RAJIV GANDHI UNIVERSITY OF KNOWLEDGE TECHNOLOGY
ANDHRA PRADESH

(NUZVID RK VALLEY SRIKAKULAM ONGOLE CAMPUSES)

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

DRAFT COURSE STRUCTURE AND DETAILED SYLLABI FOR THE B.TECH PROGRAM IN ELECTRICAL & ELECTRONICS ENGINEERING

(BOARD OF STUDIES PROPOSED COPY)

[AY 2022-23]

CONTENTS

		Mandatory Courses	
		22HS3102:Indian Constitution	
		22BE4101:Environmental Studies	
		22MC3101:Career Development Course	
	(iv)	**Program Core Courses**	
		22EC2102:Digital Logic Design	
		22EC2182:Digital Logic Design Laboratory	
		22EE1201: Network Theory	
		22EC21XX:Signals and Systems	
		22EC2101:Analog Electronic Circuits	
		22EC2181:Analog Electronic Circuits Laboratory	
		22EE2101:Electrical Machines	
		22EE2181:Electrical Machines Lab	
		22EE2201: Power Systems-I	
		22EE2204: Machine Learning	
		22EE2202:Control Systems	
		22EE2282:Control Systems Lab	
		22EC2203:Linear Integrated Circuits	
		22EC2283:Linear Integrated Circuits Laboratory	
		22EC31XX: Digital Signal Processing	
		22EE3101: Power Systems-II	
		22EE3181: Power Systems Lab	
		22EE2203: Power Electronics	
		22EE2283: Power Electronics Lab	
		22EE3102: Introduction to Electrical Vehicles	
		22EE3182: Electrical Vehicles Lab	
		22EC31XX: Embedded Systems	
		22EC31XX: Embedded Systems lab	
	(v)	**Program Elective Courses (The list will be updated after finalizing the electives)**	
		22EEXXXX: Electrical Distribution System	
		22EEXXXX: Smart Grid Technology	
		22EEXXXX:Power System Protection	
		22EEXXXX: Power System Operation & Control	
		22EEXXXX: Non Conventional energy Sourses	
		22EEXXXX: EV Batteries & Battery Management System	
		22EEXXXX: Fundamental of Electric and Hybrid Vehicles	
		22EEXXXX: Switched Mode Power Conversion	
		22EEXXXX: Electric Drives	
		22EEXXXX: HVdc Transmission Systems	
		22EEXXXX: High Voltage Engineering	

		22EEXXXX: Industrial Electrical Systems	
		22EEXXXX: Digital Control Systems	
		22EEXXXX: Digital Signal Processing	
		22EEXXXX: Control Systems Design	
		22EEXXXX: Computer Organization and Architecture	
		22EEXXXX: Advanced Digital Signal Processing	
		22EEXXXX: Artificial Neural Networks	
		22EEXXXX: Bio Medical Signal Processing	
		22EEXXXX: Digital Image Processing	
		22EEXXXX: Estimation of Signals and Systems	
		22EEXXXX: Medical Image analysis	
		22EEXXXX: Pattern Recognition and Applications	
		22EEXXXX: Analog IC Design	
		22EEXXXX: Digital IC Design	
		22EEXXXX: Digital VLSI System Design	
		22EEXXXX: Electronics Systems Packaging	
		22EEXXXX: Embedded System Software Testing	
		22EEXXXX: FPGA based System design	
		22EEXXXX: Low Power Circuits and Systems	
		22EEXXXX: MEMS and Microsystems	
		22EEXXXX: System Verilog	
		22EEXXXX: VLSI DSP	
		22EEXXXX: VLSI Physical Design	
		22EEXXXX: VLSI Testing and Verification	
	(vi)	**Open Elective Courses**	
		22EEXXXX: Artificial Intelligence	
		22EEXXXX: Computational Science and Engineering using Python	
		22EEXXXX: Linux programming and Scripting	
		22EEXXXX: Robotics Operating System: Drones	
	(vii)	**Seminars/Mini Projects/Projects**	
		22EEXXXX:Mini-Project I (Socially Relevant Project)	
		22EEXXXX:Mini Project –II	
		22EEXXXX:Summer Internship	
		22EEXXXX:Project-I	
		22EEXXXX:Project-II & Dissertation	
		22XXXXXX:Product Design & Innovation	
	(viii)	**Courses being offered to other Departments**	
		22EEXXXX: Electrical Technology	
		22EEXXXX: Electrical Technology Laboratory	

