

Streaming Talk for CEG2 students (CEG3 in AY2013/2014)

**27 March 2013
11 – 12 noon
LT4**

CEG3 Streaming Talk AY2013/2014

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CEG2 & CEG3 Coordinator

Department of Electrical & Computer Engineering (ECE)

Joint Academic Committee (JAC)

Three groups of students going to CEG3 in AY2013/14

- CEG Direct-entry, AY2011/12 intake
- AY2011/12 Common Engineering intake
(streamed to CEG2 in AY12/13)
- CEG2 Direct-Entry Poly, AY2012/13 intake

B.Eng. (CEG) Curriculum Structure

AY2011/12 intake and CEG2 (poly) AY2012/13 intake

University Level Requirements (ULR)	Faculty Requirements & Year 1 modules	CEG Major Requirements	Unrestricted Elective Modules (UEM)
<p>2 General Education Modules (GEMs) = 8 MCs</p> <p>1 Singapore Studies (SS) Module = 4 MCs</p> <p>2 Breadth Electives outside FoE/SoC = 8 MCs</p>	<p>FoE Reqs (10 MCs): CG1413, EG2401 & HR2002</p> <p>Year 1 Math & Sci (16 MCs): CS1231, MA1505, MA1506 & PC1432</p> <p>Year 1 Technology (12 MCs): CG1101, CG1103 & CG1108</p>	<p>CEG Core Modules (38 MCs)</p> <p>CEG Core Projects (22 MCs)</p> <p>CEG Technical Electives to satisfy breadth and depth requirements (24 MCs)</p>	<p>18 MCs</p> <p>Any Faculty/School (for Breadth/Depth)</p>
MCs = 20	MCs = 38	MCs = 84	MCs = 18
Total = 160 MCs			

- Refer to the specific **File For Graduation (FFG)** document at:

http://www.ceb.nus.edu.sg/students/FFG_Checklists.html

CEG Modular Requirements and Credits

AY2011/12 intake
CEG2 (poly) AY2012/13 intake

Modular Requirements	MCs
UNIVERSITY LEVEL REQUIREMENTS	20
General Education Modules Requirement (GEM) (at least one from Group B: Humanities and Social Sciences)	8
Singapore Studies (SS) Module	4
Breadth: Modules Outside Student's Faculty/School**	8
UNRESTRICTED ELECTIVE MODULES	18
PROGRAMME REQUIREMENTS	
Faculty Requirements:	10
CG1413 Effective Team Communication	4
HR2002 Human Capital in Organizations	3
EG2401 Engineering Professionalism	3
English*	-
Foundation Requirements:	28
CG1101 Programming Methodology	4
CG1103 Data Structures and Algorithms I	4
CG1108 Electrical Engineering	4
CS1231 Discrete Structures	4
MA1505 Mathematics I	4
MA1506 Mathematics II	4
PC1432 Physics IIE	4

Computer Engineering Major Requirements	
CEG Core Subjects:	38
CG2007 Microprocessor Systems	4
CG2271 Real-time Operating Systems	4
CG3207 Computer Architecture	4
CS2103 Software Engineering	4
EE2020 Digital Fundamentals	4
EE2021 Devices & Circuits	4
EE2023 Signals & Systems	4
EE2031 Circuit & Systems Design Lab	2
EE3204 Computer Communication Networks I	4
ST2334 Probability & Statistics	4
CEG Project Modules:	22
CG3002 Embedded Systems Design Project	6
EE3001 Project EE3031 Innovation & Enterprise I	4
CG4001 B.Eng. Dissertation (over 2 semesters)	12
CEG Technical Electives:	
Technical Elective Modules to satisfy the breadth and depth requirements of the B.Eng. (CEG) programme.	24
TOTAL	160

* For students who have not passed or been exempted from the Qualifying English Test at the time of admission

** Refers to both Faculty of Engineering (FoE) and School of Computing (SoC)

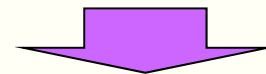
+ S/U policy – cannot S/U TE - http://www.eng.nus.edu.sg/ugrad/SI_su_policies.html

CEG Specialisation and Technical Elective Modules

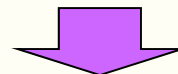
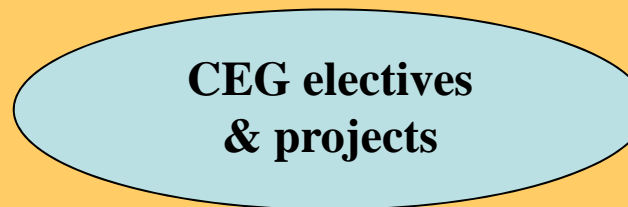
- **What does streaming involve?**
- What are the compulsory requirements?
- How are technical electives organised?
- CEG technical electives requirements
- Recommended study schedules

CEG Curriculum

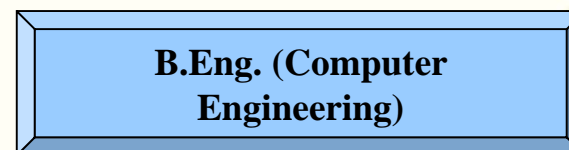
- **Early years:** wide coverage of Math, Engineering, Computing and Scientific fundamentals.



