COMSATS Institute of Information Technology
Registrar Office, Principal Seat, Islamabad

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No: CIIT-Reg/Notif- 772/12/1106 July 11, 2012

Scheme of Studies of Bachelor of Science (BS) in Electrical Engineering, BS(EE)

NOTIFICATION

It is hereby notified that the Academic Council in its 13th Meeting held on June 04, 2012 approved the following scheme of studies of Bachelor of Science (BS) in Electrical Engineering, BS(EE) with effect from Fall 2012 at CIIT system:

The launching of the program is subject to approval from Pakistan Engineering Council.

i.	Minimum Duration:	04 Years
ii.	Minimum No of Semesters	08
iii.	No of Credit Hours in each Semester:	13-19
iv.	**Core Courses:**	
a.	Engineering Courses (List Attached)	21
b.	Non-Engineering Courses (List Attached)	12
v.	**Elective Courses:**	
c.	Major Electives (I, II, III and V)***	4
d.	Major Elective IV (Optional)* or EE Open I ***	1-2
e.	EE Open II (Optional)*	1
f.	Interdisciplinary Elective**** or Non Engineering Elective (Optional)*	1
vi.	Total No of Courses:	40
vii.	Total No of Credit Hours:	**133-140 Credit Hours**

Note:

The Regulations relating to Undergraduate Degree Programs approved by the Competent Authority and amended from time to time shall also be applicable to this program.

This issues with the approval of the Competent Authority.

Nadeem Uddin Qureshi
Additional Registrar

Encl: Brief Introduction, Course Distribution, Tentative Plan of Studies, Course Hierarchy.

Distribution:

1. Dean, Faculty of Engineering, CIIT.
2. Dean of Research, Innovation and Commercialization (DORIC), CIIT.
3. All Directors, CIIT System.
4. Incharge, CIIT Islamabad Campus.
5. Chairman, Department of Electrical Engineering, CIIT.
6. All Incharges, Academic Sections, CIIT Campuses.
7. All HoD's/Incharges, Department of Electrical Engineering, CIIT Campuses.
8. Controller of Examinations, CIIT.
9. All Incharges, Examination Departments, CIIT Campuses.

CC:

1. PS to Rector.
2. PA to Registrar.

List of Core Courses:

Engineering Courses:

Sr No	Course Code	Course Title	Credit Hours[1]	Prerequisite(s)†
1	CSC141	Introduction to Computer Programming	4(3, 1)	
2	CSC241	Object Oriented Programming	4(3, 1)	CSC141
3	EEE112	Engineering Mechanics and Thermodynamics	3(3, 0)	
4	EEE113	Engineering Drawing	1(0, 1)	
5	EEE241	Digital Logic Design	4(3, 1)	
6	EEE121	Electric Circuits Analysis I	4(3, 1)	PHY121
7	EEE222	Electric Circuits Analysis II	4(3, 1)	MTH241,EEE121
8	EEE223	Signals and Systems	4(3, 1)	MTH241
9	EEE281	Introduction to Power Engineering	3(3, 0)	
10	EEE231	Electronics I	4(3, 1)	EEE121
11	EEE374	Electrical Measurements and Instrumentation	4(3, 1)	EEE121
12	EEE261	Electromagnetic Theory	3(3, 0)	MTH105
13	EEE251	Probability Methods in Engineering	3(3, 0)	MTH104, MTH231
14	EEE371	Electric Machines	4(3, 1)	EEE222
15	EEE232	Electronics II	4(3, 1)	EEE231
16	EEE325	Control Systems	4(3, 1)	EEE223
17	EEE351 OR EEE352	Principles of Communication Systems (For all majors except telecom) OR Analog Communication Systems (For Telecom)	4(3, 1)	EEE223
18	EEE342	Microprocessor Systems and Interfacing	4(3, 1)	EEE241
19	EEE324	Digital Signal Processing	4(3, 1)	EEE223
20	EEE490	Final Year Project (Part I)**	1(0, 1)	
21	EEE490	Final Year Project (Part II)**	5(0, 5)	

***Non-Engineering Courses**

Sr No	Course Code	Course Title	Credit Hours[1]	Prerequisite(s)†
1	ECO300	Engineering Economics	3(3, 0)	
2	HUM100	English Comprehension and Composition	3(3, 0)	
3	HUM102	Report Writing Skills	3(3, 0)	HUM100
4	HUM110	Islamic Studies	3(3, 0)	
5	HUM111	Pakistan Studies	3(3, 0)	
6	MGT462	Project Planning and Management	3(3, 0)	

7	MTH104	Calculus and Analytical Geometry	3(3, 0)	
8	MTH105	Multivariable Calculus	3(3, 0)	MTH104
9	MTH231	Linear Algebra	3(3, 0)	
10	MTH241	Ordinary Differential Equations	3(3, 0)	MTH104
11	MTH375	Numerical Computations	3(2, 1)	MTH104, CSC141
12	PHY121	Applied Physics for Engineers	4(3, 1)	

The student has the flexibility of selecting between Major Elective and EE Open Electives, Non Engineering Elective and Inter Disciplinary Electives from the list of elective courses.

