

Gowdavelli (V), Medchal & Malkajgiri District, Telangana-501401



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CSE-COURSE STRUCTURE

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B.TECH. HR-2021 COURSE STRUCTURE

COMPUTER SCIENCE AND ENGINEERING

(Applicable from the batch admitted during 2021-22 and onwards)

Induction Program-2 Weeks

I-S	Semest	ter ()	I – Y	(ear)
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Hours Per

S.			-	urs 1 Week	-		Scheme of Evalua				
No.	Course code	Subject	L	Т	Р	Credits	Maximum Marks				
			L	1	P		Int.	Ext.	Tot.		
1	21BS1MT01	Matrix Algebra and Calculus	3	1	-	4	30	70	100		
2	21BS1PH01	Applied Physics	3	-	-	3	30	70	100		
3	21ES1EE01	Basic Electrical and Electronics Engineering	3	-	-	3	30	70	100		
4	21HS1EG01	English	2	-	-	2	30	70	100		
5	21HS1MB01	Business Economics and Financial Analysis	2	-	-	2	30	70	100		
6	21ES1EE02	Basic Electrical and Electronics Engineering-Lab	-	-	3	1.5	30	70	100		
7	21HS1EG02	English Language Communication Skills Lab	-	-	3	1	30	70	100		
8	21BS1PH02	Applied Physics Lab	-	-	3	1.5	30	70	100		
		TOTAL				18	240 560 8		800		
		Non Cred	lit C	ourse	es						
9	21AC1ME02	Engineering Projects in Community Services	-	-	2	0	0	0	0		
II – Semester											
				urs I Week			Scheme of Evaluation				
S. No.	Course code	Subject	L	Т	P	Credits	Ma	Maximum Marks			
							Int.	Ext.	Tot.		
1	21BS2MT02	Advanced Calculus for Engineers	3	1	-	4	30	70	100		
2	21BS2CH01	Engineering Chemistry	3	1	ı	3	30	70	100		
3	21ES2ME01	Engineering Graphics	2	ı	ı	3	30	70	100		
4	21ES2CS01	Problem Solving using C	3	-	-	3	30	70	100		
5	21EB2CB01										
3	21BS2CH02	Engineering Chemistry Lab	-	-	2	1.5	30	70	100		
6			- 1	-	2	1.5	30	70 70	100		
	21BS2CH02	Engineering Chemistry Lab	- 1 -	- - -							
6	21BS2CH02 21ES2ME02	Engineering Chemistry Lab Engineering Prototyping Lab	1 -	-	2	2	30	70	100		
6	21BS2CH02 21ES2ME02	Engineering Chemistry Lab Engineering Prototyping Lab Problem Solving using C -Lab	-	-	2 3	2 1.5	30 30	70 70	100		
6	21BS2CH02 21ES2ME02	Engineering Chemistry Lab Engineering Prototyping Lab Problem Solving using C -Lab TOTAL	-	-	2 3	2 1.5	30 30	70 70	100		

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	III – Semester (II – Year)									
S.	Course			urs 1 Week		G 114	Scheme	e of Evalua	ition	
No.	code	Subject	т	Т	P	Credits	Max	ks		
			L	1	P		Int.	Ext.	Tot.	
1	21BS3MT03	Probability and Statistics	3	1	-	4	30	70	100	
2	21ES3CS03	Python Programming	3	-	-	3	30	70	100	
3	21PC3CS01	Data Structures using C	3	1	-	4	30	70	100	
4	21PC3CS02	Discrete Mathematics	3	-	-	3	30	70	100	
5	21PC3CS03	Database Management Systems	3	-	-	3	30	70	100	
6	21ES3CS04	Python Programming Lab	-	-	3	1.5	30	70	100	
7	21PC3CS04	Data Structures using C Lab	-	-	2	1	30	70	100	
8	21PC3CS05	Database Management Systems Lab	-	-	3	1.5	30	70	100	
9	21PR3IN01	Evaluation of Summer Internship-1	-	-	2	1	100	-	100	
	TOTAL					22	340	560	900	
	Non Credi		<mark>it C</mark> o	urse	S					
10	21AC3HS02	Universal Human Values	2	-	-	0	0	-	0	
IV – Semester (II – Year)										
S.	Course	Subject		urs 1 Week		Credits	Scheme of Evaluation			
No.	code	Subject	L	T	P	Credits	Maximum Marks			
				-	-		Int.	Ext.	Tot.	
1	21HS4EG03	English for Employability	1	-	-	1	30	70	100	
2	21PC4CS06	Computer Organization and Architecture	3	-	-	3	30	70	100	
3	21PC4CS07	Design and Analysis of Algorithms	3	-	-	3	30	70	100	
4	21PC4CS08	Formal Languages and Automata Theory	3	-	-	3	30	70	100	
5	21PC4CS09	Object Oriented Programming using Java	3	1	-	4	30	70	100	
6	21PC4CS10	Software Engineering	3	-	-	3	30	70	100	
7	21HS4EG04	English for Employability-Lab	-	-	2	1	30	70	100	
8	21PC4CS11	Object Oriented Programming using Java Lab	-	-	3	1.5	30	70	100	
9	21PC4CS12	Software Engineering Lab	-	-	2	1	30	70	100	
10	21PR4CS01	Doing Engineering-1	1	-	1	1.5	30	70	100	
	TOTAL					22	300	700	1000	

		V – Semester (III -	- Ye	ar)					
S. No.	Course code	Subject	H	lour Per Veel	'S	Credits		me of Evaluation		
110.			L	T	P		Max Int.	ximum Marks		
1	21PC5CS13	Operating Systems	3	_	_	3	30	Ext. 70	Tot. 100	
2	21PC5CS14	Computer Networks	3		_	3	30	70	100	
3	21PC5CS14	Compiler Design	3	1	_	4	30	70	100	
4	211 C3C513	Professional Elective - I	3	1	_	3	30	70	100	
5		Open Elective - 1	3	_	_	3	30	70	100	
6	21PC5CS16	Operating Systems & Computer Networks Lab	-	-	3	1.5	30	70	100	
7	21PC5CS17	Web Technologies Lab	_	-	2	1	30	70	100	
8	21HS5EG05	Advanced English Communication Skills-Lab	-	ı	2	1	30	70	100	
9	21PR5IN02	Evaluation of Summer Internship-2	-	-	2	1	100	0	100	
10	21PR5CS02	Doing Engineering-2	1	-	1	1.5	30	70	100	
	TOTAL					22	370	630	1000	
		Non Credit	I	rses	S I	<u> </u>		1	1	
11	21MC5HS03	Analytical Reasoning	2		-	0	100	0	100	
		VI – Semester			ear)					
			L		•6					
G				lour Per			Schem	e of Evalua	ation	
S.	Course code	Subject				Credits				
S. No.	Course code	Subject		Per		Credits	Max	imum Maı	ks	
	Course code 21ES6CS05	Statistical Programming with R-	V	Per Veel	k	Credits 3				
No.		Ů	L	Per Veel	k P		Max Int.	imum Mai Ext.	rks Tot.	
No. 1	21ES6CS05	Statistical Programming with R-Programming Fundamentals of Engineering	L 3	Per Veel	k P	3	Max Int.	imum Mar Ext.	Tot. 100	
1 2	21ES6CS05 21HS6MB02	Statistical Programming with R-Programming Fundamentals of Engineering Management	L 3 2	Per Veel	k P	3 2	Max Int. 30	imum Mai Ext. 70	*ks Tot. 100 100	
1 2 3	21ES6CS05 21HS6MB02 21PC6CS18	Statistical Programming with R-Programming Fundamentals of Engineering Management Cloud Computing	1 3 2 3	Per Veel	- -	3 2 3	Max Int. 30 30 30	imum Mar Ext. 70 70 70	Tot. 100 100 100	
1 2 3 4	21ES6CS05 21HS6MB02 21PC6CS18	Statistical Programming with R-Programming Fundamentals of Engineering Management Cloud Computing Data Mining	1 3 2 3 3 3	Per Veel	- - -	3 2 3 3	Max Int. 30 30 30 30 30	imum Mar Ext. 70 70 70 70	Tot. 100 100 100 100	
1 2 3 4 5	21ES6CS05 21HS6MB02 21PC6CS18	Statistical Programming with R-Programming Fundamentals of Engineering Management Cloud Computing Data Mining Professional Elective - II	L 3 2 3 3 3	Per Veel T		3 2 3 3 3	Max Int. 30 30 30 30 30 30	70 70 70 70 70 70	Tot. 100 100 100 100 100 100	
1 2 3 4 5 6	21ES6CS05 21HS6MB02 21PC6CS18 21PC6CS19	Statistical Programming with R-Programming Fundamentals of Engineering Management Cloud Computing Data Mining Professional Elective - II Open Elective - II	L 3 2 3 3 3 3 3 3	Per Veel T		3 2 3 3 3 3	Max Int. 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70	Tot. 100 100 100 100 100 100 100	
No. 1 2 3 4 5 6 7	21ES6CS05 21HS6MB02 21PC6CS18 21PC6CS19 21ES6CS06	Statistical Programming with R-Programming Fundamentals of Engineering Management Cloud Computing Data Mining Professional Elective - II Open Elective - II R Programming Lab Data Mining Lab Cloud Computing Lab	3 2 3 3 3 3	Per Veel T	3	3 2 3 3 3 3 1.5	Max Int. 30 30 30 30 30 30 30 30 30 3	70 70 70 70 70 70 70 70	Tot. 100 100 100 100 100 100 100 1	
1 2 3 4 5 6 7 8	21ES6CS05 21HS6MB02 21PC6CS18 21PC6CS19 21ES6CS06 21PC6CS20	Statistical Programming with R-Programming Fundamentals of Engineering Management Cloud Computing Data Mining Professional Elective - II Open Elective - II R Programming Lab Data Mining Lab	3 2 3 3 3 3 -	Per Veel T	3 3	3 2 3 3 3 1.5 1.5	Max Int. 30 30 30 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70 70 70	Tot. 100 100 100 100 100 100 100 1	
1 2 3 4 5 6 7 8 9	21ES6CS05 21HS6MB02 21PC6CS18 21PC6CS19 21ES6CS06 21PC6CS20 21PC6CS21	Statistical Programming with R-Programming Fundamentals of Engineering Management Cloud Computing Data Mining Professional Elective - II Open Elective - II R Programming Lab Data Mining Lab Cloud Computing Lab Mobile Application Development Lab TOTAL	3 2 3 3 3 - -	Per Veel T	P 3 3 2 2 2	3 2 3 3 3 1.5 1.5	Max Int. 30 30 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70 70 70	Tot. 100 100 100 100 100 100 100 1	
1 2 3 4 5 6 7 8 9	21ES6CS05 21HS6MB02 21PC6CS18 21PC6CS19 21ES6CS06 21PC6CS20 21PC6CS21	Statistical Programming with R-Programming Fundamentals of Engineering Management Cloud Computing Data Mining Professional Elective - II Open Elective - II R Programming Lab Data Mining Lab Cloud Computing Lab Mobile Application Development Lab	3 2 3 3 3 - -	Per Veel T	P 3 3 2 2 2	3 2 3 3 3 1.5 1.5	Max Int. 30 30 30 30 30 30 30 30 30 30 30	imum Mar Ext. 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70	Tot. 100 100 100 100 100 100 100 1	

		VII – Semester	·(IV	- Y	(ear)					
S.	Course code	Subject		Hou r W		Credits	Scheme of Evaluation			
No.	Course code	Subject	L	Т	Р	Credits		<mark>imum Mai</mark>		
				1	•		Int.	Ext.	Tot.	
1	21PC7CM03	Machine Learning	3	-	-	3	30	70	100	
2		Professional Elective - III	3	-	-	3	30	70	100	
3		Professional Elective - IV	3	-	-	3	30	70	100	
4	210E7CS03	Open Elective - III	3	-	-	3	30	70	100	
5	21PC7CM04	Machine Learning Lab	-	-	3	1.5	30	70	100	
6	21PC7CD10	Full Stack Development Lab	-	-	3	1.5	30	70	100	
7	21PR7IN03	Doing Engineering-3(MINI PROJ/Internship)	-	2	-	2	30	70	100	
8	21PR7PS01	Project Stage-I	-	-	6	3	100	0	100	
	TOTAL					20	310	490	800	
Non Credit Co				S						
9	21MC7HS05	Intellectual Property Rights	2	-	-	0	0	0	0	
		VIII – Semeste	_ \)				
S.	Course code	Subject		Hours Per Week		Credits	Scheme of Evaluation			
No.	Course code	Subject	L	Т	P	Cicuits		imum Mai		
	* 1770.000.7						Int.	Ext.	Tot.	
1	21PE8CS05	Professional Elective - V	3	-	-	3	30	70	100	
2	21PE8CS06	Professional Elective - VI	3	-	-	3	30	70	100	
3	210E8CS04	Open Elective - IV	3	-	- 1.4	3	30	70	100	
4	4 21PR8PS02 Project Stage-II		-	-	14	7	30	70	100	
		TOTAL Non Credit	Ca	11400	<u> </u>	16	120	280	500	
5	21MC8HS06	Constitution of India	2	urse _	<u>S</u>	0	100	0	100	
		Foreign Languages				-		-		
6	21AC8HS03	(German/French/Japanese)	_	-	2	0	0	0	0	

Subject Code	Professional Elective 1
21PE5CS11	Software Testing Methodologies
21PE5CS12	Distributed Databases
21PE5CS13	Web Technologies
21PE5CS14	Data Analytics
21PE5CS15	Statistical Programming With R

	Professional Elective 2
21PE6CS21	Software Process And Project Management
21PE6CS22	Mobile Application Development
21PE6CS23	Information Retrieval System
21PE6CS24	Computer Forensics
21PE6CS25	Big Data Architecture

	Professional Elective 3	
21PE7CS31	Information Security	
21PE7CS32	Data Security	
21PE7CS33	Adhoc Sensor Networks	
21PE7CS34	Modern Software Engineering	
21PE7CS35	Big Data Analytics	

	Professional Elective 4
21PE7CS41	Data Science
21PE7CS42	Big Data and Business Analytics
21PE7CS43	Cloud Security
21PE7CS44	Advanced Algorithms
21PE7CS45	Big Data Security

	Professional Elective 5
21PE8CS51	Deep Learning
21PE8CS52	Software Engineering
21PE8CS53	Natural Language Processing
21PE8CS54	Artificial Intelligence
21PE8CS55	Data Visualisation

	Professional Elective 6
21PE8CS61	Expert Systems
21PE8CS62	Data Visualisation
21PE8CS63	Deep Learning
21PE8CS64	Blockchain Technology
21PE8CS65	Big Data Analytics - AP Skills



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ECE-COURSE STRUCTURE

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B.TECH. HR-21 COURSE STRUCTURE

ELECTRONICS AND COMMUNICATION ENGINEERING

(Applicable for the batch admitted from 2021-22 onwards)

