KURUKSHETRA UNIVERSITY, KURUKSHETRA

(ESTABLISHED BY THE STATE LEGISLATURE ACT XII OF 1956)
('A+' GRADE NAAC ACCREDITED)

Scheme & Syllabus
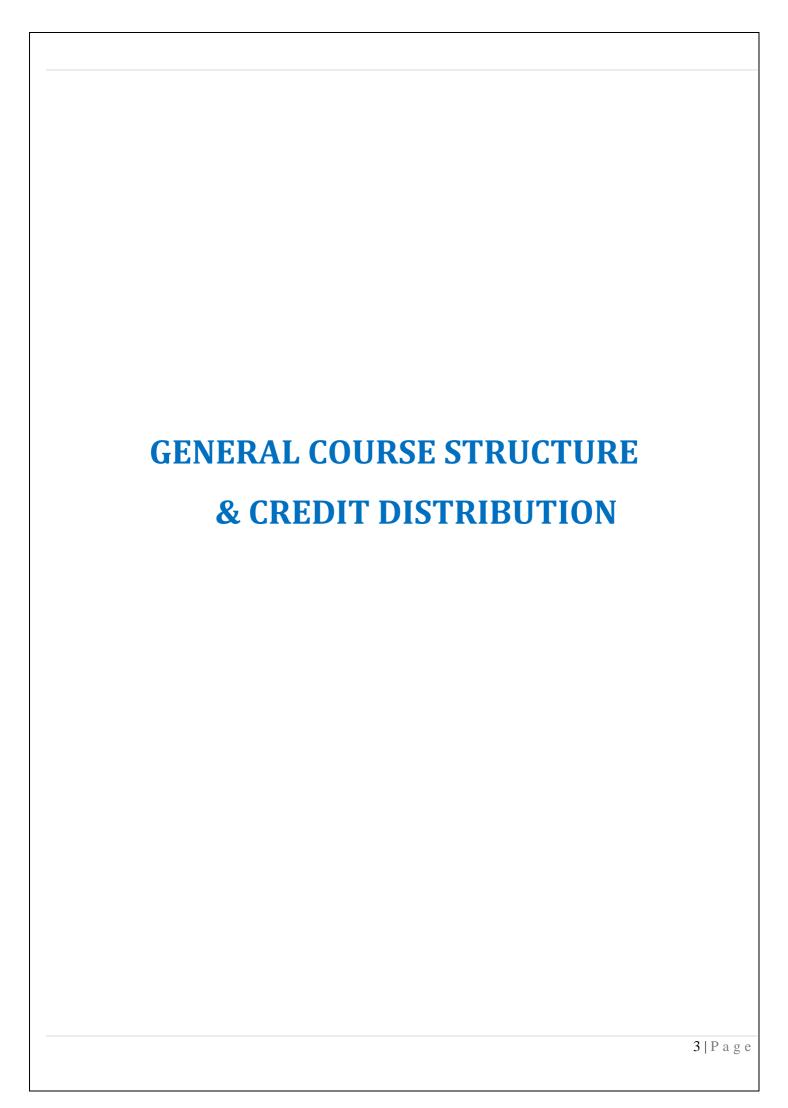# of
B.Tech. Degree
in
Electronics and Communications
Engineering (ECE)

(w.e.f. session 2023-24 onwards)

Table of Contents

GENERAL COURSE STRUCTURE

& CREDIT DISTRIBUTION

GENERAL COURSE STRUCTURE & THEME

A. Definition of Credit*:

1 Hr. Lecture (L) per week	1 Credit
1 Hr. Tutorial (T) per week	1 Credit
1 Hr. Practical (P) per week	0.5 Credit
2 Hours Practical (P) per week	1 Credit

*Except for mandatory and value added courses

B. Range of Credits: The total number of credits proposed for the four-year B.Tech. degree in Electronics and Communication Engineering (ECE) is kept as 172. In addition to this, for B.Tech. with Honors & specialization/minor degree, the student has to acquire additional 18-20 credits through MOOC courses offered at SWAYAM/NPTEL portal.