***Major Elective Courses:

Electives Power

Sr No	Course Code	Course Title	Credit Hours[1]	Pre-requisite(s)
1	EEE338	Power Electronics	4(3, 1)	EEE232
2	EEE486	Power System Analysis	3(3, 0)	EEE222
3	EEE381	Power Transmission	4(3, 1)	EEE222
4	EEE487	Power Distribution and Utilization	4(3, 1)	EEE222
5	EEE484	High Voltage Engineering	4(3, 1)	EEE222
6	EEE488	Renewable and Alternate Energy Systems	3(3, 0)	
7	EEE382	Power Generation	3(3, 0)	EEE222
8	EEE483	Power System Operation and Control	3(3, 0)	EEE222
9	EEE481	Design of Electrical Machines	3(3, 0)	EEE371
10	EEE485	Power System Protection	3(3, 0)	EEE484
11	EEE435	Industrial Electronics	4(3, 1)	EEE338
12	EEE489	Power Plant Engineering	3(3, 0)	EEE222

Electives Telecommunications

Sr. No	Course Code	Course Title	Credit Hours[1]	Prerequisite(s)†
1	EEE314	Data Communication and Computer Networks	4(3, 1)	
2	EEE463	Antenna and Radio Wave Propagation	4(3, 1)	EEE261
3	EEE353	Digital Communication Systems	4(3, 1)	EEE351 or EEE352, MTH263
4	EEE354	Telecommunication Systems Engineering	3(3, 0)	EEE351 or EEE352
5	EEE362	Microwave Engineering	4(3, 1)	EEE261, EEE232
6	EEE455	Optical Fiber Communications	3(3, 0)	EEE362
7	CSC341	Network Programming	4(3, 1)	EEE314,CSC141
8	EEE454	Transmission and Switching Systems	3(3, 0)	EEE353

9	EEE456	Broadband Technologies	3(3, 0)	EEE314
10	EEE464	Wireless Communication Systems	3(3, 0)	EEE351 or EEE352
11	EEE465	Microwave and Satellite Communication Systems	3(3, 0)	EEE353,EEE463
12	EEE466	Radars and Navigation Aids	3(3, 0)	EEE463
13	EEE467	Telecommunication Policies Standards and Regulations	3(3, 0)	
14	CSC336	Web Engineering	4(3, 1)	CSC141
15	CSC341	Network Programming	4(3, 1)	EEE314, CSC141

Electives Electronics

Sr No.	Course Code	Semester Course Title	Credit Hours[1]	Prerequisite(s)†
1	EEE338	Power Electronics	4(3, 1)	EEE232
2	EEE434	VLSI Design	4(3, 1)	EEE241, EEE232
3	EEE344	Digital System Design	4(3, 1)	EEE241,CSC141
4	EEE435	Industrial Electronics	4(3, 1)	EEE374, EEE231
5	EEE446	Real Time Embedded Systems	4(3, 1)	EEE342
6	EEE333	Analog Integrated Circuits, Analysis and Design	4(3, 1)	EEE232
7	EEE436	Applied Optoelectronics	3(3, 0)	EEE232
8	EEE437	Analog Filter Design	4(3, 1)	EEE232
9	EEE362	Microwave Engineering	4(3, 1)	EEE261, EEE232
10	EEE438	RF Electronics	3(3, 0)	

Electives Computer

Sr. No	Course Code	Course Title	Credit Hours[1]	Prerequisite(s)†
1	CSC112	Algorithms and Data Structures	4(3, 1)	CSC141
2	EEE253	Computer Graphics	4(3, 1)	CSC141
3	EEE324	Digital Signal Processing	4(3, 1)	EEE223
4	EEE314	Data Communication and Computer Networks	4(3, 1)	EEE351
5	EEE343	Computer Organization and Architecture	4(3, 1)	EEE241
6	CSC322	Operating Systems Concepts	3(3, 0)	CSC112
7	EEE446	Real Time Embedded Systems	4(3, 1)	EEE342
8	EEE461	Neural Networks	3(3, 0)	
9	EEE462	Artificial Intelligence	3(2, 1)	CSC141
10	CSC492	Software Engineering	4(3, 1)	
11	EEE415	Digital Image Processing	4(3, 1)	EEE324