Induction Program-2 Weeks

		I – Semester (I – Y	(ear)						
			Hours Per				Scheme of		
S.	Course code	e Subject		Wee	k	Credits	Evaluation		
No.	Course code Subject	Subject	L	T	P	Credits	Maxi	mum N	Aarks
			L	1	1		Int.	Ext.	Tot.
1	21BS1MT01	Matrix Algebra and Calculus	3	1	-	4	30	70	100
2	21BS1PH01	Applied Physics	3	-	-	3	30	70	100
3	21HS1EG01	English	2	-	-	2	30	70	100
4	21ES1EE01	Basic Electrical and Electronics Engineering	3	-	-	3	30	70	100
5	21HS1MB01	Business Economics and Financial Analysis	2	-	-	2	30	70	100
6	21BS1PH02	Applied Physics Lab	-	-	3	1.5	30	70	100
7	21HS1EG02	English Language Communication Skills Lab	-	-	3	1	30	70	100
8	21ES1EE02	Basic Electrical and Electronics Engineering-Lab	-	-	3	1.5	30	70	100
TOTAL					18	240	560	800	
		Non Credit Cour	ses						
9	21AC1ME01	Engineering Projects in Community Services	-	-	2	0	0	0	0
		II – Semester (I – Y	Year))					
				Hours Per				cheme	
S.	Course code	Subject		Wee	Week Credits		Evaluation		
No.	Course coue	Bubject	L	T	P	Cicuits	Maximum Marks		
					-		Int.	Ext.	Tot.
1	21BS2MT02	Advanced Calculus for Engineers	3	1	-	4	30	70	100
2	21BS2CH01	Engineering Chemistry	3	-	-	3	30	70	100
3	21ES2ME01	Engineering Graphics	2	-	2	3	30	70	100
4	21ES2CS01	Problem Solving using C	3	-	-	3	30	70	100
5	21BS2CH02	Engineering Chemistry Lab	-	-	2	1.5	30	70	100
6	21ES2CS02	Problem Solving using C -Lab	-	-	3	1.5	30	70	100
7	21EC2MEO2	Engineering Prototyping Lab	1	-	2	2	30	70	100
7	21ES2ME02		1						
/ TOT						18	210	490	700
ТОТ	AL	Non Credit Cour							
			rses 2	- 2	-	0 0	100 0	0 0	700 100 0

		III – Semester (II –	Year	r)					
S.	Course code	Subject	Н	ours Wee		Credits	E	<mark>cheme</mark> valuati	on
No.	Course code	Subject	L	T	P	Credits	Maximum Marks		
			L	1	1		Int.	Ext.	Tot.
1	21BS3MT03	Laplace Transforms, Numerical Methods & Complex variables	3	1	-	4	30	70	100
2	21PC3CS01	Data Structures using C	3	-	-	3	30	70	100
3	21PC3EC01	Electronic Devices and Circuits	3	1	-	4	30	70	100
4	21PC3EC02	Digital Logic design	3	-	-	3	30	70	100
5	21PC3EC03	Signals and Systems	3	-	-	3	30	70	100
6	21PC3CS04	Data Structures using C Lab	-	-	3	1.5	30	70	100
7	21PC3EC04	Electronic Devices and Circuits Laboratory	-	-	2	1	30	70	100
8	21PC3EC05	Digital logic Design Laboratory	-	-	3	1.5	30	70	100
9	21PR3IN01	Evaluation of Summer Internship-I	-	-	2	1	100	0	100
		TOTAL				22	340	560	900
		Non Credit Cou	ses						
12	21MC3HS01	Universal Human Values	2	-	-	0	100	0	100
		IV – Semester (II –	Year	r)					
				Hours Per				cheme	
S.	Course code	Subject		Wee	k	Credits		<u>valuati</u>	
No.	Course code	Subject	L	T	P	Cicuits		mum N	
							Int.	Ext.	Tot.
1	21PC4EC06	Communication Systems	3	-	-	3	30	70	100
2	21PC4EC07	Linear Integrated circuit applications	3	-	-	3	30	70	100
3	21PC4EC08	Electromagnetic field & Waves	3	-	-	3	30	70	100
4	21PC4EE08	Control Systems	3	-	-	3	30	70	100
5	21PC4EC10	Elements of Bioelectronics	3	-	-	3	30	70	100
6	21HS4EG03	English for Employability	1	-	-	1	30	70	100
7	21HS4EG04	English for Employability-Lab	-	-	2	1	30	70	100
8	21PC4EC11	Communication Systems Laboratory		-	3	1.5	30	70	100
9	21PC4EC12	Linear and Digital IC Applications Laboratory	-	-	2	1	30	70	100
10	21PC4EC13	Signals and Systems Laboratory	_	-	2	1	30	70	100
11	21PR4EC01	Doing Engineering-1	_	1	1	1.5	30	70	100
		TOTAL				22	330	770	1100

		V – Semester (III –	Year	r)					
S.	Course code	Subject	Н	ours Wee		Credits	E	cheme valuati	on
No.	Course code	Subject	L	T	P	Cicuits		mum N	
1	01DG5EG14	D: 1.10	2			2	Int.	Ext.	Tot.
1	21PC5EC14	Digital Communication	3	-	-	3	30	70	100
2	21PC5EC15	Antennas and Wave Propagation	3	1	-	4	30	70	100
3	21PC5EC16	Microcontrollers and its Applications	3	-	-	3	30	70	100
4		Professional Elective-I	3	-	-	3	30	70	100
5		Open Elective-I	3	-	-	3	30	70	100
6	21PC5EC17	Digital Communication Lab	-	-	3	1.5	30	70	100
7	21PC5EC18	Microcontrollers and its Applications Lab	-	-	2	1	30	70	100
8	21HS5EG05	Advanced English Communication Skills-Lab	-	-	2	1	30	70	100
9	21PR5EC02	Doing Engineering-2	-	1	1	1.5	30	70	100
10	21PR5IN02	Evaluation of Summer Internship-2	_	_	2	1	100	0	100
		TOTAL				22	370	630	1000
		Non Credit Cour	ses						
11	21MC5HS03	Analytical Reasoning	2	-	-	0	100	0	100
		VI – Semester (III –	Yea	r)					
			Hours Per				cheme		
S.	Course code	Subject		Wee	k	Credits		<u>valuati</u>	
No.	Course coue	Subject	L	Т	P	Cicuits		mum N	
4	217 3 133 2		-			-	Int.	Ext.	Tot.
1	21ES6CS03	Python Programming	3	-	-	3	30	70	100
2	21PC6EC19	Digital Signal Processing	3	1	-	4	30	70	100
3	21PC6EC20	VLSI Design	3	-	-	3	30	70	100
4	21HS6MB02	Fundamentals of Engineering Management	2	-	-	2	30	70	100
5		Professional Elective-II	3	-	-	3	30	70	100
6		Open elective-II	3	-	-	3	30	70	100
7	21PC6EC21	VLSI Design Laboratory	-	-	3	1.5	30	70	100
8	21ES6CS04	Python Programming Lab	-	-	3	1.5	30	70	100
9	21PC6CS22	Digital Signal Processing Laboratory	_	_	2	1	30	70	100
		TOTAL				22	270	630	900
		Non Credit Cour	ses						
10	21MC6HS04	Quantitative Aptitude	2	-	_	0	100	0	100

		VII – Semester (IV -	- Yea	ır)					
S. No.	Course code	Subject		Hours Per Week		Credits	E	cheme valuati mum N	on
			L	T	P		Int.	Ext.	Tot.
1	21PC7EC23	Microwave Engineering	3	-	-	3	30	70	100
2	21PC7EC24	Cellular and mobile communication	3	-	-	2	30	70	100
3		Professional Elective-III	3	-	-	3	30	70	100
4		Professional Elective-IV	3	-	-	3	30	70	100
5		Open Elective- III	3	-	-	3	30	70	100
6	21PC7EC25	Microwave Engineering Laboratory	-	-	3	1	30	70	100
7	21PR7PS01	Project Stage-I	-	-	6	3	100	0	100
8	21PR7IN03	Doing Engineering-3(MINI PROJ/Internship)	-	2	-	2	100	0	100
		TOTAL				20	380	420	800
		Non Credit Cour	ses						
9	21MC7HS06	Intellectual Property Rights	2	-	-	0	100	0	100
		VIII – Semester (IV -							
				ours				cheme	_
S.	Course code	Subject		Wee	K	Credits		valuati	
No.			L	T	P		Int.	mum M	Tot.
1		Professional Elective- V	3	_	_	3	30	70	100
2		Professional Elective- VI	3	_	_	3	30	70	100
3		Open Elective- IV	3	_	_	3	30	70	100
4	21PR8PS02	Project Stage-II	-	_	14	7	30	70	100
	211 Koi 502	TOTAL			17	16	120	280	400
		Non Credit Cour	SPS	<u> </u>		10	120	200	700
5	21MC8HS05	Constitution of India	2	_	_	0	100	0	100
6	21AC8HS03	Foreign Languages(German/French/Japanese)	2	-	-	0	0	0	0

Subject Code	Professional Elective-I
21PE5EC11	Transmission lines and waveguides
21PE5EC12	Computer Architecture & Organization
21PE5EC13	Digital Integrated Circuits & Applications
21PE5EC14	Computer Networks

Subject Code	Professional Elective-II
21PE6EC21	ARM Microcontroller
21PE6EC22	Digital system design
21PE6EC23	Optical Communications
21PE6EC24	Electronic Gadgets functioning & Applications

Subject Code	Professional Elective-III
21PE7EC31	digital Image processing
21PE7EC32	CMOS digital and analog IC design
21PE7EC33	Speech & Video processing
21PE7EC34	Wireless Communications and Networks

Subject Code	Professional Elective-IV
21PE7EC41	Global Positioning Systems
21PE7EC42	4G- Long Term Evolution Networks
21PE7EC43	Signal Processing for Communication and Biomedical Applications
21PE7EC44	Digital Television Engineering

Subject Code	Professional Elective-V
21PE8EC51	Advanced Programmable Logic Device Architectures
21PE8EC52	Analog Integrated Circuit Design
21PE8EC53	Satellite Communication
21PE8EC54	Embedded system Design

Subject Code	Professional Elective-VI
21PE8EC61	Advanced Digital Signal Processing
21PE8EC62	Information Theory and Coding
21PE8EC63	RF and Mixed signal Circuits
21PE8EC64	Radar Systems



Gowdavelli (V), Medchal & Malkajgiri District, Telangana-501401



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MECH-COURSE STRUCTURE

w.e.f. from 2021-22

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B.TECH. HR-21 COURSE STRUCTURE

MECHANICALN ENGINEERING

(Applicable for the batch admitted from 2021-22 onwards)

Induction Program-2 Weeks

I – Semester (I – Year)

Q		1 – Semester (1 – 1		Hour r W				<mark>cheme</mark> valuati	
S. No.	Course code	Subject	L	Т	P	Credits		Iaximu Marks	
				•	•		Int.	Ext.	Tot.
1	21BS1MT01	Matrix Algebra and Calculus	3	1	-	4	30	70	100
2	21BS1PH03	Engineering Physics	3	-	-	3	30	70	100
3	21HS1EG01	English	2	-	-	2	30	70	100
4	21ES1CS01	Problem Solving using C	3	-	-	3	30	70	100
5	21HS1MB01	Business Economics and Financial Analysis	2	-	-	2	30	70	100
6	21BS1PH04	Engineering Physics Lab	-	-	3	1.5	30	70	100
7	21HS1EG02	English Language Communication Skills Lab	-	-	2	1	30	70	100
8	21ES1CS02	Problem Solving using C-Lab	-	1	3	1.5	30	70	100
		TOTAL				18	240	560	800
	<u> </u>	Non Credit Cours	ses			T		ı	
9	21AC1ME02	Engineering Projects in Community Services	-	1	2	0	0	0	0
		II – Semester (I – Y							
				Hou				cheme	
S.	C	6.1	Pe	r W	eek	C - 1'4		<mark>valuati</mark> Iaximu	
No.	Course code	Subject	L	Т	P	Credits		Marks Marks	
				•	•		Int.	Ext.	Tot.
1	21BS2MT02	Advanced Calculus for Engineers	3	1	-	4	30	70	100
2	21BS2CH01	Engineering-Chemistry	3	-	-	3	30	70	100
3	21ES2ME01	Engineering Graphics	2	-	2	3	30	70	100
4	21ES2ME03	Engineering Mechanics	3	-	-	3	30	70	100
5	21BS2CH02	Engineering Chemistry Lab	-	-	3	1.5	30	70	100
6	21ES2EE05	MATLAB & SIMULINK	-	-	3	1.5	30	70	100
7	21ES2ME02	Engineering Prototyping Lab	1	-	2	2	30	70	100
		TOTAL				18	210	490	700
	I	Non Credit Cours							
8	21MC2HS02	Environmental Science	2	_	_	0	100	0	100
9	21AC2HS01	Social and Health Consciousness	+		2	0	0	0	0

		III – Semester (II – '	Year)						
S. No.	Course code	Subject	I	Hour r W		Credits	Scheme of Evaluation Maximum		on
No.			L	T	P			Mark	
		Basic Electrical & Electronics					Int.	Ext.	Tot.
1	21ES3EE01	Engineering	3	-	-	3	30	70	100
2	21PC3ME01	Mechanics of Solids	3	-	-	3	30	70	100
3	21PC3ME02	Thermodynamics	3	-	-	3	30	70	100
4	21PC3ME03	Material Science & Metallurgy	3	-	-	3	30	70	100
5	21PC3ME04	Production Technology	3	-	-	3	30	70	100
6	21HS3EG03	English for Employability	1	-	-	1	30	70	100
7	21HS3EG04	English for Employability-Lab	-	-	2	1	30	70	100
8	21PC3ME05	Material Science & Mechanics of Solids Lab	-	-	3	1.5	30	70	100
9	21PC3ME06	Production Technology Lab	-	-	2	1	30	70	100
10	21ES3EE02	Basic Electrical & Electronics Engineering Lab	-	-	3	1.5	30	70	100
11	21PR3IN01	Evaluation of Summer Internship -1	-	-	2	1	100	0	100
		TOTAL				22	400	700	1100
		Non Credit Cours	ses			<u>'</u>			
12	21MC3HS01	Universal Human Values	2	-	-	0	100	0	100
		TTI C 4 (TT T)					
		IV – Semester (II – Y							
		IV – Semester (II – Y	I	Hou				<mark>cheme</mark>	
S			I				E	valuati	on
S. No.	Course code	Subject	Pe	Hour r W	eek	Credits	E M	<mark>valuati</mark> Iaximu	on ım
	Course code		I	Hou		Credits	E M	valuati Iaximu Mark	on im
	Course code 21ES4MT07	Subject Statistical Methods and Complex	Pe	Hour r W	eek	Credits 4	E M	<mark>valuati</mark> Iaximu	on im
No.		Statistical Methods and Complex Variables	Pe L	Hour r W	eek		Example 1	valuati Iaximu Marks Ext.	Tot.
No. 1	21ES4MT07	Statistical Methods and Complex Variables Kinematics of Machinery	Pe L	T 1	P -	4	Int. 30	valuati Iaximu Marks Ext. 70	on
1 2	21ES4MT07 21PC4ME07	Statistical Methods and Complex Variables	L 3 3	T 1	P -	4 4	Int. 30 30	valuati Iaximu Marks Ext. 70	Tot. 100
1 2 3	21ES4MT07 21PC4ME07 21PC4ME08	Subject Statistical Methods and Complex Variables Kinematics of Machinery Thermal Engineering-I	L 3 3 3 3	T 1 1 -	P -	4 4 3	Int. 30 30 30	valuati Iaximu Marks Ext. 70 70 70	Tot. 100 100 100
1 2 3 4	21ES4MT07 21PC4ME07 21PC4ME08 21ES4CS03	Statistical Methods and Complex Variables Kinematics of Machinery Thermal Engineering-I Python Programming Fluid Mechanics & Hydraulic Machinery Machine Drawing Practice	1 Pe L 3 3 3 3 3 3 3	T 1 1 -		4 4 3 3	Int. 30 30 30 30	valuati Iaximu Marks Ext. 70 70 70 70	Tot. 100 100 100 100 100
1 2 3 4 5	21ES4MT07 21PC4ME07 21PC4ME08 21ES4CS03 21PC4ME09	Statistical Methods and Complex Variables Kinematics of Machinery Thermal Engineering-I Python Programming Fluid Mechanics & Hydraulic Machinery	1 Pe L 3 3 3 3 3 3 3	T 1 1		4 4 3 3 3	Int. 30 30 30 30 30	valuati Iaximu Marks Ext. 70 70 70 70 70	Tot. 100 100 100 100 100 100
1 2 3 4 5 6	21ES4MT07 21PC4ME07 21PC4ME08 21ES4CS03 21PC4ME09 21PC4ME10	Statistical Methods and Complex Variables Kinematics of Machinery Thermal Engineering-I Python Programming Fluid Mechanics & Hydraulic Machinery Machine Drawing Practice Fluid Mechanics & Hydraulic	1 Pe L 3 3 3 3 3 3 3	T 1 1	2	4 4 3 3 3	Int. 30 30 30 30 30 30 30	valuation Iaximum Marks Ext. 70 70 70 70 70 70 70 70 70	Tot. 100 100 100 100 100 100
1 2 3 4 5 6 7	21ES4MT07 21PC4ME07 21PC4ME08 21ES4CS03 21PC4ME09 21PC4ME10 21PC4ME11	Statistical Methods and Complex Variables Kinematics of Machinery Thermal Engineering-I Python Programming Fluid Mechanics & Hydraulic Machinery Machine Drawing Practice Fluid Mechanics & Hydraulic Machinery Lab	3 3 3 3 3	T 1 1 - - -	2 2	4 4 3 3 3 1 1	Int. 30 30 30 30 30 30 30 30	valuation Iaximum Marks Ext. 70 70 70 70 70 70 70 70 70 70 70 70 70	Tot. 100 100 100 100 100 100 100

