
**School of Science and Engineering**

**Office of Graduate Studies**

Master of Science

# DIGITAL ELECTRONICS

Academic Program

Fall 2012

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# 1. Introduction

Electronics is the branch of science, engineering and technology that deals with electrical circuits involving active electrical components such as transistors, diodes and integrated circuits, and associated passive interconnection technologies.

The nonlinear behavior of active components and their ability to control electron flows makes amplification of weak signals possible and is usually applied to information and signal processing. Similarly, the ability of electronic devices to act as switches makes digital information processing possible. Interconnection technologies such as circuit boards, electronics packaging technology, and other varied forms of communication infrastructure complete circuit functionality and transform the mixed components into a working system.

Today, most electronic devices use semiconductor components to perform electron control. The study of designing and constructing the electronic circuits to solve practical problems regarded as electronics engineering.

## 2. Program in a glance

| | |
|---|---|
| **Course Length:** | 2 years |
| **Number of credits required to graduate for thesis option** | A minimum of 32 credits |
| **Courses required to graduate:** | a) 15 credits from core courses (Table 3)<br>b) 9 credits from optional courses (Table 4)<br>c) 2 credits for "Seminar" (Mandatory)<br>d) 6 credits for "Thesis" (Mandatory) |

| | |
|---|---|
| **Course Length:** | 2 years |
| **Number of credits required to graduate for none thesis option** | A minimum of 32 credits |
| **Courses required to graduate:** | a) 15 credits from core courses (Table 3)<br>b) 15 credits from optional courses (Table 4)<br>c) 2 credits for "Seminar" (Mandatory) |

**Important Notes:**

1. Compensatory courses (Table 1) are mandatory for those students who have not taken any of these courses in their Bachelor Degree. The minimum pass mark is 12 out of 20.
2. Students are not allowed to take those courses which have already been taken in their bachelor degree.

**Table 1: Compensatory Courses**

| No | Course Name | Credit | Code |
|---|---|---|---|
| **1-1** | Microprocessor System Design | 3 | 55-771 |

**Table 2: Thesis, Seminar and Advanced Technical English**

| No | Course Name | Credit | Code |
|---|---|---|---|
| **2-1** | MSc Thesis | 6 | 55-810 |
| **2-2** | Seminar | 2 | 55-590 |

*** Note: "Seminar" is mandatory for all students.**

**Table 3: Core Courses**

| No | Course Name | Credit | Code |
|---|---|---|---|
| **3-1** | VLSI Design | 3 | 55-568 |
| **3-2** | Advanced Applied Programming | 3 | 55-533 |
| **3-3** | Microprocessors 2 | 3 | 55-563 |
| **3-4** | Dig Signal Processing | 3 | 55-155 |
| **3-5** | Computer Interfacing | 3 | 55-558 |

**Table 4: Optional Courses**

| No | Course Name | Credit | Code |
|---|---|---|---|
| **4-1** | Digital Electronics | 3 | 55-262 |
| **4-2** | Vision In Man & Machine | 3 | 55-626 |
| **4-3** | Computer Vision | 3 | 55-553 |
| **4-4** | Robotics | 3 | 55-637 |
| **4-5** | Digital Image Processing | 3 | 55-157 |
| **4-6** | Fuzzy Logic & Applied | 3 | 55-446 |
| **4-7** | Neural Networks | 3 | 55-443 |
| **4-8** | Applied Digital Controllers | 3 | 55-556 |
| **4-9** | Special Topics In Digital System | 3 | 55-540 |
| **4-10** | Special Problems In Digital Systems | 3 | 55-570 |

## 3. Suggested 2-years course selection

Suggested 2-years program for student choosing thesis option

| 1st Semester | | | 2nd semester | | |
|---|---|---|---|---|---|
| Course No. | | Credit | Course No. | | Credit |
| | Core Course | 3 | | Core Course | 3 |
| | Core Course | 3 | | Core Course | 3 |
| | Core Course | 3 | | Optional Course | 3 |
| | Seminar | 2 | | | |
| | Total | 11 | | Total | 9 |

| 3rd Semester | | | 4th semester | | |
|---|---|---|---|---|---|
| Course No. | | Credit | Course No. | | Credit |
| | Thesis | 3 | | Thesis | 3 |
| | Optional Course | 3 | | | |
| | Optional Course | 3 | | | |
| | | | | | |
| | Total | 9 | | Total | 3 |

Suggested 2-years program for student choosing none thesis option

| 1st Semester | | | 2nd semester | | |
|---|---|---|---|---|---|
| Course No. | | Credit | Course No. | | Credit |
| | Core Course | 3 | | Core Course | 3 |
| | Core Course | 3 | | Core Course | 3 |
| | Core Course | 3 | | Optional Course | 3 |
| | Seminar | 2 | | | |
| | Total | 11 | | Total | 9 |

| 3rd Semester | | | 4th semester | | |
|---|---|---|---|---|---|
| Course No. | | Credit | Course No. | | Credit |
| | Optional Course | 3 | | Optional Course | 3 |
| | Optional Course | 3 | | Optional Course | 3 |
| | | | | | |
| | | | | | |
| | Total | 6 | | Total | 6 |

## 4. Research areas

ASIC/FPGA, Computer Interfacing, Computer Vision, Communication System, Digital Electronics, DSP Processors, Digital Signal Processing, Digital Image Processing, Fuzzy Logics, Medical Imaging, Neural Networks, Robotics, Speech processing, Video Processing, VLSI Design.