12	EEE434	VLSI Design	4(3, 1)	EEE241, EEE232
13	CSC421	Systems Programming	4(3, 1)	CSC141
14	CSC271	Database Systems	4(3, 1)	CSC112
15	CSC334	Distributed Computing	4(3, 1)	EEE314, CSC141

Electives Control

Sr.	Course Code	Course Title	Credit Hours[1]	Prerequisite(s)*
1	EEE447	Robotics	3(3, 0)	EEE325
2	EEE461	Neural Networks	3(3, 0)	
3	EEE462	Artificial Intelligence	3(2, 1)	CSC141
4	EEE421	Introduction to Digital Control Systems	4(3, 1)	EEE325
5	EEE422	Fuzzy Logic	4(3, 1)	EEE325
6	EEE423	Applied Control Systems	4(3, 1)	EEE325
7	EEE424	Optimal Control	4(3, 1)	EEE325
8	EEE425	Introduction to Adaptive Control	4(3, 1)	EEE325
9	EEE426	Stochastic Control	4(3, 1)	EEE325
10	EEE427	Multivariable Control	4(3, 1)	EEE325
11	EEE428	Introduction to Non-linear Control	3(3, 0)	EEE325

***Non-Engineering Electives**

Sr No.	Course Code	Course Title	Credit Hours[1]	Prerequisite(s)*
1	HUM200	Business Communication Workshop	3(3, 0)	HUM100
2	HUM202	Creative Thinking and Decision Making	3(3, 0)	
3	HUM220	Introduction to Psychology	3(3, 0)	
4	HUM320	Introduction to Sociology	3(3, 0)	
5	HUM400	Business Communication	3(3, 0)	
6	LAW300	Corporate Law	3(3, 0)	
7	MGT131	Financial Accounting	3(3, 0)	
8	MGT330	Financial Management	3(3, 0)	
9	MGT350	Human Resource Management	3(3, 0)	
10	MGT403	Entrepreneurship	3(3, 0)	
11	MGT450	HRM Policies and Practices	3(3, 0)	

12	MGT460	Operations Management	3(3, 0)	
13	MGT522	Marketing of IT and Telecom Products	3(3, 0)	
14	MTH374	Optimization	3(3, 0)	MTH102
15	MTH375	Numerical Computations	3(2, 1)	MTH102, CSC141
16	MTH467	Operations Research	3(3, 0)	MTH102

[1] 3 credit hours of theory is equivalent to 3 hours of lectures whereas 1 credit hour of lab is equivalent to 3 hours of lab session. All the lab sessions are graded. Students have to pass both theory and lab to earn the course credits.

† Courses with prerequisites can only be allowed if all prerequisite courses have been passed.

* With the consent of Academic Advisor, Project Supervisor & Course Instructor, the students can select an elective course in their area of specialization (chosen Major) according to their aptitudes and requirements of the final year project.

** Students must clear all the engineering subjects in the first five semesters as given in the tentative plan to be eligible for the Final year project.

*** With the consent of Academic Advisor, Project Supervisor & Course Instructor, the students can take any course of EE which he has not taken before (including the electives of TE, EPE, CE, EL) according to his/her aptitude/future plans and further requirement (if any) of his final year project.

****With the advice and consent of the Department, the student may select interdisciplinary elective course from the list of courses and the student may select any approved course of EE, which he/she has not taken before.

Note: The list of Electives may be revised from time to time and will be offered by the department subject to the availability of the faculty.

Bachelor of Science in Electrical Engineering

Introduction

The Electrical Engineering program is designed to provide its graduates with a solid educational foundation on which they can build successful and sustainable careers in electrical engineering and related fields. The curriculum of Bachelor of Science in Electrical Engineering is developed with the objective to facilitate the teaching of common core courses and selection of courses of a particular major area depending upon the interest of the student. The curriculum offers following major areas:

- Power
- Telecommunication
- Electronics
- Computer
- Control

Program Objectives:

The objective of this program is:

- To equip students with the sound knowledge of Engineering
- To produce well-trained, skilled and efficient professional engineers
- To develop their communication skills
- To develop their analysis, synthesis and design skills
- To produce graduates with the necessary background and technical skills to work professionally in one or more of the following areas: Power, Telecommunication, Electronics, Computer and Control
- To prepare graduates who are capable of entering and succeeding in an advanced degree program in their field of study
- To create an excellent environment for research and development activities

Program Outcomes:

The graduates of the program will be able to:

- Possess essential engineering knowledge for meeting the requirements of industries and other organizations needing graduate engineers
- Do planning, specification, design, implementation, and operation of systems
- Apply engineering knowledge, mathematical tools and probabilistic/statistical methods to solve technical problems
- Function effectively in a multi-disciplinary team