		V – Semester (III – `	Year)						
S.	Course code	Subject	1	Hour r W		Credits	E	cheme valuati Iaximu	ion
No.	Course code	Subject	L	T	P	Credits	Marks		
							Int.	Ext.	Tot.
1	21PC5ME12	Dynamics of Machinery	3	-	-	3	30	70	100
2	21PC5ME13	Thermal Engineering-II	3	-	-	3	30	70	100
3	21PC5ME14	Metrology & Machine Tools	3	-	-	3	30	70	100
4	21PC5ME15	Design of Machine Members-I	3	-	-	3	30	70	100
5		Professional Elective-1	3	-	-	3	30	70	100
6		Open Elective-1	3	-	-	3	30	70	100
7	21PC5ME16	Metrology & Machine Tools Lab	_	-	2	1	30	70	100
8	21PC5ME17	Thermal Engineering Lab	_	-	2	1	30	70	100
9	21PC5ME18	Kinematics & Dynamics Lab	-	-	2	1	30	70	100
10	21PR5IN02	Evaluation of Summer Internship-2	-	-	2	1	100	0	100
		TOTAL				22	370	630	1000
		Non Credit Cours	ses						
11	21MC5HS03	Analytical Reasoning	2	-	-	0	100	0	100
	VI – Semester (III – Year)								
		T							
				Hou				cheme	
S.	Course code	Subject		Hour r W		Cradita	E	valuati	ion
S. No.	Course code	Subject	Pe	r W	eek	Credits	E	<mark>valuati</mark> Iaximi	ion um
	Course code	Subject				Credits	E	valuati	ion um
	Course code 21PC6ME19	Subject Design of Machine Members-II	Pe	r W	eek	Credits 3	E M	valuati Iaximu Mark	ion ım s
No.		· ·	Pe L	r W	eek P		Moderate Property of the Prope	valuati Iaximu Mark Ext.	ion im s Tot.
No. 1	21PC6ME19	Design of Machine Members-II	L 3	r W	P -	3	E N	valuati Iaximu Mark Ext. 70	ion um s Tot.
1 2	21PC6ME19 21PC6ME20	Design of Machine Members-II Heat Transfer	L 3 3	T - 1	P -	3 3	Int. 30 30	valuati Iaximu Mark Ext. 70	Tot. 100 100
1 2 3	21PC6ME19 21PC6ME20 21PC6ME21	Design of Machine Members-II Heat Transfer CAD/CAM	Pe	T - 1 -	P	3 3 3	Int. 30 30 30	valuati Iaximu Marki Ext. 70 70 70	Tot. 100 100 100
1 2 3 4	21PC6ME19 21PC6ME20 21PC6ME21	Design of Machine Members-II Heat Transfer CAD/CAM Instrumentation & Control Systems	Pe	T - 1 -	P	3 3 3 2	Int. 30 30 30 30	valuati Iaximu Marki Ext. 70 70 70 70	Tot. 100 100 100 100
No. 1 2 3 4 5	21PC6ME19 21PC6ME20 21PC6ME21	Design of Machine Members-II Heat Transfer CAD/CAM Instrumentation & Control Systems Professional Elective-II	Pe	T	P	3 3 3 2 3	Int. 30 30 30 30 30	valuati Iaximu Marki Ext. 70 70 70 70 70	Tot. 100 100 100 100 100
No. 1 2 3 4 5 6	21PC6ME19 21PC6ME20 21PC6ME21 21PC6ME22	Design of Machine Members-II Heat Transfer CAD/CAM Instrumentation & Control Systems Professional Elective-II Open elective-2 Heat Transfer Lab Instrumentation & Control Systems Lab	3 3 3 2 3 3	T		3 3 3 2 3 3	Int. 30 30 30 30 30 30	valuati Iaximu Marks Ext. 70 70 70 70 70 70 70	Tot. 100 100 100 100 100 100 100
No. 1 2 3 4 5 6 7	21PC6ME19 21PC6ME20 21PC6ME21 21PC6ME22 21PC6ME23	Design of Machine Members-II Heat Transfer CAD/CAM Instrumentation & Control Systems Professional Elective-II Open elective-2 Heat Transfer Lab Instrumentation & Control Systems	3 3 3 2 3 3	T - 1	2	3 3 3 2 3 3 1	Int. 30 30 30 30 30 30 30 30	valuati Iaximu Marks Ext. 70 70 70 70 70 70 70	Tot. 100 100 100 100 100 100 100 100
No. 1 2 3 4 5 6 7 8	21PC6ME19 21PC6ME20 21PC6ME21 21PC6ME22 21PC6ME23 21PC6ME24	Design of Machine Members-II Heat Transfer CAD/CAM Instrumentation & Control Systems Professional Elective-II Open elective-2 Heat Transfer Lab Instrumentation & Control Systems Lab Advanced English Communication	3 3 3 2 3 3	T - 1	2 3	3 3 3 2 3 3 1 1.5	Int. 30 30 30 30 30 30 30 30 30	Name	Tot. 100 100 100 100 100 100 100 100 100
No. 1 2 3 4 5 6 7 8	21PC6ME19 21PC6ME20 21PC6ME21 21PC6ME22 21PC6ME23 21PC6ME24 21HS6EG05	Design of Machine Members-II Heat Transfer CAD/CAM Instrumentation & Control Systems Professional Elective-II Open elective-2 Heat Transfer Lab Instrumentation & Control Systems Lab Advanced English Communication Skills-Lab	3 3 3 2 3 3 - -	T	2 3 2	3 3 2 3 3 1 1.5	Int. 30 30 30 30 30 30 30 30 30 30 30	xaluati Marki Marki 70 70 70 70 70 70 70 70 70 70	Tot. 100 100 100 100 100 100 100 100 100 10
No. 1 2 3 4 5 6 7 8	21PC6ME19 21PC6ME20 21PC6ME21 21PC6ME22 21PC6ME23 21PC6ME24 21HS6EG05	Design of Machine Members-II Heat Transfer CAD/CAM Instrumentation & Control Systems Professional Elective-II Open elective-2 Heat Transfer Lab Instrumentation & Control Systems Lab Advanced English Communication Skills-Lab Doing Engineering-2	3 3 3 2 3 3 - -	T	2 3 2	3 3 3 2 3 1 1.5	Int. 30 30 30 30 30 30 30 30 30 30 30 30	valuation Iaximum Mark Ext. 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70	Tot. 100 100 100 100 100 100 100 100 100 10

	VII – Semester (IV – Year)								
]	Hou	rs		Scheme of		
S.			Per Week			Evaluation			
No.	Course code	Subject	L			Credits	Maximum		
1100				T	P		Marks		
						2	Int.	Ext.	Tot.
1		Professional Elective-III	3	-	-	3	30	70	100
2	21HS7MB02	Fundamentals of Engineering	2	_	_	2	30	70	100
2		Management	3			2	20	70	100
3	21DC7ME25	Professional Elective-IV	3	-	-	3	30	70	100
4	21PC7ME25	Finite Element Methods		-	-	3	30	70	100
5	2100515526	Open Elective-3	3	-	-	3	30	70	100
6	21PC7ME26	CAD/CAM Lab	-	-	2	1	30	70	100
7	21PR7IN03	Doing Engineering-3(MINI PROJ/Internship)	-	-	3	2	100	0	100
8	21PR7PS06	Project Stage-I	-	-	6	3	100	0	100
	TOTAL 20				20	380	420	800	
		Non Credit Course	es						
10	21MC7HS06	Intellectual Property Rights	2	-	-	0	100	0	100
		VIII – Semester (IV –	Yea	r)					
				Hou				cheme	_
S.			Pe	r W	eek			valuati	
No.	Course code	Subject	_		_	Credits		Iaximu Mari	
			L	T	P		Int.	Marks Ext.	Tot.
1		Professional Elective-5	3	_	_	3	30	70	100
				_	_	_			
2		Professional Elective-6	3	-	-	3	30	70	100
3		Open Elective-4	3	-	-	3	30	70	100
4	21PR8PS07	Project Stage-II	-	-	14	7	30	70	100
		TOTAL				16	120	280	400
		Non-Credit Cours	es						
5	21AC8HS03	Foreign Languages(German/French/Japanese)	2		-	0	0	0	0
6	21MC8HS05	Constitution of India	2	-	-	0	100	0	100

PE-1 Code	Professional Elective-I
21PE5ME11	Operations Research
21PE5ME12	Industrial Robotics
21PE5ME13	Mechanical Vibrations
21PE5ME14	Machine Tool Design

PE-2 Code	Professional Elective-II
21PE6ME21	Un Conventional Machining Processes
21PE6ME22	Production Planning & Control
21PE6ME23	Machining Science
21PE6ME24	Composite Materials

PE-3 Code	Professional Elective-III
21PE7ME31	Additive Manufacturing Technology
21PE7ME32	Automation in Manufacturing
21PE7ME33	Micro Electro Mechanical Systems
21PE7ME34	Design for Manufacturing and Assembly

PE-4 Code	Professional Elective-IV
21PE7ME41	Power Plant Engineering
21PE7ME42	Hybrid Vehicles
21PE7ME43	Renewable Energy Sources
21PE7ME44	Automobile Engineering

PE-5 Code	Professional Elective-V
21PE8ME51	Computational Fluid Dynamics
21PE8ME52	Turbo Machinery
21PE8ME53	Refrigeration & Air Conditioning
21PE8ME54	Fuel Cell Technology

PE-6 Code	Professional Elective-VI
21PE8ME61	Production Operations and Management
21PE8ME62	Tribology
21PE8ME63	Total Quality Management
21PE8ME64	Green Manufacturing



Gowdavelli (V), Medchal & Malkajgiri District, Telangana-501401



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EEE-COURSE STRUCTURE

w.e.f. from 2021-22

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	HIDEKA	B.TECH. HR-21 COUL					AINIAIRI	<u> </u>	
		ELECTRICAL AND ELECT							
	(Applicable for the batch admitted from 2021-22 onwards)								
Induction Program-2 Weeks I – Semester (I – Year)									
		1 – Semester (rs Pe	r		Scher	ne of	
S. No	Subject	uhiect		k		Credits	Evalu		
110	Code	Subject	L	Т	P	Credits		mum N	
					_		Int.	Ext.	Tot.
1	21BS1MT01	Matrix Algebra and Calculus	3	1	-	4	30	70	100
2	21BS1PH01	Applied Physics	3	-	-	3	30	70	100
3	21HS1EG01	English	2	-	-	2	30	70	100
4	21HS1MB01	Business Economics and Financial Analysis	2	-	-	2	30	70	100
5	21ES1CS01	Problem Solving using C	3	-	-	3	30	70	100
6	21BS1PH02	Applied Physics Lab	-	-	3	1.5	30	70	100
7	21HS1EG02	English Language Communication Skills Lab	-	-	2	1	30	70	100
8	21ES1CS02	Problem Solving using C - Lab	-	-	3	1.5	30	70	100
TOTAL						18	240	560	800
	I	Non Credit	Cours	es			I	1	
9	21AC1ME02	Engineering Projects in Community Services	2	-	-	0	0	0	0
II – Semester (I – Year)									
		II – Semester (a	_	0
S.	Subject	II – Semester (Н	ours P				cheme	
S. No	Subject Code	II – Semester (Subject	Но	ours P Week		Credits	E	valuati	ion
	Subject Code		Н	ours P		Credits	E		ion
No	•		Но	ours P Week		Credits 4	E Maxi	valuati mum l	ion Marks
No ·	Code	Subject Advanced Calculus for	H _Q	ours P Week T	P		Maxi Int.	valuati mum I Ext.	Marks Tot.
No . 1	Code 21BS2MT02	Subject Advanced Calculus for Engineers	L 3	T	P -	4	Maxi Int.	valuati mum I Ext. 70	Marks Tot.
No 1 2	21BS2MT02 21BS2CH01	Subject Advanced Calculus for Engineers Engineering Chemistry	L 3	T 1	P -	4 3	Maxi Int. 30 30	valuati mum I Ext. 70	Marks Tot. 100
No	21BS2MT02 21BS2CH01 21ES2ME01	Advanced Calculus for Engineers Engineering Chemistry Engineering Graphics	L 3 3 2	T 1 -	P 2	4 3 3	Maxi Int. 30 30 30	valuati mum I Ext. 70 70 70	Marks Tot. 100 100
No	Code 21BS2MT02 21BS2CH01 21ES2ME01 21PC2EE01	Advanced Calculus for Engineers Engineering Chemistry Engineering Graphics Electric Circuit Analysis-I	L 3 3 2 3	T 1	P 2	4 3 3 3	Maxi Int. 30 30 30 30	valuati mum I Ext. 70 70 70 70	Marks Tot. 100 100 100 100
No	Code 21BS2MT02 21BS2CH01 21ES2ME01 21PC2EE01 21BS2CH02	Subject Advanced Calculus for Engineers Engineering Chemistry Engineering Graphics Electric Circuit Analysis-I Engineering Chemistry Lab Electric Circuit Analysis-I	L 3 3 2 3	T 1	P - 2 - 2	4 3 3 3 1.5	Maxi Int. 30 30 30 30 30 30	70 70 70 70 70 70	Marks Tot. 100 100 100 100 100
No	Code 21BS2MT02 21BS2CH01 21ES2ME01 21PC2EE01 21BS2CH02 21PC2EE02	Advanced Calculus for Engineers Engineering Chemistry Engineering Graphics Electric Circuit Analysis-I Engineering Chemistry Lab Electric Circuit Analysis-I Lab	3 3 2 3 -	T 1	P - 2 - 2 3	4 3 3 3 1.5 1.5	Maxi Int. 30 30 30 30 30 30	70 70 70 70 70 70 70	100 100 100 100 100
No	Code 21BS2MT02 21BS2CH01 21ES2ME01 21PC2EE01 21BS2CH02 21PC2EE02	Advanced Calculus for Engineers Engineering Chemistry Engineering Graphics Electric Circuit Analysis-I Engineering Chemistry Lab Electric Circuit Analysis-I Lab Engineering Prototyping Lab	3 3 2 3 -	T 1	P - 2 - 2 3	4 3 3 1.5 1.5	30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70	100 100 100 100 100 100
No	Code 21BS2MT02 21BS2CH01 21ES2ME01 21PC2EE01 21BS2CH02 21PC2EE02	Subject Advanced Calculus for Engineers Engineering Chemistry Engineering Graphics Electric Circuit Analysis-I Engineering Chemistry Lab Electric Circuit Analysis-I Lab Engineering Prototyping Lab TOTAL	3 3 2 3 -	T 1	P - 2 - 2 3	4 3 3 1.5 1.5	30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70	100 100 100 100 100 100

