<table>
<thead>
<tr>
<th>#</th>
<th>Programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Welcome Address by Assoc Prof Tay Teng Tiow, Chairman of Joint Academic Committee (JAC)</td>
</tr>
<tr>
<td>2</td>
<td>Briefing on Academic Matters by Dr Colin Tan, CEG Year 1 Coordinator</td>
</tr>
<tr>
<td>3</td>
<td>Sharing by CEG2 senior Mr Akash Ranka</td>
</tr>
<tr>
<td>4</td>
<td>Talk by Comp Club Representative, Mr Lho Chen Yang</td>
</tr>
<tr>
<td>5</td>
<td>Tea refreshment</td>
</tr>
</tbody>
</table>
BEng (Computer Engineering)

http://www.ceg.nus.edu.sg

Joint programme between School of Computing and Faculty of Engineering
Joint Academic Committee

A/P Tay Teng Tiow (Chairman JAC)
A/P Wong Weng Fai
A/Prof Loh Ai Poh
Dr Colin Tan Keng Yan (Year 1 Coordinator)
A/P Cheong Loong Fah (Year 2 and 3 Coordinator)
A/P Tulika Mitra (SEP/IA Coordinator)
Dr Ha Yajun (Long term IA Coordinator)

Ms Winnie Chua EO support for the CEG programme
What is Computer Engineering?

- Discipline which combines electrical engineering and computer science

- Computer engineers are involved in many aspects of computing, from low level circuit designs using computing devices to large scale integration involving hardware and software systems.

- A graduate in this programme is expected to have fundamental knowledge in mathematics, physics, electronics, digital logic, programming and algorithms, computer architecture, operating systems, networks, embedded systems

- A graduate is also expected to have some experience in design of hardware and software systems

- Relevant industrial experience will also complement the knowledge and skills of the student.
CDIO = Conceive-Design-Implement-Operate

Educate students who understand how to conceive-design-implement-operate complex value-added engineering systems in a modern team-based engineering environment and are mature, thoughtful individuals.

CDIO initiatives prescribe improvements in 4 basic areas:
- Increase in active and hands-on learning
- Emphasis on problem formulation
- Emphasis on concept learning
- Enhancement of learning feedback mechanisms
The CEG HyperMarket Group

Core Activity
Hypermarket retailing in 60 different countries
- 15,000 stores in 512 cities
- Global virtual store
- 8,000,000 different products
- Revenue USD 500 bn per year

Competitive advantage
Procurement
- Low cost bulk sourcing with JIT store delivery
- Ultra low inventory
- Diverse product mix

Fulfillment
- Fast, straightforward customer processing
- Active pricing to control product flow

Key enabler
Information Technology
The CEG Inventory Control and Monitoring System (CICMS)

A global DB keeping tab of:
- Current inventory at all CHM warehouse and stores
  - Age
  - Procured prices, etc
- Current good available at all vendor locations
  - Condition for sales
  - Lead time
  - Pricing
- Live (to the minute) demand status of all products at all stores

**Automatic data capture front**
- Feed live data for backend monitoring and control

**Auto pricing control system, with live dynamic pricing.**
- Changes pricing on the fly to ensure supply and demand matching
Modules in CDIO Major Cycle

CG1101 Programming Methodology
CG1103 Data Structures and Algorithms
CG1413 Effective Team Communication
CG2007 Microprocessor Systems
CG2271 Real-time Operating Systems
CG2001 Embedded Systems Design Project

EE3001 Project
# Full Degree Programme Requirements

<table>
<thead>
<tr>
<th>Programme Requirements</th>
<th>University Level Requirements</th>
<th>Unrestricted Elective Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>122 MCs</td>
<td>20 MCs</td>
<td>18 MCs</td>
</tr>
<tr>
<td></td>
<td>- 2 GEMs</td>
<td>May include:</td>
</tr>
<tr>
<td></td>
<td>- 1 Singapore Studies Module</td>
<td>- internships</td>
</tr>
<tr>
<td></td>
<td>- 2 breadth modules outside Faculty</td>
<td>- other enhancement prg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- minor programme</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- unrestricted modules</td>
</tr>
</tbody>
</table>