C.   Structure of UG Program in Electronics and Communication Engineering (ECE): The structure of UG program in Electronics and Communication Engineering (ECE) has essentially the following categories of courses with the breakup of credits as given:

S. No.	Category	Credit Breakup for ECE
1	Humanities and Social Sciences including Management courses	13.5
2	Basic Science courses	24
3	Engineering Science courses including workshop, drawing, basics of electronics/electrical/mechanical/computer etc.	17.5
4	Professional core courses	62
5	Professional Elective courses relevant to chosen specialization/branch	13
6	Open subjects – Electives from other technical and /or emerging subjects	12
7	Skill Enhancement Based Project work, seminar and internship in industry or elsewhere	22
8	Value Added and Mandatory Courses [Environmental Sciences, Induction Program, Indian Constitution, Essence of Indian Knowledge Tradition], [IDEA Workshop, Personality Development and Soft Skills, National/International languages, NCC/NSS/Yoga/Sports/Technical and cultural activities]	8 (1 for each course)
	Total	**172**

D.   Course code and definition:

Course code	Definitions
L:T:P	Lecture: Tutorial: Practical
BSC	Basic Science Courses
ESC	Engineering Science Courses
HSC/HSM	Humanities and Social Sciences including Management courses
ECE	Program Core Courses
ECP	Program Elective Courses
OEC	Open Elective Courses
VAC	Value Added Courses
MAC	Mandatory Courses

➢ **Category-wise Courses**

HUMANITIES & SOCIAL SCIENCES COURSES [HSC/HSM]

S.No	Course No./ Code	Subject	Semester	Hrs/ week			Credits
				Lecture	Tutorial	Practical	
1	B23-HSC-101	English for TechnicalWriting	I	2	0	2	3
2	B23-HSC-102	Design Thinking	II	0	0	3	1.5
3	B23-HSM-101	Universal Human Values- II: Understanding Harmony And Ethical Human Conduct	II	3	0	0	3
4	B23-HSM-202	Innovation, Start- up and Entrepreneurship	IV	3	0	0	3
5	B23-HSM-201	Organizational Behaviour	V	3	0	0	3
Total Credits							**13.5**

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BASIC SCIENCE COURSES [BSC]

S. No	Course No./ Code	Subject	Semester	Hrs/ week			Credits
				Lecture	Tutorial	Practical	
1	B23-BSC-104	Engineering Chemistry	I	3	0	2	4
2	B23-BSC-107	Mathematics-I	I	3	1	0	4
3	B23-BSC-106	Biology	I	3	0	0	3
4	B23-BSC-102	Introduction to Electromagnetic Theory	II	3	1	2	5
5	B23-BSC-108	Mathematics-II	II	3	1	0	4
6	B23-BSC-202	Complex Variables and Statistics	IV	3	1	0	4
Total Credits							**24**

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ENGINEERING SCIENCE COURSE [ESC]

S. No	Course No./ Code	Subject	Semester	Hrs/ week			Credits
				Lecture	Tutorial	Practical	
1	B23-ESC-101	Programming for Problem Solving	I	3	0	2	4
2	B23-ESC-107	Manufacturing Processes Workshop	I	0	0	3	1.5
3	B23-ESC-103	Basic Electrical and Electronics Engineering	II	3	1	2	5
4	B23-ESC-102	Engineering Graphics and Design	II	1	0	4	3
5	B23-ESC-201	Integral Transforms & Numerical Techniques	III	3	1	0	4
Total Credits							**17.5**

Scheme of UG Degree course in Electronics and Communications Engineering (ECE)
w.e.f. session 2023-24 onwards

PROGRAM CORE COURSES [ECE]

