# Ming Chuan University Department of Electronic Engineering
## Course Outline for all students entering in 2016

| Course | | Credits | Hours | 1st year | | | | 2nd year | | | | 3rd year | | | | 4th year | | | | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Fall | | Spring | | Fall | | Spring | | Fall | | Spring | | Fall | | Spring | | |
| | | | | class | lab | class | lab | class | lab | class | lab | class | lab | class | lab | class | lab | class | lab | |
| Core Required Courses | Chinese Literature: Appreciation And Creative Writing I | 2 | 2 | 2 | | | | | | | | | | | | | | | | 1 |
| | Chinese Literature: Appreciation And Creative Writing II | 2 | 2 | | | 2 | | | | | | | | | | | | | | |
| | Practical English 1 | 0 | 2 | 1 | 1 | | | | | | | | | | | | | | | |
| | Practical English 2 | 0 | 2 | | | 1 | 1 | | | | | | | | | | | | | |
| | Practical English 3 | 0 | 2 | | | | | 1 | 1 | | | | | | | | | | | |
| | Practical English 4 | 0 | 2 | | | | | | | 1 | 1 | | | | | | | | | |
| | English for Business Communication 1 | 2 | 3 | | | | | | | | | 2 | 1 | | | | | | | |
| | English for Business Communication 2 | 2 | 3 | | | | | | | | | | | 2 | 1 | | | | | |
| | Practical English of Professionals 1 | 2 | 3 | | | | | | | | | | | | | 2 | 1 | | | |
| | Practical English of Professionals 2 | 2 | 3 | | | | | | | | | | | | | | | 2 | 1 | |
| | General Ed | 12 | 12 | | | | | | | | | | | | | | | | | 2 |
| | Physical Education (1)~(6) | 0 | 12 | 2 | | 2 | | 2 | | 2 | | 2 | | 2 | | | | | | |
| | **Subtotal** | 24 | 48 | | | | | | | | | | | | | | | | | |
| Professional Required Courses | Calculus I | 3 | 4 | 3 | 1 | | | | | | | | | | | | | | | |
| | Physics I | 3 | 3 | 3 | | | | | | | | | | | | | | | | |
| | Physics Laboratory I | 1 | 3 | 1 | 2 | | | | | | | | | | | | | | | Computer course |
| | Concept of Computer Science | 3 | 5 | 3 | 2 | | | | | | | | | | | | | | | Computer course |
| | Introduction to Information Technology | 1 | 1 | 1 | | | | | | | | | | | | | | | | |
| | Programming Design I | 3 | 5 | | | 3 | 2 | | | | | | | | | | | | | Computer course |
| | Calculus II | 3 | 4 | | | 3 | 1 | | | | | | | | | | | | | |

| Course | Credits | Hours | 1st year Fall class | 1st year Fall lab | 1st year Spring class | 1st year Spring lab | 2nd year Fall class | 2nd year Fall lab | 2nd year Spring class | 2nd year Spring lab | 3rd year Fall class | 3rd year Fall lab | 3rd year Spring class | 3rd year Spring lab | 4th year Fall class | 4th year Fall lab | 4th year Spring class | 4th year Spring lab | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Physics II | 3 | 3 | | | 3 | | | | | | | | | | | | | | |
| Physics Laboratory II | 1 | 3 | | | 1 | 2 | | | | | | | | | | | | | Computer course |
| Electronic Circuits I | 3 | 3 | | | 3 | | | | | | | | | | | | | | |
| Digital Logic Design | 3 | 3 | | | 3 | | | | | | | | | | | | | | |
| Programming Design II | 3 | 3 | | | | | 3 | | | | | | | | | | | | Computer course |
| Electronic Circuits II | 3 | 3 | | | | | 3 | | | | | | | | | | | | |
| Electronic Circuits Laboratory I | 1 | 3 | | | | | 1 | 2 | | | | | | | | | | | Computer course |
| Engineering Mathematics I | 3 | 3 | | | | | 3 | | | | | | | | | | | | |
| Electronics I | 3 | 3 | | | | | 3 | | | | | | | | | | | | |
| Electromagnetics I | 3 | 3 | | | | | 3 | | | | | | | | | | | | |
| Engineering Mathematics II | 3 | 3 | | | | | | | 3 | | | | | | | | | | |
| Electronics II | 3 | 3 | | | | | | | 3 | | | | | | | | | | |
| Electronic Circuits Laboratory II | 3 | 4 | | | | | | | 3 | 1 | | | | | | | | | Computer course |
| Microprocessor Design and Laboratory | 1 | 3 | | | | | | | 1 | 2 | | | | | | | | | Computer course |
| Signals and Systems | 3 | 3 | | | | | | | | | 3 | | | | | | | | |
| Electronic Circuits Laboratory III | 1 | 3 | | | | | | | | | 1 | 2 | | | | | | | Computer course |
| Project Research I | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| Project Research II | 3 | 3 | | | | | | | | | | | | | 3 | | | | |
| | | | | | | | | | | | | | | | | | | | |
| **Subtotal** | 63 | 82 | 14 | | 16 | | 13 | | 10 | | 4 | | 3 | | 3 | | | | |