Total MCs = 160
# Major Programme Requirements

<table>
<thead>
<tr>
<th>Programme Components</th>
<th>Modules</th>
<th>MC</th>
</tr>
</thead>
</table>
| Non-technical requirements common to all BEng students | ▪ CG1413 Effective Team Communications  
▪ HR2002 Human Capital in Organizations  
▪ EG2401 Engineering Professionalism | 10 |
| Core Modules         | ▪ MA1505 Mathematics I  
▪ MA1506 Mathematics II  
▪ PC1432 Physics IIIE  
▪ CS1231 Discrete Structures  
▪ CS2103 Software Engg  
▪ CG1101 Prog Methodology  
▪ CG1103 Data Structures  
▪ CG1108 Electrical Engg  
▪ CG2007 MicroP Systems  
▪ CG2271 RTOS  
▪ CG3207 Computer Arch  
▪ EE2020 Digital Fundamentl  
▪ EE2021 Devices & Circuits  
▪ EE2023 Signals & Systems  
▪ EE203x Lab module x  
▪ EE3204 CCNI  
▪ ST2334 Prob & Statistics | 66 |
| Projects             | ▪ CG2001 Embedded Systems Design Project  
▪ EE3001 Project  
▪ CG4001 BEng Dissertation | 22 |
| Technical Electives  | Minimum 6 modules, at least 3 must be at level 4 | 24 |
| **Total MCs for Programme Requirements** | **122** |
Optional Industrial Component in the Programme

- 6 month internship + 6 months industrial assignment (both parts are optional)
- Industrial Assignment for the 2nd 6 month will be approved if it has technical contents that can map to 12 MC equivalence of CEG technical modules; supervised by both NUS and industrial supervisors, and have rigorous CAs together with a final module grade.

1st 6 months
UEM
12 MCs

2nd 6 months
Technical electives
Up to 12 MCs

Total of 24 MCs is possible for 1 year of internship.
Summary of Programme Design

CDIO mapped modules: 28% of Prog Req
(Selected Computer Engineering modules taught within a simulated industrial focused environment)

Programme Flexibility

Academic focused modules: from 52% to 72%
Industrial focused modules: from 0% to 20%
(dependent on election of 12 months, 6 months or no industrial exposure)
Checklist for CEG

(Direct entry to CEG1 / Streamed to CEG in Year2) of AY2010 intake
& Direct Entry Poly students of AY2010 intake
Other information:

1. Limit on Level 1000 modules:
   Students should not read more than 60 MCs of level 1000 modules towards their degree requirements (minimum of 160 MCs for graduation).
   [http://www.eng.nus.edu.sg/ugrad/SI_faq.html#A9](http://www.eng.nus.edu.sg/ugrad/SI_faq.html#A9)

2. S/U Option (AY2010 intake):
   - [http://www.nus.edu.sg/registrar/edu/UG/graduation.html#SU](http://www.nus.edu.sg/registrar/edu/UG/graduation.html#SU)
   - [http://www.eng.nus.edu.sg/ugrad/SI_su_policies.html](http://www.eng.nus.edu.sg/ugrad/SI_su_policies.html)
   S/U for semester 1: late Dec; for semester 2: early June
   3 days only: Check NUSNET mail for more information from RO
   Note: You must score a minimum of a “C” to get “S”. Otherwise your transcript will show “Unsatisfactory” for the module.
3. ES1102 English for Academic Purposes
If you do not pass your QET, you must bid for ES1102 EAP so that you can take CG1413 next semester.

This is important because you need to take CG1413 and CG1103 together!
4. Exemptions for Poly graduates of AY2010/11 intake admitted into CEG:

Poly graduates admitted into the CEG in AY2010/11 will follow AY2009/10 CEG curriculum (except with CG1103 replacing CG1102, EE2024 replacing EE2009 and UEM requirement = 24 MCs) and may be eligible for the following exemptions (up to 40 MCs) from the following list, depending on the Diploma from the polytechnics.