S. No.	Course No./ Code	Subject	Semester	Hrs /Week L:T:P	Credits
1	B23-ECE-201	Electronic Devices	III	3:0:0	3
2	B23-ECE-211	Electronic Devices Lab	III	0:0:2	1
3	B23-ECE-203	Digital System Design	III	3:0:0	3
4	B23-ECE-213	Digital System Design Lab	III	0:0:2	1
5	B23-ECE-205	Signals and Systems	III	3:0:0	3
6	B23-ECE-215	Signals and Systems Lab	III	0:0:2	1
7	B23-ECE-207	Network Theory	III	3:0:0	3
8	B23-ECE-209	Analog Communication	III	2:1:0	3
9	B23-ECE-202	Advanced Microprocessors and Interfacing	IV	3:0:0	3
10	B23-ECE-204	Analog Circuits	IV	3:0:0	3
11	B23-ECE-208	Analog Circuits Lab	IV	0:0:2	1
12	B23-ECE-206	Electromagnetic Waves	IV	3:0:0	3
13	B23-ECE-210	Electromagnetic Waves Lab	IV	0:0:2	1
14	B23-ECE-212	Programming with PYTHON	IV	0:0:2	1
15	B23-ECE-301	Digital Signal Processing	V	3:1:0	4
16	B23-ECE-309	Digital Signal Processing Lab	V	0:0:2	1
17	B23-ECE-303	Digital Communication	V	3:0:0	3
18	B23-ECE-311	Communication Lab	V	0:0:2	1
19	B23-ECE-305	Microcontrollers	V	3:0:0	3
20	B23-ECE-313	Microcontrollers Lab	V	0:0:2	1
21	B23-ECE-307	Antenna and Wave Propagation	V	3:0:0	3
22	B23-ECE-315	Microcontrollers Lab	V	0:0:2	1
23	B23-ECE-302	Computer Networks	VI	3:0:0	3
24	B23-ECE-310	Computer Networks Lab	VI	0:0:2	1
25	B23-ECE-304	VLSI Design	VI	3:0:0	3
26	B23-ECE-306	Wireless and Mobile Communication	VI	3:0:0	3
27	B23-ECE-308	Control System Engineering	VI	3:0:0	3
28	B23-ECE-401	Computer Architecture	VII	3:0:0	3
Total					**62**

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SKILL ENHANCEMENT BASED PROJECT WORK, SEMINAR AND INTERNSHIP

S. No.	Course No./ Code	Subject	Semester	Hrs /Week L:T:P	Credits
1	B23-ECE-214	Project-I	IV	0:0:6	3
2	B23-ECE-312	Project-II	VI	0:0:4	2
3	B23-ECE-403	Seminar	VII	0:0:2	1
4	B23-ECE-405	Industrial Training-II	VII	0:0:4	2
5	B23-ECE-407	Project-III	VII	0:0:4	2
6	B23-ECE-412/414/416/418	Project-IV/ Industrial Training/ Entrepreneurship/ Start-up	VIII	0:0:24	12
Total					**22**

PROGRAMME ELECTIVES

S. No.	Course No./ Code	Subject	Semester	Hrs /Week L:T:P	Credits
1		PROGRAMME ELECTIVE-I	VI	3:0:0	3
2		PROGRAMME ELECTIVE-I LAB	VI	0:0:2	1
3		PROGRAMME ELECTIVE-II	VII	3:0: 0	3
4		PROGRAMME ELECTIVE-III	VII	3:0:0	3
5		PROGRAMME ELECTIVE-IV	VIII	3:0: 0	3
Total					**13**

LIST OF PROGRAMME ELECTIVE COURSES [ECP]

S. No.	Course No./ Code	Subject	Semester	Hrs /Week L: T: P	Credits
1	B23-ECP-302	Internet of Things	VI	3:0: 0	3
2	B23-ECP-314	Internet of Things Lab	VI	0: 0:2	1
3	B23-ECP-304	Microwave Engineering	VI	3:0: 0	3
4	B23-ECP-316	Microwave Engineering Lab	VI	0:0:2	1
5	B23-ECP-306	Biomedical Electronics	VI	3:0: 0	3
6	B23-ECP-318	Biomedical Electronics Lab	VI	0:0:2	1
7	B23-ECP-308	Digital Image Processing	VI	3:0: 0	3
8	B23-ECP-320	Digital Image Processing Lab	VI	0:0:2	1
9	B23-ECP-405	Transducers and their applications	VII	3:0: 0	3
10	B23-ECP-407	Multimedia Communication	VII	3:0: 0	3
11	B23-ECP-409	Information Theory and Coding	VII	3:0: 0	3
12	B23-ECP-411	Bio-medical Signal Processing	VII	3:0: 0	3
13	B23-ECP-413	Audio & Speech Processing	VII	3:0: 0	3
14	B23-ECP-415	Satellite Communication	VII	3:0: 0	3
15	B23-ECP-417	RF System	VII	3:0: 0	3
16	B23-ECP-419	Wireless Sensor Networks	VII	3:0: 0	3
17	B23-ECP-421	Advanced Mobile Communication	VII	3:0: 0	3
18	B23-ECP-423	DSP Processors	VII	3:0:0	3
19	B23-ECP-402	Fiber Optical Communication	VIII	3:0: 0	3
20	B23-ECP-404	Embedded Systems	VIII	3:0: 0	3
21	B23-ECP-406	Electronic Materials	VIII	3:0: 0	3
22	B23-ECP-408	Radar Engineering	VIII	3:0: 0	3
23	B23-ECP-410	Adaptive Signal Processing	VIII	3:0:0	3

