**COMSATS Institute of Information Technology**

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Department of Electrical Engineering

**Self Assessment Report**

**BS Computer Engineering**

Prepared for Quality Enhancement Cell

# Mission, Objectives and Outcomes

## Mission & Objectives

### Mission of the Institute

COMSATS Institute of Information Technology (CIIT) is a multi-campus academic institute that aims to educate students from all over the country (and abroad), and improves the well-being of individuals through both the teaching and research activities. CIIT aims to search for truth through advancement of learning and extending the frontiers of knowledge and to apply this knowledge for the benefit of Pakistan in particular, and the world in general. The Institute’s mission is threefold, i.e.

1. Research and Discovery
2. Teaching and Learning
3. Outreach and Public Service

### Mission of the Campus

CIIT Wah Campus aims to serve the nation through education in business and technology-related disciplines. The Campus has a mission of producing well-educated and well-versed leaders in order to grow the educated community in Pakistan. Although the institute’s functional emphasis will remain on academic programs; the faculty and students will also engage in research and public service programs.

### Mission of the Department

The Electrical Engineering (EE) department aims to produce high-quality engineers in the discipline of Electronics, Computer Systems, Telecommunication and Power Engineering. The department aims to be ranked amongst the top engineering schools of the world.

The department has a mission to grow the technically educated community of Pakistan. The faculty and students will also engage themselves in quality research related to the discipline of electrical engineering and public service programs.

### Mission of the Computer Engineering Program

The aim of the B.Sc. (Computer Engineering) program is to prepare high quality computer systems engineers who will become the intellectual leaders in technology-driven industry, government and academia.

### Program Objectives

Following are the primary objectives of B.Sc. (CE) program that shape our curriculum and academic calendar:-

1. To build solid foundations in mathematics and engineering sciences through coursework that should be updated every year with the latest advancement in relevant fields.
2. To develop the ability to analyze, synthesize and design application-centric computer and embedded systems.
3. To develop communication and social skills among the students so that they acquire an understanding of intellectual achievements in other fields.
4. To motivate our graduates towards understanding the economic, environmental and ethical issues so that they can apply their expertise to solve real-world problems.
5. To prepare our graduates for high quality research and innovations.

The objectives of the program are inter-connected, for example, students will only be able to design and implement computer systems (OBJ2) after building their foundations in mathematics and engineering sciences (OBJ1). The objectives are well-defined and support the faculty and institution mission statements.

### Strategic Plan

The program’s mission will be achieved through the following strategic plan:-

1. **Curriculum design:** Curriculum will be designed to cover fundamentals of computer engineering including mathematics and electronics. In addition to the core courses, a wide variety of elective subjects will be offered to introduce cutting edge technologies related to computer engineering.
2. **Laboratory work:** Theoretical foundations will be complemented by extensive laboratory work in order to apply theoretical knowledge in practical situations.
3. **Project development:** During the course of study, students will be asked to do small-scale projects in order to understand the intricacies and constraints when practically developing and delivering a product. Finally, a comprehensive one-year project will be developed by the engineering students that may lead to further research or, alternatively, help securing a relevant job.
4. **Co-curricular activities**: Students will be encouraged to participate in national and international quizzes, competitions and exhibitions. These activities will help our students in exploring the latest advancement in the field of computer engineering.

## Program Outcomes

1. The graduates of the B.Sc. (CE) program will have an ability to apply knowledge of mathematics and engineering sciences to both theoretical and practical problems.
2. The graduates will be able to design and implement their own hardware systems and related software applications.
3. The graduates will be able to communicate effectively in both the international and domestic organizations.
4. The graduates will have a good understanding of the impact of engineering solutions in the economic, environmental and social areas. The graduates will have an ability to identify, formulate and solve computer engineering problems that may exist in industry, government or academic community.
5. The graduates interested in research will be able to secure admissions in top-ranked universities of the world.
6. An ability to function on multi-disciplinary teams.

The objectives and their expected outcomes are visually shown in Figure 1 along with their dependencies.

**OUT1: Good Scientific Knowledge**

* Winning quiz competitions
* Participations in scholastic debates

**OBJ1: Build Foundations**

**OBJ3: Social & Communication Skills**

**OBJ2: Build Practical Skills**

**OBJ4: Solve Real-world Problems**

**OBJ5: Prepare for Higher Studies Abroad**

**OUT2: Design and Develop Hardware & Software Systems**

* Quality final-year projects
* Winning project competitions

**OUT3: Effective Oral & Written Communications**

* Impressive presentations
* Good report writing

**OUT4: Solving Industrial Problems**

* Job placements
* Entrepreneurship

**OUT5: Admissions in Top Universities**

* Conference publications
* Relations with the centers of excellence around the globe

**OUT6: Multi-disciplinary Teams**

* Improved social networking of alumni and senior students

Figure 1: Objectives & Outcomes

## Program’s assessment

The department assesses its overall performance at the end of each semester by student’s feedback, faculty’s feedback and end-of-semester meetings. These reports are compiled and archived for one year. The EE department has also initiated survey of alumni and their employers’ feedback.

Summary of these surveys is discussed in the following section.

## Overall performance

### Students

There are currently 403 students enrolled in the B.Sc.(CE) program. The details are provided as below:-

|  |  |  |
| --- | --- | --- |
| Sr. No. | Intake | Strength |
| 1 | FALL 2011 | 104 |
| 2 | FALL 2010 | 72 |
| 3 | FALL 2009 | 93 |
| 4 | FALL 2008 | 134 |

At present, the department has 43 faculty members whereby 21 members are dedicated to the Computer Engineering program. Therefore, student-to-teacher ratio for the B.Sc. (CE) program turns out to be:-

So far, 1061 students have successfully graduated with the degree of B.Sc. (CE) out of which 65 students were awarded the degree with honors.

The 1061 students graduated in 8.45 semesters and bear an average CGPA of 2.667 out of 4. Figure 2 shows the average number of semesters taken by each batch while their average CGPA are plotted in Figure 3. The CGPA graph shows a slow but steady increase for last four years in the average CGPA of our students.

In CIIT, a student is awarded degree with honors if he or she maintains the CGPA of 3.33 or above without any F grade and completing the program in regular 8 semesters. Figure 4 gives the percentage of honored students in each batch passed out. Only 5% of the students usually receive their degree with honors; however, the last batch that was passed out in Fall-2011 showed much better result and 9% of them secured the CGPA of 3.33 or above.

Attrition (drop) rate for the program since 2001 is shown graphically in Figure 5. The drop rate has fallen down to roughly 25% in last three years

Figure 2 Average Number of Semesters taken (batch-wise)

Figure 3 Average CGPA of students (batch-wise)

Figure 4 Percentage of Honored Students (batch-wise)

Figure 5 Attrition Rate for the BSc(CE) Program

Figure 6 Faculty Satisfaction Survey Report (April 2012)

### Alumni

The campus has recently established CIIT Wah Campus alumni chapter and their web portal. Alumni feedback and their employers’ satisfaction reports will soon be received.

### Faculty

The EE faculty has been actively involved in cutting edge research and development. Our PhD-qualified faculty members publish 3 journal publications per year on average.

In addition to these publications, our faculty has recently developed 3-phase and single-phase transformer trainers in house. On the software side, an open-source preference elicitation tool has been launched that offers cutting-edge decision making tools based on evolutionary multi-objective optimization (EMO).