Course Distribution

Domain	Knowledge Area	Total Courses	Total Credits	Overall %age
Non-Engineering	Humanities	4	12	32.5%
	Management Sciences	2	6	
	Natural Sciences	6	19	
	Non-Engineering (Optional)*	1	3	
	Sub Total	**12-13**	**37-40**	
Engineering	Computing	2	8	67.5%
	Engineering Foundation	10	36	
	Major Engg Core (Breadth)	5	18	
	Major Engg Core (Depth)	6	19-24	
	Minor Engg Courses	1-2	3-4 to 6-8*	
	Inter-Disciplinary Elective	1-2	6-7	
	Final Year Project	2	6	
	Sub Total	**28-29**	**96-100**	
Grand Total		**40-42**	**133-140**	**100%**

Courses of Non-Engineering Domain

Knowledge Area	Course Title	Credit Hrs.	Total Courses	Total Credit Hrs.	%age
Humanities	English Comprehension and Composition	3(3,0)	4	12	10%
	Report Writing Skills	3(3,0)			
	Islamic Studies	3(3,0)			
	Pakistan Studies	3(3,0)			
Management Sciences	Engineering Economics	3(3,0)	2	6	5%
	Project Planning and Management	3(3,0)			
Natural Sciences	Applied Physics for Engineers	4(3,1)	6	19	15%
	Calculus and Analytical Geometry	3(3,0)			

	Linear Algebra	3(3,0)			
	Multivariable Calculus	3(3,0)			
	Ordinary Differential Equations	3(3,0)			
	Numerical Computations	3(2,1)			
Non-engineering	Non – Engineering Elective (optional)*	3(3,0)	1	3	2.5%
	Total		**12-13**	**37-40**	**32.5%**

Courses of Engineering Domain

Knowledge Area	Course Title	Credit Hrs.	Total Courses	Total Credit Hrs.	%age
Computing	Introduction to Computer Programming	4(3,1)	2	8	5%
	Object Oriented Programming	4(3,1)			
Engineering Foundation	Engineering Drawing	1(0,1)	10	36	25%
	Signals and Systems	4(3,1)			
	Digital Logic Design	4(3,1)			
	Electric Circuits Analysis I	4(3,1)			
	Electric Circuits Analysis II	4(3,1)			
	Electronics I	4(3,1)			
	Electronics II	4(3,1)			
	Electrical Measurements and Instrumentation	4(3,1)			
	Electric Machines	4(3,1)			
	Probability Methods in Engineering	3(3,0)			
Major Engineering Core Courses (Breadth)	Principles of Communication Systems (for all majors except Telecom) / Analog Communication Systems (for Telecom Only)	4(3,1)	5	18	12.5%
	Introduction to Power Engineering	3(3,0)			
	Electromagnetic Theory	3(3,0)			

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	Control Systems	4(3,1)			
	Microprocessor Systems and Interfacing	4(3,1)			
Major Engineering Core Courses (Depth)	Digital Signal Processing	4(3,1)	6	19-24	15%
	Major Elective I	3(3,0) / 4(3,1)			
	Major Elective II	3(3,0) / 4(3,1)			
	Major Elective III	3(3,0) / 4(3,1)			
	Major Elective IV (optional)*	3(3,0) / 4(3,1)			
	Major Elective V	3(3,0) / 4(3,1)			
Minor Engineering Courses	EE Open I	3(3,0) / 4(3,1)	1-2	3-4 to 6-8	2.5%
	EE. Open II (optional)*	3(3,0) / 4(3,1)			
Inter-Disciplinary Course	Engineering Mechanics and Thermodynamics	3(3, 0)	1-2	6-7	2.5%
	IDEE II (optional)*	3(3,0) / 4(3,1)			
Final Year Design Project	Final Year Project (Part I)	1(0,1)	2	6	5%
	Final Year Project (Part II)	5(0,5)			
	Total		**28-29**	**96-100**	**67.5%**

* The student has the flexibility of selecting between Major Elective and EE Open Electives, Non Engineering Elective and Inter Disciplinary Engineering Electives.

Tentative Plan of Studies

The course offering in each semester as given below is not fixed; it may vary depending on the availability of faculty and needs of the students.

