THE NEW B ENG (EEE) CURRICULUM

The new EEE curriculum focuses on breadth-based training to provide flexibility of career choices and nurture lifelong learning. It strikes a judicious balance between breadth and depth to provide a solid foundation in the physical sciences and mathematics, on the one hand, and comprehensive training in electrical & electronic engineering on the other.

Also included are general education modules to broaden the education beyond the technical and professional. They comprise subjects in humanities, arts and social sciences (HSS) and general electives. Together with other essential modules in Communication Skills and Human Resource Management, the general education modules comprise a total of 36 Academic Units (AU) and account for about 23% of the overall curriculum workload. These modules are spread out over the 4 years of study.

FIRST YEAR CURRICULUM

The first year curriculum covers fundamentals in the physical sciences such as Mathematics, Physics, Chemistry and Materials Science, to provide a strong foundation for the specialisation years of studies. It also includes one communication-related module and two HSS modules to provide a broadening in non-technical areas that is beneficial to professional careers and lifelong learning.

SECOND YEAR CURRICULUM

In the second year, further modules in Engineering Mathematics are included to strengthen the foundation for more advanced study in electrical & electronic engineering. Other core fundamental electrical & electronic engineering modules such as Circuit Analysis, Electronics, Data Structures, Signals & Systems and AC Circuits & Machines are introduced to provide a broad background for all areas of electrical & electronic engineering. In addition, students undertake 2 modules of laboratory experiments and a Design & Innovation Project to provide the necessary grounding in the practical skills required for engineers.

For Polytechnic Diploma holders who are directly admitted to the second year, bridging modules on Basic Engineering Mathematics and Foundation Physics are provided to ease their transition into the degree programme. These students are also required to read a further Physics module to assist in preparing them for the other subjects in electrical & electronic engineering.

THIRD YEAR CURRICULUM

In the third year, basic principles which underpin a broad spectrum of technologies encompassed by the field of electrical and electronic engineering are taught. These include core modules on Electromagnetics, Integrated Electronics and Microprocessors. In addition, students will select 2 elective modules from a list of more specialized modules in preparation for more in-depth specialization in their final year. The elective subjects are Modelling & Control, Communication Principles, Semiconductor Devices & Processing, Digital Signal Processing, Power Systems & Conversion, Optics and Computer Communications.

FOURTH YEAR CURRICULUM

In the final year, students are given the flexibility to select their prescribed elective subjects under 3 broad groups, namely Electrical Engineering, Electronic Engineering and Infocommunication Engineering. They may select any 2 design elective subjects and at least 3 technical elective subjects from one of the groups and one more technical elective subject from any group.

However, students who prefer a more in-depth study can select the subjects from one of 10 areas of specialization, namely, Biomedical Engineering, Communication Engineering, Computer Engineering, Control & Automation, Digital Signal Processing, Electronics, Infocommunications, Microelectronics, Photonics and Power Engineering.

In addition to the elective technical subjects, all students are required to take a compulsory subject in Software Engineering and other subjects like Human Resource Management and Engineers & Society.
### THE NEW CURRICULUM STRUCTURE

#### YEAR 1
- **FE1001** Physics I
- **FE1002** Physics II
- **FE1003** Chemistry
- **FE1004** Life Sciences
- **FE1005** Materials Science
- **FE1006** Mathematics I
- **FE1007** Mathematics II
- **FE1008** Computing
- **FE1009** Effective Communication
- **FE1071** Laboratory 1A
- **FE1072** Laboratory 1B

#### YEAR 2
- **EE2001** Circuit Analysis
- **EE2002** Analog Electronics
- **EE2003** Semiconductor Fundamentals
- **EE2004** Digital Electronics
- **EE2005** AC Circuits & Machines
- **EE2006** Engineering Mathematics I
- **EE2007** Engineering Mathematics II
- **EE2008** Data Structures & Algorithms
- **EE2009** Technical Communication
- **EE2010** Signals & Systems
- **EE2071** Laboratory 2A
- **EE2072** Laboratory 2B
- **EE2079** Design & Innovation Project

#### YEAR 3
- **EE3001** Engineering Electromagnetics
- **EE3002** Microprocessors
- **EE3003** Integrated Electronics
- **EE3071** Laboratory 3
- **EE3072** Project
- **EE3079** Industrial Attachment
  - Elective 1
  - Elective 2

#### YEAR 4
- **EE4001** Software Engineering
- **EE4009** Professional Communication
- **EE4040** Engineers & Society
- **EE4041** Human Resource Management
- **EE4079** Final Year Project
  - Design Elective 1
  - Design Elective 2
  - Technical Elective 1
  - Technical Elective 2
  - Technical Elective 3
  - Technical Elective 4