### Faculty Satisfaction

According to the latest survey conducted in April 2012, the EE faculty appears to be satisfied working in the department. The survey was conducted using HEC-provided forms. Following linguistic variables were used to represent satisfaction and dissatisfaction:-

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Choice** | A | B | C | D | E |
| **Linguistic variables** | Highly satisfied | Satisfied | Neutral | Dissatisfied | Highly Dissatisfied |
| **Numerical Equivalence** | 100% | 75% | 50% | 25% | 0% |

The overall satisfaction ratings are provided in **Figure 6** while **Figure 7** shows the satisfaction index for junior and senior faculty i.e. Instructors, RAs, Lecturers and Assistant Professors.

Looking at **Figure 7**, the EE faculty appears to be satisfied with the cooperation with their colleagues, interaction with the students and the time available for their families. However, they appear dissatisfied with the administrative support and the promotion policies being conveyed to them.

**Figure 7 Designation-wise Faculty Satisfaction Survey Report (April 2012)**

### Community Services

The EE department has been organizing seminars and workshops on regular basis.

**A seminar on “Networking with IPv6 and IPv4”** was arranged on 29-Mar-2012 at the campus auditorium. The seminar was delivered by a group of networking experts from CISCOM (Pvt.) Ltd. led by Mr. Umer Gul. The three hours of seminar proved quite useful for the engineering students in general and the Telecommunication engineering students in particular.

**A workshop on LaTeX** was held 8-April-2011 to help academic community in developing their skills to write articles. The workshop was led by Dr. Sajid Siraj who started with the basics of installing a typesetting software and then creating a document containing technical content e.g. equations, tables and figures. Considering the needs of majority of attendants, LyX editor was also introduced in order to reduce steep learning curve that is usually faced whilst learning LaTeX.

**A seminar on Vehicular Ad-Hoc Network** or VANET was arranged by the Electrical Engineering Department on April 15th 2011. VANETs are a cornerstone of the envisioned Intelligent Transportation Systems (ITS).

**A faculty development workshop on counseling** was arranged on 25-March-2011 in order to train the EE faculty on how to counsel their students. Many educators lack the skills necessary to counsel their students whilst teaching their university courses. The workshop covered several topics including self-control, self-fullness, needs, fears and expectation management. Various topics on counseling were discussed among the participants, for example, major deficiencies of our students, diversity, trust-building exercises, ice-breaking and extroversion.

**A workshop on “PCB Design & Fabrication”** was delivered by the final-year engineering students with the help of Dr. Sajid Siraj. The workshop was designed for the engineering students of second and third year in order to prepare them for final-year projects and internships. The event was arranged on 25-Nov-2011 in PC Lab-3, Allama-Iqbal Block, CIIT Wah Campus.

**A product launching ceremony** was held in the campus on 9-Jan-2012 by the computer engineering students of the Fall-2008 batch. Other departments were also invited to attend and judge the two products launched by the final-year students. The two groups - team A and team B - were assigned a task of developing a full-fledge product for PIC Microcontroller Development Kit.

**A seminar on ‘Emerging Technologies in Embedded Systems & Automation’** was delivered by Mr. Saqib Farhan (Industrial Automation Ltd.) on 6-May-2011 in the campus auditorium. The seminar was arranged by Dr. Sajid Siraj to help students in finding ideas for their final-year projects.

**A career development workshop** was organized for the final-year engineering students on 16-Mar-2012. The event was divided into three stages: the first stage was led by Dr. Sajid Siraj who helped the participants to realize the importance of developing both their personality and their social network. The second stage was led by Ms. Fasiha Subhan who helped the students in building their CVs. She guided the students in writing an impressive CV and also warned of the common mistakes that people usually commit whilst preparing their CV. In the end, Mr. Muhammad Shafiq delivered a comprehensive lecture on interview preparation.

**A Seminar on Awareness of Cancer-Related Diseases:** The Management Sciences department of CIIT Wah Campus organized this seminar on 23rd February 2012. The team of Shoukat Khanam Memorial Trust visited the campus and gave presentation followed by question and answer session. Sessions for gents and ladies were held separately in the campus auditorium.

# Curriculum

**Title of the program:** B.Sc. Electrical Computer Engineering

**Credit Hour:** A student earns credits for successfully completing a [course](http://en.wikipedia.org/wiki/Course_%28education%29) in the curriculum of the program. A credit hour is equivalent to the time spent by a student every week during the course of study. For example, a 3-credit course implies that students have to study three hours every week during the semester.

Curriculum for the B.Sc. (CE) program gets revised by the Board of Studies (BoS) every year. The core material of the program has been designed according to the Pakistan Engineering Council (PEC) requirements. Detail of the curriculum is given below:-

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Semester 1 | | | | |
| **Course Code** | **Course Title** | **Credit Hours** | | **Prerequisite(s)** |
| HUM100 | English Comprehension and Composition | 3(3,0) | |  |
| HUM110 | Islamic Studies | 3(3,0) | |  |
| PHY121 | Applied Physics for Engineers | 4(3,1) | |  |
| MTH101 | Calculus –I | 3(3,0) | |  |
| EEE113 | Engineering Drawing | 1(0,1) | |  |
| EEE112 | Engineering Mechanics and Thermodynamics | 3(3,0) | |  |
|  |  | 17(15,2) | |  |
| Semester 2 | | | | |
| **Course Code** | **Course Title** | **Credit Hours** | | **Prerequisite(s)** |
| HUM111 | Pakistan Studies | 3(3,0) | |  |
| MTH102 | Calculus – II | 3(3,0) | | MTH101 |
| MTH231 | Linear Algebra | 3(3,0) | |  |
| CSC141 | Introduction to Computer Programming | 4(3,1) | |  |
| EEE121 | Electric Circuits Analysis – I | 4(3,1) | | MTH101,PHY121 |
|  |  | 17(15, 2) | |  |
| Semester 3 | | | | |
| **Course Code** | **Course Title** | **Credit Hours** | | **Prerequisite(s)** |
| MTH203 | Calculus – III | 3(3,0) | | MTH102 |
| MTH242 | Differential Equations | 3(3,0) | | MTH102 |
| EEE241 | Digital Logic Design | 4(3,1) | |  |
| EEE231 | Electronics – I | 4(3,1) | | EEE121 |
| CSC241 | Object Oriented Programming | 4(3,1) | | CSC141 |
|  |  | 18 (15,3) | |  |
| Semester 4 | | | | |
| **Course Code** | **Course Title** | **Credit Hours** | **Prerequisite(s)** | |
| MTH263 | Probability Theory and Random Variables | 3(3,0) | MTH203 | |
| EEE261 | Electromagnetic Theory | 3(3,0) | MTH203 | |
| EEE222 | Electric Circuits Analysis – II | 3(3,0) | MTH242,EEE121 | |
| EEE223 | Signals and Systems | 4(3,1) | MTH242 | |
| EEE375 | Power Distribution and Utilization | 3(3,0) |  | |
|  |  | 16(15,1) |  | |
| Semester 5 | | | | |
| **Course Code** | **Course Title** | **Credit Hours** | **Prerequisite(s)** | |
| EEE232 | Electronics – II | 4(3,1) | EEE222,EEE231 | |
| EEE371 | Electric Machines | 4(3,1) | EEE222,EEE261 | |
| EEE343 | Computer Organization | 4(3,1) | EEE241 | |
| EEE324 | Digital Signal Processing | 4(3,1) | EEE223 | |
| EEE351 | Principles of Communication Systems | 4(3,1) | EEE223 | |
|  |  | 20(15,5) |  | |
| Semester 6 | | | | |
| **Course Code** | **Course Title** | **Credit Hours** | **Prerequisite(s)** | |
| ECO300 | Engineering Economics | 3(3,0) |  | |
| EEE325 | Control Systems | 4(3,1) | EEE223,EEE232 | |
| EEE342 | Microprocessor Systems and Interfacing | 4(3,1) | EEE241 | |
| EEE314 | Data Communication and Computer Networks | 4(3,1) |  | |
| CSC322 | Operating Systems Concepts | 3(3,0) | CSC141 | |
|  |  | 18(15,3) |  | |
| Semester 7 | | | | |
| **Course Code** | **Course Title** | **Credit Hours** | **Prerequisite(s)** | |
| HUM102 | Report Writing Skills | 3(3,0) | HUM100 | |
|  | Major/Specialization Elective I | 3(3,0)/4(3,1) |  | |
|  | Non-Engineering Elective | 3(3,0) |  | |
| EEE490 | Final Year Project (Part-I)\*\* | 1(0,1) |  | |
| CSC112 | Algorithms and Data Structures | 4(3,1) | CSC141 | |
|  |  | 14-15(12,2-3) |  | |
| Semester 8 | | | | |
| **Course Code** | **Course Title** | **Credit Hours** | | **Prerequisite(s)** |
| MGT462 | Project Planning and Management | 3(3,0) | |  |
|  | Major/Specialization Elective II | 3(3,0)/4(3,1) | |  |
|  | EE Open/Free Elective\*\*\* | 3(3,0)/4(3,1) | |  |
| EEE490 | Final Year Project (Part-II) | 5(0,5) | |  |
|  |  | 14-16(9,5-7) | |  |