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Consciousness

		III – Semester (II – Y	ear)						
S.	Subject	Subject		ours P Week	-	Credits		Scheme of Evaluation		
No	Code	Subject	L	Т	P		Maximum Marks			
•			L	1	1		Int.	Ext.	Tot.	
1	21BS3MT06	Laplace Transforms, Numerical Methods & Complex variables	3	1	-	4	30	70	100	
2	21PC3CS01	Data Structures using C	3	-	-	3	30	70	100	
3	21PC3EE03	Electrical Circuit Analysis-II	3	-	-	3	30	70	100	
4	21PC3EE04	Electrical Machines – I	3	-	-	4	30	70	100	
5	21PC3EE05	Electromagnetic Fields	3	-	-	3	30	70	100	
6	21PC3CS04	Data Structures using C Lab	-	-	3	1.5	30	70	100	
7	21PC3EE06	Electrical Circuit Analysis-II Lab	-	-	2	1	30	70	100	
8	21PC3EE07	Electrical Machines – I Lab	-	-	3	1.5	30	70	100	
9	21PR3IN01	Evaluation of Summer Internship-1	-	-	2	1	100	0	100	
		TOTAL	L 22		22	340	560	900		
	Non Credit Courses									
10	21MC3HS01	Universal Human Values	2	-	-	0	100	0	100	
		IV – Semester (II - Y	ear)						
S.				urs P					neme of	
No	Subject	Subject		Week		Crodita		Evaluation		
•	Code	Suageet	L	T	P	Credits	Maximum Marks			
	21DC4EC02	0. 1 10	2			2	Int.	Ext.	Tot.	
1	21PC4EC03	Signals and Systems	3	-	-	3	30	70	100	
2	21PC4EE08	Control Systems	3	-	-	3	30	70	100	
3	21PC4EE09	Power Systems-I	3	-	-	3	30	70	100	
4	21PC4EE10	Analog and Digital Electronics	3	-	-	3	30	70	100	
5	21PC4EE11	Electrical Machines – II	3	-	-	3	30	70	100	
6	21HS4EG03	English for Employability	1	-	-	1	30	70	100	
7	21PC4EE12	Electrical Machines – II Lab	-	-	3	1.5	30	70	100	
8	21PC4EE13	Analog and Digital Electronics Lab	-	-	2	1	30	70	100	
9	21PC4EE14	Control Systems Lab	-	_	2	1	30	70	100	
10	21HS4EG04	English for Employability Lab	-	-	2	1	30	70	100	
11	21PR4EE01	Doing Engineering-1	-	1	1	1.5	30	70	100	
		TOTAL				22	330	770	1100	

		V – Semester (l	III – Y	'ear)					
S. No.	Subject Code	Subject	Hours Per Week		Credits	Scheme of Evaluation			
			L	T	P		Maxi	mum N	Marks
							Int.	Ext.	Tot.
1	21PC5EE15	Power systems II	3	-	-	3	30	70	100
2	21PC5EE16	Microprocessor & Microcontrollers	3	-	-	3	30	70	100
3	21PC5EE17	Power Electronics	3	-	-	3	30	70	100
4		Professional Elective-I	3	-	-	3	30	70	100
5		Open Elective-1	3	-	-	3	30	70	100
6	21PC5EE18	Microprocessor & Microcontrollers Lab	-	-	2	1	30	70	100
7	21PC5EE19	Power Electronics Lab	-	-	3	1.5	30	70	100
8	21PC5EE20	Electrical and Electronics Design Lab	-	-	2	1	30	70	100
9	21HS5EG05	Advanced English Communication Skills-Lab	-	-	2	1	30	70	100
10	21PR5EE02	Doing Engineering-2	-	1	1	1.5	30	70	100
11	21PR5IN02	Evaluation of Summer Internship-2	-	-	2	1	100	0	100
			_						
TOTA	AL					22	400	700	1100
		Non Credit		es					
TOT A	21MC5HS03	Analytical Reasoning	2	-	-	0	100	700 0	1100
			2 III – Y	- Year)	-		100	0	100
12	21MC5HS03	Analytical Reasoning VI – Semester (2 III – Y Ho	- Year) ours P		0	100 S		100 of
		Analytical Reasoning	2 III – Y	ear) ours P Week			100 S E	0 cheme	100 of on
12 S.	21MC5HS03 Subject	Analytical Reasoning VI – Semester (2 III – Y Ho	- Year) ours P		0	100 S E	0 cheme valuati	100 of on
12 S. No.	21MC5HS03 Subject	Analytical Reasoning VI – Semester (2 III – Y Ho L	ear) ours P Week		0 Credits	100 S E Maxi	0 cheme valuati mum M	of on Marks
12 S. No. 1 2	Subject Code 21ES6CS03 21PC6EE21	Analytical Reasoning VI – Semester (Subject Python Programming Electrical Measurements	2 Ho L 3 3	ear) Ours P Week T		Credits 3 3	100 S E Maxi Int. 30 30	cheme valuati mum MExt.	100 of on Marks Tot. 100 100
12 S. No.	21MC5HS03 Subject Code 21ES6CS03	Analytical Reasoning VI – Semester (Subject Python Programming Electrical Measurements Power systems III	2 III – Y Ho L	ear) Ours P Week T		0 Credits	100 SE Maxi Int. 30	cheme valuati mum M Ext. 70	100 of on Warks Tot. 100
12 S. No. 1 2	Subject Code 21ES6CS03 21PC6EE21	Analytical Reasoning VI – Semester (Subject Python Programming Electrical Measurements	2 Ho L 3 3 3 2	- Year) Ours P Week T	P	Credits 3 3	100 S E Maxi Int. 30 30	cheme valuati mum MExt.	100 of on Varks Tot. 100 100 100 100
12 S. No. 1 2 3 4 5	Subject Code 21ES6CS03 21PC6EE21 21PC6EE22	VI – Semester (Subject Python Programming Electrical Measurements Power systems III Fundamentals of Engineering Management Professional Elective-II	2 Ho L 3 3 3 2 3	- Year) Ours P Week T	P	0 Credits 3 3 4 2 3	100 SE Maxi Int. 30 30 30 30 30	0 cheme valuati mum M Ext. 70 70 70 70	100 of on Marks Tot. 100 100 100 100 100
12 S. No. 1 2 3 4 5 6	21MC5HS03 Subject Code 21ES6CS03 21PC6EE21 21PC6EE22 21HS6MB02	Analytical Reasoning VI – Semester (Subject Python Programming Electrical Measurements Power systems III Fundamentals of Engineering Management Professional Elective-II Open elective-II	2 Ho L 3 3 3 2	- Year) Ours P Week T		0 Credits 3 3 4 2 3 3 3	100 SE Maxi Int. 30 30 30 30 30 30	0 cheme valuati mum M Ext. 70 70 70 70 70 70	100 of on Warks Tot. 100 100 100 100 100 100
12 S. No. 1 2 3 4 5 6 7	21MC5HS03 Subject Code 21ES6CS03 21PC6EE21 21PC6EE22 21HS6MB02 21ES6CS04	Analytical Reasoning VI – Semester (Subject Python Programming Electrical Measurements Power systems III Fundamentals of Engineering Management Professional Elective-II Open elective-II Python Programming Lab	2 Ho L 3 3 3 2 3	- Year) Ours P Week T	P 3	0 Credits 3 3 4 2 3 1.5	100 SE Maxi Int. 30 30 30 30 30 30 30 30	0 cheme valuati mum N Ext. 70 70 70 70 70 70 70	100 of on Warks Tot. 100 100 100 100 100 100 100 1
12 S. No. 1 2 3 4 5 6 7 8	21MC5HS03 Subject Code 21ES6CS03 21PC6EE21 21PC6EE22 21HS6MB02 21ES6CS04 21PC6EE23	Analytical Reasoning VI – Semester (Subject Python Programming Electrical Measurements Power systems III Fundamentals of Engineering Management Professional Elective-II Open elective-II Python Programming Lab Power Systems Lab	2 Ho L 3 3 3 2 3	- Year) Ours P Week T	P 3 3 3	0 Credits 3 3 4 2 3 1.5 1.5	100 SE Maxi Int. 30 30 30 30 30 30 30 30 30	0 cheme valuati mum M Ext. 70 70 70 70 70 70 70 70 70 70	100 of on Marks Tot. 100 100 100 100 100 100 100 1
12 S. No. 1 2 3 4 5 6 7 8 9	21MC5HS03 Subject Code 21ES6CS03 21PC6EE21 21PC6EE22 21HS6MB02 21ES6CS04 21PC6EE23 21PC6EE23	Analytical Reasoning VI – Semester (Subject Python Programming Electrical Measurements Power systems III Fundamentals of Engineering Management Professional Elective-II Open elective-II Python Programming Lab	2 Ho L 3 3 3 2 3	- Year) Ours P Week T	P 3	0 Credits 3 3 4 2 3 1.5 1.5	100 SE Maxi Int. 30 30 30 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70	100 of on Warks Tot. 100 100 100 100 100 100 100 1
12 S. No. 1 2 3 4 5 6 7 8	21MC5HS03 Subject Code 21ES6CS03 21PC6EE21 21PC6EE22 21HS6MB02 21ES6CS04 21PC6EE23 21PC6EE23	Python Programming Electrical Measurements Power systems III Fundamentals of Engineering Management Professional Elective-II Open elective-II Python Programming Lab Power Systems Lab Electrical Measurements Lab	L 3 3 3 2 3 3	- Vear) Ours P Week T	P 3 3 3	0 Credits 3 3 4 2 3 1.5 1.5	100 SE Maxi Int. 30 30 30 30 30 30 30 30 30	0 cheme valuati mum M Ext. 70 70 70 70 70 70 70 70 70 70	100 of on Marks Tot. 100 100 100 100 100 100 100 1
12 S. No. 1 2 3 4 5 6 7 8 9	21MC5HS03 Subject Code 21ES6CS03 21PC6EE21 21PC6EE22 21HS6MB02 21ES6CS04 21PC6EE23 21PC6EE23	Analytical Reasoning VI – Semester (Subject Python Programming Electrical Measurements Power systems III Fundamentals of Engineering Management Professional Elective-II Open elective-II Python Programming Lab Power Systems Lab	L 3 3 3 2 3 3	- Vear) Ours P Week T	P 3 3 3	0 Credits 3 3 4 2 3 1.5 1.5	100 SE Maxi Int. 30 30 30 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70	100 of on Warks Tot. 100 100 100 100 100 100 100 1

		VII – Semester (IV – Y	Year)						
			_	urs P	-		Scheme			
S. No.	Subject	Subject		Week		Credits		valuation		
	Code		L	T	P			mum N		
		Power Semiconductor					Int.	Ext.	Tot.	
1	21PC7EE25	Drives	3	-	-	3	30	70	100	
2	21PC7EE26	Power System Operation and Control	3	-	-	3	30	70	100	
3		Professional Elective-III	3	-	-	3	30	70	100	
4		Professional Elective-IV	3	-	-	3	30	70	100	
5		Open Elective-III	3	-	-	3	30	70	100	
6	21PR7PS01	Project Stage-I	-	-	6	3	100	0	100	
7	21PR7IN03	Doing Engineering- 3(MINI PROJ/Internship)	-	2	-	2	100	0	100	
TOTAL					20	350	350	700		
		Non Credit (Course	es						
8	21MC7HS06	Intellectual Property Rights	2	-	-	0	100	0	100	
		VIII – Semester	(IV – `	Year)						
			Hours Per			Scheme of				
S. No.	Subject	Subject		Week		Credits	Evaluation			
	Code		L	T	P	0.200.200	Maximum Marks			
1		Professional Elective-V	3		_	3	Int. 30	Ext. 70	Tot. 100	
2		Professional Elective-VI	3	-	-	3	30	70	100	
3		Open Elective-IV	3	_	_	3	30	70	100	
4	21PR8PS02	Project Stage-II	-	_	14	7	30	70	100	
TOTAL		1 Toject Stage-II	_		14	16	120	280	400	
TOTAL		Non Credit (Course	es es		10	120	200	700	
5	21MC8HS05	Constitution of India	2	_	_	0	100	0	100	
6	21AC8HS03	Foreign Languages(German/ French/Japanese)	2	-	-	0	0	0	0	

Subject Code	Professional Elective-I
21PE5EE11	Computer Architecture
21PE5EE12	High Voltage Engineering
21PE5EE13	Digital Control Systems

Subject Code	Professional Elective-II
21PE6EE21	High Voltage Direct Current Transmission
21PE6EE22	VLSI Design
21PE6EE23	Neural Networks and Fuzzy Logic

Subject Code	Professional Elective-III
21PE7EE31	Digital Signal Processing
21PE7EE32	Electrical Distribution Systems
21PE7EE33	Data Communications and Networks

Subject Code	Professional Elective-IV
21PE7EE41	PQ & FACTS
21PE7EE42	Industrial Instrumentation
21PE7EE43	Utilization of Electrical Power

Subject Code	Professional Elective-V
21PE8EE51	Renewable Energy Systems
21PE8EE52	Electrical Hybrid Vehicles
21PE8EE53	Smart Appliances and Internet of Things

Subject Code	Professional Elective-VI
21PE8EE61	Smart Grid System
21PE8EE62	Data Science Applications in Power Engineering
21PE8EE63	Wide-Area Monitoring and Control



Gowdavelli (V), Medchal & Malkajgiri District, Telangana-501401



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B.TECH. HR-21 COURSE STRUCTURE

CSE-ARTIFICIAL INTELIGENCE & MACHINE LEARNING
(Applicable for the batch admitted from 2021-22 onwards)

Induction Program-2 Weeks

	Induction Program-2 Weeks								
	I – Semester (I – Year)								
S.	Course code	Subject		Hours Per Week		Credits	Scheme of Evaluation		
No.		•	L	T	P		Maximum Marks		
1	21DC1MT01	Matrice Alexander and Calculus	2	1		4	Int.	Ext.	Tot.
1	21BS1MT01	Matrix Algebra and Calculus	3	1	-	4	30	70	100
2	21BS1CH01	Engineering-Chemistry	3	-	-	3	30	70	100
3	21ES1ME01	Engineering Graphics	1	-	4	3	30	70	100
4	21ES1CS01	Problem Solving using C	3	-	-	3	30	70	100
5	21ES1CS02	Problem Solving using C Language-Lab	-	-	3	1.5	30	70	100
6	21ES1ME02	Engineering Prototyping Lab	-	-	4	2	30	70	100
7	21BS1CH02	Engineering Chemistry Lab	-	-	2	1.5	30	70	100
		TOTAL				18	210	490	700
		Non Credit C	ours	es					
8	21AC1HS01	Social and Health Consciousness	-	-	2	0	0	0	0
		II – Semester (1	[- Y 6	ear)					
S.		G 11. 4	Hours Per Week		Call	Scheme of Evaluation			
No.	Course code	Subject	L	Т	P	Credits	Maximum Marks		Iarks
			L	1	P		Int.	Ext.	Tot.
1	21BS2MT02	Advanced Calculus for Engineers	3	1	-	4	30	70	100
2	21BS2PH01	Applied Physics	3	-	-	3	30	70	100
3	21ES2EE01	Basic Electrical and Electronics Engineering	3	-	1	3	30	70	100
4	21HS2EG01	English	2	-	-	2	30	70	100
5	21BS2PH02	Applied Physics Lab	-	-	3	1.5	30	70	100
6	245625562	Basic Electrical and Electronics			2	1.5	20	70	100
O	21ES2EE02	Engineering-Lab	-	-	3	1.5	30	70	100

