# Study Plan

## University Compulsory Courses

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Code</th>
<th>Course</th>
<th>C.H</th>
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<tbody>
<tr>
<td>244820</td>
<td>EE482</td>
<td>ELECTROMECHANICAL SYSTEM LAB</td>
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<tr>
<td>244901</td>
<td>EE490A</td>
<td>ENGINEERING TRAINING</td>
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<tr>
<td>245911</td>
<td>EE591</td>
<td>GRADUATION PROJECT (1)</td>
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<td>245920</td>
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<td>GRADUATION PROJECT (2)</td>
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<td>ME200</td>
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<td>252150</td>
<td>ME215</td>
<td>ENGINEERING MECHANICS</td>
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<td>293410</td>
<td>IE341</td>
<td>ENGINEERING ECONOMY</td>
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<tbody>
<tr>
<td>241000</td>
<td>CHE400C</td>
<td>PROFESSIONAL ETHICS FOR ENGINEERS</td>
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<tr>
<td>242020</td>
<td>EE202E</td>
<td>COMMUNICATION SKILLS FOR ENGINEERS</td>
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## Faculty Compulsory Courses

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<thead>
<tr>
<th>Line No.</th>
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<tr>
<td>091010</td>
<td>MATH101</td>
<td>CALCULUS (1)</td>
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<td>MATH102</td>
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<td>092030</td>
<td>MATH203</td>
<td>ORDINARY DIFFERENTIAL EQUATIONS</td>
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## Department Compulsory Courses

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Code</th>
<th>Course</th>
<th>C.H</th>
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<tr>
<td>911010</td>
<td>CHEM101</td>
<td>GENERAL CHEMISTRY (1)</td>
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<td>911020</td>
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<td>1731150</td>
<td>CS115</td>
<td>C++ PROGRAMMING LANGUAGES</td>
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<th>Line No.</th>
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<tr>
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<td>EE507A</td>
<td>ANTENNAS</td>
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<tr>
<td>245081</td>
<td>EE508A</td>
<td>INTRODUCTION TO ELECTROMAGNETIC COMPATIBILITY</td>
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## Specialization Compulsory Courses

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<tr>
<td>244070</td>
<td>EE407</td>
<td>RADIOWAVE PROPAGATION &amp; ANTENNAS</td>
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<td>244220</td>
<td>EE422</td>
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<td>DIGITAL SIGNAL PROCESSING</td>
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<td>ELECTRONIC COMMUNICATION CIRCUITS</td>
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<td>EE528</td>
<td>MICROWAVE ELECTRONICS</td>
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<td>EE551B</td>
<td>DIGITAL COMMUNICATIONS</td>
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<td>245592</td>
<td>EE559B</td>
<td>INTRODUCTION TO WIRELESS COMMUNICATIONS</td>
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## TOTAL

159 C.H

*For prerequisite & equivalent courses see the Courses’ Description.*
B.Sc. in Electrical Engineering
Power & Control
Study Plan

- **University Compulsory Courses** 16 C.H
  - Page ( 64 )
  - **University Elective Courses** 9 C.H
    - Pages ( 64 & 65 )
  - **Faculty Compulsory Courses** 32 C.H
    - Line No. Code Course
      - 224000 CHE400CH PROFESSIONAL ETHICS FOR ENGINEERS 1
      - 242020 EE202EE COMMUNICATION SKILLS FOR ENGINEERS 2
      - 901010 MATH101 CALCULUS (1) 3
      - 901020 MATH102 CALCULUS (2) 3
      - 902010 MATH201 INTERMEDIATE ANALYSIS 3
      - 902030 MATH203 ORDINARY DIFFERENTIAL EQUATIONS 3
      - 911010 CHEM101 GENERAL CHEMISTRY (1) 3
      - 911020 CHEM102 GENERAL CHEMISTRY (2) 3
      - 911072 CHEM107B GENERAL CHEMISTRY LAB 1
      - 921010 PHY101 GENERAL PHYSICS (1) 3
      - 921020 PHY102 GENERAL PHYSICS (2) 3
      - 921072 PHY107B GENERAL PHYSICS (LAB) 1
      - 1731150 CS115 C++ PROGRAMMING LANGUAGES 3