- University Level Requirements (up to 8MCs)
  1 GEM (Module code GXK1999 under Subject Group B: Humanities and Social Science) 4 MCs
  1 Breadth (ULR) module 4 MCs
- Unrestricted Elective Modules (UEMs up to 12MCs)
- Faculty/Programme Requirements (up to 20MCs)
  CG1413 Effective Team Communication 4 MCs
  HR2002 Human Capital in Organisations 3 MCs
  CG1108 Electrical Engineering 4 MCs
  EE3001 Project 4 MCs

For details on the poly exemptions, please refer to: http://www.ceg.nus.edu.sg/admissions/.

Note that the 12 MCs granted to diploma holders will not count against the limit on level 1000 modules.
# Possible Schedule for CEG AY2010/11

## Direct Intake (without IA)

<table>
<thead>
<tr>
<th>Sem 1</th>
<th>Sem 2</th>
<th>Sem 3</th>
<th>Sem 4</th>
<th>Sem 5</th>
<th>Sem 6</th>
<th>Sem 7</th>
<th>Sem 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS1231 Discrete Structures</td>
<td>CG1413 ETC</td>
<td>CS2103 Software Engrg</td>
<td>ULR 2</td>
<td>EG2401 Engrg Profsn</td>
<td>BREADTH ELECTIVE</td>
<td>UEM 3</td>
<td>UEM 5</td>
</tr>
<tr>
<td>SS and/or ES1102*</td>
<td>ULR 1</td>
<td>EE203x Lab Module x* (2 MCs)</td>
<td>GEM 2</td>
<td>UEM 1 (2 MCs)</td>
<td>UEM 2</td>
<td>UEM 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GEM 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 MCs</td>
<td>20 MCs</td>
<td>22 MCs</td>
<td>20 MCs</td>
<td>19 MCs</td>
<td>20 MCs</td>
<td>21 MCs</td>
<td>18 MCs</td>
</tr>
</tbody>
</table>

**TOTAL GRADUATION REQUIREMENTS = 160 MCs**

*pending: EE2031 Lab Module 1 or EE2032 Lab Module 2 (Note: Recommended semester could be sem 3 or sem 4)

http://www.ceg.nus.edu.sg/students/studyschedule.html
### Possible Schedule for CEG AY2010/11
**Direct Intake (with 6 months IA)**

<table>
<thead>
<tr>
<th>Sem 1</th>
<th>Sem 2</th>
<th>Sem 3</th>
<th>Sem 4</th>
<th>Sem 5</th>
<th>Sem 6</th>
<th>Sem 7</th>
<th>Sem 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS1231 Discrete Structures</td>
<td>CG1413 ETC</td>
<td>CS2103 Software Engrg</td>
<td>EE3001 Project</td>
<td>EG2401 Engrg Profsm.</td>
<td>BREADTH ELECTIVE</td>
<td>DEPTH ELECTIVE</td>
<td></td>
</tr>
<tr>
<td>SS</td>
<td>ULR 1</td>
<td>EE203x Lab Module x* (2 MCs)</td>
<td>GEM 2</td>
<td>UEM 1 (2 MCs)</td>
<td>BREADTH ELECTIVE</td>
<td>UEM 2</td>
<td></td>
</tr>
<tr>
<td>ES1102*</td>
<td>GEM 1</td>
<td>ULR 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*pendding: EE2031 Lab Module 1 or EE2032 Lab Module 2 (Note: Recommended semester could be sem 3 or sem 4)

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**TOTAL GRADUATION REQUIREMENTS = 160MCs**

