Streaming Talk for CEG2 Students (CEG3 in AY2015/16)

26 March 2015, 12 pm @ LT1

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Joint Academic Committee (JAC)
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Three groups of students going to CEG3 in AY2015/16

- CEG1, AY2013/14 intake
- Common Engineering, AY2013/14 intake (streamed to CEG2 in AY2014/15)
- CEG2 Poly, AY2014/15 intake

B.Eng. (CEG) Curriculum Structure

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) - 4 MCs 2 Breadth modules outside of FoE & SoC - 8 MCs	Faculty reqs: ES1531, EG2401 & HR2002 - 10 MCs Level 1000 Mathematics, Science & 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 (on graded basis) + 12 MCs from any Faculty/School
MCs = 20	MCs = 124	MCs = 16
Total (minimum) MCs for graduation = 160		

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

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

CEG Modular Requirements and Credits

AY2013/14 intake

Modular Requirements	MCs
UNIVERSITY LEVEL REQUIREMENTS	**20**
General Education Modules Requirement (GEM) **(at least one from Subj Grp B: Humanities & Social Sciences)**	8
Singapore Studies (SS) Module	4
Breadth: Modules Outside FoE and SoC	8
UNRESTRICTED ELECTIVE MODULES - CS2101 Effective Comm for Computing Professionals	**16**
PROGRAMME REQUIREMENTS	**124**
Faculty Requirements	10
EG2401 Engineering Professionalism	3
ES1531 Critical Thinking & Writing	4
HR2002 Human Capital in Organizations	3
English*	-
CEG 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	24
Technical Electives to satisfy the Breadth and Depth requirements of the B.Eng. (CEG) programme	
TOTAL	**160**

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

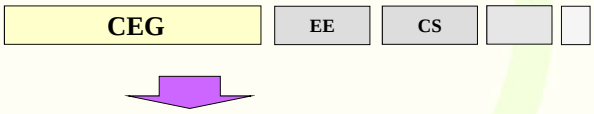
S/U policy – cannot S/U Technical Electives - http://www.eng.nus.edu.sg/ugrad/SI_su_policies.html

CEG Concentrations and Technical Elective Modules

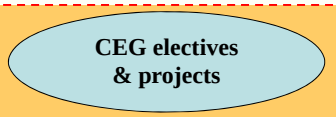
- **What does streaming involve?**
- What are the compulsory requirements?
- How are technical electives organised?
- CEG technical electives requirements
- Recommended study schedules

CEG Curriculum

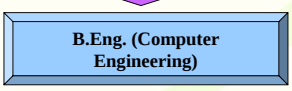
- Year 1 & 2: Wide coverage of Math, Engineering, Computing and Scientific fundamentals.



- Year 3 & 4: 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 year 3 & 4 (some choose to start in year 2)
- Choice of technical elective modules must satisfy the technical elective requirement
- Failure to meet the requirements can delay graduation!

CEG Concentrations and Technical Elective Modules

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Compulsory Requirements

- Core Modules*
  - ✓ CG3002 Embedded Systems Design Project
  - ✓ CG3207 Computer Architecture
  - ✓ CG4001 BEng Dissertation
  - ✓ EE3031 Innovation & Enterprise I
  - ✓ EE3204 Computer Communications Netowrks 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 Breadth and Depth in the B.Eng. programme.

CEG Concentrations 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
- Other modules hosted by CS or ECE may also 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.
- CEG students CANNOT exercise S/U option on ALL modules hosted by FoE and SoC (regardless taken to fulfill TE or UE requirements).
- More than 50 modules (offered by CS/ECE) are available.
- Only SIX TEs (equivalent to 24 MCs) need to be taken over 3 or 4 semesters.

Organisation of Technical Electives

- There are changes to the technical electives (from last year):
  - change in semester in which a module is offered [Most TEs are offered once a year.]
  - change in pre-requisites
  - changes in title, code and syllabus
  - new / removal of technical elective

Refer to:
1. NUS Bulletin
http://www.nus.edu.sg/registrar/nusbulletin/modulesearch.html
2. the updated master-list of Technical Electives
http://www.ceg.nus.edu.sg/students/third_year.html
(under 'Academic Information/Useful Links')
3. CEG TE page - http://www.ceg.nus.edu.sg/students/ceg3TE/

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~~ <no longer offered>
CS3103 Computer Networks Practice <new>
EE3131C Communication Systems
CS4222 Wireless Networking ~~Computing & Sensor Networks~~
CS4226 Internet Architecture <new>
~~CS4274 Mobile and Multimedia Networking~~ <no longer offered>
EE4113 Digital Communications & Coding
EE4114 Optical Communications
EE4210 Computer Communication Networks II

Example: CS3103 [Offer semester in AY15: pending]
Pre-req is CS2105/EE3204
Preclusion: EE4210
CEG students are precluded from CS2105.
EE3204 (CEG Major/core requirement) is only offered in sem 1, and scheduled for Year 3.