- **Department Compulsory Courses** 75 C.H
  - Line No. Code Course
    - 241000 EE100 INTRODUCTION TO ELECTRICAL ENGINEERING 3
    - 242070 EE207 ELECTROMAGNETICS (1) 3
    - 242100 EE210 ELECTRIC CIRCUITS (1) 3
    - 242130 EE213 ELECTRICAL CIRCUITS LAB 1
    - 242201 EE220A INTRODUCTION TO ELECTRONICS 3
    - 242401 EE240 INTRODUCTION TO LINEAR SYSTEMS 3
    - 242601 EE260 SIGNAL AND SYSTEM ANALYSIS 3
    - 243051 EE305 NUMERICAL METHODS FOR ENGINEERS 3
    - 243071 EE307 ELECTROMAGNETICS (2) 3
    - 243101 EE310 ELECTRIC CIRCUITS (2) 3
    - 243201 EE320 ELECTRONICS (2) 3
    - 243220 EE322 ELECTRONIC CIRCUITS LAB (2) 1
    - 243320 EE332 ELECTRICAL MACHINES (1) 3
    - 243411 EE341 INSTRUMENTATION & MEASUREMENTS 3
    - 243450 EE345 INTRODUCTION TO MICROCONTROLLERS 3
    - 243460 EE346 MICROCONTROLLERS LAB 1
    - 243501 EE360 RANDOM SIGNAL ANALYSIS 3
    - 244201 EE420 DIGITAL ELECTRONIC CIRCUITS 3
    - 244402 EE440B CONTROL SYSTEMS 3
    - 244451 EE445A MICROCONTROLLERS & EMBEDDED SYSTEMS 3
    - 244501 EE450A COMMUNICATION SYSTEMS 3
    - 244521 EE452A COMMUNICATION SYSTEMS LAB 1
  - 244801 EE480A POWER SYSTEMS 3
  - 244820 EE482 ELECTROMECHANICAL SYSTEM LAB 1
  - 244901 EE490A ENGINEERING TRAINING 3
  - 245911 EE591 GRADUATION PROJECT (1) 1
  - 245920 EE592 GRADUATION PROJECT (2) 3
  - 252000 ME200 ENGINEERING DRAWING (A) 1
  - 252150 ME215 ENGINEERING MECHANICS 3
  - 293410 IE341 ENGINEERING ECONOMY 2

- **Department Elective Courses** 6 C.H
  - Line No. Code Course
    - 245372 EE537B SWITCHED - MODE POWER SUPPLIES 3
    - 245381 EE538A HIGH VOLTAGE ENGINEERING 3
    - 245393 EE539C ADVANCED ELECTRIC MACHINES 3
    - 245401 EE540A INTRODUCTION TO ROBOTICS 3
    - 245412 EE541B SENSORS & ACTUATORS 3
    - 245460 EE546 POWER SYSTEM CONTROL 3
    - 245560 EE556 POWER SYSTEM PROTECTION 3
    - 245960 EE596 SPECIAL TOPICS IN POWER & CONTROL 3

- **Specialization Compulsory Courses** 21 C.H
  - Line No. Code Course
    - 244351 EE435A POWER ELECTRONICS 3
    - 244361 EE436A POWER ELECTRONICS LAB 1
    - 244422 EE442B CONTROL SYSTEMS LAB 1
    - 244471 EE447 DIGITAL CONTROL 3
    - 244830 EE483 POWER TRANSMISSION & DISTRIBUTION 3
    - 245312 EE531B ELECTRIC DRIVE SYSTEMS 3
    - 245470 EE547 COMPUTER CONTROL 3
    - 245805 EE580E POWER SYSTEMS LAB 3
    - 245820 EE582 POWER SYSTEMS LAB 1

**TOTAL** 159 C.H

* For prerequisite & equivalent courses see the Courses’ Description.
B.Sc. in Electrical Engineering

Courses’ Description

EE 100  Introduction to Electrical Engineering  (3C,2H,2L)

EE 20  Communication Skills for Engineers  2C,2H
Managing technical data & writing for the workplace. namely, memorandums, letters, applications, & research projects. Building presentation skills through several individual & team presentations, focusing on style of delivery, & interaction with audience. Job interview skills. (Pre-/Co-Requisites: EE 100, Department Compulsory)