Semester 1

Course Code	Course Title	Credit Hours[1]	Prerequisite(s)†
HUM100	English Comprehension and Composition	3(3, 0)	
MTH231	Linear Algebra	3(3, 0)	
PHY121	Applied Physics for Engineers	4(3, 1)	
MTH104	Calculus and Analytical Geometry	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[1]	Prerequisite(s)†
EEE241	Digital Logic Design	4(3, 1)	
MTH105	Multivariable Calculus	3(3, 0)	MTH104
MTH241	Ordinary Differential Equations	3(3, 0)	MTH104
CSC141	Introduction to Computer Programming	4(3, 1)	
EEE121	Electric Circuits Analysis I	4(3, 1)	PHY121
		18(15, 3)	

Semester 3

Course Code	Course Title	Credit Hours[1]	Prerequisite(s)†
EEE222	Electric Circuits Analysis II	4(3 1)	MTH241, EEE121
EEE223	Signals and Systems	4(3, 1)	MTH241
EEE281	Introduction to Power Engineering	3(3, 0)	
EEE231	Electronics I	4(3, 1)	EEE121
CSC241	Object Oriented Programming	4(3, 1)	CSC141
		19(15, 4)	

Semester 4

Course Code	Course Title	Credit Hours[1]	Prerequisite(s)†
EEE374	Electrical Measurements and Instrumentation	4(3, 1)	EEE121
EEE261	Electromagnetic Theory	3(3, 0)	MTH105
EEE251	Probability Methods in Engineering	3(3, 0)	MTH104, MTH231
EEE371	Electric Machines	4(3, 1)	EEE222
EEE232	Electronics II	4(3, 1)	EEE231
		18(15, 3)	

Semester 5

Course Code	Course Title	Credit Hours[1]	Prerequisite(s)†
MTH375	Numerical Computations	3(2, 1)	MTH104, CSC141
EEE325	Control Systems	4(3, 1)	EEE223
EEE351 EEE352	Principles of Communication Systems (For all majors except Telecom) / Analog Communication Systems (For Telecom Only)	4(3, 1)	EEE223, EEE251
EEE342	Microprocessor Systems and Interfacing	4(3, 1)	EEE241
EEE	Major Elective I	3(3, 0)/4(3, 1)	
		18-19(14,4-5)	

Semester 6

Course Code	Course Title	Credit Hours[1]	Prerequisite(s)†
ECO300	Engineering Economics	3(3, 0)	
EEE324	Digital Signal Processing	4(3,1)	EEE223
EEE	Major Elective II	3(3, 0)/4(3,1)	
EEE	Major Elective III	3(3, 0)/4(3,1)	
	EE Open I/Major Elective IV	3(3, 0)/4(3, 1)	
		16-19(15,1-4)	

Semester 7

Course Code	Course Title	Credit Hours[1]	Prerequisite(s)†
HUM102	Report Writing Skills	3(3, 0)	HUM100
EEE490	Final Year Project (Part I)	1(0,1)	
EEE	Major Elective V	3(3, 0)/4(3,1)	
	Non Engineering Elective/ IDEE II	3(3, 0)/4(3,1)	
HUM110	Islamic Studies	3(3, 0)	
		13-15(12,1-3)	