**Grand Total: 134-137 Credit Hours**

\* Electives

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Credit Hours** | **Prerequisite(s)** |
| CSC421 | Systems Programming | 4(3,1) | CSC322 |
| CSC341 | Network Programming | 4(3,1) | EEE314,CSC141 |
| EEE434 | VLSI Design | 4(3,1) | EEE241,EEE232 |
| EEE440 | Computer Architecture | 3(3,0) | EEE343 |
| EEE446 | Real Time Embedded Systems | 4(3,1) | EEE342 |
| EEE415 | Digital Image Processing | 4(3,1) | MTH231,EEE223 |
| CSC271 | Database Systems | 4(3,1) | CSC112 |
| CSC334 | Distributed Computing | 4(3,1) | EEE314,CSC141 |
| CSC492 | Software Engineering | 3(3,0) |  |
| CSC462 | Artificial Intelligence | 3(2,1) | CSC141 |
| CSC336 | Web Engineering | 4(3,1) | CSC141 |
| EEE447 | Robotics | 3(3,0) | EEE446,CSC462 |
|  |  |  |  |

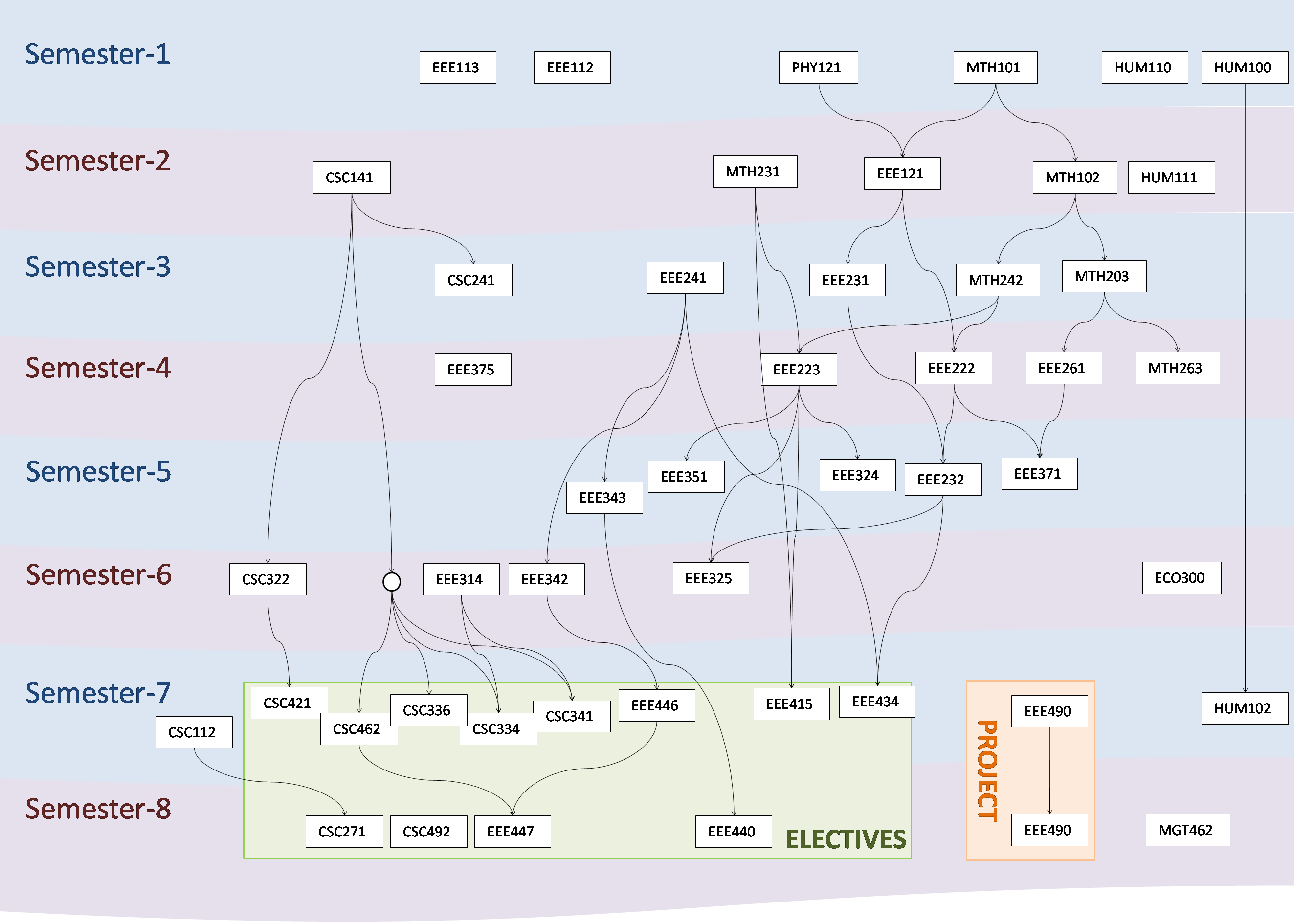


Figure 8 Degree Program Flow Graph

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Semester** | **Course Code** | **Category (Credit Hours)** | | | | |
| **Math and Basic Science** | | **Core Courses** | **Humanities and Social Sciences** | **Technical Electives** |
| **Math** | **Basic**  **Science** |
| **I** | HUM100 |  |  |  | 3(3,0) |  |
| PHY121 |  | 4(3,1) |  |  |  |
| MTH104 | 3(3,0) |  |  |  |  |
| EEE113 |  |  | 1(0,1) |  |  |
| HUM110 |  |  |  | 3(3,0) |  |
| EEE112 |  |  | 3(3,0) |  |  |
| **II** | CSC141 |  | 4(3,1) |  |  |  |
| HUM111 |  |  |  | 3(3,0) |  |
| MTH231 | 3(3,0) |  |  |  |  |
| MTH102 | 3(3,0) |  |  |  |  |
| EEE121 |  |  | 4(3,1) |  |  |
| **III** | EEE241 |  |  | 4(3,1) |  |  |
| MTH203 | 3(3,0) |  |  |  |  |
| MTH242 | 3(3,0) |  |  |  |  |
| EEE231 |  |  | 4(3,1) |  |  |
| CSC241 |  | 4(3,1) |  |  |  |
| **IV** | EEE261 |  |  | 3(3,0) |  |  |
| MTH263 | 3(3,0) |  |  |  |  |
| EEE223 |  |  | 4(3,1) |  |  |
| EEE222 |  |  | 4(3,1) |  |  |
| EEE375 |  |  | 3(3,0) |  |  |
| EEE232 |  |  | 4(3,1) |  |  |
| **V** | EEE232 |  |  | 4(3,1) |  |  |
| EEE371 |  |  | 4(3,1) |  |  |
| EEE343 |  |  | 4(3,1) |  |  |
| CSC112 |  | 4(3,1) |  |  |  |
| EEE324 |  |  | 4(3,1) |  |  |
| EEE351 |  |  | 4(3,1) |  |  |
| **VI** | ECO300 |  |  |  | 3(3,0) |  |
| EEE325 |  |  | 4(3,1) |  |  |
| EEE314 |  |  | 4(3,1) |  |  |
| EEE342 |  |  | 4(3,1) |  |  |
| CSC322 |  |  | 4(3,1) |  |  |
|  |  |  |  |  |  |
| **VII** | HUM102 |  |  |  | 3(3,0) |  |
| EEE490 |  |  | 1(0,1) |  |  |
| EEE\*\*\* |  |  |  |  | 3(3,0) |
| EEE\*\*\* |  |  |  |  | 3(3,0)/4(3,1) |
| CSC112 |  | 4(3,1) |  |  |  |
| **VIII** | EEE490 |  |  | 5(0,5) |  |  |
| EEE\*\*\* |  |  |  |  | 4(3,1) |
| EEE\*\*\* |  |  |  |  | 3(3,0) |
| MGT462 |  |  |  | 3(3,0) |  |
| **Total Courses** | 43 | 7 | 5 | 19 | 6 | 3 |
| **Total Credits** | **137** | **21** | **19** | **67** | **18** | **11** |
| **Minimum**  **Requirements** |  |  |  |  |  |  |

## The curriculum is consistent and supports the program’s documented objectives

The scheme of studies for the B.Sc. (CE) program has been carefully designed to attain the above-mentioned objectives. Following is the list of offered courses and the objectives targeted by each course:-

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **OBJ1** | **OBJ2** | **OBJ3** | **OBJ4** | **OBJ5** |