EE 207  Electromagnetics I  3C,3H

EE 210  Electric Circuits I  3C,3H

EE 212  Electric Circuit Analysis  3C,3H

EE 213  Electric Circuits Lab  1C,3L

EE 220  Introduction to Electronics  3C,3H

EE 240  Introduction to Linear Systems  3C,3H

EE 260  Signal and System Analysis  3C,3H

EE 303  Fundamentals of Electrical Engineering  3C,3H

EE 304  Electric Drives  3C,3H
Introduction to electric drives, DC drives. AC drives: induction motors, synchronous motors, reluctance & stepping motors. Servomotor drives. (Pre-/Co-Requisites: EE 212 or EE 303 Non-EE Students)

EE 305  Numerical Methods for Engineers  3C,3H

EE 306  Electrical Engineering Lab  1C,3L

EE 307  Electromagnetics II  3C,3H

EE 310  Electric Circuits II  3C,3H

EE 320  Electronic Circuits  3C,3H
Small signal analysis of BJTs and FETs. Multistage amplifiers. Frequency response of single &

(Pre-/Co- Requisites: EE 220 Department Compulsory)


(Pre-/Co- Requisites: EE 212 or EE 303 Non-EE Students)


(Pre-/Co-Requisites: EE 213, EE 320 Department Compulsory)


(Pre-/Co- Requisites: EE 207, EE 310 Department Compulsory)

EE 341 Instrumentation and Measurements 1C,3L Units, Dimensions, & standards; Measurement errors; Statistical analysis of experimental data; Operational amplifier circuits in instrumentation; Transducers: mechanical, thermal, optical; Measurements of basic electrical quantities: electromechanical indicating instruments, electronics multi-meters, digital multi-meters, ac bridges; Digital-signal conditioning: analogue-to-digital converters, digital-to-analogue converters, sample-and-hold circuits, data acquisition hardware, IEEE 488 instrumentation bus; Oscilloscopes: vertical deflection system, horizontal deflection system, digital storage oscilloscopes; Spectrum analyzers.

(Pre-/Co- Requisites: EE 320, EE 260 Power & Control Compulsory)


(Pre-/Co- Requisites: EE 100 Department Compulsory)

EE 346 Microcontrollers Lab 1C,3L Experiments using TTL family via implementation of logic functions using & OR, & NOT. Implementation of logic functions using MSI chips such as encoders, decoders, multiplexers, EPROMS. Software and hardware experiments with a microcontroller system. Assembly language programming & simple input/output interfacing. Lab project.

(Pre-/Co- Requisites: EE 345 Department Compulsory)


EE 407 Radiowave Propagation & Antennas 3C,3H Antenna principles & types; Antenna parameters (gain, beamwidth, aperture, impedance, polarization); ideal & practical dipoles; Friis transmission formula & radar equation; Plane earth propagation; Knife-edge diffraction; Biological effects of radiation; Satellite communications; Urban propagation; Noise in communication systems. (Pre-/Co- Requisites: EE 307 Communications & Electronics Compulsory)


(Pre-/Co- Requisites: EE 320 Department Compulsory)


(Pre-/Co-Requisites: EE 322, EE 435 Power & Control Compulsory)


(Pre-/Co- Requisites: EE 260 Department Compulsory)


(Pre-/Co- Requisites: EE 440 Power and Control Compulsory)

parallel interfacing. Timers, A/D & D/A relevant chips. Software & hardware interrupt handling routines. Application of top-down design to microcontroller software development in assembly language & a high level language. Evaluation of hardware & software trade-offs. Laboratory experiments on the software & hardware of the microcontroller & a final comprehensive lab project. (Pre-/Co- Requisites: EE 322, EE 346Department Compulsory)

**EE 447 Digital Control 3C,3H**

**EE 450 Communication Systems 3C,3H**

**EE 452 Communication Systems Lab 1C,3L**

**EE 460 Digital Signal Processing 3C,3H**

**EE 462 Digital Signal Processing Lab 1C,3L**
The lab uses Matlab as the simulation package & experiments will be conducted on the available DSP boards. Familiarization experiments with the DSP kit. Experiments include FIR & IIR filter design, quantization effects, & spectral estimation. Real signals are sampled & processed including speech and images. Lab project. (Pre-/Co- Requisites: EE 460 Communications & Electronics Compulsory)