		22EEXXXX: Basic Electrical & Electronics Engineering	
		22EEXXXX: Basic Electrical & Electronics Engineering lab	

Chapter-1

General, Course structure, Semester-wise credit distribution

A. **Definition of Credit:**

1 Hour Lecture (L) per week	1 credit
1 Hour Tutorial (T) per week	1 credit
3 Hours Practical (Lab)/week	1.5 credits

B. Total number of credits: 160

C. Minimum number of contact hours/weeks per semester: 15 weeks of teaching

For 1 credit course: 15 contact hours per semester
For 2 credit course: 30 contact hours per semester
For 3 credit course: 45 contact hours per semester
For 4 credit course: 60 contact hours per semester

D. Course code and definition, Abbreviations

Course code	Definitions
L	Lecture
T	Tutorial
P	Practical
EC	Core Courses
ECEL	Program Electives
ECP1	Project Stage-I
ECP2	Project Stage-II
ECMP1	Mini Project Stage-I
ECMP2	Mini Project Stage-II
ECSI	Summer Internship
BS	Basic Science
ES	General Engineering Courses
HS	Humanities and Social Sciences including Management Science
OE	Open Electives
MC	Mandatory Courses
PCC	Program Core Course
PEC	Program Elective Course
OEC	Open Elective Course
BSC	Basic Science Course
HSC	Humanities and Social Sciences including Management Science Course
PROJ	Mini project/Project

E.Structure of Program

S.No	Category	Credits
1	Basic Science Courses	20
2	Engineering Science Courses	24
3	Humanities and Social Sciences including Management courses	8.5
4	Program core courses	65.5
5	Program Elective courses	15
6	Open Elective courses	12
7	Project work, Miniproject work, Summer internships project	15
8	Mandatorycourses - 03 [Indian Constitution, Environmental Studies, Career Development Course]	(non- credit)
	Total	160

F. Semester-wise Credits Distribution

	TOTAL	E1-S1	E1-S2	E2-S1	E2-S2	E3-S1	E3-S2	E4-S1	E4-S2
BSC	20	10.5	6.5	3	0	0	0	0	0
ESC	24	12.5	5.5	5	1	0	0	0	0
HSC	8.5	0	2.5	0	0	2.5	1.5	0	2
PCC	65.5	0	9.5	15	23.5	17.5	0	0	0
PEC	15	0	0	0	0	0	6	6	3
OEC	12	0	0	0	0	0	6	3	3
PROJECTS/ MINI PROJ	12	0	0	0	0	1.0	1.0	4	6
SUM INTERN	3	0	0	0	0	0	0	3	0
	160	23	24	23	24.5	21	14.5	16	14

Total number of Mandatory Courses (MC): 03 (Indian Constitution, Environmental Science, Career Development Course)
*Mandatory Induction Program completes before the start of First year Semester-I.

Notations:

E1-S1: Engineering first year first semester
E1-S2: Engineering first sear second semester
E2-S1: Engineering second year first semester
E2-S2: Engineering second year first semester
E3-S1: Engineering third year first semester
E3-S2: Engineering third year second semester
E4-S1: Engineering fourth year first semester
E4-S2: Engineering fourth year second semester
SUM INTERN: Summer Internship program

Chapter – 2

Semester-Wise Structure of Curriculum

Mandatory Induction Program

3 Weeks Duration
Physical activity Creative Arts Universal Human Values Literary Proficiency Modules Lectures by Eminent people Visit to local areas Familiarization of Dept./Branch Innovations