|  |  |  |  |  |  |  |
| **Semester 1** |  |  |  |  |  |  |
| HUM100 | English Comprehension and Composition |  |  | ⃝ |  |  |
| HUM110 | Islamic Studies |  |  | ⃝ |  |  |
| PHY121 | Applied Physics for Engineers | ⃝ |  |  |  |  |
| MTH101 | Calculus –I | ⃝ |  |  |  |  |
| EEE113 | Engineering Drawing |  | ⃝ |  |  |  |
| EEE112 | Engineering Mechanics and Thermodynamics | ⃝ |  |  |  |  |
| **Semester 2** |  |  |  |  |  |  |
| HUM111 | Pakistan Studies |  |  | ⃝ |  |  |
| MTH102 | Calculus – II | ⃝ |  |  |  |  |
| MTH231 | Linear Algebra | ⃝ |  |  |  |  |
| CSC141 | Introduction to Computer Programming | ⃝ | ⃝ |  |  |  |
| EEE121 | Electric Circuits Analysis – I | ⃝ | ⃝ |  |  |  |
| **Semester 3** |  |  |  |  |  |  |
| MTH203 | Calculus – III | ⃝ |  |  |  |  |
| MTH242 | Differential Equations | ⃝ |  |  |  |  |
| EEE241 | Digital Logic Design | ⃝ | ⃝ |  |  |  |
| EEE231 | Electronics – I | ⃝ | ⃝ |  |  |  |
| CSC241 | Object Oriented Programming | ⃝ | ⃝ |  |  |  |
| **Semester 4** |  |  |  |  |  |  |
| MTH263 | Probability Theory and Random Variables | ⃝ |  |  |  |  |
| EEE261 | Electromagnetic Theory | ⃝ |  |  |  |  |
| EEE222 | Electric Circuits Analysis – II | ⃝ | ⃝ |  |  |  |
| EEE223 | Signals and Systems | ⃝ | ⃝ |  |  |  |
| EEE375 | Power Distribution and Utilization | ⃝ |  |  |  |  |
| **Semester 5** |  |  |  |  |  |  |
| EEE232 | Electronics – II | ⃝ |  |  |  |  |
| EEE371 | Electric Machines | ⃝ | ⃝ |  |  |  |
| EEE343 | Computer Organization | ⃝ |  |  |  |  |
| EEE324 | Digital Signal Processing | ⃝ | ⃝ |  |  |  |
| EEE351 | Principles of Communication Systems | ⃝ | ⃝ |  |  |  |
| **Semester 6** |  |  |  |  |  |  |
| ECO300 | Engineering Economics |  |  | ⃝ | ⃝ |  |
| EEE325 | Control Systems | ⃝ | ⃝ |  |  |  |
| EEE342 | Microprocessor Systems and Interfacing | ⃝ | ⃝ |  |  |  |
| EEE314 | Data Communication and Computer Networks | ⃝ | ⃝ |  |  |  |
| CSC322 | Operating Systems Concepts | ⃝ |  |  |  |  |
| **Semester 7** | **Course Title** |  |  |  |  |  |
| HUM102 | Report Writing Skills |  |  | ⃝ |  | ⃝ |
|  | Major/Specialization Elective I |  | ⃝ |  | ⃝ | ⃝ |
|  | Non-Engineering Elective |  | ⃝ |  | ⃝ | ⃝ |
| EEE490 | Final Year Project (Part-I)\*\* |  | ⃝ | ⃝ | ⃝ | ⃝ |
| CSC112 | Algorithms and Data Structures | ⃝ | ⃝ |  |  |  |
| **Semester 8** |  |  |  |  |  |  |
| MGT462 | Project Planning and Management |  |  | ⃝ | ⃝ |  |
|  | Major/Specialization Elective II |  | ⃝ |  | ⃝ | ⃝ |
|  | EE Open/Free Elective\*\*\* |  | ⃝ |  | ⃝ | ⃝ |
| EEE490 | Final Year Project (Part-II) |  | ⃝ | ⃝ | ⃝ | ⃝ |
| **Electives** |  |  |  |  |  |  |
| CSC421 | Systems Programming |  | ⃝ |  | ⃝ | ⃝ |
| CSC341 | Network Programming |  | ⃝ |  | ⃝ | ⃝ |
| EEE434 | VLSI Design |  | ⃝ |  | ⃝ | ⃝ |
| EEE440 | Computer Architecture |  | ⃝ |  | ⃝ | ⃝ |
| EEE446 | Real Time Embedded Systems |  | ⃝ |  | ⃝ | ⃝ |
| EEE415 | Digital Image Processing |  | ⃝ |  | ⃝ | ⃝ |
| CSC271 | Database Systems |  | ⃝ |  | ⃝ | ⃝ |
| CSC334 | Distributed Computing |  |  |  | ⃝ | ⃝ |
| CSC492 | Software Engineering |  |  |  | ⃝ | ⃝ |
| CSC462 | Artificial Intelligence |  |  |  | ⃝ | ⃝ |
| CSC336 | Web Engineering |  | ⃝ |  | ⃝ | ⃝ |
| EEE447 | Robotics |  | ⃝ |  | ⃝ | ⃝ |

