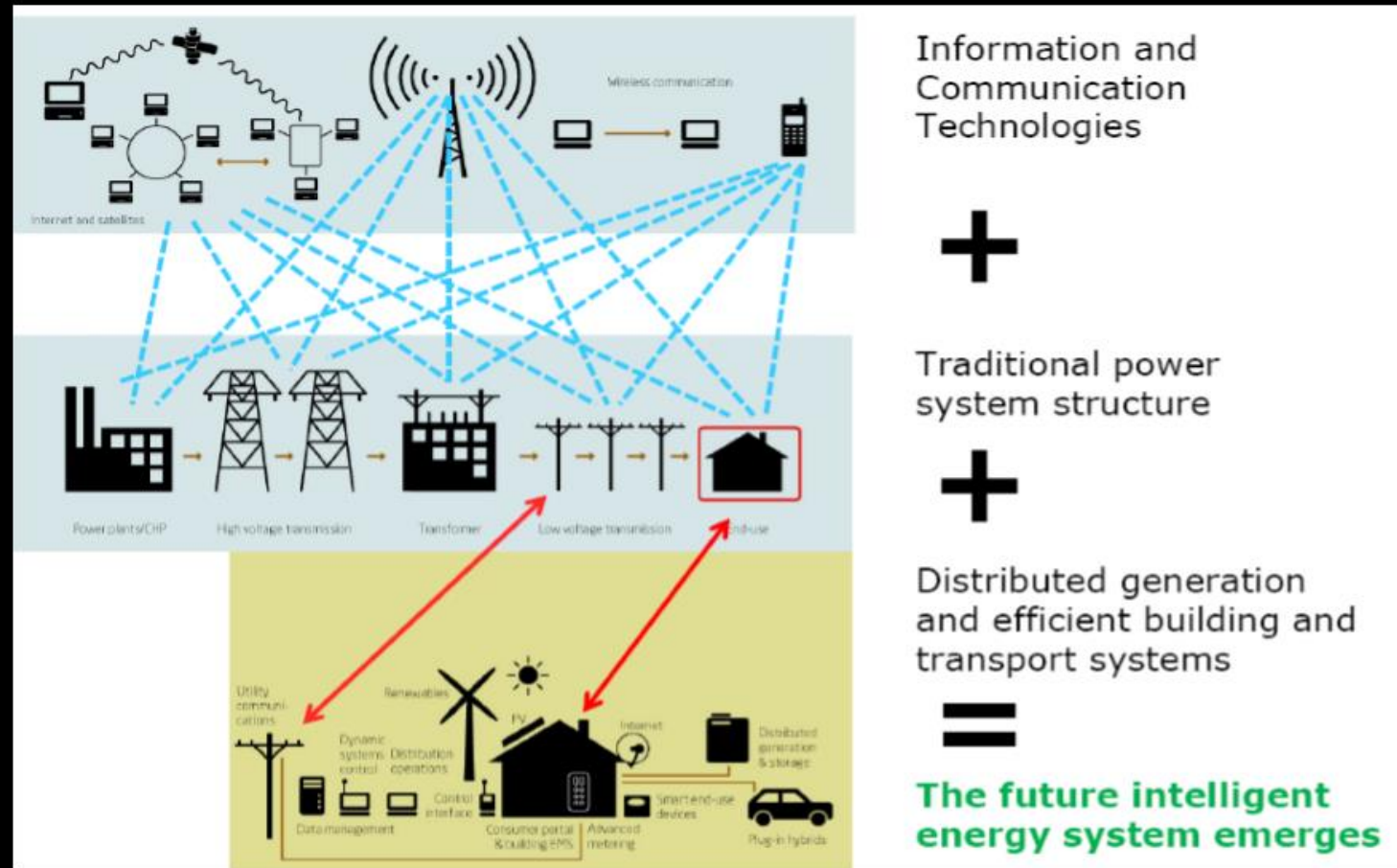


SREE

- 500AD ? – first windmills for grinding grain, pumping water
- 1816 - Stirling engine uses biomass as fuel
- 1839 - fuel cell invented
- 1852 – Kelvin invented heat pump
- 1882 – first Edison hydroelectric power plant (60 customers in Manhattan)
- 1883 – first solar cell (selenium/gold)
- 1888 – first windmill to generate electricity
- 1911 – first commercial geothermal power plant
- 1946 – modern semiconductor solar cell invented
- 1957 – first commercial nuclear power station
- Recent – energy harvester IC chips
-

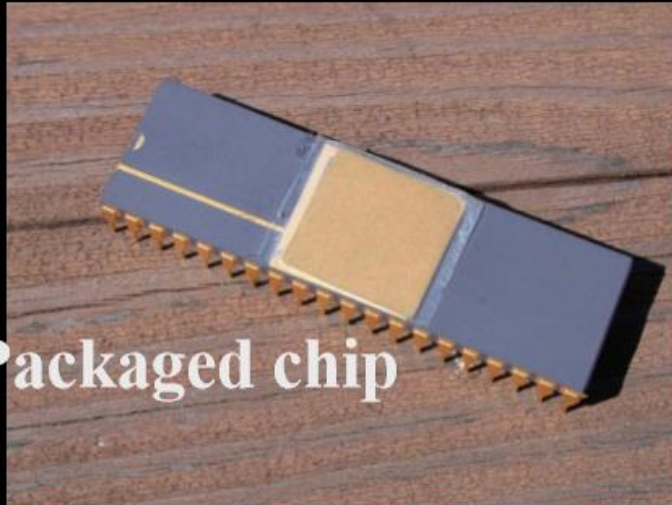
Your contribution to develop SREE?