**EE 480 Power Systems 3C,3H**

**EE 482 Electromechanical Systems Lab 1C,3L**

Computer simulation & analysis. Lab project. (Pre-/Co- Requisites: EE 213, EE 480 Department Compulsory)

**EE 483 Power Transmission and Distribution 3C,3H**

**EE 490 Engineering Training 3C.H**
The student has to spend at least 8 weeks of electrical engineering training at recognized companies and establishments during the summer semester. (Pre-/Co- Requisites: Passing 117 credit hours Department Compulsory)

**EE 507 Antennas 3C, 3H**

**EE 508 Introduction to Electromagnetic Compatibility 3C,3H**
Causes & effects of interference. Electrical dimensions. EMC units. EMC regulations. Non-ideal behavior of components including: wires, printed circuit boards, resistors, capacitors, inductors, & switches. Bio-electromagnetics.(Pre-/Co- Requisites: EE 307, EE 320Communications & Electronics Elective)

**EE 509 Microwave Engineering 3C,3H**

**EE 521 Solid State Electronics 3C,3H**

**EE 522 Optoelectronics 3C,3H**

**EE 524 Electronic Communication Circuits 3C,3H**

**EE 525 Electronic Circuit Design 3C,3H**
Active filters. Internal structure of operational amplifiers. Integrated analog circuits and applications. (Pre-/Co- Requisites: EE 320 Communications & Electronics Elective)

**EE 526 Semiconductor Devices 3C,3H**

**EE 528 Microwave Electronics 3C,3H**

**EE 529 CMOS Circuit Design 3C,3H**
Analog design with MOS technology. MOS operational amplifier. Wideband amplifiers. Multipliers & modulators. CMOS oscillators. Voltage-controlled oscillators. (Pre-/Co- Requisites: EE 420 Communications & Electronics Elective)

**EE 531 Electric Drive Systems 3C,3H**

**EE 537 Switched-Mode Power Supplies 3C,3H**

**EE 538 High Voltage Engineering 3C,3H**

**EE 539 Advanced Electric Machines 3C,3H**

**EE 540 Introduction to Robotics 3C,3H**

**EE 541 Sensors and Actuators 3C,3H**

**EE 546 Power System Control 3C,3H**
Flow of power in an AC system. Flexible AC transmission systems. Static VAR types & basic characteristics. Static VAR compensator applications to electric power systems: static shunt compensators & statcom. Application examples. (Pre-/Co- Requisites: EE 440, EE 480 Power and Control Elective)

**EE 547 Computer Control 3C,3H**

**EE 551 Digital Communications 3C,3H**

**EE 552 Digital Communications Lab 1C,3L**

**EE 555 Optical Fiber Communication Systems 3C,3H**

**EE 558 Satellite Communication Systems 3C,3H**

EE 559  Introduction to Wireless Communications  3C,3H

EE 565  Digital Speech Processing  3C,3H

EE 566  Digital Image Processing  3C,3H

EE 570  Communication Networks  3C,3H

EE 580  Power System Analysis  3C,3H

EE 582  Power Systems Lab  1C,3L

EE 586  Power System Protection  3C,3H

EE 591  Graduation Project I  1C,1H
Project preparation & theory in the semester preceding the graduation semester. Pre-/Co- Requisites: Passing 114 credit hours Department Compulsory

EE 592  Graduation Project II  3C,2H,2L
Practical implementation of the project as prepared for in Graduation Project 1. Pre-/Co- Requisites: EE 591 Department Compulsory

EE 595  Special Topics in Communications (3C,3H) and Electronics
Content has to be approved by the Electrical Engineering Department Council. (Pre-/Co- Requisites: EE 450 Communications & Electronics Elective)

EE 596  Special Topics in Power (3C,3H) and Control
Content has to be approved by the Electrical Engineering Department Council. (Pre-/Co- Requisites: EE 480 Power and Control Elective)