---

*NUS National University of Singapore*
<table>
<thead>
<tr>
<th>Sem 1</th>
<th>Sem 2</th>
<th>Sem 3</th>
<th>Sem 4</th>
<th>Sem 5</th>
<th>Sem 6</th>
<th>Sem 7</th>
<th>Sem 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA1505 Math I</td>
<td>MA1506 Math II</td>
<td>CG2271 RTOS</td>
<td>CG2007 MicroP Systems</td>
<td></td>
<td></td>
<td>CG4001 FYP</td>
<td>CG4001 FYP</td>
</tr>
<tr>
<td>CS1231 Discrete Structures</td>
<td>CG1413 ETC</td>
<td>CS2103 Software Engng</td>
<td>EE3001 Project</td>
<td></td>
<td></td>
<td></td>
<td>EG2401 Engg Profsm.</td>
</tr>
<tr>
<td>SS</td>
<td>ULR 1</td>
<td>EE203x Lab Module x (2 MCs)</td>
<td>GEM 2</td>
<td></td>
<td></td>
<td></td>
<td>EE3204 Computer Comms Networks I</td>
</tr>
<tr>
<td>ES1102*</td>
<td>GEM 1</td>
<td>ULR 2</td>
<td>UEM 1</td>
<td></td>
<td></td>
<td></td>
<td>UEM 2 (2 MCs)</td>
</tr>
<tr>
<td>20 MCs</td>
<td>24 MCs</td>
<td>22 MCs</td>
<td>24 MCs</td>
<td>12 MCs</td>
<td>Up to 12 MCs</td>
<td>25 MCs</td>
<td>21 MCs</td>
</tr>
</tbody>
</table>

**TOTAL GRADUATION REQUIREMENTS = 160MCs**

*pending: EE2031 Lab Module 1 or EE2032 Lab Module 2 (Note: Recommended semester could be sem 3 or sem 4)
## Possible Schedule for CEG AY2010/11 Poly Intake (without IA)

<table>
<thead>
<tr>
<th></th>
<th>Sem 1</th>
<th>Sem 2</th>
<th>Sem 3</th>
<th>Sem 4</th>
<th>Sem 5</th>
<th>Sem 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA1301</td>
<td>MA1505 Math I</td>
<td>MA1506 Math II</td>
<td>EE2023 Signals &amp; Systems</td>
<td>CG4001 FYP</td>
<td>CG4001 FYP</td>
<td></td>
</tr>
<tr>
<td>PC1222</td>
<td>PC1432 Physics IIIE</td>
<td>CS2103 Software Engrg</td>
<td>ST2334 Probability &amp; Statistics</td>
<td>CG2001 Design Project</td>
<td>DEPTH ELECTIVE</td>
<td></td>
</tr>
<tr>
<td>CG1101</td>
<td>CG1103 Data Structures &amp; Algorithms</td>
<td>CG2271 RTOS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE2005</td>
<td>CG2007 Microprocessor Systems</td>
<td>CG3207 Computer Architecture</td>
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<td>BREADTH ELECTIVE</td>
<td>BREADTH ELECTIVE</td>
<td>DEPTH ELECTIVE</td>
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<td>EE2006</td>
<td>CS1231 Discrete Structures</td>
<td>EE3204 Computer Comms Networks</td>
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<td>BREADTH ELECTIVE</td>
<td>1 GEM</td>
<td>DEPTH ELECTIVE</td>
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<tr>
<td>ES1102</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 SS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20 MCs</td>
<td>20 MCs</td>
<td>23 MCs</td>
<td>20 MCs</td>
<td>20 MCs</td>
<td>22 MCs</td>
</tr>
</tbody>
</table>

**TOTAL GRADUATION REQUIREMENTS = 160 MCs**
# CEG Technical Electives

## Embedded Systems
- CS3211 Parallel and Concurrent Programming
- CS3271 Software Engineering for Reactive Sys
- CS4223 Parallel Computer Architecture
- CS4271 Critical Systems and Their Verification
- CS4214 Real-time Embedded Systems
- EE4218 Embedded Hardware System Design
- EE4415 Integrated Digital Design

## Communications
- EE2011 Engineering Electromagnetics
- EE3101 Digital Signal Processing
- EE3103 Communications
- EE3104 Introduction to RF & Microwave
- EE4101 RF Communications
- EE4104 Microwave Circuits & Devices
- EE4110 RFIC and MMIC Design
- EE4112 HF Techniques
- EE4113 Digital Communications & Coding
- EE4114 Optical Communications