ENGINEERING FIRST YEAR: SEMESTER-1					
SL NO	**CATEGORY**	**COURSE CODE**	**SUBJECT NAME**	**L-T-P**	**Credits**
1	BSC	22MA1101	Differential Equations and Multivariable calculus	3-1-0	4
2	BSC	22PY1101	Engineering Physics	3-1-0	4
3	BSC	22PY1181	Engineering Physics Lab	0-0-3	1.5
4	ESC	22CE1114	Engineering Graphics & Computer Drafting	1-0-2	2.5
5	ESC	22EE1101	Electrical Technology	3-1-0	4
6	ESC	22EE1181	Electrical Technology Lab	0-0-3	1.5
7	BSC	22EE1102	Introduction to Latest Technical Advancements	1-0-0	1
8	ESC	22CS1108	Programming & Data Structures	3-0-0	3
9	ESC	22CS1188	Programming & Data Structures Lab	0-0-3	1.5
Total Credits					**23**
Total contact hours : 28 hours					

ENGINEERING FIRST YEAR: SEMESTER-2					
SLNO	**CATEGORY**	**COURSE CODE**	**SUBJECT NAME**	**L-T-P**	**Credits**
1	BSC	22MA1201	Mathematical Methods	3-1-0	4
2	PCC	22EC2102	Digital Logic Design	3-1-0	4
3	PCC	22EC2182	Digital Logic Design Lab	0-0-3	1.5
4	BSC	22EE1281	Computational Lab	0-0-3	1.5
5	HSC	22EG1281	English Language communication skills lab 1	1-0-3	2.5
6	ESC	22EC1201	Electronics Devices and Circuits	3-1-0	4
7	ESC	22EC1281	Electronics Devices and Circuits Lab	0-0-3	1.5
8	PCC	22EE1201	Network Theory	3-1-0	4
9	BSC	22EE1202	Introduction to AI	1-0-0	1
Total Credits					**24**
Total contact hours : 30 hours					

ENGINEERING SECOND YEAR: SEMESTER-1					
SLNO	**CATEGORY**	**COURSE CODE**	**SUBJECT NAME**	**L-T-P**	**Credits**
1	BSC	22MA2101	Probability & Random Variables	2-1-0	3
2	ESC	22EE2182	Internet of Things Lab	0-0-3	1
3	PCC	22EC2101	Analog Electronic Circuits	3-1-0	4
4	PCC	22EC2181	Analog Electronic Circuits Lab	0-0-3	1.5
5	ESC	22CS1209	Object Oriented Programming	3-1-0	3
6	ESC	22CS1289	Object Oriented Programming Lab	0-0-3	1
7	PCC	22ECXXXX (To be filled after ECE BOS)	Signals & Systems	3-1-0	4
8	PCC	22EE2101	Electrical Machines	3-1-0	4
9	PCC	22EE2181	Electrical Machines Lab	0-0-3	1.5
Total Credits					**23**
Total contact hours: 31 hours					

ENGINEERING SECOND YEAR: SEMESTER-2					
SLNO	**CATEGORY**	**COURSE CODE**	**SUBJECT NAME**	**L-T-P**	**Credits**
1	ESC	22EE2281	Robotics Laboratory	0-0-3	1
2	PCC	22EE2201	Power Systems-I	3-1-0	4
3	PCC	22EE2204	Machine Learning	3-0-0	3
4	PCC	22EE2202	Control Systems	3-1-0	4
5	PCC	22EE2282	Control Systems Lab	0-0-3	1.5
6	PCC	22EC2203	Linear Integrated Circuits	3-1-0	4
7	PCC	22EC2283	Linear Integrated Circuits Lab	0-0-3	1.5
8	PCC	22EE2203	Power Electronics	3-1-0	4
9	PCC	22EE2283	Power Electronics Lab	0-0-3	1.5
Total Credits					**24.5**
Total contact hours : 31 hours					