## Theoretical background, problems analysis and solution design are stressed within program’s core material

Theoretical background, problem analysis and solution design are thoroughly stressed in the course outlines for core engineering subjects. The courses that construct theoretical background, problem analysis and solution design are as follows:-

|  |  |
| --- | --- |
| **Elements** | **Courses/Course codes** |
| Theoretical background | EEE121 Electric Circuits Analysis – I  EEE112 Engineering Mechanics and Thermodynamics  EEE241 Digital Logic Design  EEE231 Electronics – I  EEE222 Electric Circuits Analysis – II  EEE223 Signals and Systems  MTH263 Probability Theory and Random Variables  EEE232 Electronics – II  EEE371 Electric Machines  EEE261 Electromagnetic Theory |
| Problem analysis | EEE113 Engineering Drawing  EEE375 Power Distribution and Utilization  EEE324 Digital Signal Processing  EEE325 Control Systems  EEE342 Microprocessor Systems and Interfacing  EEE314 Data Communication and Computer Networks  EEE343 Computer Organization  EEE351 Principles of Communication Systems |
| Solution design | CSC421 Systems Programming  CSC341 Network Programming  EEE434 VLSI Design  EEE440 Computer Architecture  EEE446 Real Time Embedded Systems  EEE415 Digital Image Processing  CSC271 Database Systems  CSC334 Distributed Computing  CSC492 Software Engineering  CSC462 Artificial Intelligence  CSC336 Web Engineering  EEE447 Robotics |

## The curriculum satisfies the core requirements for the program, as specified by HEC

The program has been carefully designed to meet the HEC requirements for Computer Engineering. Following four courses in the curriculum cover the HEC requirement of computing courses:-

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Credit** | **Theory** | **Laboratory** |
| CSC141 | Introduction to Computer Programming | 4 | 3 | 1 |
| CSC241 | Object Oriented Programming | 4 | 3 | 1 |
| CSC112 | Algorithms and Data Structures | 4 | 3 | 1 |
| CSC322 | Operating Systems Concepts | 3 | 3 | 0 |

Similarly, HEC requirement for the core courses are met by following courses in the curriculum:-

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Credit** | **Theory** | **Laboratory** |
| EEE113 | Engineering Drawing | 1 | 0 | 1 |
| EEE112 | Engineering Mechanics and Thermodynamics | 3 | 3 | 0 |
| EEE121 | Electric Circuits Analysis – I | 4 | 3 | 1 |
| EEE241 | Digital Logic Design | 4 | 3 | 1 |
| EEE231 | Electronics – I | 4 | 3 | 1 |
| EEE222 | Electric Circuits Analysis – II | 3 | 3 | 0 |
| MTH263 | Probability Theory and Random Variables | 3 | 3 | 0 |
| EEE232 | Electronics – II | 4 | 3 | 1 |
| EEE371 | Electric Machines | 4 | 3 | 1 |
| EEE261 | Electromagnetic Theory | 3 | 3 | 0 |

## The curriculum satisfies the major requirements for the program

As mentioned earlier, the core material of the program has been designed according to the PEC requirements. Although most of it remains consistent, some discrepancies in the scheme of studies have previously been found. These discrepancies have now been recovered and the curriculum now satisfies the requirements of PEC. PEC has, therefore, re-accredited the B.Sc. (CE) program of CIIT Wah Campus.

## The curriculum satisfies general education, arts and professional and other discipline requirements for its programs

Currently, the curriculum has not much to offer in the field of arts, nevertheless, following courses do cover the general education and non-engineering discipline requirements:-

HUM111 Pakistan Studies

HUM110 Islamic Studies

HUM100 English Comprehension and Composition

## Information technology component of the curriculum is integrated throughout the programs

Most of the IT components are integrated throughout the program, for example, the use of Matlab®, LabView®, PSpice® and several other tools to facilitate engineering students in learning the basic and advanced engineering concepts. Following laboratory courses are offered with the help of different IT tools:-

EEE113 Engineering Drawing

CSC141 Introduction to Computer Programming

CSC241 Object Oriented Programming

EEE223 Signals and Systems

EEE324 Digital Signal Processing

EEE342 Microprocessor Systems and Interfacing

EEE314 Data Communication and Computer Networks

CSC112 Algorithms and Data Structures

CSC341 Network Programming

CSC421 Systems Programming

EEE434 VLSI Design

EEE446 Real Time Embedded Systems

EEE415 Digital Image Processing

CSC271 Database Systems

The engineering students are also familiar with general software applications like Microsoft Office, LaTeX typesetting and Google Scholar for searching and editing articles and reports. These tools are extensively used in the following courses:-

HUM102 Report Writing Skills

MGT462 Project Planning and Management

EEE490 Final-year Project – Part 1

EEE490 Final-year Project – Part 2

## Oral and written communication skills of the student are developed and applied in the program

The engineering students are taught following courses related to the communication skills:-

HUM102 Report Writing Skills

MGT462 Project Planning and Management

HUM100 English Comprehension and Composition

The senior students of third and fourth year are also asked to present and demonstrate their lab-based projects. The department has strong emphasis on the quality of final-year projects and carefully monitors its progress through well-defined process flow.

EEE490 Final Year Project - Part 1

EEE490 Final Year Project - Part 2

During their final-year projects, the engineering students are given plenty of opportunities to practice their verbal and written communication skills.

These efforts have considerably improved the communication skills of our students, yet the oral and written skills of high standards have not been achieved. We need to revise our strategy to handle this problem, for example, introducing activity-based learning in classrooms.

# Laboratories and Computing Facilities

Following laboratories are currently available in the EE department:-

* **Control Systems Lab**

|  |  |
| --- | --- |
| Location: | First Floor, Allama Iqbal Block |
| Area: | 750 sq. ft. (25’x30’) |
| Objectives: | To perform experiments of Control Systems course. |
| Adequacy for instruction: | Adequate for 25 students (3 students per workstation) |
| Courses taught: | Control Systems |
| Software: | TriLogi, ALTERA PLCs Training Kit |
| Major Equipment: | Control Engineering Trainers  PLC’s Trainer kits with PID Controllers  DSP Development and Experiment Systems  Control Modules for DSP Development Boards  FPGA Trainers  Magnetic Levitation System  Inverted Pendulum System  Oscilloscopes 20 MHz |
| Safety regulations: | Fire extinguishers required (not available)  Students can only use the equipment under supervision of the lab instructor. |

* **Electric Machines and Power Systems lab**

|  |  |
| --- | --- |
| Location: | First Floor, Allama Iqbal Block |
| Area: | 750 sq. ft. (25’x30’) |
| Objectives: | To perform experiments of Electric Machines and Power distribution. |
| Adequacy for instruction: | Adequate for 25 students (3 students per workstation) |
| Courses taught: | Electric Machines |
| Software: | None |
| Major Equipment: | DC Motor/Generators  Induction Motors,  Training Systems for 3-phase Transformers  Flux meters  Tachometers  Dissectible Machines Training Systems |
| Safety regulations: | Fire extinguishers required (not available)  All the electrical equipment must be properly earthed.  Students can only use the equipment under supervision of the lab instructor. |