TOTAL 18 240 **560** 800 **Non Credit Courses** Universal Human Values 9 21MC2HS01 0 100 0 100 Engineering Projects in 10 21AC2ME02 2 0 0 0 0

2

2

1

2

30

30

70

70

100

100

Updated on: 14 Sep 2022

7

8

21HS2EG02

21HS2MB01

English Language

Financial Analysis

Community Services

Communication Skills Lab
Business Economics and

	III – Semester (II – Year)								
S.	Course code	code Subject		ours l Week		Credits	Scheme of Evaluation		
No.	30 41 56 6046		L	T	P	Creares	Maxi Int.	mum N Ext.	Tot.
		Mathematical & Statistical							
1	21BS3MT03	Foundations	3	1	-	4	30	70	100
2	21ES3CS03	Python Programming	3	1	-	3	30	70	100
3	21HS3EG03	English for Employability	1			1	30	70	100
4	21PC3CS01	Data Structures using C	3	1	-	4	30	70	100
5	21PC3CM01	Introduction to Artificial Intelligence	3		-	3	30	70	100
6	21ES3CS04	Python Programming-Lab	-	-	3	1.5	30	70	100
7	21HS3EG04	English for Employability-Lab	-		2	1	30	70	100
8	21PC3CM02	Artificial Intelligence-LAB	-	-	3	1.5	30	70	100
9	21PC3CS04	Data Structures using C-Lab	-	-	3	1.5	30	70	100
10	21PR3IN01	Evaluation of Summer Internship-I	-		2	1	100	0	100
	TOTAL					21.5	370	630	1000
		Non Credit C	ourse	es					
11	21MC3HS02	Environmental Science	2	-	-	0	100	0	100
		IV – Semester (1			_	T			_
G				Hours Per			Scheme of		
S. No.	Course code	Subject		Week	<u> </u>	Credits	Evaluation Maximum Marks		
110.			L	T	P		Int.	Ext.	Tot.
1	21ES4MT04	Matrix Computations and it's Applications	3	-	-	3	30	70	100
2	21PC4CS09	Object Oriented Programming using Java	3	-	-	3	30	70	100
3	21PC4CS13	Operating Systems	3	-	-	3	30	70	100
4	21PC4CS03	Database Management Systems	3	-	-	3	30	70	100
5	21PC4CD02	Data Mining & Data Analytics	3	-	-	3	30	70	100
6	21PS4CS24	Operating Systems-Lab	-	-	3	1.5	30	70	100
7	21PC4CS11	Programming Using Java- Lab	-	_	3	1.5	30	70	100
8	21PC4CS05	Database Management Systems- Lab	-	-	3	1.5	30	70	100
9	21PC4CS20	Data Mining Lab	-		3	1.5	30	70	100
10	21PR4CD01	Doing Engineering-1	-	1	1	1.5	30	70	100
1		TOTAL				22.5	300	700	1000

	V – Semester (III – Year)								
		, 2000000	Н	ours l	-			cheme	
S.	Course code	Subject		Week	K	Credits	Evaluation		
No.	Course coue	Subject	L	Т	Р	Credits	Maxi	<mark>mum N</mark>	Iarks
			L	1	1		Int.	Ext.	Tot.
1	21PC5CD04	Software Engineering & Testing Methodologies	3	-	-	3	30	70	100
2	21PC5CS07	Design & Analysis of Algorithms	3	-	-	3	30	70	100
3	21PC5CM03	Machine Learning	3	1	-	4	30	70	100
4		Professional Elective-I	3	-	-	3	30	70	100
5		Open Elective-I	3	-	-	3	30	70	100
6	21PC5CS23	Design & Analysis of Algorithms-Lab	-	-	3	1.5	30	70	100
7	21PC5CD05	Software Engineering-LAB	-	-	3	1.5	30	70	100
8	21PC5CM04	Machine Learning-LAB	-	-	3	1.5	30	70	100
9	21PR5IN02	Evaluation of Summer Internship-II	-	-	2	1	100	0	100
	l	TOTAL				21.5	340	560	900
		Non Credit C	ours	es					
10	21MC7HS03	Analytical Reasoning	2	-	-	0	100	0	100
	VI – Semester (III – Year)								
		VI – Semester (1	<u>11 – 1</u>	(ear)					
G		VI – Semester (1	Н	ours l				cheme	-
S.	Course code		Н			Credits	E	valuati	on
S. No.	Course code		Н	ours l		Credits	E Maxi	valuati mum N	on Iarks
	Course code 21PC6CS08		Н	ours l Week	<u> </u>	Credits 3	E	valuati	on
No.		Subject Formal Languages and	H ₀	ours I Week T	P		E Maxi Int.	valuation Markette M Ext.	on //arks // Tot.
No. 1	21PC6CS08	Formal Languages and Automata Theory Neural Networks and Deep	L 3	ours I Week T	P	3	Maxi Int.	valuation Market Market No. 1985 (1985) 70	Tot.
1 2	21PC6CS08 21PC6CM05	Formal Languages and Automata Theory Neural Networks and Deep Learning	L 3 3	T 1	P -	3 4	E Maxi Int. 30	valuation Market Nation	100 100
1 2 3	21PC6CS08 21PC6CM05 21PC6CM06	Formal Languages and Automata Theory Neural Networks and Deep Learning Expert Systems	L 3 3	T - 1		3 4 3	Maxi Int. 30 30 30	valuation Market No. 10	Tot. 100 100 100
1 2 3 4	21PC6CS08 21PC6CM05 21PC6CM06	Formal Languages and Automata Theory Neural Networks and Deep Learning Expert Systems Descriptive Statistics-Lab	3 3 3	T - 1	1	3 4 3 1.5	Maxi Int. 30 30 30 30 30	70 70 70 70	100 100 100 100
1 2 3 4 5	21PC6CS08 21PC6CM05 21PC6CM06	Formal Languages and Automata Theory Neural Networks and Deep Learning Expert Systems Descriptive Statistics-Lab Professional Elective-II	3 3 3 - 3	T - 1	1	3 4 3 1.5 3	Maxi Int. 30 30 30 30 30 30	70 70 70 70 70	100 100 100 100 100 100
1 2 3 4 5 6	21PC6CS08 21PC6CM05 21PC6CM06 21ES6MT05	Formal Languages and Automata Theory Neural Networks and Deep Learning Expert Systems Descriptive Statistics-Lab Professional Elective-II Open elective-II	3 3 3 - 3	T 1 - 1	1	3 4 3 1.5 3	Maxi Int. 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70	100 100 100 100 100 100 100
1 2 3 4 5 6 7	21PC6CS08 21PC6CM05 21PC6CM06 21ES6MT05 21PC6CM07	Formal Languages and Automata Theory Neural Networks and Deep Learning Expert Systems Descriptive Statistics-Lab Professional Elective-II Open elective-II Expert Systems Lab Neural Networks and Deep	3 3 3 - 3	T 1 - 1 - 1	P 1 2 3 2	3 4 3 1.5 3 3	Maxi Int. 30 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70 70 70	100 100 100 100 100 100 100 100 100
1 2 3 4 5 6 7 8	21PC6CS08 21PC6CM05 21PC6CM06 21ES6MT05 21PC6CM07 21PC6CM08	Formal Languages and Automata Theory Neural Networks and Deep Learning Expert Systems Descriptive Statistics-Lab Professional Elective-II Open elective-II Expert Systems Lab Neural Networks and Deep Learning - Lab Advanced English	3 3 3 - 3	T 1 - 1 - 1	P 1 2 3	3 4 3 1.5 3 1 1.5	Maxi Int. 30 30 30 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70 70	100 100 100 100 100 100 100 100
1 2 3 4 5 6 7 8 9	21PC6CS08 21PC6CM05 21PC6CM06 21ES6MT05 21PC6CM07 21PC6CM08 21HS6EG05	Formal Languages and Automata Theory Neural Networks and Deep Learning Expert Systems Descriptive Statistics-Lab Professional Elective-II Open elective-II Expert Systems Lab Neural Networks and Deep Learning - Lab Advanced English Communication Skills-Lab Doing Engineering-2 TOTAL	3 3 3 - 3 - -	T - 1	P 1 2 3 2	3 4 3 1.5 3 1 1.5	Maxi Int. 30 30 30 30 30 30 30 30 30 3	70 70 70 70 70 70 70 70 70 70	100 100 100 100 100 100 100 100 100
1 2 3 4 5 6 7 8 9	21PC6CS08 21PC6CM05 21PC6CM06 21ES6MT05 21PC6CM07 21PC6CM08 21HS6EG05	Formal Languages and Automata Theory Neural Networks and Deep Learning Expert Systems Descriptive Statistics-Lab Professional Elective-II Open elective-II Expert Systems Lab Neural Networks and Deep Learning - Lab Advanced English Communication Skills-Lab Doing Engineering-2	3 3 3 - 3 - -	T - 1	P 1 2 3 2	3 4 3 1.5 3 1 1.5 1 1.5	Maxi Int. 30 30 30 30 30 30 30 30 30 3	70 70 70 70 70 70 70 70 70 70	100 100 100 100 100 100 100 100 100

	VII – Semester (IV – Year)								
			Н	ours l	Per		Scheme of		
S.	Course code	Subject		Week		Credits	E	<u>valuati</u>	on
No.	Course coue	Subject	L	Т	Р	Credits	Maxi	<mark>mum N</mark>	
			L	1	1		Int.	Ext.	Tot.
1	21HS7MB02	Fundamentals of Engineering Management	3	-	-	2	30	70	100
2	21PC6CM09	Natural Language Processing	3	-	-	3	30	70	100
3		Professional Elective-III	3	-	-	3	30	70	100
4		Professional Elective-IV	3	-	-	3	30	70	100
5		Open Electives-III	3	-	-	3	30	70	100
6	21PC6CM10	Natural Language Processing- Lab	-	-	2	1	30	70	100
7	21PR7IN03	Doing Engineering-3(MINI PROJ/Internship)	-	2	-	2	30	70	100
8	21PR7PS01	Project Stage-I	-	-	6	3	100	0	100
		TOTAL				20	310	490	800
		Non Credit (Cours	es					
9	21MC7HS05	Constitution of India	2	-	-	0	100	0	100
		VIII – Semester (/				
				ours l	-			cheme	-
S.	Course code	Subject	Week		<u> </u>	Credits	Evaluation		
No.		Bubject	L	T	P		Maximum Marks		
1		D . C	2			2	Int.	Ext.	Tot.
1		Professional Elective-V	3	-	-	3	30	70	100
3		Professional Elective-VI	3	 -	-	3	30	70	100
4	21PR8PS02	Open Elective-IV	3	-	14	7	30	70 70	100
4	21PK8PSU2	Project Stage-II TOTAL	+-	-	14	16	120	280	400
		Non Credit (Our	06		10	140	∠ 00	400
5	21MC8HS06	Intellectual Property Rights	2	es 	_	0	100	0	100
6	21AC8HS03	Foreign Languages (German/French/Spanish)	2	_	_	0	0	0	0

Subject Code	Professional Elective-I
21PE5CM11	Big Data Analytics
21PE5CM12	Data Warehousing
21PE5CM13	Text Mining and Analytics
21PE5CM14	Design Thinking, dev ops, Agile

Subject Code	Professional Elective-II
21PE6CM21	Fundamental of Robotics
21PE6CM22	Predicative Analytics
21PE6CM23	Virtual Reality
21PE6CM24	Data Visualization

Subject Code	Professional Elective-III
21PE7CM31	Business Analytics
21PE7CM32	Health Care Data Analytics
21PE7CM33	Computer Vision
21PE7CM34	Cognitive Computing

Subject Code	Professional Elective-IV
21PE7CM41	Data Handling and Visualization
21PE7CM42	Information Retrieval Systems
21PE7CM43	Embedded Systems
21PE7CM44	Watson services & Business Decisions

Subject Code	Professional Elective-V	
21PE8CM51	Social media Analytics	
21PE8CM52	Information Visualization	
21PE8CM53	Blockchain technology	
21PE8CM54	Predictive Modelling	

Subject Code	Professional Elective-VI
21PE8CM61	Digital Marketing
21PE8CM62	Cloud Computing
21PE8CM63	Pattern Recognition
21PE8CD64	AI Analytics



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HYDERABAD INSTITUTE OF TECHNOLOGY AND MANAGEMENT B.TECH. HR-21 COURSE STRUCTURE

CSE-DATA SCIENCE

(Applicable for the batch admitted from 2021-22 onwards)

		* *	Induction Program-2 Weeks						
		I-Semester (1			3 13				
S. No.	Subject Code	Subject	Но	Hours Per Week		Credits	Scheme of Evaluation Maximum Marks		
	2002		L	T	P		Int.	Ext.	Tot.
1	21BS1MT01	Matrix Algebra and Calculus	3	1	-	4	30	70	100
2	21BS1CH01	Engineering-Chemistry	3	-	-	3	30	70	100
3	21ES1ME01	Engineering Graphics	2	-	2	3	30	70	100
4	21ES1CS01	Problem Solving using C	3	-	1	3	30	70	100
5	21BS1CH02	Engineering Chemistry Lab	-	-	3	1.5	30	70	100
6	21ES1CS02	Problem Solving using C-Lab	-	-	3	1.5	30	70	100
7	21ES1ME02	Engineering Prototyping Lab	1	-	2	2	30	70	100
		TOTAL				18	210	490	700
		Non Credit C	<mark>cours</mark>	es		T		ı	ı
8	21AC1HS01	Social and Health Consciousness	-	2	-	0	0	0	0
		II-Semester (
S.	Subject	Cubicat	Hours Per Week			G 111	Scheme of Evaluation		
		Subject				Credits			
No.	Code	Subject	L	Т	P	Credits		mum N	Aarks
No.	Code	, and the second	L	T	P	Credits	Maxi Int.		
No. 1	21BS2MT02	Advanced Calculus for Engineers	3	T	P -	Credits 4		mum N	Aarks
1 2	21BS2MT02 21BS2PH01	Advanced Calculus for Engineers Applied Physics	3			4 3	30 30	mum N Ext. 70 70	Tot. 100 100
1	21BS2MT02	Advanced Calculus for Engineers Applied Physics English	3	1	-	4	Int. 30	mum N Ext. 70	Tot.
1 2	21BS2MT02 21BS2PH01	Advanced Calculus for Engineers Applied Physics	3	1	-	4 3	30 30	mum N Ext. 70 70	Tot. 100 100
1 2 3	21BS2MT02 21BS2PH01 21HS2EG01	Advanced Calculus for Engineers Applied Physics English Business Economics and	3 2	1 -		4 3 2	30 30 30	70 70 70	Tot. 100 100 100
1 2 3 4	21BS2MT02 21BS2PH01 21HS2EG01 21HS2MB01	Advanced Calculus for Engineers Applied Physics English Business Economics and Financial Analysis Basic Electrical and	3 3 2 2	1 -		4 3 2 2	30 30 30 30	70 70 70 70 70	Tot. 100 100 100 100
1 2 3 4 5	21BS2MT02 21BS2PH01 21HS2EG01 21HS2MB01 21ES2EE01	Advanced Calculus for Engineers Applied Physics English Business Economics and Financial Analysis Basic Electrical and Electronics Engineering	3 2 2 3	1	- - - -	4 3 2 2 3	30 30 30 30 30 30	70 70 70 70 70 70	Tot. 100 100 100 100 100
1 2 3 4 5	21BS2MT02 21BS2PH01 21HS2EG01 21HS2MB01 21ES2EE01 21BS2PH02	Advanced Calculus for Engineers Applied Physics English Business Economics and Financial Analysis Basic Electrical and Electronics Engineering Applied Physics Lab English Language	3 2 2 3	1	- - - - 3	4 3 2 2 2 3 1.5	30 30 30 30 30 30	70 70 70 70 70 70	100 100 100 100 100
1 2 3 4 5 6 7	21BS2MT02 21BS2PH01 21HS2EG01 21HS2MB01 21ES2EE01 21BS2PH02 21HS2EG02	Advanced Calculus for Engineers Applied Physics English Business Economics and Financial Analysis Basic Electrical and Electronics Engineering Applied Physics Lab English Language Communication Skills Lab Basic Electrical and	3 2 2 3	1	- - - - 3	4 3 2 2 3 1.5	30 30 30 30 30 30 30	70 70 70 70 70 70 70	100 100 100 100 100 100 100 100
1 2 3 4 5 6 7	21BS2MT02 21BS2PH01 21HS2EG01 21HS2MB01 21ES2EE01 21BS2PH02 21HS2EG02	Advanced Calculus for Engineers Applied Physics English Business Economics and Financial Analysis Basic Electrical and Electronics Engineering Applied Physics Lab English Language Communication Skills Lab Basic Electrical and Electronics Engineering-Lab	3 2 2 3		- - - - 3	4 3 2 2 3 1.5 1	30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70	100 100 100 100 100 100 100 100 100
1 2 3 4 5 6 7	21BS2MT02 21BS2PH01 21HS2EG01 21HS2MB01 21ES2EE01 21BS2PH02 21HS2EG02	Advanced Calculus for Engineers Applied Physics English Business Economics and Financial Analysis Basic Electrical and Electronics Engineering Applied Physics Lab English Language Communication Skills Lab Basic Electrical and Electronics Engineering-Lab	3 2 2 3		- - - - 3	4 3 2 2 3 1.5 1	30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70	100 100 100 100 100 100 100 100 100