ENGINEERING THIRD YEAR: SEMESTER-1					
SLNO	**CATEGORY**	**COURSE CODE**	**SUBJECT NAME**	**L-T-P**	**Credits**
1	PCC	22EC31XX (To be filled After BOS)	Digital Signal Processing	3-1-0	3
2	PCC	22EE3101	Power Systems-II	3-1-0	4
3	PCC	22EE3181	Power Systems Lab	0-0-3	1.5
4	HSC	22EG3182	English Language communication skills Lab-2	0-0-3	1.5
5	PCC	22EE3102	Electrical Vehicles	3-1-0	3
6	PCC	22EE3182	Electrical Vehicles Lab	0-0-3	1.5
7	PCC	22EC31XX To be filled After BOS	Embedded Systems	3-1-0	3
8	PCC	22EC31XX To be filled After BOS	Embedded Systems Lab	0-0-3	1.5
9	PROJ	22EE3190	Mini-Project-I (Socially Relevant Project)	0-0-2	1
10	HSC	22MG32XX	Product Design & Innovation	1-0-0	1
Total Credits					**21**
Total contact hours: 31 hours *Mini Project-1 workload not included in above workload calculation					

ENGINEERING THIRD YEAR: SEMESTER-2					
SLNO	**CATEGORY**	**COURSE CODE**	**SUBJECT NAME**	**L-T-P**	**Credits**
1	HSC	22EG3283	English Language Communication skills lab-3	0-0-3	1.5
2	PEC	22EE32XX	Elective-1	3-0-0	3
3	PEC	22EE32XX	Elective-2	3-0-0	3
4	OEC	22XX32XX	Open Elective-1	3-0-0	3
5	OEC	22XX32XX	Open Elective-2	3-0-0	3
6	PROJ	22EE3290	Mini Project-II	0-0-3	1
Total Credits					**14.5**
MC		MC3201	Career Development Course	2-0-0	0
MC		MC3101	Indian Constitution	1-0-0	0
Total contact hours : 21 hours *Mini Project-2 work load not included in above calculation					

ENGINEERING FOURTH YEAR: SEMESTER-1					
SLNO	**CATEGORY**	**COURSE CODE**	**SUBJECT NAME**	**L-T-P**	**Credits**
1	PEC	22EE41XX	Elective-3	3-0-0	3
2	PEC	22EE41XX	Elective-4	3-0-0	3
3	OEC	22XX41XX	Open Elective-3	3-0-0	3
4	PROJ	22EE41XX	Summer Internship Project	0-0-6	3
5	PROJ	22EE4190	Project – I	0-0-8	4
Total Credits					**16**
MC		22BE4101	Environmental Science	2-0-0	0
Total contact hours : 11 hours *Project-1 work load not included in above calculation *Summer Internship Project will be after completion of Engineering Third Year Semester-2					

ENGINEERING FOURTH YEAR: SEMESTER -2					
SLNO	**CATEGORY**	**COURSE CODE**	**SUBJECT NAME**	**L-T-P**	**Credits**
1	HSC	22HS4299	Community Service	0-0-4	2
3	PEC	22EE42XX	Elective-5	3-0-0	3
5	OEC	22XX42XX	Open Elective-4	3-0-0	3
6	PROJ	22EE4290	Project-II & Dissertation	0-0-12	6
Total Credits					**14**
Total contact hours : 6 hours *Project-2 and Community Service work load not included in above calculation					

** Completion of courses through MOOCs is subjected to the regulations and guidelines of the University/Institute from time to time.
** At least two courses must be taken from Open Elective Courses

COURSES BEING OFFERED TO OTHER DEPARTMENTS

COURSE CODE	SUBJECT NAME	L-T-P	CREDITS	BRANCHES
22EEXX09	Basic Electrical and Electronics Engineering	X-X-X	X	MME, CE, CH, CSE, ME
22EEXX89	Basic Electrical and Electronics Engineering Laboratory	0-0-3	X	MME, CE, CH, CSE, ME

CHE: Department of Chemical Engineering
CE: Department of Civil Engineering
CSE: Department of Computer Science and Engineering
ME: Department of Mechanical Engineering
MME: Department of Metallurgy and Materials Engineering