* **Communication Lab**

|  |  |
| --- | --- |
| Location: | Ground Floor, Allama Iqbal Block |
| Area: | 750 sq. ft. (25’x30’) |
| Objectives: | To perform communication-related experiments |
| Adequacy for instruction: | Adequate for 25 students (3 students per workstation) |
| Courses taught: | Communication Systems  Data Communication & Computer Networks  Antenna and Wave Propagation |
| Software: | MATLAB, National Instrument’s LabVIEW, HFSS |
| Major Equipment: | Modularized Communication Trainers  Optical Fiber Trainers  Antenna Trainers  Satellite Trainers  DSO (Digital Signal Oscilloscope)  Programmable DC Power Supplies  P-IV High performance PCs for Simulations |
| Safety regulations: | Fire extinguishers required (not available)  All the electrical equipment must be properly earthed.  Students can only use the equipment under supervision of the lab instructor. |

* **Digital Signal Processing Lab**

|  |  |
| --- | --- |
| Location: | Ground Floor, Allama Iqbal Block |
| Area: | 750 sq. ft. (25’x30’) |
| Objectives: | - |
| Adequacy for instruction: | Adequate for 25 students (3 students per workstation) |
| Courses taught: | Digital Signal Processing |
| Software: | MATLAB, LabVIEW |
| Major Equipment: | DSO (Digital Signal Oscilloscope)  TMS C6713 DSP Development Kits  Power Supply and Audio Signal Generator, Function generators  Programmable DC Power Supplies  P-IV High performance PCs for Simulations |
| Safety regulations: | Fire extinguishers required (not available)  All the electrical equipment must be properly earthed.  Students can only use the equipment under supervision of the lab instructor. |

* **Digital System Design Lab**

|  |  |
| --- | --- |
| Location: | Ground Floor, Quaid-e-Azam Block |
| Area: | 750 sq. ft. (25’x30’) |
| Objectives: | To perform VLSI and Embedded Systems experiments |
| Adequacy for instruction: | Adequate for 25 students (3 students per workstation) |
| Courses taught: | Digital Logic Design  Advanced Digital Logic Design  Computer Organization and Architecture |
| Software: | Xilinx ISE software (Academic License)  NI LabView 9.0 (Academic Site License) |
| Major Equipment: | Xilinx XtremeDSP Spartan-3E Boards  Xilinx Virtex-5 FPGA Development Boards  Workstation Computers with Core i5  Digital Storage Oscilloscopes  Function Generators  Power Supplies  Digital Multi-meters  Universal Chip Programmer |
| Safety regulations: | Fire extinguishers required (not available) |

* **Microprocessor lab**

|  |  |
| --- | --- |
| Location: | Ground Floor, Quaid-e-Azam Block |
| Area: | 750 sq. ft. (25’x30’) |
| Objectives: | To perform experiments for Microprocessor Systems and Digital Logic Design |
| Adequacy for instruction: | Adequate for 25 students (3 students per workstation) |
| Courses taught: | Microprocessor Architecture & Programming  Real Time Embedded Systems  Engineering Drawing |
| Software: | Microchip MPLAB IDE  TI Code Compose Studio |
| Major Equipment: | Microprocessors trainer kits for Intel 8086  Microcontrollers trainers Kits for Intel 8051  MPLAB ICD2 Debuggers  MPLAB ICE Emulators  Workstation Computers with Core i5  Digital Storage Oscilloscopes  Function Generators  Power Supplies  Digital Multi-meters  Universal Chip Programmer |
| Safety regulations: | Fire extinguishers required (not available) |

* **Electronics Lab**

|  |  |
| --- | --- |
| Location: | Ground Floor, Quaid-e-Azam Block |
| Area: | 750 sq. ft. (25’x30’) |
| Objectives: | To perform basic electronics related experiments |
| Adequacy for instruction: | Adequate for 25 students (3 students per workstation) |
| Courses taught: | Electric Circuit Analysis 1  Digital Logic Design  Electronic Devices & Circuits 1 |
| Software: | None |
| Major Equipment: | 20MHz dual channel CRO  Function Generators  Power Supplies  Analog & Digital Trainer Kits  Digital Multi-meters  Soldering Stations  Pulsars and Probes |
| Safety regulations: | Fire extinguishers required (not available)  All the electrical equipment must be properly earthed.  Students can only use the equipment under supervision of the lab instructor. |

* **Advanced Electronics Lab**

|  |  |
| --- | --- |
| Location: | Ground Floor, Quaid-e-Azam Block |
| Area: | 750 sq. ft. (25’x30’) |
| Objectives: | To perform IC design experiments and mixed signal circuit designs |
| Adequacy for instruction: | Adequate for 25 students (3 students per workstation) |
| Courses taught: | Electric Circuit Analysis 1  Electronic Devices & Circuits 2 |
| Software: | None |
| Major Equipment: | 20MHz dual channel CRO  Function Generators  Power Supplies  Analog & Digital Trainer Kits  Digital Multi-meters  Soldering Stations  Pulsars and Probes |
| Safety regulations: | Fire extinguishers required (not available)  All the electrical equipment must be properly earthed.  Students can only use the equipment under supervision of the lab instructor. |

* **Project Lab**

|  |  |
| --- | --- |
| Location: | Ground Floor, Quaid-e-Azam Block |
| Area: | 400 sq. ft. (20’x15’) |
| Objectives: | To perform final-year projects |
| Adequacy for instruction: | Adequate for 20 students (3 students per workstation) |
| Courses taught: | Final Year Project |
| Software: | None |
| Major Equipment: | PCB Drilling Machines  Digital Oscilloscopes  DC Power Supplies |
| Safety regulations: | Fire extinguishers required (not available)  All the electrical equipment must be properly earthed. |

* **Electronics Devices and Physics Lab**

|  |  |
| --- | --- |
| Location: | Ground Floor, Quaid-e-Azam Block |
| Area: | 750 sq. ft. (25’x30’) |
| Objectives: | To perform physics-related experiments |
| Adequacy for instruction: | Adequate for 25 students (3 students per workstation) |
| Courses taught: | Applied Physics  Electrical Circuit Analysis |
| Software: | None |
| Major Equipment: | Ammeter Analog, Bread boards  Barton’s Apparatus ,Carry Foster’s Bridge  Cater’s Pendulum, Concave Lens,  Digital Power Supply, Meldie’s Apparatus  Disc Palorimeter , Stand Brass  Flat/Spring r/stand, Sonometer Apparatus  Function Generator, Sodium Lamp  Galvanometer , Sextant, Glass Prism, Screw Gauge, Optical Bench, Potentiometer, Neon Flash Lamp |
| Safety regulations: | Fire extinguishers required (not available)  All the electrical equipment must be properly earthed.  Students can only use the equipment under supervision of the lab instructor. |

## Laboratory manuals/documentation/instructions for experiments must be available and readily accessible to faculty and students

Laboratory manuals and instructions are available and readily accessible to faculty and students. Faculty uploads their lab manuals and instructions on the Coordination Server (managed by the Campus Coordination Office) that students can easily access from anywhere inside the Campus. Handouts are also provided by instructors during lab exercises.

## There must be adequate support personnel for instruction and maintaining the laboratories

There exists a need to hire more lab engineers. Currently, we have a shortage of 4 lab engineers and the shortage may increase as some of the staff will soon be leaving for higher studies abroad. Several equipments are not fully utilized due to lab staff not having proper training on these equipments.

## The University computing infrastructure and facilities must be adequate to support program’s objectives.

There exists a need to provide more workstation computers in the Communications Lab and Projects Lab. The other equipment in EE Labs appears sufficient for the current number of students in the CE and TE Program. However, quantity needs to be increased for future intake.