- **Upper years:** highly specialized courses that track the latest technology developments in the field.



- Enable CEG graduates to deal with computer engineering problems of today and face future challenges.



Streaming Involves...

- Own choice of technical elective modules in semester 5, 6, 7 & 8.
- Choice of technical elective modules must satisfy the **technical elective requirement**.
- Failure to meet the requirements can delay graduation!

CEG Specialisation and Technical Elective Modules

- What does streaming involve?
- **What are the compulsory requirements?**
- How are technical electives organised?
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Compulsory Requirements

■ Essential TMs*

- ✓ CG3002 Embedded Systems Design Project
- ✓ EE3031 Innovation & Enterprise I
- ✓ CG4001 BEng Dissertation

■ Essential NTMs*

- ✓ HR2002 Human Capital in Organizations
- ✓ EG2401 Engineering Professionalism

+ (At least) 24 MCs of Technical Elective Modules to achieve both breadth and depth in your B.Eng. program.

* *This is in addition to other modules that are usually taken in the lower years.*

CEG Specialisation and Technical Elective Modules

- What does streaming involve?
- What are the compulsory requirements?
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Organisation of Technical Electives

- The technical electives (TE) are organised into 6 different concentrations. Each concentration contains some breadth & depth modules.
- **Breadth modules**: Core to the area and provides broad understanding of concepts.
- **Depth modules**: More specialised and provides greater depth & coverage.
- A total of 43 technical elective modules are available (20 breadth and 23 depth modules).
- Only 6 technical elective modules need to be taken over 3 or 4 semesters.
- <new> Other modules hosted by CS or ECE may be used as fulfilling CEG TE requirements. Generally, a level 3000 module will count as **TE Breadth**, while a level 4000 will count as **TE Depth**.

Organisation of Technical Electives (cont.)

- There are changes in the electives (from last year):
 - change in semester in which a module is offered
 - new / removal of technical elective modules or change in pre-requisites
 - changes in title, code and syllabus

Refer to the updated masterlist of **Technical Electives** via http://www.ceg.nus.edu.sg/students/third_year.html
(under 'Academic Information/Useful Links')

[AY13/14 CEG Technical Electives for AY11 intake & after](#)
(*updated 26 March 2013 – more updates expected when Bulletin for AY13/14 is available*)

CEG Breadth/Depth

- Specialisation in CEG is achieved through technical breadth/depth electives from the following concentrations:
 - **Communications & Networking**
 - **Embedded Computing**
 - **Large-Scale Computing**
 - **Intelligent Systems**
 - **Interactive Digital Media**
 - **System-on-a-Chip Design**

CEG Concentrations

Communications & Networking

CG3204L Computer Networks Laboratory

EE3131C Communication Systems

CS4222 Wireless Computing & Sensor Networks

CS4274 Mobile and Multimedia Networking

EE4113 Digital Communications & Coding

EE4114 Optical Communications

EE4210 Computer Communication Networks II

CEG Concentrations

Embedded Computing

- CG3204L Computer Networks Laboratory
- CS2107 Introduction to Information & System Security
- CS3218 Multimodal Processing in Mobile Platforms
- CS3235 Computer Security
- CS4222 Wireless Computing & Sensor Networks
- CS4274 Mobile and Multimedia Networking
- EE4210 Computer Communication Networks II
- EE4214 Real-time Embedded Systems
- EE4218 Embedded Hardware Systems Design
- EE4415 Integrated Digital Design

CEG Concentrations

Large-Scale Computing

CS2010 Data Structures & Algorithms II

CS2102 Database Systems

CS2107 Introduction to Information & System Security

CS3211 Parallel and Concurrent Programming

CS3235 Computer Security

CS3223 Database Systems Implementation

CS4221 Database Design

CS4223 Multi-Core Architectures

CS4224 Distributed Database

EE4210 Computer Communication Networks II

CEG Concentrations

Intelligent Systems

CS2010 Data Structures & Algorithms II

CS3240 Interaction Design

CS3243 Introduction to Artificial Intelligence

CS3244 Machine Learning

EE3206 Introduction to Computer Vision and Image Processing

EE3331C Feedback Control Systems

CS4248 Natural Language Processing

EE4212 Computer Vision

EE4213 Image Processing

EE4305 Introduction to Fuzzy/Neural Systems

EE4306 Distributed Autonomous Robotics Systems

EE4307 Control Systems Design and Simulation

CEG Concentrations

Interactive Digital Media

CS3240 Interaction Design

CS3241 Computer Graphics

CS3242 3D Modeling and Animation

CS3247 Game Development

CS3249 User Interface Development

EE3206 Introduction to Computer Vision and Image Processing

EE3331C Feedback Control Systems

EE3701 Digital Media Technologies

CS4247 Graphics Rendering Techniques

EE4212 Computer Vision

EE4213 Image Processing

ME4245 Robot Kinematics, Dynamics and Control

- From sem 1, AY13/14 onwards, CS3242 and CS3247 will count as CEG TE Breadth.
- Only students who read CS3242 and/or CS3247 in sem 2, AY12/13, are allowed to count as CEG TE Depth.