OPEN ELECTIVES

S. No.	Course No./ Code	Subject	Semester	Hrs /Week L:T:P	Credits
1		OPEN ELECTIVE-I	VI	3:0:0	3
2		OPEN ELECTIVE-II	VII	3:0:0	3
3		OPEN ELECTIVE-III	VII	3:0:0	3
4		OPEN ELECTIVE-IV	VIII	3:0:0	3
Total					**12**

LIST OF OPEN ELECTIVE COURSES [OEC]

S. No.	Course No./ Code	Subject	Semester	Hrs /Week L:T:P	Credits
1	B23-OEC-302	Consumer Electronics	VI	3:0:0	3
2	B23-OEC-304	Data Structure	VI	3:0:0	3
3	B23-OEC-306	Bio-informatics	VI	3:0:0	3
4	B23-OEC-308	Intellectual Property Rights (IPR) and Regulatory Framework	VI	3:0:0	3
5	B23-OEC-401	Operating System	VII	3:0:0	3
6	B23-OEC-403	Robotics & Automation	VII	3:0:0	3
7	B23-ECO-405	Soft Computing	VII	3:0:0	3
8	B23-ECO-407	Mixed Signal Design	VII	3:0:0	3
9	B23-ECO-409	Power Electronics	VII	3:0:0	3
10	B23-ECO-411	Artificial Intelligence & Machine Learning	VII	3:0:0	3
11	B23-ECO-413	Blockchain Technology	VII	3:0:0	3
12	B23-OEC-415	Neuro Fuzzy Systems	VII	3:0:0	3
13	B23-OEC-417	Probability and Stochastic Processes	VII	3:0:0	3
14	B23-OEC-419	Introduction to Digital Marketing	VII	3:0:0	3
15	B23-OEC-402	Renewable Energy Resources	VIII	3:0:0	3
16	B23-OEC-404	Supply Chain Management	VIII	3:0:0	3
17	B23-OEC-406	Mobile App Development	VIII	3:0:0	3
18	B23-OEC-408	Electric Vehicles	VIII	3:0:0	3
19	B23-OEC-410	Gender Equality at Workplace	VIII	3:0:0	3

VALUE ADDED AND MANDATORY COURSES [VAC/MAC]

S. No.	Course No./ Code	Subject	Semester	Hrs /Week L:T:P	Credits
1	B23-VAC-101	Personality Development and Soft Skills	I	2:0:0	1
2	B23-VAC-102	IDEA Workshop Theory	II	2:0:0	1
3	B23-VAC-104	IDEA Workshop Lab	II	0:0:3	1
4	B23-VAC-302/304/306/308/310	Hindi Language Skills/ Sanskrit Language Skills/ German Language Skills/ Japanese Language Skills/ French Language Skills	VI	2:0:0	1
5	B23-VAC-401/403/405/407/409/411	NCC/NSS/Sports/ Yoga/ Technical or Cultural Club/Society activities	VII	0:0:2	1
6	B23-MAC-201	Environmental Studies	III	3:0:0	1
7	B23-MAC-202	Essence of Indian Traditional Knowledge	IV	3:0:0	1
8	B23-MAC-301	Constitution of India	V	3:0:0	1
Total					**8**

SEMESTER WISE STRUCTURE

Scheme of UG Degree course in Electronics and Communications Engineering (ECE)
w.e.f. session 2023-24 onwards

B.Tech. Electronics and Communications Engineering (ECE)
KURUKSHETRA UNIVERSITY, KURUKSHETRA