The EE department is currently facing a major issue of limited space (along with other departments). This is evident from a recent activity of dividing each lab into two partitions. This partitioning was executed in order to satisfy the PEC requirement of having more labs. The partition is a temporary solution that creates a chaotic situation when two labs are scheduled simultaneously under one roof. This needs to be addressed by assigning dedicated space for each lab. CIIT Wah Campus has recently acquired a piece of land adjacent to the existing campus. This will resolve the space issue in near future.

# Students Support and Advising

The department has assigned class counselors for each section of each batch. The duties of the class counselors include providing academic advice and help in professional matters.

## Course offering

Due to the fact that B.Sc. (Electrical Computer Engineering) starts in fall semesters and B.Sc. (Electrical Telecom Engineering) starts in spring semesters; all the core engineering and mathematics courses are offered every semester. The students of Computer Engineering can therefore avail the opportunity of improving or registering such courses in any semester.

Only those elective courses are usually offered that can be taught by our regular faculty. The EE department has no policy of hiring faculty on visiting basis. In the last semester, Real-time Embedded Systems, Network Programming and System Programming were offered as electives for the CE batch.

Some of the CS-related elective courses are also taught by the faculty from Computer Science Department.

## Effective Student-Teacher Interaction

Instructors are bound to follow standardized course outlines that are regularly updated by the Board of Studies (BoS), CIIT. Teachers of the EE department consult each other to improve the quality of course contents.

Teaching methodology consists of lecturing, discussion seminars, practical exercises, quizzes and case studies that enhance the interaction between teachers and students.

The faculty members who teach core courses are specially instructed to ensure effective interaction between students and faculty. Since there are no teaching assistants in the EE department, faculty members are available for the students counseling in defined counseling hours

## Guidance for Program Completion and Career Plan

Basic requirements are communicated through program prospectus that contains information about the degree requirements in details. Semester calenderer notified by the deputy registrar office provides guidelines

Every class has a class counselor to take care of their administrative and academic problems. Career Development Cell (CDC) is also established at each campus of COMSATS Institute of Information Technology to help students resolve their career-related problems. Department provides full support for making career related choices through CDC. The EE department is currently pursuing a survey of alumni and their employers to measure the effectiveness of the CDC.

A business forum as recently organized at Pak-China Friendship Center, Islamabad in order to provide a platform for our students to demonstrate their projects and to meet personnel from both industries and academia.

# Process Control

The EE department is under the process of defining their process flows. Currently, the processes are loosely defined and are not well-documented.

## Admission Process

The admission criteria are discussed in the Board of Studies meeting that is held twice a year. These criteria are governed by Higher Education Commission (HEC) and Pakistan Engineering Council (PEC).

The EE department has following criteria for admission into the B.Sc. (CE) program:-

* Eligibility criteria of HSSC (or equivalent) with Pre-Engineering or Computer Science.
* Eligibility criteria of scoring 60% and above in HSSC (or equivalent).
* The performance in the entry test is supervised by the National Testing Service (NTS).
* Open merit list is generated using the following formula
  + Merit Score = 0.50\*(NTS Score) + 0.40\*(HSSC Score) + 0.10\*(SSC Score)
* The merit list is sorted according to the merit score in descending order and only top 120 candidates on the list are offered admissions into the program.

CIIT has NO policy of importing students from other universities/institutes by transferring credits from the other university/institute. However, a student may transfer his credits from CIIT to the other university/institute.

## Registration Process

CIIT Wah Campus has an online Students Information System (COMSIS) that facilitates the process of registration along with several other processes including attendance record, results submission, lecture details etc.

Fresh students get registered in their first semester through COMSIS website that is then verified by Accounts and Deputy Registrar offices. After successful verification, their name appears in the attendance and examination sheets.

The program is divided into 8 regular semesters with the maximum of 10 semesters allowed for each student. Students are required to register for the courses they take each semester prior to the commencement of a semester.

A number of courses are offered in each semester where each course has different number of credit hours[[1]](#footnote-1).

* A student of B.Sc. (CE) can study maximum of 18 credit hours in a semester.
* A student is only allowed to enroll in a course when he has already passed the required pre-requisites for that course.
* Students cannot transfer any credit/program from other universities or institutes to CIIT. However, the inverse may be possible i.e. Students are allowed to transfer their credits to other university, if permissible by that university.

Students are examined regularly for each course registered by them prior to the commencement of a semester. The students undertake two examinations during the semester, termed as “Sessional 1” and “Sessional 2”. In addition to these, students are also assessed regularly by means of giving assignments and quizzes. The assessment criterion for a course is as follows:-

|  |  |
| --- | --- |
| **Assessment** | **Weight** |
| Sessional 1 | 10% |
| Sessional 2 | 15% |
| Assignments, quizzes, projects | 25% |
| Final Examination | 50% |

Each course must bear at least 3 assignments and 3 quizzes before the final examination. The final marks for each course are then graded according to the following scheme:-

|  |  |
| --- | --- |
| Marks | Grade |
| 90-100 | A |
| 85-89 | A- |
| 80-84 | B+ |
| 75-79 | B |
| 70-74 | B- |
| 65-69 | C+ |
| 60-64 | C |
| 55-59 | C- |
| 50-54 | D |
| Below 50 | F |

The program of study is verified through the Grade Point Average (GPA) system and students are awarded scholastic status based on the GPA (and Cumulative GPA) in that particular semester. Grade Point (GP) for each course is calculated from the acquired grade using the following table:-

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Grade** | **A** | **A-** | **B+** | **B** | **B-** | **C+** | **C** | **C-** | **D** | **F** |
| GP | 4 | 3.7 | 3.6 | 3.3 | 2.7 | 2.3 | 2 | 1.7 | 1.3 | 0 |

GPA for each semester is calculated using the following formula:-

Where ‘i’ spans the number of courses taken in a semester, Cri is the number of credit hours assigned to the ith course and Gi is the GP attained in that course. The same formula is applied to calculate cumulative GPA (CGPA) by spanning “i” for all the courses taken by a student in all semesters.

Each student’s performance is measured at the end of each semester.

* A student must achieve 50% marks in order to avoid “F” grade in a subject.
* The “D” grade may affect adversely the overall GPA of a student.
* If the CGPA of a student goes below 2.00 after a semester, a warning is issued and the student is put on probation.
* A student is dropped from the B. Sc. (CE) program if he does not recover from probation.

The process of registration is monitored and reviewed before the start of every semester and also when any complaint/suggestion is received. The process is monitored by the Head of the Department himself and also by the Examination department. The results of evaluation are implemented as soon as possible and help to improve the process.

## Recruitment Process

CIIT advertises the vacancies in major newspapers and upon receipt of applications; the candidates are short-listed by the department according to the HEC criteria and the list is forwarded to the Human Resource (HR) department of CIIT for further actions.

The department retains faculty and staff by attractive remunerations and compensations packages offered to its faculty members. Rewarding teaching efforts, state-of-the-art research facilities, competitive salaries, and regular promotions are few of the norms in our department that help retain the faculty in our department.

The faculty is evaluated based on:-

1. The quality of teaching, assessed by students’ feedback and their academic results.
2. Completion of extra tasks assigned on ad hoc basis.
3. Research work in terms of the number of publications in impact-factor journals.
4. Work experience in terms of years.

The appraisal procedure is conducted by the EE department in collaboration with the HR department. This process is evaluated every year in June, before the contracts are renewed.

## Instruction Process

Faculty members of the EE department are provided with a course outline and recommended books. The course requirements are already outlined and approved by the Board of Studies. All of the final exams and Sessionals are ratified by Head of the Department. The process remains consistent; however, suggestions are taken from both faculty and students in order to improve the process.