### TABLE 1: FINAL YEAR PRESCRIBED ELECTIVE SUBJECTS

#### GROUP A - ELECTRICAL ENGINEERING

**Design Elective Subjects (Select any 2)**
- EE4207 Control Engineering Design
- EE4208 Intelligent System Design
- EE4501 Power Engineering Design I
- EE4502 Power Engineering Design II
- EE4901 Biomedical Control System Design
- EE4902 Design of Medical Information Processing Systems

#### Technical Elective Subjects (Select at least 3)
- EE4264 Data Fusion in Machine Intelligence
- EE4265 Process Control Systems
- EE4266 Computer Vision
- EE4268 Robotics and Automation
- EE4273 Digital Control Systems
- EE4285 Computational Intelligence
- EE4530 Power System Analysis and Control
- EE4531 Electricity Utilization Systems
- EE4532 Power Electronics and Drives
- EE4533 Power Apparatus and System Protection
- EE4903 Physiological Systems Analysis
- EE4904 Biomedical Instrumentation
- EE4905 Biomedical Signal Processing
- EE4906 Medical Imaging Systems
- EE4907 Bioelectronics

#### GROUP B - ELECTRONIC ENGINEERING

**Design Elective Subjects (Select any 2)**
- EE4303 Mixed-Signal IC Design
- EE4304 Radio Frequency Integrated System Design
- EE4320 Design and Manufacturing of Integrated Circuits
- EE4322 Advanced Analog Circuits
- EE4323 Radio Frequency Circuits
- EE4344 Analysis & Design of Integrated Circuits
- EE4645 Microfabrication Engineering
- EE4646 VLSI Technology
- EE4647 Semiconductor Devices
- EE4648 Flat Panel Display Technologies
- EE4649 IC Reliability and Failure Analysis
- EE4685 Semiconductor Physics
- EE4686 Semiconductor Optoelectronics
- EE4838 Laser Engineering
- EE4839 Fibre Optic Communications

#### Technical Elective Subjects (Select at least 3)
- EE4340 VLSI Systems
- EE4341 Advanced Analog Circuits
- EE4343 Radio Frequency Circuits
- EE4344 Analysis & Design of Integrated Circuits
- EE4645 Microfabrication Engineering
- EE4646 VLSI Technology
- EE4647 Semiconductor Devices
- EE4648 Flat Panel Display Technologies
- EE4649 IC Reliability and Failure Analysis
- EE4685 Semiconductor Physics
- EE4686 Semiconductor Optoelectronics
- EE4838 Laser Engineering
- EE4839 Fibre Optic Communications

#### GROUP C - INFOCOMMUNICATION ENGINEERING

**Design Elective Subjects (Select any 2)**
- EE4105 Cellular Communication System Design
- EE4109 Microwave Circuit Design
- EE4110 Optical Communication System Design
- EE4413 DSP System Design
- EE4706 Object Oriented Software Engineering Design
- EE4717 Web Application Design
- EE4718 Enterprise Network Design

#### Technical Elective Subjects (Select at least 3)
- EE4151 RF & Microwave Engineering
- EE4152 Digital Communications
- EE4153 Telecommunication Systems
- EE4170 Radar Engineering
- EE4188 Wireless Communications
- EE4189 Spread Spectrum Communications
- EE4454 Computer Interfacing Techniques
- EE4475 Audio Signal Processing
- EE4476 Image Processing
- EE4477 Speech Signal Processing
- EE4478 Digital Video Processing
- EE4483 Artificial Intelligence
- EE4490 Multimedia Systems
- EE4497 Pattern Recognition
- EE4705 Object-Oriented Programming
- EE4755 Operating Systems
- EE4756 Computer Architecture
- EE4758 Computer Security
- EE4759 Compiler
- EE4761 Computer Networking
- EE4762 Web Services
- EE4791 Database Systems

### TABLE 2: FINAL YEAR SPECIALISATION SUBJECTS

#### Biomedical Engineering:
- EE4901, EE4902, EE4903, EE4904, EE4905, EE4906, EE4907

#### Communication Engineering:
- EE4105, EE4109, EE4410, EE4415, EE4412, EE4413, EE4418, EE4419

#### Computer Engineering:
- EE4708, EE4718, EE4454, EE4755, EE4756, EE4757, EE4479, EE4479

#### Control & Automation:
- EE4207, EE4208, EE4264, EE4265, EE4266, EE4268, EE4273, EE4295

#### Digital Signal Processing:
- EE4105, EE4413, EE4475, EE4476, EE4477, EE4478, EE4490, EE4497

#### Electronics:
- EE4303, EE4304, EE4305, EE4340, EE4341, EE4342, EE4344

#### Infocommunications:
- EE4717, EE4718, EE4490, EE4750, EE4758, EE4761, EE4762, EE4791

#### Microelectronics:
- EE4618, EE4612, EE4645, EE4648, EE4664, EE4694, EE4695

#### Photonics:
- EE4815, EE4816, EE4836, EE4838, EE4839

#### Power Engineering:
- EE4501, EE4502, EE4530, EE4531, EE4532, EE4533