## Control & Energy Management
- EE2010 Systems & Control
- CS3243 Foundations of Artificial Intelligence
- CS3244 Machine Learning
- EE3302 Industrial Control Systems
- EE3304 Digital Control Systems
- EE3505 Electrical Energy Systems
- EE4302 Advanced Control Systems
- EE4305 Introduction to Fuzzy/Neural Sys
- EE4306 Distributed Autonomous Robotic Sys
- EE4307 Control Systems Design & Simulation
- EE4501 Power System Mgmt & Protection
- EE4502 Electric Drives and Control
- EE4505 Power Semiconductor Devices & ICs

## Networking
- CS3235 Introduction to Computer Security
- CS4222 Wireless Computing & Sensor Networks
- CS4236 Cryptography Theory & Practice
- CS4274 Mobile and Multimedia Networking
- CS4344 Networked & Mobile Gaming
- EE4210 Computer Communication Networks II
- EE4214 Real-time Embedded Systems
CEG Technical Electives

Multimedia Processing

EE3206 Intro to Computer Vision & Image Processing
EE3701 Digital Media Technologies
EE3702 Introduction to Electronic Gaming
EE4212 Computer Vision
EE4213 Image Processing
CS3230 Design and Analysis of Algorithms
CS3240 Human Computer Interaction
CS3248 Design of Interactive Media
CS3241 Computer Graphics
CS4240 Virtual Reality and 3-D Interaction
CS4243 Computer Vision & Pattern Recognition
CS4249 Design of Advanced User Interfaces

CS4247 Image Synthesis & Computer Animation
CS3248 Design of Interactive Systems
CS3249 Elements of User Interface Design
CS4248 Natural Language Processing
CS4341 Multimedia Technologies
CS4345 General-Purpose Computation on GPU
CS4213 Game Development
CS4247 Graphics Rendering Techniques
CS4342 3D Modeling and Animation
CS4344 Networked and Gaming
CS4347 Sound and Music Computing

Advisories will be provided during Year 2 to guide them on the choice of technical electives for specialization

http://www.ceg.nus.edu.sg/academic/electives.html
Industrial Attachment

Refer to http://www.ceg.nus.edu.sg/iap/

Plan carefully: Nothing, 6-month, 12 month

1\textsuperscript{st} 6-month (option): 12 MCs credited under UEM

2\textsuperscript{nd} 6-month (further option): Up to 12 MCs credited under technical requirements – only if you are able to map the work performed in the 6 months to learning outcomes in CEG technical modules.

http://www.ceg.nus.edu.sg/iap/
Student Exchange Programme

http://www.nus.edu.sg/iro/nus/students/prog/sep/faq.html

General
What does SEP offer?
Where can I find out more about SEP?
How much does it cost to go on SEP?
What is the difference between University-wide and Faculty-wide SEP?
How do I search for information on Partner Universities?
Will my graduation be delayed?

Application
How do I apply for SEP?
When can I apply for SEP?
What happens after I apply for SEP?
What do I do after I have been selected by Partner University for SEP?
What do I do after I have arrived at Partner University for SEP?

Eligibility
What are the minimum criteria for SEP eligibility?
Student Exchange Programme

http://www.nus.edu.sg/iro/nus/students/prog/sep/faq.html

I am not a Singaporean, can I apply for SEP?

Can I go for FULL year SEP in SEM2?

There is an overlap in semester dates. How can I complete the semester at the Partner University and be at NUS at the same time?

What happens after SEP?

Financial Assistance

Are there any forms of financial assistance for SEP?

Modules Mapping

What modules can I take during my SEP overseas? How do I map the modules offered by the Partner University with NUS modules?
Student Exchange Programme

http://www.nus.edu.sg/iro/nus/students/prog/sep/faq.html

Credit Transfer
How do I apply for transfer of credits after I return from SEP?
Can I transfer credits for a module read as 'Pass/Fail' option?
Will the modules taken overseas affect my CAP?

SEP Withdrawal or Deferment
Can I withdraw from the SEP upon successful application?
Can I defer my SEP to the next academic year?
Will withdrawal of current SEP affect my future application?