## Graduation Process

The degree is awarded on completion of a minimum 133 credits with a CGPA of 2.0 or above. In addition to this, final year project should have been successfully completed and the project report must have been submitted in a given time. The requirements are ensured through checking each student’s CGPA and whether they have submitted the final-year project.

A student must submit a clearance form to the Registrar Office prior to the degree awarding ceremony. This is to make sure that the student has satisfied all the requirements and has no outstanding issue as a student of CIIT.

# Faculty

The department has got sufficient number of full time faculty members to provide adequate coverage of the program. This number may drop with many young faculty members going abroad for their higher education.

## Adequate faculty members

The following table indicates the number of faculty in the CE program:-

|  |  |  |  |
| --- | --- | --- | --- |
| **Faculty Post** | **Qualification** | **Total** | **Dedicated for  B.Sc. (CE)** |
| Professor | PhD | 1 | 1 |
| Assoc. Professor | PhD | 1 | 0 |
| Asst. Professor | M.S/PhD | 15 | 9 |
| Lecturer | M.S/B.S. | 16 | 8 |
| Lab Engineer/RA | B.S. | 7 | 3 |
|  | TOTAL | 40 | 21 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Program area of specialization** | **Courses in the area and average number of sections per year** | **Number of faculty members in each area** | **Number of faculty with Ph.D. degree** |
| Computer Engineering | 21 Courses  9 Sections | 21 | 3 |

The resumes of the EE faculty members are available on the website of CIIT Wah Campus.

## Currency of faculty members

All the faculty members in EE Department are either MS-qualified or PhD-qualified. The PhD-qualified members are active in research along with teaching activities, and are considered to be the experts in their fields. This is evident from the resumes of the EE faculty members available on our website i.e. http://ciitwah.edu.pk/home.

The faculty members are assigned at most 3 courses per semester along with them they have time for research activities. The department also hires new faculty on need basis so that the course load for each faculty member remains below 9 credit hours per semester. In this way, the department ensures that the scholarly activities can be performed.

The young faculty members are given training in teaching in the faculty development workshop (FDW) that is arranged every year. Faculty development program (FDP) scheme regularly publishes opportunities for pursuing higher education on scholarships for studying in local and foreign countries.

The department regularly invites visiting foreign faculty and arranges lectures by them for the benefit of the faculty members. CIIT provides excellent environment for the young faculty members to excel in their field and develop in the profession of academia.

## Faculty Satisfaction

### Faculty Motivation programs

CIIT offers many scholarships for faculty development. Many of the faculty members are either studying abroad or currently applying for the scholarships. The department also arranges workshops and seminars regularly on different topics related to Computer Engineering.

In order to promote research activities among faculty members, a scheme of reward has been offered for faculty on producing research papers. Most of the faculty members have started working on research projects.

### Results of Faculty Survey

The faculty satisfaction survey results are already provided in **Figure 6** and  **Figure 7**. The EE faculty appears to be satisfied with the cooperation of their colleagues, interaction with the students and the time available for their families. However, they appear dissatisfied with the administrative support and the promotion policies being conveyed to them.

### Effectiveness of motivational programs

The effectiveness of these programs can be seen as many of the faculty members are studying abroad on scholarships offered by CIIT. Motivation for research can also be evidenced from the number of articles published by the EE faculty i.e. PhD faculty members have published three articles on average.

# Institutional Facilities

CIIT has a tendency to adapt to the ever changing global trends in the academia.

## The institution must have the infrastructure to support new trends in learning such as e-learning.

The campus offers a rich learning environment complemented with electronic information access and services. COMSATS Students Information System (COMSIS) provides one-click information to faculty members, students and other related departments. This includes the course lectures, course outlines, assignments, examination results and attendance reports etc. Students are encouraged to make use of this material available on the electronic media.

## The library must possess an up-to-date technical collection relevant to the program and must be adequately staffed with professional personnel.

The library of the campus provides 6,000 books for the subjects related to Electrical Engineering. In addition to that, there exists an institutional access to the academic journals. The library has access to about 12,000 HEC-provided research journals. The library also has multimedia support, audio video recorders, digital archiving, a heavy duty printer & scanner, photocopier, 6 computer workstations and a TV set. The campus has also enabled a virtual access to the Islamabad Campus of CIIT having more than 24,000 books in their library.

## Class-rooms must be adequately equipped and offices must be adequate to enable faculty to carry out their responsibilities.

There are 11 lecture halls dedicated for the EE department. Each lecture hall has the capacity for 50 students. All the rooms are air-conditioned, networked and equipped with Multi-media Projection System. Faculty and Students can access Internet from these classrooms using Wireless Ethernet (Wi-Fi).

There are 8 offices of size 10’x10’ and 8 cubicles of size 6’x6’. Considering the faculty strength of 41, the number of offices for the EE faculty is not adequate.

# Institutional Support

## High-quality faculty and the means to maintain competence

The faculty members are provided with a decent amount of salary. At present, the office space for faculty and staff does not currently meet the standards as prescribed by HEC. However, as mentioned earlier, this problem will soon get resolved once the recently acquired piece of land is made functional. In addition to the salary, other facilities like CPF (Contributory Provident Fund) and Medical Insurance are also provided. CIIT is also planning to offer residential plots to its faculty and staff under the umbrella of CIIT Employee’s Co-operative Housing Society.

## Graduate students, research assistants and Ph.D. students

Following is the number of students graduated from CIIT Wah Campus with the degree of B.Sc. (CE):-

|  |  |  |
| --- | --- | --- |
| **No.** | **Year** | **Students graduated** |
| 1 | 2009 | 58 |
| 2 | 2010 | 113 |
| 3 | 2011 | 158 |

The teacher to student ratio has increased significantly, however the ratio will soon fall due to several faculty members going abroad for higher studies. The ratio for last three years is provided below:-

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Year** | **# of Faculty** | **# of Students** | **Faculty: Students** |
| 1 | 2009 | 22 | 634 | 29:1 |
| 2 | 2010 | 29 | 627 | 22:1 |
| 3 | 2011 | 21 | 586 | 28:1 |

CIIT has recently started post-graduate (PG) programs in Electrical Engineering. There is sufficient number of Ph.D. students currently busy in research under the supervision of senior faculty members.

## Library, laboratories and computing facilities

### Library

The campus library has been built with total covered area of 2050 sq. ft. and remains open from 8:30AM to 8:00PM everyday including weekends. It has the sitting capacity of 70 students and is part of the CIIT inter-campus library system. The estimated budget for the library this year reaches 5 million rupees.

Total number of books available for students and staff is 14,000 out of which 6,000 books are in the area of Electrical Computer Engineering. In addition to this, the library provides access to 12,000 online international academic journals. The library also has multimedia support, audio video recorders, digital archiving, a heavy duty printer & scanner, photocopier, 6 computer workstations and a TV set.

### Laboratories

Currently, there are 10 dedicated labs in the EE department. Due to space issue, major equipment is not displayed on racks and is provided on request from faculty and students.

### Computing Facilities

The department currently has no dedicated computer lab for their students. The department shares three computer labs with the department of computer science.

Every faculty member as well as supporting staff has a personal computer and access to printer on network. Computer systems are frequently updated as per requirement of the EE faculty.

END OF DOCUMENT

1. Credit hour is defined as the number of hours taught each week. It is important to note that three hours of lab work is considered equivalent to one hour of lecture. [↑](#footnote-ref-1)