EE3204 (sem 5) -> CS3103 (sem 7) -> CS4222 (sem 8)
EE3204 (sem 5) -> CS3103 (sem 6) -> CS4222 (sem 8)

CEG Concentrations

Embedded Computing

~~CG3204L Computer Networks Laboratory~~ <no longer offered>
CS2107 Introduction to Information & System Security
CS3103 Computer Networks Practice <new>
CS3218 Multimodal Processing in Mobile Platforms
CS3235 Computer Security
CS4222 Wireless Networking ~~Computing & Sensor Networks~~
~~CS4274 Mobile and Multimedia Networking~~ <no longer offered>
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
CS4345 General-Purpose Computation on GPU
EE4210 Computer Communication Networks II

Example: CS4224 [Pre-req change]
AY13: CS2102
AY14: CS3223 or CS2102
AY15: CS3223 (strictly!)

CS1020 (sem 2) -> CS2010 & CS2102 (sem 3/4/5) -> CS3223 (sem 6) -> CS4224 (sem 7)

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
CS4244 Knowledge-based systems <new>
CS4246 AI Planning and Decision Making <new>
CS4248 Natural Language Processing
EE4212 Computer Vision
EE4213 Image & Video Processing <not offered in AY15>
EE4305 Introduction to Fuzzy/Neural Systems
EE4306 Distributed Autonomous Robotics Systems
EE4307 Control Systems Design and Simulation

CEG Concentrations

Interactive Digital Media

CS2108 Introduction to Media Computing <new>
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
EE3731C Signal Processing Methods <new>
EE3701 Digital Media Technologies
CS4247 Graphics Rendering Techniques
CS4249 Phenomena and Theories of Human-Computer Interaction <new>
CS4347 Sound and Music Computing <new>
EE4212 Computer Vision
EE4213 Image & Video Processing <not offered in AY15>
EE4604 Biological Perception in Digital Media <new>
ME4245 Robot Kinematics, Dynamics and Control

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~~ <no longer offered>
EE4415 Integrated Digital Design
EE4505 Power Semiconductor Devices & ICs

CEG Concentrations 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 Technical Electives requirements

(a) Depth (D) requirement

At least THREE 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 & Career Fair tomorrow - 27 Mar (Fri)
12 - 5pm @ Engineering Auditorium and EA foyer
CEG2 may join from 1.15pm.

CEG Concentrations and Technical Elective Modules

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- **Recommended study schedules**

Recommended Study Schedules

- UEM, ULR (SS, GEM, ULR Breadth) requirements are indicated in random semesters. Remember to read these modules. Refer to the respective document at http://www.ceg.nus.edu.sg/students/studyschedule.html.
- Workload: Minimum of 15 MCs and up to 25 MCs 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!

Recommended Schedule for CEG AY2013/14 Intake

Sem 4 →	Sem 5	Sem 6	Sem 7	Sem 8
CG2023 Signals & Systems	CG3002 Embedded Systems Design Project	EE3031 Innovation & Enterprise I	CG4001 B.Eng. Dissertation	CG4001 B.Eng. Dissertation
CG2271 Real-Time Operating Systems	CG3207 Computer Architecture	Breadth Elective	HR2002 Human Capital in Organizations	Depth Elective
EE2024 Programming for Computer Interfaces (5 MCs)	EE3204 Computer Comms Networks I	Breadth Elective	Depth Elective	Depth Elective
ST2334 Probability & Statistics	EG2401 Engrg Profsm	Breadth Elective	UEM 1	UEM 3
SS	ULR Breadth 1	ULR Breadth 2	UEM 2	
21 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 in any semester upon satisfying the pre-requisites.
- The **ULR (GEMs, SS, ULR Breadths) and UEM** can be taken in any semester.

Enjoy the rest of your B.Eng. programme!

… the best is yet to come!

Questions??