CEG Concentrations

System-on-a-Chip Design

EE3407 Analog Electronics

EE3408C Integrated Analog Design

CS4223 Multi-Core Architectures

EE4214 Real-time Embedded Systems

EE4218 Embedded Hardware Systems Design

EE4410A Integrated Circuit Design

EE4415 Integrated Digital Design

EE4505 Power Semiconductor Devices & ICs

CEG Specialisation and Technical Elective Modules

- What does streaming involve?
- What are the compulsory requirements?
- How are technical electives organised?
- **CEG technical electives requirements**
- Recommended study schedules

Rules to achieve breadth & depth: B.Eng. (CEG)

(a) Depth (D) requirement

- At least **3** technical **depth** electives

(b) Modular credits requirement

- At least **24** MCs from Technical Electives

Modules may come from any of the concentrations!

ECE2 Streaming Talk on 28 Mar 2013 (Thurs) 2-6pm at Engrg Aud;
CEG2 may join from 3.15pm onwards

CEG Specialisation and Technical Elective Modules

- What does streaming involve?
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- CEG technical electives requirements
- **Recommended study schedules**

Recommended Study Schedules (RSS)

- UEM, ULR (SS, GEM, ULR Breadth) requirements are indicated in random semesters in RSS. Remember to read these modules. Refer to the specific RSS document at: <http://www.ceg.nus.edu.sg/students/studyschedule.html>
- Note: Min 15 MCs and max 25 MCs workload per semester.
- Compulsory Modules (Faculty requirements): EG2401 and HR2002
- CG3002 & EE3031 Project Modules:
 - Be careful about taking CG3002/EE3031 together with CG4001 FYP in semester 7 (e.g. due to SEP/IA).
 - Workload is very heavy!
 - Should try to find suitable mapping modules for either EE3031 (relatively easier) or CG3002 while on SEP.
 - If you plan to go for IA in semester 6, you *may* take EE3031 and one other module (UEM/ULR/TE) in the evening classes during your IA, *subject to availability and approval*.
- Pay attention to workload balancing!

POSSIBLE SCHEDULE FOR CEG AY2011 INTAKE STUDENTS (MAJOR REQUIREMENTS)

Possible Schedule for CEG AY2011/2012 Intake (Major Requirements)

Semester 3	Semester 4	Semester 5	Semester 6	Semester 7	Semester 8
EE2020 Digital Fundamentals	CG2007 Microprocessor Systems	CG3002 Embedded Systems Design Project	EE3031 Innovation & Enterprise I	CG4001 B.Eng Dissertation	CG4001 B.Eng Dissertation
EE2021 Devices & Circuits	EE2023 Signals & Systems	EE3204 Computer Comms Networks I	BREADTH ELECTIVE	HR2002 Human Capital in Organizations	DEPTH ELECTIVE
CS2103 Software Engineering	ST2334 Probability & Statistics	CG3207 Computer Architecture	BREADTH ELECTIVE	DEPTH ELECTIVE	DEPTH ELECTIVE
CG2271 Real-time Operating Systems	EE2031 Circuits & Sys Design Lab	EG2401 Engineering Professionalism	BREADTH ELECTIVE	UEM3	UEM5
GEM1	GEM2	UEM1	UEM2	UEM4	
	ULR2				

IMPORTANT:

- Students are strongly encouraged to take at least one business/management module to satisfy ULR/UEM.
- The minimum **24** MCs of electives satisfying CEG **Breadth/Depth** requirements can be taken at any semester upon satisfying the pre-requisites.
- The University-level requirements (GEMs, SS, ULR Breadths) and Unrestricted Elective Module Requirements (UEM) can be taken at any semester.

POSSIBLE SCHEDULE FOR CEG AY2011 INTAKE STUDENTS (MAJOR REQUIREMENTS)

Possible Schedule for Direct Entry (Poly) Students admitted to CEG2 in Sem 1, AY2012/13 (Major Requirements)

Semester 5	Semester 6	Semester 7	Semester 8
CG2271 Real-time Operating Systems	EE2023 Signals & Systems	CG4001 BEng Dissertation	CG4001 BEng Dissertation
CG3207 Computer Architecture	ST2334 Probability & Statistics	CG3002 Embedded Systems Design Project	DEPTH ELECTIVE
CS2103 Software Engrg	EE2031 Circuits & Sys Design Lab	BREADTH ELECTIVE	DEPTH ELECTIVE
EG2401 Engineering Professionalism	BREADTH ELECTIVE	1SS	DEPTH ELECTIVE
EE3204 Computer Comms Networks I	BREADTH ELECTIVE	1UEM	
MA1506 Mathematics II	1GEM		

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- The University-level requirements (GEMs, SS, ULR Breadths) and Unrestricted Elective Module Requirements (UEM) can be taken at any semester.

**Enjoy the rest of your
B.Eng. program!**

.....The best is yet to come!!!

QUESTIONS ???