SEMESTER I

S. No.	Course No./ Code	Subject	L:T:P	Hours/ Week	Credits	End Semester Exam	Internal assessment	Practical exam	Total	Duration of exam (Hours)
						Examination Schedule (Marks)				
1	B23-HSC-101	English for Technical Writing	2:0:0	2	2	70	30	--	100	3
2	B23-ESC-101	Programming for Problem Solving	3:0:0	3	3	70	30	--	100	3
3	B23-BSC-104	Engineering Chemistry	3:0:0	3	3	70	30	--	100	3
4	B23-BSC-107	Mathematics-I	3:1:0	4	4	70	30	--	100	3
5	B23-BSC-106	Biology	3:0:0	3	3	70	30	--	100	3
6	B23-HSC-103	English Language Lab	0:0:2	2	1	--	40	60	100	3
7	B23-ESC-105	Programming for Problem Solving Lab	0:0:2	2	1	--	40	60	100	3
8	B23-ESC-107	Manufacturing Processes Workshop	0:0:3	3	1.5	--	40	60	100	3
9	B23-BSC-114	Engineering Chemistry Lab	0:0:2	2	1	--	40	60	100	3
10	B23-VAC-101	Personality Development and Soft Skills	2:0:0	2	1	--	100	--	100	3
		TOTAL		**26**	**20.5**	**350**	**410**	**240**	**1000**	

Note:

➢ **NCC/NSS/Sports/Yoga/Technical or cultural club/society activities will be joined by students in first year and will be evaluated in 7th semester by the institute based upon continuous evaluation model as per guidelines.**

B.Tech. Electronics and Communications Engineering (ECE)
KURUKSHETRA UNIVERSITY, KURUKSHETRA

SEMESTER II

S. No.	Course No./ Code	Subject	L:T:P	Hours/ Week	Credits	Examination Schedule (Marks)				Duration of exam (Hours)
						End Semester	Internal assessment	Practical Exam	Total	
1	B23-HSM-101	Universal Human Values-II: Understanding Harmony and Ethical Human conduct	3:0:0	3	3	70	30	--	100	3
2	B23-BSC-102	Introduction to Electromagnetic Theory	3:1:0	4	4	70	30	--	100	3
3	B23-ESC-102	Engineering Graphics and Design	1:0:0	1	1	70	30	--	100	3
4	B23-ESC-103	Basic Electrical and Electronics Engineering	3:1:0	4	4	70	30	--	100	3
5	B23-BSC-108	Mathematics-II	3:1:0	4	4	70	30	--	100	3
6	B23-BSC-112	Electromagnetic Lab	0:0:2	2	1	--	40	60	100	3
7	B23-ESC-106	Engineering Graphics and Design Lab	0:0:4	4	2	--	40	60	100	3
8	B23-ESC-108	Basic Electrical and Electronics Engineering Lab	0:0:2	2	1	--	40	60	100	3
9	B23-HSC-102	Design Thinking	0:0:3	3	1.5	--	100	--	100	3
10	B23-VAC-102	IDEA Workshop Theory	2:0:0	2	1	--	100	--	100	3
11	B23-VAC-104	IDEA Workshop Lab	0:0:3	3	1	--	100	--	100	3
		TOTAL		**32**	**23.5**	**350**	**570**	**180**	**1100**	

B.Tech. Electronics and Communications Engineering (ECE)
KURUKSHETRA UNIVERSITY, KURUKSHETRA

SEMESTER-III

S. No.	Course No./ Code	Subject	L:T:P	Hours/ Week	Credits	Examination Schedule (Marks)				Duration of exam (Hours)
						End Semester Exam	Internal assessment	Practical Exam	Total	
1	B23-ESC-201	Integral Transforms & Numerical Techniques	3:1:0	4	4	70	30	--	100	3
2	B23-ECE-201	Electronic Devices	3:0:0	3	3	70	30	--	100	3
3	B23-ECE-203	Digital System Design	3:0:0	3	3	70	30	--	100	3
4	B23-ECE-205	Signals and Systems	3:0:0	3	3	70	30	--	100	3
5	B23-ECE-207	Network Theory	3:0:0	3	3	70	30	--	100	3
6	B23-ECE-209	Analog Communication	2:1:0	3	3	70	30	--	100	3
7	B23-ECE-211	Electronic Devices Lab	0:0:2	2	1	--	40	60	100	3
8	B23-ECE-213	Digital System Design Lab	0:0:2	2	1	--	40	60	100	3
9	B23-ECE-215	Signals and Systems Lab	0:0:2	2	1	--	40	60	100	3
10	B23-MAC-201	Environmental Studies	3:0:0	3	1	--	100	--	100	3
		TOTAL		**28**	**23**	**420**	**400**	**180**	**1000**	

