

Streaming Talk for CEG2 students (CEG3 in AY2014/2015)

**28 March 2014
12 – 1pm
LT3**

CEG3 Streaming Talk AY2014/2015

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Department of Electrical & Computer Engineering (ECE)
Joint Academic Committee (JAC)**

Three groups of students going to CEG3 in AY2014/15

- CEG1, AY2012/13 intake
- Common Engineering, AY2012/13 intake
(streamed to CEG2 in AY13/14)
- CEG2 Poly, AY2013/14 intake

B.Eng. (CEG) Curriculum Structure

AY2012/13 intake

University Level Requirements (ULR)	CEG Programme / Major Requirements	Unrestricted Elective Modules (UEM)
2 General Education Modules (GEMs) - 8 MCs 1 Singapore Studies (SS) module - 4 MCs 2 Breadth modules outside FoE & SoC - 8 MCs	Faculty reqs - 10 MCs: CG1413, EG2401 & HR2002 Level 1000 Math, Sci & Technology - 28 MCs Other core modules - 38 MCs CEG core projects - 22 MCs CEG Technical Electives to satisfy Breadth and Depth requirements - 24 MCs	18 MCs from any Faculty/School
MCs = 20	MCs = 122	MCs = 18
Total = 160 MCs		

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

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

CEG Modular Requirements and Credits

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	16
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 Modules:	41
EE2024 Programming for Computer Interfaces	5
CG2271 Real-time Operating Systems	4
CG3207 Computer Architecture	4
CS2103 Software Engineering	4
EE2020 Digital Fundamentals	5
EE2021 Devices & Circuits	4
EE2023 Signals & Systems	4
EE2031 Circuit & Systems Design Lab	3
EE3204 Computer Communication Networks I	4
ST2334 Probability & Statistics	4
CEG Project Modules:	22
CG3002 Embedded Systems Design Project	6
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	161

* 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

B.Eng. (CEG) Curriculum Structure

CEG2 Poly AY2013/14 intake

University Level Requirements (ULR)	CEG Programme / Major Requirements	Unrestricted Elective Modules (UEM)
2 General Education Modules (GEMs) - 8 MCs 1 Singapore Studies (SS) module - 4 MCs 2 Breadth modules outside FoE & SoC - 8 MCs	Faculty reqs - 10 MCs: ES1531, EG2401 & HR2002 Level 1000 Math, Sci & Technology - 30 MCs Other core modules - 38 MCs CEG core projects - 22 MCs CEG Technical Electives to satisfy Breadth and Depth requirements - 24 MCs	CS2101 4 MCs (on graded basis) and 12 MCs from any Faculty/School
MCs = 20	MCs = 124	MCs = 16
Total = 160 MCs		

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

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CEG Modular Requirements and Credits

CEG2 Poly AY2013/14 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	12+4
CS2101 Effective Comm for Computing Professionals	4
PROGRAMME REQUIREMENTS	124
Faculty Requirements:	10
ES1531 Critical Thinking & Writing	4
HR2002 Human Capital in Organizations	3
EG2401 Engineering Professionalism	3
English*	-
Core Modules:	68
CG1001 Introduction to Computer Engineering	2
CG1108 Electrical Engineering	4
CG2023 Signals & Systems	4
CG2271 Real-time Operating Systems	4
CG3207 Computer Architecture	4
CS1010 Programming Methodology	4

CS1020 Data Structures and Algorithms I	4
CS1231 Discrete Structures	4
CS2103T Software Engineering	4
EE2020 Digital Fundamentals	5
EE2021 Devices & Circuits	4
EE2024 Programming for Computer Interfaces	5
EE3204 Computer Communication Networks I	4
MA1505 Mathematics I	4
MA1506 Mathematics II	4
PC1432 Physics IIE	4
ST2334 Probability & Statistics	4
CEG Project Modules:	22
CG3002 Embedded Systems Design Project	6
EE3031 Innovation & Enterprise I	4
CG4001 B.Eng. Dissertation (over 2 semesters)	12
CEG Technical Electives:	
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CEG Specialisation and Technical Elective Modules

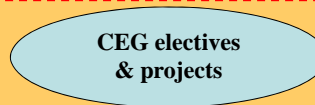
- What does streaming involve?
- What are the compulsory requirements?
- How are technical electives organised?
- CEG technical electives requirements
- Recommended study schedules

CEG Curriculum

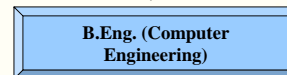
- **Early years:** wide coverage of Math, Engineering, Computing and Scientific fundamentals.