| **Total Required Course Credits** (Electronic Engineering Department) | 87 | | | | | | | | | | | | | | | | | | |

| Elective Courses | | Credits | Hours | 1st year Fall | | 1st year Spring | | 2nd year Fall | | 2nd year Spring | | 3rd year Fall | | 3rd year Spring | | 4th year Fall | | 4th year Spring | | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | class | lab | class | lab | class | lab | class | lab | class | lab | class | lab | class | lab | class | lab | |
| IC Chip and System | Digital System Design and Laboratory | 3 | 3 | | | | | 3 | | | | | | | | | | | | Computer course (Program core course) |
| | MATLAB Programming | 3 | 3 | | | | | 3 | | | | | | | | | | | | Computer course (Program core course) |
| | Probability and Statistics | 3 | 3 | | | | | 3 | | | | | | | | | | | | |
| | Linear Algebra | 3 | 3 | | | | | 3 | | | | | | | | | | | | |
| | Computer organization | 3 | 3 | | | | | | | | | 3 | | | | | | | | |
| | Data Structure | 3 | 3 | | | | | | | | | 3 | | | | | | | | Computer course |
| | Introduction to VLSI Design | 3 | 3 | | | | | | | | | 3 | | | | | | | | Computer course (Program core course) |
| | Electronic Circuit Design | 3 | 3 | | | | | | | | | 3 | | | | | | | | |
| | Digital Signal Processing | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| | Digital Image Processing | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| | Analog IC Design | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| | Linear Circuit Design | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| | FPGA/CPLD Design | 3 | 3 | | | | | | | | | | | 3 | | | | | | Computer course |
| | Control System | 3 | 3 | | | | | | | | | | | | | 3 | | | | |
| | Embedded Systems | 3 | 3 | | | | | | | | | | | | | | | 3 | | Computer course |
| Electronic and semiconductor device | Introduction to Solar Cells | 3 | 3 | | | | | | | | | | | | | 3 | | | | |
| | Modern Physics | 3 | 3 | | | | | | | 3 | | | | | | | | | | |
| | Electromagnetics II | 3 | 3 | | | | | | | 3 | | | | | | | | | | Program core course |

| Elective Courses | | Credits | Hours | 1st year Fall class | 1st year Fall lab | 1st year Spring class | 1st year Spring lab | 2nd year Fall class | 2nd year Fall lab | 2nd year Spring class | 2nd year Spring lab | 3rd year Fall class | 3rd year Fall lab | 3rd year Spring class | 3rd year Spring lab | 4th year Fall class | 4th year Fall lab | 4th year Spring class | 4th year Spring lab | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Introduction to Electronic Materials | 3 | 3 | | | | | | | 3 | | | | | | | | | | |
| | Optoelectronic Devices | 3 | 3 | | | | | | | | | 3 | | | | | | | | Program core course |
| | Introduction to Semiconductor Devices | 3 | 3 | | | | | | | | | 3 | | | | | | | | Program core course |
| | Electromagnetic Wave | 3 | 3 | | | | | | | | | 3 | | | | | | | | |
| | Introduction to Microwave Engineering | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| | Semiconductor Measurement | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| | Optoelectronic | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| | Optoelectronic Design and Application | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| | Introduction to Semiconductor Manufacuring Technology | 3 | 3 | | | | | | | | | | | | | 3 | | | | |
| | Introduction to Flat Display | 3 | 3 | | | | | | | | | | | | | 3 | | | | |
| | Semiconductor Thin Film Technology | 3 | 3 | | | | | | | | | | | | | | | 3 | | |
| | Optical Fiber Communication | 3 | 3 | | | | | | | | | | | | | | | 3 | | |
| Military Training Education I | | 0 | 2 | 2 | | | | | | | | | | | | | | | | |
| Japanese I | | 2 | 3 | 2 | 1 | | | | | | | | | | | | | | | |
| Military Training Education II | | 0 | 2 | | | 2 | | | | | | | | | | | | | | |
| Japanese II | | 2 | 3 | | | 2 | 1 | | | | | | | | | | | | | |
| Information Applications | | 2 | 4 | | | 2 | 2 | | | | | | | | | | | | | Computer course |
| Military Training Education III | | 0 | 2 | | | | | 2 | | | | | | | | | | | | |