B.Tech. Electronics and Communications Engineering (ECE)
KURUKSHETRA UNIVERSITY, KURUKSHETRA

SEMESTER-IV

S. No.	Course No./ Code	Subject	L:T:P	Hours/ Week	Credits	End Semester Exam	Internal assessment	Practical Exam	Total	Duration of exam (Hours)
1	B23-BSC-202	Complex Variables and Statistics	3:1:0	4	4	70	30	--	100	3
2	B23-HSM-202	Innovation, Start- up and Entrepreneurship	3:0:0	3	3	70	30	--	100	3
3	B23-ECE-202	Advanced Microprocessors and Interfacing	3:0:0	3	3	70	30	--	100	3
4	B23-ECE-204	Analog Circuits	3:0:0	3	3	70	30	--	100	3
5	B23-ECE-206	Electromagnetic Waves	3:0:0	3	3	70	30	--	100	3
6	B23-ECE-208	Analog Circuits Lab	0:0:2	2	1	--	40	60	100	3
7	B23-ECE-210	Electromagnetic Waves Lab	0:0:2	2	1	--	40	60	100	3
8	B23-ECE-212	Programming with PYTHON	0:0:2	2	1	--	40	60	100	3
9	B23-ECE-214	Project-I	0:0:6	6	3	--	40	60	100	3
10	B23-MAC-202	Essence of Indian Traditional Knowledge	3:0:0	3	1	--	100	--	100	3
	TOTAL			31	23	350	410	240	1000	

Note: All students have to undertake the industrial training for 6 to 8 weeks after 4th semester which will be evaluated in 5th semester.

B.Tech. Electronics and Communications Engineering (ECE)
KURUKSHETRA UNIVERSITY, KURUKSHETRA

SEMESTER-V

S. No.	Course No./ Code	Subject	L:T:P	Hours/ Week	Credits	Examination Schedule (Marks)				Duration of exam (Hours)
						End Semester Exam	Internal assessment	Practical Exam	Total	
1	B23-HSM-201	Organizational Behaviour	3:0:0	3	3	70	30	--	100	3
2	B23-ECE-301	Digital Signal Processing	3:1:0	4	4	70	30	--	100	3
3	B23-ECE-303	Digital Communication	3:0:0	3	3	70	30	--	100	3
4	B23-ECE-305	Microcontrollers	3:0:0	3	3	70	30	--	100	3
5	B23-ECE-307	Antenna and Wave Propagation	3:0:0	3	3	70	30	--	100	3
6	B23-ECE-309	Digital Signal Processing Lab	0:0:2	2	1	--	40	60	100	3
7	B23-ECE-311	Communication Lab	0:0:2	2	1	--	40	60	100	3
8	B23-ECE-313	Microcontrollers Lab	0:0:2	2	1	--	40	60	100	3
9	*B23-ECE-315	Industrial Training-I	2:0:0	2	--	--	100	--	100	3
10	B23-MAC-301	Constitution of India	3:0:0	3	1	--	100	--	100	3
	TOTAL			**27**	**20**	**350**	**370**	**180**	**900**	

Note: *B23-ECE-315 is a mandatory non-credit course in which the students will be required to get passing marks.