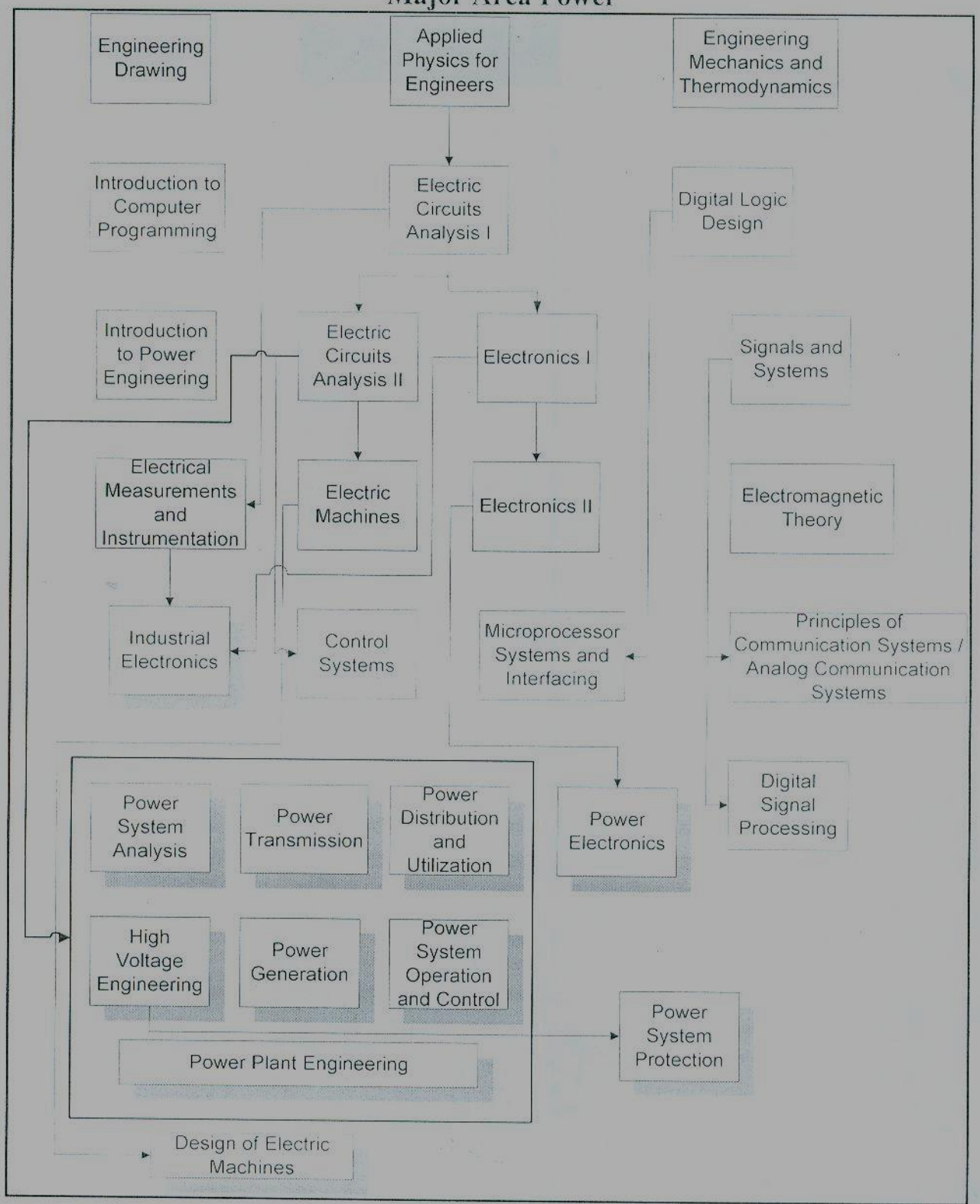
Semester 8

Course Code	Course Title	Credit Hours[1]	Prerequisite(s)†
MGT462	Project Planning and Management	3(3, 0)	
EEE490	Final Year Project (Part II)	5(0, 5)	
HUM111	Pakistan Studies	3(3, 0)	
	EE Open II	3(3, 0)/4(3,1)	
		14-15(9,5-6)	