| Elective Courses | Credits | Hours | 1st year Fall | | 1st year Spring | | 2nd year Fall | | 2nd year Spring | | 3rd year Fall | | 3rd year Spring | | 4th year Fall | | 4th year Spring | | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | class | lab | class | lab | class | lab | class | lab | class | lab | class | lab | class | lab | class | lab | |
| Vector Calculus | 3 | 3 | | | | | 3 | | | | | | | | | | | | |
| Military Training Education IV | 0 | 2 | | | | | | | 2 | | | | | | | | | | |
| Optics and Optical Design | 3 | 3 | | | | | | | 3 | | | | | | | | | | Computer course |
| OrCAD Electronic Circuit Design | 3 | 3 | | | | | | | 3 | | | | | | | | | | Computer course |
| Communication Systems | 3 | 3 | | | | | | | | | 3 | | | | | | | | |
| Complex Functions | 3 | 3 | | | | | | | | | 3 | | | | | | | | |
| Microcontrollers | 3 | 3 | | | | | | | | | 3 | | | | | | | | Computer course |
| Microprocessor Fundamentals | 3 | 3 | | | | | | | | | 3 | | | | | | | | |
| Microprocessor Laboratory | 2 | 2 | | | | | | | | | 2 | | | | | | | | |
| Synthesis Design I | 3 | 3 | | | | | | | | | 3 | | | | | | | | |
| Synthesis Design II | 4 | 4 | | | | | | | | | | | 4 | | | | | | |
| Communication System Lab | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| Global Positioning System and Navigation | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| Remote Sensing of Oceanography | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| Real-time operating system | 3 | 3 | | | | | | | | | | | 3 | | | | | | Computer course |
| Workplace English | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| Introduction to Telecommunication Engineering | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| Introduction to Random Processes | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| Numerical Analysis | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| VLSI Design | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| Discrete Mathematics | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| Antenna Project | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| Communication Lab | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| Green Energy Technology | 3 | 3 | | | | | | | | | | | 3 | | | | | | |
| Interactive Technology | 3 | 3 | | | | | | | | | | | | | 3 | | | | Computer course |
| Introduction to Data Compression | 3 | 3 | | | | | | | | | | | | | 3 | | | | |
| Solid State Electronics | 3 | 3 | | | | | | | | | | | | | 3 | | | | |
| Introduction to Computer Networks | 3 | 3 | | | | | | | | | | | | | 3 | | | | |
| Computer Vision | 3 | 3 | | | | | | | | | | | | | 3 | | | | |
| Chip Design Practices | 3 | 3 | | | | | | | | | | | | | 3 | | | | Computer course |

| Elective Courses | | Credits | Hours | 1st year Fall class | 1st year Fall lab | 1st year Spring class | 1st year Spring lab | 2nd year Fall class | 2nd year Fall lab | 2nd year Spring class | 2nd year Spring lab | 3rd year Fall class | 3rd year Fall lab | 3rd year Spring class | 3rd year Spring lab | 4th year Fall class | 4th year Fall lab | 4th year Spring class | 4th year Spring lab | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Physical Training (7) | | 2 | 2 | | | | | | | | | | | | | 2 | | | | |
| Internship | | 3 | 3 | | | | | | | | | | | | | 3 | | | | |
| Advanced Internship | | 3 | 3 | | | | | | | | | | | | | | | 3 | | |
| Practical Project of Electronics | | 3 | 3 | | | | | | | | | | | | | | | 3 | | |
| NANO Electronic Devices | | 3 | 3 | | | | | | | | | | | | | | | 3 | | |
| Physical Training (8) | | 2 | 2 | | | | | | | | | | | | | | | 2 | | |
| **Grand Total** | Subtotal Required Course Credits | 87 | | | | | | | | | | | | | | | | | | |
| | Subtotal Elective Course Credits | 41 | | | | | | | | | | | | | | | | | | |
| | Total | 128 | | | | | | | | | | | | | | | | | | |

Graduation Requirements:

1. In accordance with the General Provisions for Study, undergraduate students need to satisfactorily complete Service Learning, meet the university-wide basic competencies of English, Information Technology, Chinese, and Sports, and pass the core competencies of their department to be eligible for graduation.

2. Students who entered in and since the 2008-09 academic year need to complete at least 12 General Education course credits. General Education courses are divided into three areas: Humanities, Social Science, and Natural Science. Each area is divided into two subcategories: core and extended. Students need to take 1 two-credit course in both of the subcategories within each area to be eligible for graduation. Only 12 course credits will be counted toward graduation. Additional course credits earned in General Education courses are not counted toward graduation.

3. Courses from focused course programs set up by any individual IT department or cooperatively between IT and other Schools can be regarded as the EE professional elective courses under the approval of the department chair. Courses selected from other Schools can also be regarded as the EE professional elective courses under the approval of the department chair with a limitation of at most 20 course credits.

4. When retaking the required course, students can choose those which are with the same course name or the same course content as substitutions under the approval of the department chair. These courses can be regarded as their graduation credits.

5. Students who fulfill the requirement of each courses groups can apply for the corresponding certificate. Each courses groups has its own regulation as follows:

   (1) The VLSI and System Engineering Courses Groups: In order to get the courses groups certificate, students must make at least seven elective courses, the program required courses include: Digital System Design and Lab, MATLAB Programming, Introduction to VLSI Design.

(2) The Electronic Components Courses Groups: In order to get the courses groups certificate, students must make at least seven elective courses, the program required courses include: Electromagnetics II, Optoelectronic Devices, Introduction to Semiconductor Devices.

6. Students can choose the courses from the EE master program, which can be counted as their graduation credits under the approval of the department chair.

7. Education credits cannot be counted as the graduation credits.

8. The elective courses on this Course Outline may be counted toward total graduation credits by students who entered the university prior to the 2015 academic year.