B.Tech. Electronics and Communications Engineering (ECE)
KURUKSHETRA UNIVERSITY, KURUKSHETRA

SEMESTER-VI

S. No.	Course No./ Code	Subject	L:T:P	Hours/ Week	Credits	Examination Schedule (Marks)				Duration of exam (Hours)
						End Semester Exam	Internal assessment	Practical Exam	Total	
1	B23-ECE-302	Computer Networks	3:0:0	3	3	70	30	--	100	3
2	B23-ECE-304	VLSI Design	3:0:0	3	3	70	30	--	100	3
3	B23-ECE-306	Wireless and Mobile Communication	3:0:0	3	3	70	30	--	100	3
4	B23-ECE-308	Control System Engineering	3:0:0	3	3	70	30	--	100	3
5	--	Program Elective-I	3:0:0	3	3	70	30	--	100	3
6	--	Open Elective-I	3:0:0	3	3	70	30	--	100	3
7	B23-ECE-310	Computer Networks Lab	0:0:2	2	1	--	40	60	100	3
8	--	Program Elective-I Lab	0:0:2	2	1	--	40	60	100	3
9	B23-ECE-312	Project-II	0:0:4	4	2	--	40	60	100	3
10	B23-VAC-302/304/306/308/310	Hindi Language Skills/ Sanskrit Language Skills/ German Language Skills/ Japanese Language Skills/ French Language Skills	2:0:0	2	1	--	100	--	100	3
		TOTAL		**28**	**23**	**420**	**400**	**180**	**1000**	

Note:

- The course of both Program Elective and Open Elective will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.
- All students have to undertake the industrial training for 6 to 8 weeks after 6th semester which will be evaluated in 7th semester.

List of Programme Elective and Open Elective Courses of 6th Semester		
PROGRAMME ELECTIVE-I	**PROGRAM ELECTIVE-I LAB**	**OPEN ELECTIVE-I**
B23-ECP -302 Internet of Things	**B23-ECP -314** Internet of Things Lab	**B23-OEC-302** Consumer Electronics
B23-ECP-304 Microwave Engineering	**B23-ECP-316** Microwave Engineering Lab	**B23-OEC-304** Data Structure
B23-ECP-306 Biomedical Electronics	**B23-ECP-318** Biomedical Electronics Lab	**B23-OEC-306** Bio-informatics
B23-ECP-308 Digital Image Processing	**B23-ECP-320** Digital Image Processing Lab	**B23-OEC-308** Intellectual Property Rights (IPR) and Regulatory Framework

B.Tech. Electronics and Communications Engineering (ECE)
KURUKSHETRA UNIVERSITY, KURUKSHETRA

SEMESTER-VII

S. No.	Course No./ Code	Subject	L:T:P	Hours/ Week	Credits	Examination Schedule (Marks)				Duration of exam
						End Semester Exam	Internal assessment	Practical Exam	Total	
1	B23-ECE-401	Computer Architecture	3:0:0	3	3	70	30	--	100	3
2	B23-ECE-403	Seminar	0:0:2	2	1	--	40	60	100	3
3	B23-ECE-405	Industrial Training-II	0:0:4	4	2	--	--	100	100	3
4	B23-ECE-407	Project-III	0:0:4	4	2	--	40	60	100	3
5	--	Program Elective-II	3:0:0	3	3	70	30	--	100	3
6	--	Program Elective-III	3:0:0	3	3	70	30	--	100	3
7	--	Open Elective-II	3:0:0	3	3	70	30	--	100	3
8	--	Open Elective-III	3:0:0	3	3	70	30	--	100	3
9	*B23-VAC-401/403/405/407/409/411	NCC/NSS/Sports/ Yoga/ Technical or Cultural Club/Society activities	0:0:2	2	1	--	100	--	100	
	TOTAL			25	21	350	330	220	900	

Note:

- **The course of both Program Elective and Open Elective will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.**
- ***B23-VAC-401/403/405/407/409/411 are single credit value added courses in which NCC/NSS/Sports/Yoga/Technical or Cultural Club/Society activities will be joined by students in first year and will be evaluated in 7th semester by the institute based upon continuous evaluation model as per guidelines.**