S.	III – Semester (II – Year)								
S		(urs l	Per		Scheme of		
Б.	Subject	Subject		Weel	ζ	Credits	Evaluation		
No.	Code	Subject	L	T	P	Cicuits	Maximum Marks		
				-	-		Int.	Ext.	Tot.
1	21BS3MT03	Mathematical & Statistical Foundations	3	1	-	4	30	70	100
2	21HS3EG03	English for Employability	1			1	30	70	100
3	21PC3CS01	Data Structures using C	3	1	-	4	30	70	100
4	21PC3CS03	Data Base Management Systems	3		-	3	30	70	100
5	21PC3CS09	Object Oriented Programming using Java	3	-	-	3	30	70	100
6	21PC3CS04	Data Structures using C -Lab	-	ı	3	1.5	30	70	100
7	21PC3CS05	Database Management Systems-Lab	-	-	3	1.5	30	70	100
8	21PC3CS11	Programming using Java- Lab	-	-	3	1.5	30	70	100
9	21HS3EG04	English for Employability-Lab	-		2	1	30	70	100
10	21PR3IN01	Evaluation of Summer Internship-I	-	-	2	1	100	0	100
TOTAL					21.5	370	630	1000	
		Non Credit C	ours	es					
11	21MC3HS02	Environmental Science	2	-	-	0	100	0	100
		IV – Semester (1							
			Hours Per				Scheme of Evaluation		
S.	Subject	Subject		Week					
No.	Code		L	T	P			mum N	
		Matrix Computations and Its					Int.	Ext.	Tot.
1	21ES4MT04	Applications	3	-	-	3	30	70	100
2	21ES4CS03	Python Programming	3	-	-	3	30	70	100
3	21PC4CS07	Design & Analysis of Algorithms	3	-	-	3	30	70	100
	21PC4CS13	Operating Systems	3	-	-	3	30	70	100
4						3	20	- 0	100
5	21PC4CS14	Computer Networks	3	-	-	3	30	70	100
	21PC4CS14 21PC4CS23	Computer Networks Design & Analysis of Algorithms-Lab	-	-	3	1.5	30	70	100
5		Design & Analysis of							
5 6	21PC4CS23	Design & Analysis of Algorithms-Lab	-	-	3	1.5	30	70	100
5 6 7	21PC4CS23 21PS4CS24	Design & Analysis of Algorithms-Lab Operating Systems-Lab	-	-	3	1.5 1.5	30	70 70	100 100
5 6 7 8	21PC4CS23 21PS4CS24 21ES4CS04	Design & Analysis of Algorithms-Lab Operating Systems-Lab Python Programming-Lab	-	-	3 3 3	1.5 1.5 1.5	30 30 30	70 70 70	100 100 100

		V – Semester (II	II _ V	⁷ ear)					
		v Schiester (1)		urs I			Scheme of		
S.	Subject	Cubicat	Week			Credits	Evaluation		
No.	Code	Subject	L	Т	P	Creans	Maximum Marks		
			L	1	1		Int.	Ext.	Tot.
1	21PC5CD04	Software Engineering & Testing Methodologies	3	-	-	3	30	70	100
2	21PC5CD02	Data mining and Data Analytics	3	-	-	3	30	70	100
3	21PC5CS08	Formal Languages and Automata Theory	3	-	-	3	30	70	100
4		Professional Elective-I	3	-	-	3	30	70	100
5		Open Elective-I	3	-	-	3	30	70	100
6	21PC5CD05	Software Engineering-LAB	-	-	3	1.5	30	70	100
7	21PC5CD03	DMDA-LAB	-	-	3	1.5	30	70	100
8	21ES5MT05	Descriptive Statistics Lab	-	1	1	1.5	30	70	100
9	21PR5IN02	Evaluation of Summer Internship-II	-	ı	2	1	100	0	100
10	21PR5CD02	DS-Doing Engineering-2	-	1	1	1.5	30	70	100
		TOTAL				22	370	630	1000
		Non Credit C	cours	es					
11	21MC5HS03	Analytical Reasoning	-	2	-	-	100	-	100
		VI – Semester (I	II – Y	Year))				
				urs I			Scheme of		
S.	Subject	Subject		Week	<u> </u>	Credits	Evaluation Maximum Marks		
No.	Code		L	T	P				
1	210000000		2			2	Int.	Ext.	Tot.
1	21PC6CD06	Information Security	3	-	-	3	30	70	100
2	21PC6CS15	Compiler Design	3	-	-	3	30	70	100
3	21PC6CD07	Machine Learning and Data Science	3	-	-	3	30	70	100
4	21PC6CD08	Full Stack Web Development	3	-	-	3	30	70	100
5		Professional Elective-II	3	-	-	3	30	70	100
6		Open elective-II	3	-	-	3	30	70	100
7	21HS6EG05	Advanced English Communication Skills-Lab	-	-	2	1	30	70	100
8	21PC6CD09	Machine Learning and Data Science-Lab	-	ı	3	1.5	30	70	100
9	21PC6CD10	Full Stack Web Development- Lab	-	ı	3	1.5	30	70	100
		TOTAL				22	270	630	900
		N C . 14 C	٠						
		Non Credit C	ours	es		<u> </u>			

	VII – Semester (IV – Year)								
			Hours Per				Scheme of		
S.	Subject	Subject	Week			Credits	Evaluation		
No.	Code	Subject	L	Т	P	Credits	Maxi	<mark>mum N</mark>	Iarks
			L	1	1		Int.	Ext.	Tot.
1	21HS7MB02	Fundamentals of Engineering Management	2	-	-	2	30	70	100
2	21PC7CD11	Cyber Security	3	-	-	3	30	70	100
3		Professional Elective-III	3	-	-	3	30	70	100
4		Professional Elective-IV	3	-	-	3	30	70	100
5		Open Electives-III	3	-	-	3	30	70	100
6	21PC7CD12	Cyber Security-Lab	-	ı	2	1	30	70	100
7	21PR7IN03	Doing Engineering-3(MINI PROJ/Internship)	-	2	-	2	100	-	100
8	21PR7PS01	Project Stage-I	-	-	6	3	100	-	100
	TOTAL					20	380	420	800
		Non Credit Co	ours	es					
9	21MC7HS05	Constitution of India	2	-	-	0	100	-	100
		VIII – Semester (I	V –	Year	:)				
			H	ours	-		Scheme of		
S.	Subject	Subject		Wee	k	Credits	Evaluation Maximum Marks		
No.	Code	Subject	L	Т	P	Cicuits			
						-	Int.	Ext.	Tot.
1		Professional Elective-V	3	-	-	3	30	70	100
2		Professional Elective-VI	3	-	-	3	30	70	100
3		Open Elective-IV	3	-	-	3	30	70	100
4	21PR8PS02	Project Stage-II	-	-	14	7	30	70	100
		TOTAL				16	120	280	400
		Non Credit Co		es		I			
5	21MC8HS06	Intellectual Property Rights	2	-	-	0	100	-	100
6	21AC8HS03	Foreign Languages (German/French/Spanish)	2	-	-	0	-	-	0

	Professional Elective-I					
1	21PE5CD11	Computer Organization & Architecture				
2	21PE5CD12	Data Warehousing				
3	21PE5CD13	Information Visualisation				
4	21PE5CD14	Digital Marketing				
5	21PE5CD15	Spark and Scala Fundamentals				

	Professional Elective-II					
1	21PE6CD21	Big Data Architecture				
2	21PE6CD22	Blockchain Technology				
3	21PE6CD23	Information Retrieval Systems				
4	21PE6CD24	Data handling and Visualization				
5	21PE6CD25	Statistical Foundations of Data Science				

	Professional Elective-III					
1	21PE7CD31	Object Oriented Analysis and Design				
2	21PE7CD32	Data Streaming				
3	21PE7CD33	Business Intelligence				
4	21PE7CD34	Probability and Inferential Statistics				
5	21PE7CD35	Computing for Data Science				

	Professional Elective-IV				
1	21PE7CD41	Data Compression			
2	21PE7CD42	Virtual Reality			
3	21PE7CD43	Data Science for Business			
4	21PE7CD44	Big Data Analytics - AP Skills			
5	21PE7CD45	Optimization for Data Science			

	Professional Elective-V				
1	21PE8CD51	Social Media Analytics			
2	21PE8CD52	Text Mining and Analytics			
3	21PE8CD53	Predictive Modelling			
4	21PE8CD54	Healthcare Data Analytics			
5	21PE8CD55	Image Processing			

Professional Elective-VI		
1	21PE8CD61	Distributed Databases
2	21PE8CD62	Cyber Laws
3	21PE8CD63	Design Thinking, Devops, Agile
4	21PE8CD64	Data Visualization
5	21PE8CD65	Deep Learning



Gowdavelli (V), Medchal & Malkajgiri District, Telangana-501401



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CSO-COURSE STRUCTURE

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B.TECH. HR-21 COURSE STRUCTURE

CSE-INTERNET OF THINGS

(Applicable for the batch admitted from 2021-22 onwards)

Induction Program-2 Weeks

		Induction Program			3				
S.		I – Semester (I -	Ho	ır) <mark>ours</mark>] Weel				<mark>cheme</mark>	
No.	Course code	Subject			`	Credits	Evaluation Maximum Marks		
110.			L	T	P		Int.	Ext.	Tot.
1	21BS1MT01	Matrix Algebra and Calculus	3	1	-	4	30	70	100
2	21BS1CH01	Engineering-Chemistry	3	-	-	3	30	70	100
3	21ES1ME01	Engineering Graphics	1	-	4	3	30	70	100
4	21ES1CS01	Problem Solving using C	3	-	-	3	30	70	100
5	21ES1CS02	Problem Solving using C-Lab	-	-	3	1.5	30	70	100
6	21ES1ME02	Engineering Prototyping Lab	-	-	4	2	30	70	100
7	21BS1CH02	Engineering Chemistry Lab	-	-	3	1.5	30	70	100
		TOTAL				18	210	490	700
		Non Credit Co	urse			<u> </u>			
8	21AC1HS01	Social and Health Consciousness	-	- 2 - 0		0	0	0	0
		II – Semester (I				<u> </u>			
~			Hours Per				Scheme o		
S. No.	Course code	Subject		Weel	<u> </u>	Credits		<mark>valuati</mark> mum N	
NO.			L	T	P		Int.	Ext.	Tot.
		Advanced Calculus for							
1	21BS2MT02	Engineers	3	1	ı	4	30	70	100
2	21BS2PH01	Applied Physics	3	-	-	3	30	70	100
3	21ES2EE01	Basic Electrical and Electronics Engineering	3	-	ı	3	30	70	100
4	21HS2EG01	English	2	-	-	2	30	70	100
5	21HS2MB01	Business Economics and Financial Analysis	2	-	ı	2	30	70	100
6	21BS2PH02	Applied Physics Lab	-	-	3	1.5	30	70	100
7		Basic Electrical and Electronics		_	3	1.5	30	70	100
/	21ES2EE02	Engineering-Lab	-		5	1.5			
8	21ES2EE02 21HS2EG02		-	-	2	1	30	70	100
		Engineering-Lab English Language		-					100 800
		Engineering-Lab English Language Communication Skills Lab	-			1	30	70	
		Engineering-Lab English Language Communication Skills Lab TOTAL	-			1	30	70	

		III – Semester (II	[- Y	ear)						
S.	Carron		Ho	urs l Weel		C l'i	Scheme of Evaluation			
No.	Course code	Subject	L	Т	P	Credits	Maximum Marks			
			L	1	Г		Int.	Ext.	Tot.	
1	21BS3MT03	Mathematical & Statistical Foundations	3	1	-	4	30	30 70		
2	21ES3CO01	Introduction to IoT	3	-	-	3	30	70	100	
3	21HS3EG03	English for Employability	1	-	-	1	30	70	100	
4	21PC3CS01	Data Structures using C	3	1	-	4	30	70	100	
5	21PC3CO02	Analog and Digital Electronics	3	-	-	3	30	70	100	
6	21ES3CO03	IoT Lab	-	-	3	1.5	30	70	100	
7	21HS3EG04	English for Employability-Lab	-	-	2	1	30	70	100	
8	21PC3CS04	Data Structures using C -Lab	-	-	3	1.5	30	70	100	
9	21PC3CO04	Analog and Digital Electronics Lab	-	-	3	1.5	30	70	100	
10	21PR3IN01	Evaluation of Summer Internship-I	-	-	2	1	100	-	100	
		TOTAL				21.5	370 630 100		1000	
		Non Credit Co	urse	S						
9	21MC3HS02	Environmental Science	2	-	-	0	100	-	100	
		IV – Semester (II	- Ye	ear)						
				urs l				cheme		
S.	Course code	Subject		Weel	<u> </u>	Credits		<u>valuati</u>		
No.	Course coue	Subject	L	T	P	Cicuits		mum N		
	217 31333					2	Int.	Ext.	Tot.	
1	21ES4CS03	Python Programming	3	-	-	3	30	70	100	
2	21PC4CO05	Sensors & Devices	3	-	-	3	30	70	100	
3	21PC4CS13	Operating Systems	3	-	-	3	30	70	100	
4	21PC4CS03	Database Management Systems	3	-	-	3	30	70	100	
5	21PC4CS14	Computer Networks	3	-	-	3	30	70	100	
6	21ES4CS04	Python Programming-Lab	-	-	3	1.5	30	70	100	
7	21PC4CS24	Operating Systems-Lab	-	-	3	1.5	30	70	100	
8	21PC4CS05	Database Management Systems- Lab	-	-	3	1.5	30	70	100	
9	21PC4CO06	Sensor & Devices-Lab	-	-	3	1.5	30	70	100	
10	21PR4CO01	Doing Engineering-1		1	1	1.5	30	70	100	
		TOTAL				22.5	300	700	1000	
		Non Credit Co	urse	S						
11	21MC4HS06	Intellectual Property Rights	2	-	-	0	100	-	100	