Future Intelligent Energy System



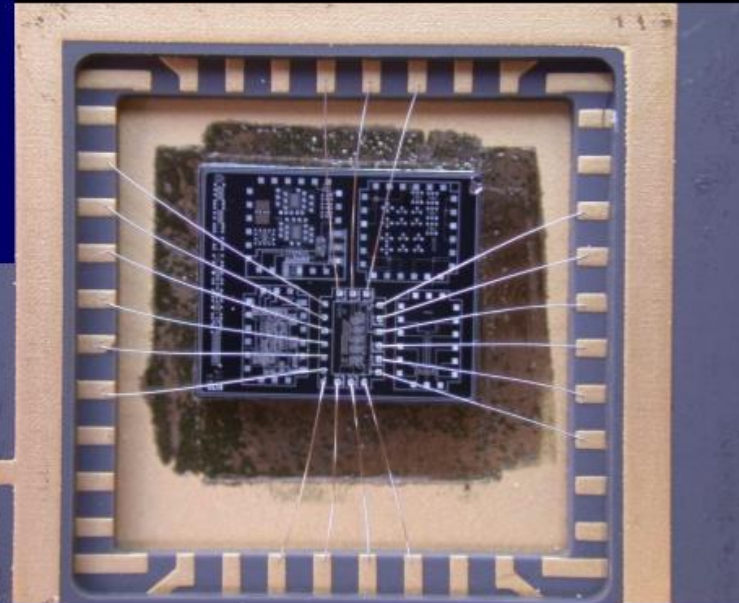
H. Larsen, "The intelligent energy infrastructure system of the future", Riso DTU

Engineering Physics



Packaged chip

In Eng. Phys., we like to “*look under the hood*”.



Microphotograph of the chip die.



Engineering Physics

- 1862 – Maxwell's equations
- 1888 – first radio waves – Hertz
- 1900 – first radio broadcast – Marconi (1901- intercontinental)
- 1904 – thermionic valve or diode invented
- 1905 – theory of relativity, quantum mechanics - Einstein
- 1907 – vacuum tube triode patented
- 1911 – superconductivity discovered
- 1947 – first semiconductor junction transistor (Bell Labs)
- 1955 – SiO₂ as diffusion mask in semiconductor device fabrication
- 1960 – first laser (Maiman - ruby crystal)
- 1962 – first semiconductor laser diode
- 1968 – molecular beam epitaxy invented = very small transistors
- 1971 – first computer on chip (INTEL)
- 2008 – memristor invented
- 2013 – polariton laser demonstrated



Future Technology (Eng. Phy.)

- Development of new technology for biomedical, communications, energy systems, etc.
 - Nanotechnology
 - Negative index materials
 - Micro-Electro-Mechanical Systems (MEMS)
 - Novel bio sensors
 - Photonic devices
 - Quantum computers
 - Flexible displays
 - ????

Faculty of Engineering and Design

Academic Orientation Day

September 4th, 2018

Time	Event	Group	Location	
8:30am - 9:15am	t-shirt distribution	Everyone	Ravens Nest	
9:15am-10:15am	Faculty Welcome	Everyone	Ravens Nest	
10:15am-10:30am	Travel time			
10:30am-11:30am	Departmental welcomes	Aerospace Engineering Mechanical Engineering Biomedical and Mechanical Engineering Sustainable and Renewable Energy Engineering (SREE B)	Ravens Nest	
		Computer Systems Engineering Communications Engineering	Minto 5050	
		Biomedical and Electrical Engineering	Minto 5030	
		Software Engineering	ME 3380	
		Civil Engineering Environmental Engineering Architectural Conservation and Sustainability Engineering	Minto 2000	
		Electrical Engineering	ME 4499	
		Engineering Physics Sustainable and Renewable Energy Engineering (SREE A)	ME 3269	
		Architecture	204 Architecture Building	
		Industrial Design	ME 3235	
		Information technology	Norm Fenn Gym	
11:30am-11:45am		Travel Time		
11:45am-12:45pm		Engineering BBQ in the Raven's Nest		
1:00pm - 4:00pm	ENG Wide and Expo Carleton			

Residence Orientation

Academic Orientation Day

September 4th, 2018

Time	Buildings	Location
1:30pm-2:30pm	Russell, Grenville, & Prescott	Bell theatre (Minto 2000)
2:30pm-2:45pm	Transition time	
2:45pm-3:45pm	Lenox, Lanark, and Renfrew	
3:45pm-4:00pm	Transition time	
4:00pm-5:00pm	Glengarry, Stormont, & Dundas	