List of Programme Elective and Open Elective Courses of 7th Semester			
PROGRAMME ELECTIVE-II	**PROGRAMME ELECTIVE-III**	**OPEN ELECTIVE-II**	**OPEN ELECTIVE-III**
B23-ECP-405 Transducers and their applications	**B23-ECP-415** Satellite Communication	**B23-OEC-401** Operating System	**B23-OEC- 411** Artificial Intelligence & Machine Learning
B23-ECP-407 Multimedia Communication	**B23-ECP-417** RF System	**B23-OEC-403** Robotics & Automation	**B23-OEC-413** Blockchain Technology
B23-ECP-409 Information Theory and Coding	**B23-ECP-419** Wireless Sensor Networks	**B23-OEC-405** Soft Computing	**B23-OEC-415** Neuro Fuzzy Systems
B23-ECP-411 Bio-medical Signal Processing	**B23-ECP-421** Advanced Mobile Communication	**B23-OEC-407** Mixed Signal Design	**B23-OEC-417** Probability and Stochastic Processes
B23-ECP-413 Audio & Speech Processing	**B23-ECP-423** DSP Processors	**B23-OEC-409** Power Electronics	**B23-OEC-419** Introduction to Digital Marketing

B.Tech. Electronics and Communications Engineering (ECE)
KURUKSHETRA UNIVERSITY, KURUKSHETRA

SEMESTER-VIII

S. No.	Course No./ Code	Subject	L:T:P	Hours/ Week	Credits	Examination Schedule (Marks)				Duration of exam(Hours)
						End Semester Exam	Internal assessment	Practical Exam	Total	
1	--	Program Elective-IV	3:0:0	3	3	70	30	--	100	3
2	--	Open Elective-IV	3:0:0	3	3	70	30	--	100	3
3	B23-ECE-412/414/416/418	Project-IV/ Industrial Training/ Entrepreneurship/ Start-up	0:0:24	24	12	--	200	200	400	3
TOTAL				30	18	140	260	200	600	

Note:

➢ **The course of both Program Elective and Open Elective will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.**

➢ **In case of semester-long project work done in industry/external institute, the Program Elective- IV and Open Elective-IV may be offered in online mode through MOOC courses offered by SWAYAM/NPTEL portal. These courses may be done from 3rd semester till completion of the degree.**

List of Programme Elective and Open Elective Courses of 8th Semester	
PROGRAMME ELECTIVE-IV	**OPEN ELECTIVE -IV**
B23-ECP-402 Fiber Optical Communication	**B23-OEC-402** Renewable Energy Resources
B23-ECP-404 Embedded Systems	**B23-OEC-404** Supply Chain Management
B23-ECP-406 Electronic Materials	**B23-OEC-406** Mobile App Development
B23-ECP-408 Radar Engineering	**B23-OEC-408** Electric Vehicles
B23-ECP-410 Adaptive Signal Processing	**B23-OEC-410** Gender Equality at workplace

Electronics and Communication Engineering

Students of Electronics and Communication Engineering are offered to earn **ADDITIONAL 18-20 CREDITS** through MOOCs/SWAYAM courses as per the 'Guidelines to implement the SWAYAM/MOOCs/ other authorized online courses (OAOC) of Kurukshetra University, Kurukshetra' in any of the emerging areas mentioned below for the award of the degree of:

1. **B.Tech. (Hons.) Electronics and Communication Engineering with Specialization in Artificial Intelligence and Machine Learning**
2. **B.Tech. (Hons.) Electronics and Communication Engineering with Specialization in Internet of Things (IoT)**
3. **B.Tech. (Hons.) Electronics and Communication Engineering with Specialization in Blockchain**
4. **B.Tech. (Hons.) Electronics and Communication Engineering with Specialization in Robotics**
5. **B.Tech. (Hons.) Electronics and Communication Engineering with Specialization in Data Science**
6. **B.Tech. (Hons.) Electronics and Communication Engineering with Specialization in Cyber Security**
7. **B.Tech. Electronics and Communication Engineering with Minor Degree in 3D Printing**
8. **B.Tech. Electronics and Communication Engineering with Minor Degree in Electric Vehicles**
9. **B.Tech. Electronics and Communication Engineering with Minor Degree in Energy Engineering**
10. **B.Tech. Electronics and Communication Engineering with Minor Degree in Mechatronics**
11. **B.Tech. Electronics and Communication Engineering with Minor Degree in Computer Science and Biology**
12. **B.Tech. Electronics and Communication Engineering with Minor Degree in Drug Engineering**
13. **B.Tech. Electronics and Communication Engineering with Minor Degree in Genome Engineering and Technology**