		V – Semester (III	- Ye	ear)					
S.		, ,	Ho	urs l Weel		Carlin		<mark>cheme</mark> valuati	=
No.	Course code	Subject	L	Т	P	Credits	Maximum M		Aarks
			L	1	P		Int.	Ext.	Tot.
1	21PC5CS06	Computer Architecture & Organization	3	-	-	3	30	70	100
2	21PC5CS07	Design and Analysis of Algorithms	3	-	-	3	30	70	100
3	21PC5CO07	Microprocessors and Microcontrollers	3	-	-	3	30	70	100
4		Professional Elective-I	3	-	-	3	30	70	100
5		Open Elective-I	3	-	-	3	30	70	100
6	21PC5CS23	Design and Analysis of Algorithms Lab	-	-	3	1.5	30	70	100
7	21PC5CO08	MPMC Lab	-	-	3	1.5	30	70	100
8	21PR5IN02	Evaluation of Summer Internship-II	-	-	2	1	100	-	100
9	21PR5CO02	Doing Engineering-2	-	1	1	1.5	30	70	100
		TOTAL				20.5	340	560	900
		Non Credit Co	ourse	S					
10	21MC5HS03	Analytical Reasoning	2	-	-	0	100	-	100
		VI – Semester (II	I V	002)					
	VI – Semester (II		1 – 1	ear)					
		VI Demester (II	Ho	urs l				cheme	
S.	Course code		Ho			Credits	E	<u>valuati</u>	on
S. No.	Course code	Subject Subject	Ho	urs l		Credits	E Maxi	valuati mum N	on Aarks
		Subject Fundamental of Cloud	Но	weel	<u> </u>	Credits 3	E	<u>valuati</u>	on
No. 1	21PC6CO09	Subject Fundamental of Cloud Computing	L 3	weel T	P -	3	Maxi Int. 30	valuation Market Market No. 190	on Marks Tot. 100
No.		Subject Fundamental of Cloud Computing Embedded Systems	Ho L	ours l Weel T	<u> </u>		E Maxi Int.	valuati mum N Ext.	on Marks Tot.
1 2 3	21PC6CO09 21PC6CO10 21PC6CO11	Fundamental of Cloud Computing Embedded Systems IoT Architecture and its Protocols	L 3 3 3	weel T	P -	3 3 3	E Maxi Int. 30 30 30	valuation Market No. 10	100 100
No. 1 2 3 4	21PC6CO09 21PC6CO10	Fundamental of Cloud Computing Embedded Systems IoT Architecture and its Protocols Virtual Reality	L 3 3 3 3 3	Weel T	P -	3 3 3 3	Maxi Int. 30 30 30 30	Valuation Mark Ext. 70 70 70 70	100 100 100
1 2 3 4 5	21PC6CO09 21PC6CO10 21PC6CO11	Fundamental of Cloud Computing Embedded Systems IoT Architecture and its Protocols Virtual Reality Professional Elective-II	L 3 3 3 3 3 3	Weel T -	P -	3 3 3 3	Maxi Int. 30 30 30 30 30 30	70 70 70 70 70 70	100 100 100 100 100
No. 1 2 3 4	21PC6CO09 21PC6CO10 21PC6CO11	Fundamental of Cloud Computing Embedded Systems IoT Architecture and its Protocols Virtual Reality Professional Elective-II Open elective-II	L 3 3 3 3 3	T		3 3 3 3	Maxi Int. 30 30 30 30	Valuation Mark Ext. 70 70 70 70	100 100 100
No. 1 2 3 4 5 6 7	21PC6CO09 21PC6CO10 21PC6CO11 21PC6CO12 21HS6EG05	Fundamental of Cloud Computing Embedded Systems IoT Architecture and its Protocols Virtual Reality Professional Elective-II Open elective-II Advanced English Communication Skills-Lab	L 3 3 3 3 3 3	T	P 2	3 3 3 3 3 3	Maxi Int. 30 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70	100 100 100 100 100 100 100
1 2 3 4 5 6	21PC6CO09 21PC6CO10 21PC6CO11 21PC6CO12 21HS6EG05 21PC6CO13	Fundamental of Cloud Computing Embedded Systems IoT Architecture and its Protocols Virtual Reality Professional Elective-II Open elective-II Advanced English Communication Skills-Lab Embedded C Lab	L 3 3 3 3 3 3	T		3 3 3 3 3 3	Maxi Int. 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70	100 100 100 100 100 100 100
1 2 3 4 5 6 7 8	21PC6CO09 21PC6CO10 21PC6CO11 21PC6CO12 21HS6EG05	Fundamental of Cloud Computing Embedded Systems IoT Architecture and its Protocols Virtual Reality Professional Elective-II Open elective-II Advanced English Communication Skills-Lab Embedded C Lab Virtual Reality Lab	1 3 3 3 3 3 3 -	T	P 2 3 3	3 3 3 3 3 3	8 Maxi Int. 30 30 30 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70	100 100 100 100 100 100 100 100
1 2 3 4 5 6 7 8	21PC6CO09 21PC6CO10 21PC6CO11 21PC6CO12 21HS6EG05 21PC6CO13	Fundamental of Cloud Computing Embedded Systems IoT Architecture and its Protocols Virtual Reality Professional Elective-II Open elective-II Advanced English Communication Skills-Lab Embedded C Lab Virtual Reality Lab IoT with Cloud Computing-Lab	L 3 3 3 3	T	P 2 3	3 3 3 3 3 1 1.5	8 Maximum 30 30 30 30 30 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70 70	100 100 100 100 100 100 100 100
1 2 3 4 5 6 7 8	21PC6CO09 21PC6CO10 21PC6CO11 21PC6CO12 21HS6EG05 21PC6CO13 21PC6CO14	Fundamental of Cloud Computing Embedded Systems IoT Architecture and its Protocols Virtual Reality Professional Elective-II Open elective-II Advanced English Communication Skills-Lab Embedded C Lab Virtual Reality Lab	3 3 3 3 3 -	T	P 2 3 3	3 3 3 3 3 1 1.5 1.5	8 Maxi Int. 30 30 30 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70 70 70	100 100 100 100 100 100 100 100 100
1 2 3 4 5 6 7 8	21PC6CO09 21PC6CO10 21PC6CO11 21PC6CO12 21HS6EG05 21PC6CO13 21PC6CO14	Fundamental of Cloud Computing Embedded Systems IoT Architecture and its Protocols Virtual Reality Professional Elective-II Open elective-II Advanced English Communication Skills-Lab Embedded C Lab Virtual Reality Lab IoT with Cloud Computing-Lab	3 3 3 3 3 		P 2 3 3	3 3 3 3 3 1 1.5 1.5	8 Maximum 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	70 70 70 70 70 70 70 70 70 70	100 100 100 100 100 100 100 100 100 100

		VII – Semester (I	V - Y	'ear)					
				ours l	-			cheme	
S.	Course code	Subject		Weel	K .	Credits	Evaluation		
No.			L	T	P	0100108	Maximum Marks		
		Eundamentals of Engineering					Int.	Ext.	Tot.
1	21HS7MB02	Fundamentals of Engineering Management	2	-	-	2	30	70	100
2	21PC7CO16	IoT using RFID and microcontroller	3	-	-	3	30	70	100
3		Professional Elective-III	3	-	-	3	30	70	100
4		Professional Elective-IV	3	-	-	3	30	70	100
5		Open Electives-III	3	-	-	3	30	70	100
6	21PC7CO17	IoT security & Applications lab	-	-	2	1	30	70	100
7	21PR7PS01	Project Work-I	-	-	6	3	30	70	100
8	21PR7IN03	Doing Engineering-3(MINI PROJ/Internship)		2	-	2	30	70	100
	TOTAL					20	240	560	800
		Non Credit Co	ourse	S					
9	21MC7HS05	Constitution of India	2	-	-	0	100	-	100
		VIII – Semester (I							
				ours l	-		Scheme of		
S.	Course code	Subject	Week			Credits	Evaluation		
No.			L	T	P	CICUIUS		mum N	
-1			-			2	Int.	Ext.	Tot.
1		Professional Elective-V	3	-	-	3	30	70	100
2		Professional Elective-VI	3	-	-	3	30	70	100
3	01000000	Open Elective-IV	3	-	-	3	30	70	100
4	21PR8PS02	Project Work-II	-	-	14	7	30	70	100
		TOTAL				16	120	280	400
	G.	RAND TOTAL							
		Non Credit Co	ourse	S	l				
6	21AC8HS03	Foreign Languages (German/French/Spanish)	2	-	-	0	0	0	0

	Professional Elective-I							
1 21PE5CO11 Introduction to IoT and Embedded Systems								
2	21PE5CO12	Sensor Technology and Instrumentation						
3	21PE5CO13	Information Visualisation						
4	21PE5CO14	Digital Marketing						

	Professional Elective-II							
1	1 21PE6CO21 Information Retrieval Systems							
2	21PE6CO22	Blockchain Technology						
3	21PE6CO23	Information Retrieval Systems						
4	21PE6CO24	Artificial Intelligence						

	Professional Elective-III						
1	21PE7CO31	Electric Vehicle Design					
2	21PE7CO32	IoT Security					
3	21PE7CO33	IoT for Health Care					
4	21PE7CO34	Machine Learning					

	Professional Elective-IV						
1 21PE7CO41 Wireless Sensor Networks							
2	21PE7CO42	Industrial IoT					
3	21PE7CO43	Data Compression					
4	21PE7CO44	Data Streaming					

	Professional Elective-V						
1 21PE8CO51 Social Media Analytics							
2	21PE8CO52	Data Science in IoT					
3	21PE8CO53	Real Time Analytics of Sensor Data					
4	21PE8CO54	Deep Learning					

	Professional Elective-VI							
1 21PE8CO61 Cognitive Science								
2	21PE8CO62	Information Retrieval Systems						
3	21PE8CO63	Software Defined Networks						
4	21PE8CO64	Multi Core Technologies						



Gowdavelli (V), Medchal & Malkajgiri District, Telangana-501401



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B.TECH. HR-21 COURSE STRUCTURE

CSE-CYBER SECURITY

(Applicable for the batch admitted from 2021-22 onwards)

Induction Program-2 Weeks

			/ T	T 7	
I - i	S	semester (· Year)	

		I – Semester (1	I – Y	ear)					
				ours I			Scheme of		
S.	Course code	Subject	week	Credits	Evaluation				
No.	Course coue	Subject	L	T	P	Cicaics	Maximum Marks		
			-				Int.	Ext.	Tot.
1	21BS1MT01	Matrix Algebra and Calculus	3	1	-	4	30	70	100
2	21BS1CH01	Engineering-Chemistry	3	-	-	3	30	70	100
3	21ES1ME01	Engineering Graphics	1	-	4	3	30	70	100
4	21ES1CS01	Problem Solving using C	3	-	-	3	30	70	100
5	21ES1CS02	Problem Solving using C Language-Lab	-	-	3	1.5	30	70	100
6	21BS1CH02	Engineering Chemistry Lab	-	-	3	1.5	30	70	100
7	21ES1ME02	Engineering Prototyping Lab	-	-	4	2	30	70	100
		TOTAL				18	210	490	700
		Non Credit (Cours	es					
8	21AC1HS01	Social and Health Consciousness	0	0	2	0	0	0	0
		II – Semester (I - Y	ear)					
			Hours Per					cheme (
S.	Course code	Subject		Week		Credits	Evaluation		
No.	Course cour	Subject		T	P	Creares		imum M	
							Int.	Ext.	Tot.
1	21BS2MT02	Advanced Calculus for Engineers	3	1	1	4	30	70	100
2	21BS2PH01	Applied Physics	3	-	ı	3	30	70	100
3	21ES2EE01	Basic Electrical and Electronics Engineering	3	-	1	3	30	70	100
4	21HS2EG01	English	2	-	-	2	30	70	100
5	21BS2PH02	Applied Physics Lab	-	-	3	1.5	30	70	100
6	21ES2EE02	Basic Electrical and Electronics Engineering-Lab	-	-	3	1.5	30	70	100
7	21HS2EG02	English Language Communication Skills Lab	-	-	2	1	30	70	100
8	21HS2MB01	Business Economics and Financial Analysis	2	-	1	2	30	70	100
		TOTAL				18	240	560	800
		Non Credit (Cours	ses					
9	21MC2HS01	Universal Human Values	2	-	1	0	100	-	100
10	21AC2ME02	Engineering Projects in Community Services	-	-	2	0	0	0	0

III – Semester (II – Year)											
				ours I	Per		Scheme of				
S.	Course code	Subject		Week	C	Credits	Evaluation				
No.	Course code	Subject	L	Т	P	Credits	Maximum Marks				
			L	1	1		Int.	Ext.	Tot.		
1	21BS3MT03	Mathematical & Statistical Foundations		1	-	4	30	70	100		
2	21ES3CS03	Python Programming	3	-	-	3	30	70	100		
3	21HS3EG03	English for Employability	1		-	1	30	70	100		
4	21PC3CS01	Data Structures using C	3	1	-	4	30	70	100		
5	21PC3CS09	Object Oriented Programming using Java	3	-	-	3	30	70	100		
6	21PC3CS04	Data Structures using C -Lab	-	-	3	1.5	30	70	100		
7	21ES3CS04	Python Programming-Lab	-	-	3	1.5	30	70	100		
8	21HS3EG04	English for Employability-Lab	-	_	2	1	30	70	100		
9	21PC3CS11	Programming using Java- Lab		-	3	1.5	30	70	100		
10	21PR3IN01	Evaluation of Summer Internship-I	-	1	2	1	100	-	100		
		TOTAL				21.5	370	630	1000		
		Non Credit (Cours	es							
11	21MC3HS02	Environmental Science	1	2	-	0	100	-	100		
		IV – Semester (IV – Semester (II – Year)								
	Hours Per										
			Н	ours l				cheme			
S.	Course code		Н			Credits	E	valuatio	on		
S. No.	Course code	Subject	Н	ours l		Credits	E Maxi	valuatio imum M	on Iarks		
	Course code	Subject	Н	ours I Week	K	Credits	E	valuatio	on		
	Course code 21PC4CS06	Subject Computer Organization and Architecture	Н	ours I Week	K	Credits 3	E Maxi	valuatio imum M	on Iarks		
No.		Subject Computer Organization and	L 3 3	ours I Week	K	3	Maxi	valuatio imum M Ext.	on Iarks Tot.		
No. 1	21PC4CS06 21PC4CS07 21PC4CS13	Subject Computer Organization and Architecture Design & Analysis of	L 3 3 3	ours I Week	K	3 3 3	Maxi Int.	valuationimum Mext.	Tot.		
1 2	21PC4CS06 21PC4CS07 21PC4CS13 21PC4CS03	Computer Organization and Architecture Design & Analysis of Algorithms Operating Systems Database Management Systems	1 3 3 3 3 3 3	ours I Week	K	3 3 3 3	Maxi Int. 30	valuation Market No. 10 valuat	Tot. 100		
1 2 3	21PC4CS06 21PC4CS07 21PC4CS13	Subject Computer Organization and Architecture Design & Analysis of Algorithms Operating Systems Database Management Systems Computer Networks	L 3 3 3	ours I Week	K	3 3 3	Maxi Int. 30 30 30	valuation Market No. 10	Tot. 100 100		
1 2 3 4	21PC4CS06 21PC4CS07 21PC4CS13 21PC4CS03	Computer Organization and Architecture Design & Analysis of Algorithms Operating Systems Database Management Systems	1 3 3 3 3 3 3	ours I Week	K	3 3 3 3	Maxi Int. 30 30 30 30 30	valuation Market No. 10	100 100 100 100		
1 2 3 4 5	21PC4CS06 21PC4CS07 21PC4CS13 21PC4CS03 21PC4CS14	Computer Organization and Architecture Design & Analysis of Algorithms Operating Systems Database Management Systems Computer Networks Design & Analysis of	1 3 3 3 3 3 3	ours I Week		3 3 3 3 3	Maxi Int. 30 30 30 30 30 30	valuation Market No. 10	100 100 100 100 100 100		
No. 1 2 3 4 5 6	21PC4CS06 21PC4CS07 21PC4CS13 21PC4CS03 21PC4CS14 21PC4CS23	Computer Organization and Architecture Design & Analysis of Algorithms Operating Systems Database Management Systems Computer Networks Design & Analysis of Algorithms Lab	3 3 3 3 -	T	3	3 3 3 3 1.5	Maxi Int. 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70	100 100 100 100 100 100		
No. 1 2 3 4 5 6 7	21PC4CS06 21PC4CS07 21PC4CS13 21PC4CS03 21PC4CS14 21PC4CS23 21PC4CS24	Computer Organization and Architecture Design & Analysis of Algorithms Operating Systems Database Management Systems Computer Networks Design & Analysis of Algorithms Lab Operating Systems-Lab Database Management Systems-	3 3 3 3 -	T	3 3 3	3 3 3 3 1.5	Maxi Int. 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70	100 100 100 100 100 100 100		
No. 1 2 3 4 5 6 7 8	21PC4CS06 21PC4CS07 21PC4CS13 21PC4CS03 21PC4CS14 21PC4CS23 21PC4CS24 21PC4CS05	Computer Organization and Architecture Design & Analysis of Algorithms Operating Systems Database Management Systems Computer Networks Design & Analysis of Algorithms Lab Operating Systems-Lab Database Management Systems-Lab	3 3 3 3 - -	T	3 3 3 3	3 3 3 3 1.5 1.5	30 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70 70	100 100 100 100 100 100 100		
No. 1 2 3 4 5 6 7 8 9	21PC4CS06 21PC4CS07 21PC4CS13 21PC4CS03 21PC4CS14 21PC4CS23 21PC4CS24 21PC4CS25	Computer Organization and Architecture Design & Analysis of Algorithms Operating Systems Database Management Systems Computer Networks Design & Analysis of Algorithms Lab Operating Systems-Lab Database Management Systems-Lab Computer Networks Lab	3 3 3 3 - -	T	3 3 3 3 3 3	3 3 3 3 1.5 1.5 1.5	30 30 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70 70 70	100 100 100 100 100 100 100 100		
1 2 3 4 5 6 7 8 9	21PC4CS06 21PC4CS07 21PC4CS13 21PC4CS03 21PC4CS14 21PC4CS23 21PC4CS24 21PC4CS25	Computer Organization and Architecture Design & Analysis of Algorithms Operating Systems Database Management Systems Computer Networks Design & Analysis of Algorithms Lab Operating Systems-Lab Operating Systems-Lab Computer Networks Lab Computer Networks Lab Doing Engineering-1	3 3 3 3 - -	T 1	3 3 3 3 3 3	3 3 3 1.5 1.5 1.5 1.5 1.5	30 30 30 30 30 30 30 30 30 30 30 30 30 3	valuation imum N Ext. 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70	100 100 100 100 100 100 100 100 100		