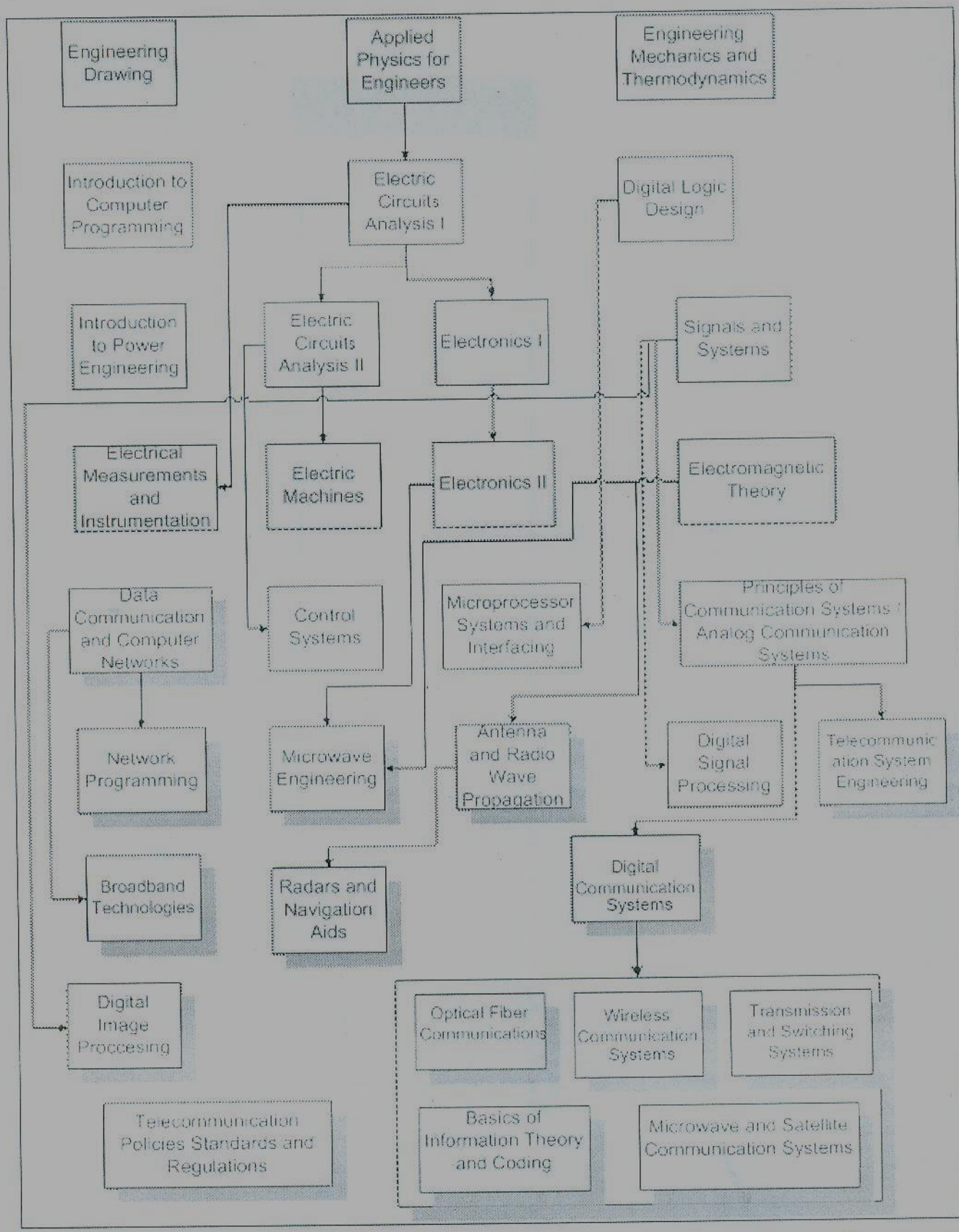
Total Credit Hours: 133-140

Courses Hierarchy

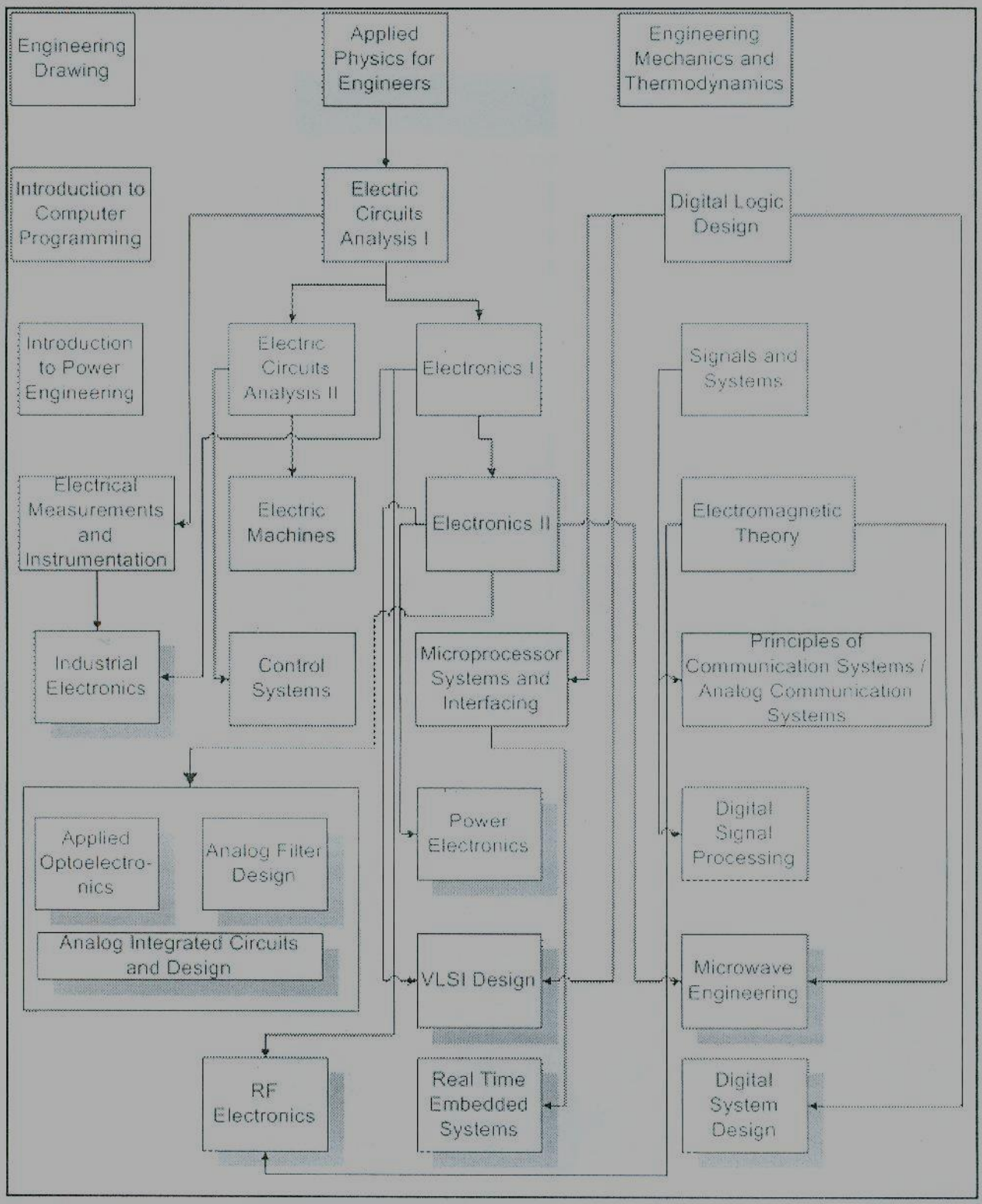
Major Area Power