- **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?
- CEG technical electives requirements
- Recommended study schedules

Compulsory Requirements

- **Essential Modules***
 - ✓ CG3002 Embedded Systems Design Project
 - ✓ CG3207 Computer Architecture
 - ✓ CG4001 BEng Dissertation
 - ✓ EE3031 Innovation & Enterprise I
 - ✓ EE3204 Computer Communications Networks I
 - ✓ EG2401 Engineering Professionalism
 - ✓ HR2002 Human Capital in Organizations

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

+ (At least) 24 MCs of Technical Elective modules to achieve both Breadth and Depth in the B.Eng. programme.

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

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.
- 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

- 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 master-list of **Technical Electives** via http://www.ceb.nus.edu.sg/students/third_year.html
(under 'Academic Information/Useful Links')

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 Elective modules

Modules may come from any of the concentrations!

ECE2 Streaming Talk later - 28 Mar 2014 (Fri), 2 - 6pm @ Engrg Auditorium;
CEG2 may join between 3 - 4pm.

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**

Recommended Study Schedules

- UEM, ULR (SS, GEM, ULR Breadth) requirements are indicated in random semesters in RSS. Remember to read these modules. Refer to the respective 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 apply to read EE3031 and one other module (UEM/ULR/TE) in the evenings, *subject to availability and approval.*
- Pay attention to workload balancing!

Possible Schedule for CEG Direct AY2012 Intake

Sem 3	Sem 4	Sem 5	Sem 6	Sem 7	Sem 8
CG2271 Real-Time Operating Syst	EE2024 Prog for Comp Interfaces (5 MCs)	CG3207 Computer Architecture	EE3031 Inno & Enterprise I	CG4001 FYP	CG4001 FYP
EE2020 Digital Fundamentals (5 MCs)	EE2023 Signals & Systems	CG3002 Embedded Systems Design Project	BREADTH ELECTIVE	HR2002 Human Capital in Organizations	DEPTH ELECTIVE
EE2021 Devices & Circuits	ST2334 Probability & Statistics	EE3204 Computer Comms Networks I	BREADTH ELECTIVE	DEPTH ELECTIVE	DEPTH ELECTIVE
CS2103 Software Engrg	EE2031 Circuits & Systems Design Lab (3 MCs)	EG2401 Engrg Profsm	BREADTH ELECTIVE	UEM 2	UEM 4
ULR 2	GEM 1	GEM 2	UEM 1	UEM 3	
21 MCs	20 MCs	21 MCs	20 MCs	21 MCs	18 MCs

IMPORTANT:

- Students are 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 ULR (GEMs, SS, ULR Breadths) and UEM can be taken at any semester.

Possible Schedule for CEG Poly AY2013 Intake (Not exempted from CG1108)

Sem 3	Sem 4	Sem 5	Sem 6
CS2101 Effective Comm for Computing Professionals	CG2023 Signals & Systems	CG3002 Embedded Systems Design Project	CG4001 B.Eng. Dissertation
CS2103T Software Engrg	CG2271 Real-Time Operating Syst	CG3207 Computer Architecture	DEPTH ELECTIVE
EE3204 Computer Comms Networks I	EG2401 Engrg Profsm	CG4001 B.Eng. Dissertation	DEPTH ELECTIVE
MA1506 Math II	EE2024 Programming for Computer Interfaces	BREADTH ELECTIVE	DEPTH ELECTIVE
PC1432 Physics IIE	ST2334 Probability & Statistics	BREADTH ELECTIVE	GEM 1
SS	BREADTH ELECTIVE		
24 MCs	24 MCs	24 MCs	22 MCs

IMPORTANT:

- Students are 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 ULR (GEMs, SS, ULR Breadths) and UEM can be taken at any semester.

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

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

QUESTIONS ???