V – Semester (III – Year)									
		(2		ours l	Per		Scheme of		
S.	Course code	Subject	Week			Credits	Evaluation		
No.	Course code		L	Т	P	Credits	Maximum Marks		
				-	-		Int.	Ext.	Tot.
1	21PC5CD04	Software Engineering & Testing Methodologies	3	-	-	3	30	70	100
2	21PC5CS19	Data Mining	3	-	-	3	30	70	100
3	21PC5CC01	Data Security	3	1	-	4	30	70	100
4		Professional Elective-I	3	-	-	3	30	70	100
5		Open Elective-I	3	-	-	3	30	70	100
6	21PC5CS20	Data Mining Lab	-	-	3	1.5	30	70	100
7	21PC5CC02	Data Security Lab	-	-	3	1	30	70	100
8	21PR5IN02	Evaluation of Summer Internship-II	-	-	2	1	100	-	100
9	21PC5CD05	•		-	3	1.5	30	70	100
		TOTAL				21	340	560	900
		Non Credit (Cours	es					
10	21MC5HS03	Analytical Reasoning	2	-	-	0	100	-	100
VI – Semester (III – Year)									
		VI – Semester (l							
		VI – Semester (I	Н	ours l	Per			cheme	
S.	Course code	·	Н		Per	Credits	E	valuatio	on
S. No.	Course code	VI – Semester (I	Н	ours l	Per	Credits	E Maxi	valuatio imum M	on Iarks
No.		Subject	H ₀	ours I Week T	Per P		E Maxi Int.	valuation Markette Valuation Mar	on Iarks Tot.
No. 1	21PC6CC03	Subject Ethical Hacking	L 3	Week T	P -	4	Maxi Int. 30	valuation mum M Ext. 70	Tot.
No. 1 2	21PC6CC03 21PC6CS15	Subject Ethical Hacking Compiler Design	L 3 3	Week T 1	P -	4 3	Maxi Int. 30 30	valuation Market Property valuation Market P	Tot. 100 100
1 2 3	21PC6CC03	Ethical Hacking Compiler Design Machine Learning	L 3 3 3 3	Week T 1 -	P	4 3 3	Maxi Int. 30 30 30	valuation Market No. 10	Tot. 100 100 100
1 2 3 4	21PC6CC03 21PC6CS15	Ethical Hacking Compiler Design Machine Learning Professional Elective-II	L 3 3 3 3 3 3	T 1	Per P	4 3 3 3	E Maxi Int. 30 30 30 30	valuation Market No. 10	Tot. 100 100 100 100
1 2 3	21PC6CC03 21PC6CS15 21PC6CM03	Ethical Hacking Compiler Design Machine Learning Professional Elective-II Open elective-II	L 3 3 3 3	Week T 1 -	P	4 3 3	Maxi Int. 30 30 30	valuation Market No. 10	Tot. 100 100 100
1 2 3 4 5	21PC6CC03 21PC6CS15 21PC6CM03 21HS6EG05	Ethical Hacking Compiler Design Machine Learning Professional Elective-II Open elective-II Advanced English Communication Skills-Lab	L 3 3 3 3 3 3	T 1	Per P P P P P P P P P P P P P P P P P P	4 3 3 3 3 1	Maxi Int. 30 30 30 30 30 30 30	valuation Market No. 10	Tot. 100 100 100 100 100 100 100
1 2 3 4 5 6 7	21PC6CC03 21PC6CS15 21PC6CM03 21PC6CM05 21PC6CS26	Ethical Hacking Compiler Design Machine Learning Professional Elective-II Open elective-II Advanced English Communication Skills-Lab Compiler Design Lab	L 3 3 3 3 3 3	T 1	P 2 3	4 3 3 3 3 1 1.5	E Maxi Int. 30 30 30 30 30 30 30 30	valuation Market No. 10	Tot. 100 100 100 100 100 100 100 100
No. 1 2 3 4 5 6 7 8	21PC6CC03 21PC6CS15 21PC6CM03 21PC6CM05 21HS6EG05 21PC6CS26 21PC6CC04	Ethical Hacking Compiler Design Machine Learning Professional Elective-II Open elective-II Advanced English Communication Skills-Lab Compiler Design Lab Ethical Hacking -Lab	L 3 3 3 3 3 -	T 1	Per	4 3 3 3 3 1 1.5 1.5	Maxi Int. 30 30 30 30 30 30 30 30 30 30	valuation Market No. 10	Tot. 100 100 100 100 100 100 100 100 100
1 2 3 4 5 6 7 8 9	21PC6CC03 21PC6CS15 21PC6CM03 21PC6CM05 21HS6EG05 21PC6CS26 21PC6CC04 21PC6CM04	Ethical Hacking Compiler Design Machine Learning Professional Elective-II Open elective-II Advanced English Communication Skills-Lab Compiler Design Lab Ethical Hacking -Lab Machine Learning Lab	L 3 3 3 3 3	1	P 2 3 3 3 3	4 3 3 3 3 1 1.5 1.5	E Maxi Int. 30 30 30 30 30 30 30 30 30 30 30	valuation mum N Ext. 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70	Tot. 100 100 100 100 100 100 100 100 100 10
No. 1 2 3 4 5 6 7 8	21PC6CC03 21PC6CS15 21PC6CM03 21PC6CM05 21HS6EG05 21PC6CS26 21PC6CC04	Ethical Hacking Compiler Design Machine Learning Professional Elective-II Open elective-II Advanced English Communication Skills-Lab Compiler Design Lab Ethical Hacking -Lab Machine Learning Lab Doing Engineering-2	L 3 3 3 3 3	T 1	Per	4 3 3 3 3 1 1.5 1.5 1.5	Maxi Int. 30 30 30 30 30 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70 70 70 70	Tot. 100 100 100 100 100 100 100 100 100 10
1 2 3 4 5 6 7 8 9	21PC6CC03 21PC6CS15 21PC6CM03 21PC6CM05 21HS6EG05 21PC6CS26 21PC6CC04 21PC6CM04	Ethical Hacking Compiler Design Machine Learning Professional Elective-II Open elective-II Advanced English Communication Skills-Lab Compiler Design Lab Ethical Hacking -Lab Machine Learning Lab Doing Engineering-2 TOTAL	3 3 3 3 	T 1 1 1	P 2 3 3 3 3	4 3 3 3 3 1 1.5 1.5	E Maxi Int. 30 30 30 30 30 30 30 30 30 30 30	valuation mum N Ext. 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70	Tot. 100 100 100 100 100 100 100 100 100 10
1 2 3 4 5 6 7 8 9	21PC6CC03 21PC6CS15 21PC6CM03 21PC6CM05 21HS6EG05 21PC6CS26 21PC6CC04 21PC6CM04	Ethical Hacking Compiler Design Machine Learning Professional Elective-II Open elective-II Advanced English Communication Skills-Lab Compiler Design Lab Ethical Hacking -Lab Machine Learning Lab Doing Engineering-2	3 3 3 3 	T 1 1 1	P 2 3 3 3 3	4 3 3 3 3 1 1.5 1.5 1.5	Maxi Int. 30 30 30 30 30 30 30 30 30 30 30 30 30	70 70 70 70 70 70 70 70 70 70 70	Tot. 100 100 100 100 100 100 100 100 100 10

	VII – Semester (IV – Year)								
S. No.	Course code	Subject	Hours Per Week L T P			Credits	Scheme of Evaluation Maximum Marks		
110.				T	P		Int.	Ext.	Tot.
1	21HS7MB02	Fundamentals of Engineering Management		-	-	2	30	70	100
2	21PC7CC05	Cloud Computing	3	-	1	3	30	70	100
3		Professional Elective-III	3	-	1	3	30	70	100
4		Professional Elective-IV	3	-	ı	3	30	70	100
5		Open Electives-III	3	-	1	3	30	70	100
6	21PC7CC06	Cloud Computing-Lab	-	-	2	1	30	70	100
7	21PR7IN03	Doing Engineering-3(MINI PROJ/Internship)		-	3	2	30	70	100
8	21PR7PS01	Project Stage-I	-	-	6	3	100		100
		TOTAL				20	310	490	800
		Non Credit (Cours	es					
9	21MC7HS05	Constitution of India	2	-	1	0	30	70	100
		VIII – Semester (
S.	Carrer and a	Carl tare	Hours Per Week			Con dita	Scheme of Evaluation		
No.	Course code	Subject	L	Т	P	Credits	Maximum Marks		Iarks
				1	1		Int.	Ext.	Tot.
1		Professional Elective-V	3	-	9	3	30	70	100
2		Professional Elective-VI	3	-	-	3	30	70	100
3		Open Elective-IV	3	-	ı	3	30	70	100
4	4 21PR8PS02 Project Stage-II		7	-	14	7	30	70	100
		TOTAL				16	120	280	400
		Non Credit (Cours	es		,		ı	
5	21AC8HS03	Foreign Languages (German/French/Spanish)	-	-	2	0	-	-	-

Professional Elective-I				
1	21PE5CC11	Spark and Scala Fundamentals		
2	21PE5CC12	Fault Tolerance System		
3	21PE5CC13	Software Security Engineering		
4	21PE5CC14	Mobile Application Security		

Professional Elective-II				
1	21PE6CC21	Information Retrieval Systems		
2	21PE6CC22	Blockchain Technology		
3	21PE6CC23	Virtual Reality		
4	21PE6CC24	Computer Graphics		

Professional Elective-III					
1	21PE7CC31	Edge Computing			
2	21PE7CC32	Quantum Computing			
3	21PE7CC33	Ubiquitous Computing			
4	21PE7CC34	Pervasive Computing			

Professional Elective-IV					
1	21PE7CC41	Cyber Physical System			
2	21PE7CC42	Cyber Security and Digital Forensic			
3	21PE7CC43	Cyber Security Governance			
4	21PE7CC44	Security Testing			

	Professional Elective-V					
1	21PE8CC51	Advanced System Programming with UNIX				
2	21PE8CC52	Principles of Computer System Design				
3	21PE8CC53	Analytical Models of Computing System				
4	21PE8CC54	Fuzzy Logic				

Professional Elective-VI					
1	21PE8CC61	Advanced System Programming with UNIX			
2	21PE8CC62	Principles of Computer System Design			
3	21PE8CC63	Analytical Models of Computing System			
4	21PE8CC64	Fuzzy Logic			

			Offering
Sl.no	SUBJECT CODE	Open Elective-I	Department
1	210E5CS01	Design Thinking-IBM Course	CSE
2	210E5EC01	Electronics measurement & Instrumentation	ECE
3	210E5ME01	Hybrid & Electric Vehicles	MECH
4	21OE5EE01	Fundamentals of Electric Circuit Analysis	EEE
5	210E5HS01	Nanoscience and Technology	H&S
6	210E5CM01	Artificial Intelligence	CSE-AI&ML
7	210E5CD01	Statistics for Data Science	CSE-DS
8	210E5C001	Sensors & Actuators	CSE-IOT
9	210E5CC01	Data Security	CSE-CS

			Offering
Sl.no	SUBJECT CODE	Open Elective-II	Department
		Computer Organization and	
1	210E6CS02	Architecture	CSE
		Fundamentals of Digital	
2	21OE6EC02	Electronics	ECE
		Total Quality Measurement & Six Sigma	
3	210E6ME02	Applications	MECH
4	21OE6EE02	Fundamentals of Industrial Electronics	EEE
5	21OE6HS02	Medical Instrumentation	H&S
6	210E6CM02	Introduction to AI	CSE-AI
7	21OE6CD02	Data Mining	CSE-DS
8	21OE6CO02	Fundamentals of IoT	CSE-IOT
9	210E6CC02	Network Security	CSE-CS

Sl.no	SUBJECT CODE	Open Elective-III	Offering Department
51.110	SUBJECT CODE		Department
		Computer Organization and	
1	210E7CS03	Architecture	CSE
2	210E7EC03	Basics of communication systems	ECE
3	210E7ME03	Smart Materials	MECH
4	210E7EE03	PLC and SCADA	EEE
5	210E7HS03	Entrepreneurship	MBA
6	210E7CM03	Neural Networks	CSE-AIML
7	210E7CD03	Distributed Computing	CSE-DS
8	210E7CO03	IoT applications	CSE-IOT
		Computer Networks and	
9	210E7CC03	Security	CSE-CS

Sl.no	SUBJECT CODE	Open Elective-IV	Offering Department
		Software Testing	
1	210E8CS04	Methodologies	CSE
2	210E8EC04	Introduction to Signal Processing	ECE
		Fundamentals of Additive	
3	210E8ME04	Manufacturing	MECH
4	210E8EE04	Renewable Energy Systems	EEE
5	210E8HS04	Enterprise Resource planning	MBA
6	210E8CM04	Expert Systems	CSE-AIML
7	210E8CD04	Full Stack Web Development	CSE-DS
8	210E8CO04	Introduction to IoT and Embedded Systems	CSE-IOT
9	210E8CC04	Computer Forensics	CSE-CS