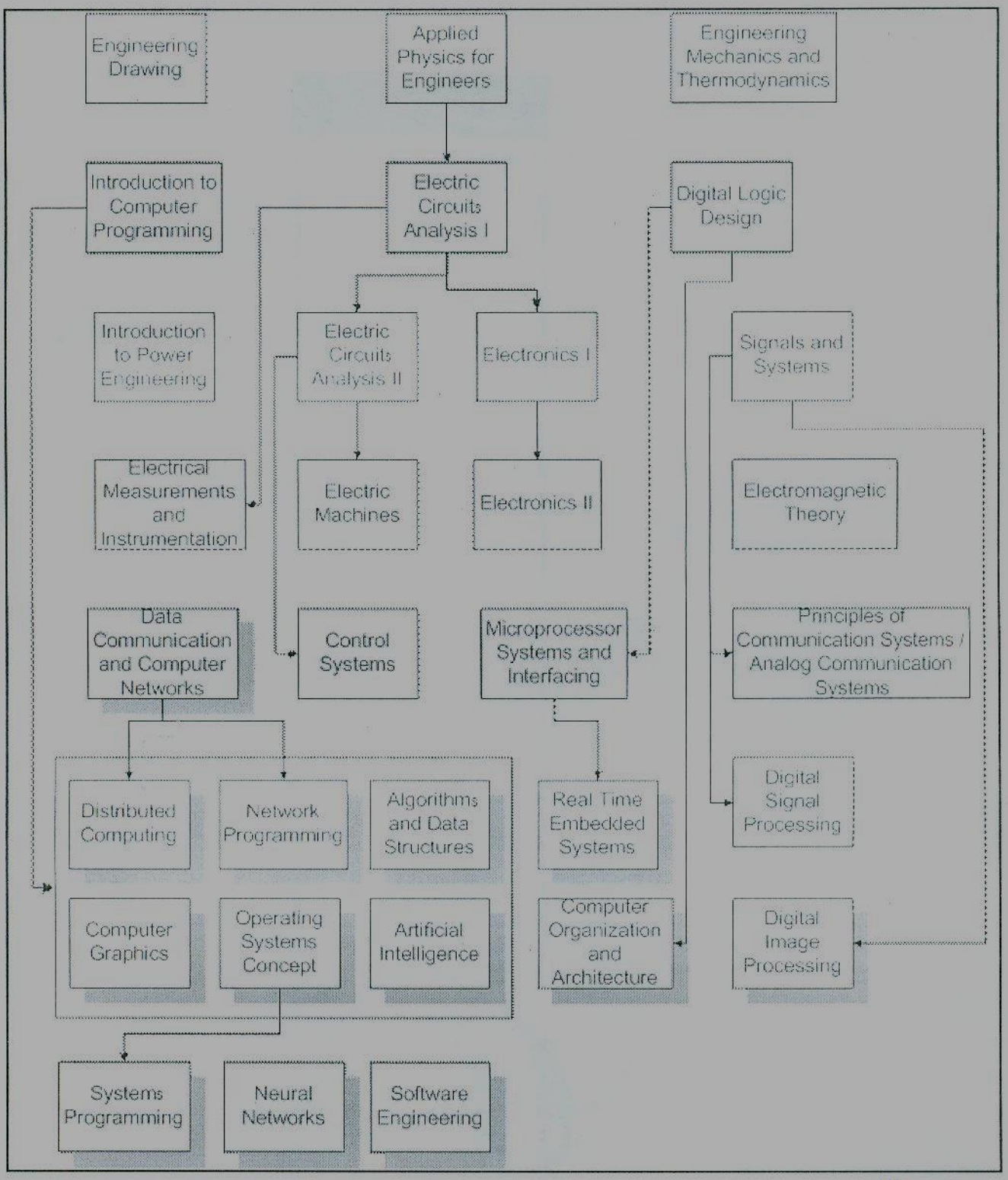
Major Area Telecommunication



Major Area Electronics



Major Area Computer



Major Area Control