Language Preparation Courses
What Preparatory courses are available for students interested in going to non-english language medium universities?
Grading System

- **Graded Basis**: A+, A, A-, B+, B, B-, C+, C, D+, D, F
  - Programme Requirements/Minor/2nd Major/2nd Degree modules

- **Ungraded Basis**
  - *Satisfactory / Unsatisfactory (S/U)*
    - Applies to ULRs and UEMs (unless used for Minor/2nd Major/2nd Degree)
    - Exercise S/U option after release of exam results
  - *Completed Satisfactorily / Completed Unsatisfactory (CS/CU)*
    - Enhancement Programme modules taken towards UE

Maximum of **12 MCs (excluding IA)** can be on ungraded basis!
Grade Point System

Grade Point (GP):

<table>
<thead>
<tr>
<th>Grade</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+/A</td>
<td>5.0</td>
</tr>
<tr>
<td>A-</td>
<td>4.5</td>
</tr>
<tr>
<td>B+</td>
<td>4.0</td>
</tr>
<tr>
<td>B</td>
<td>3.5</td>
</tr>
<tr>
<td>B-</td>
<td>3.0</td>
</tr>
<tr>
<td>C+</td>
<td>2.5</td>
</tr>
<tr>
<td>C</td>
<td>2.0</td>
</tr>
<tr>
<td>D+</td>
<td>1.5</td>
</tr>
<tr>
<td>D</td>
<td>1.0</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
</tr>
</tbody>
</table>

CAP

$$\frac{\sum MC_i \times GP_i}{\sum MC_i}$$

Honors Classification

1st Class Honors  CAP \geq 4.5 & min A- for FYP
2nd Class (Upper) CAP 4.0 to 4.49
2nd Class (Lower)  CAP 3.5 to 3.99
3rd Class       CAP 3.2 to 3.49
Pass             CAP 2.0 to 3.19
MC excluded from CAP:

- Modules taken on S/U & CS/CU basis or during exchange, NoC, IA/Internship & APC are not factored into CAP

Minimum MCs graded & factored into CAP:

- 65% of Programme/Major credits.
- 16 MCs of Minor requirements
- Only up to 12 MCs of modules graded on S/U basis

Limit on level 1 modules: 60MCs max!

Warning and Dismissal:

- CAP < 2.0
  - 1st time → warning
  - 2nd time → probation
  - 3rd time → dismissal
- CAP < 1.5
  - For 2 consecutive semesters → dismissal
Academic Advisor

Each CEG student is assigned an Academic Advisor/Mentor (mid-Sept)

• Advisors offer academic advice & counsel
• Advisors will write letters of recommendation for YOU!
• See your Academic Advisor regularly so they can get to know you better.

University Health, Wellness & Counselling Centre
http://www.nus.edu.sg/uhc/cps/

Emotional & Psychological Well Being
• Anxiety, Depression
• Eating Disorders
• Feelings, Loneliness,

Relationship Issues
• Abusive Relationships, Family Stress, Managing Conflicts, Surviving a Breakup

Personal Effectiveness
• Decision Making, Motivation, Test Anxiety, Time Management, Challenges of University Life
• Mental Health, Self-Worth, Shyness, Stress
• Sudden Loss and Grief
Life is a journey, you may need a guide. Activate your life with...

» Interpersonal Learning Group
» Life Skills Group
» Personal Effectiveness Group
» Personal Growth Group

Click here to learn more about Counselling and Psychological Services

COUNSELLING AND PSYCHOLOGICAL SERVICES
Level 2, University Health Centre, 20 Lower Kent Ridge Rd
T 6516 2376 | cps@nus.edu.sg | nus.edu.sg/uhccps
How do you make the most of and succeed in NUS?

- Plan carefully from your first year, esp. if you are interested in SEP
- Consistent work throughout the semesters
- Attend all lectures, tutorials and labs
- Plan your projects
- Form good learning habits right from day 1
- Get to know people around you
- Enjoy studying
- Many levels of help throughout the system
  -> Year Coordinators, Academic advisors, Counselling Centre