



Bachelor of Engineering (B.E)

Scheme And Syllabus Of II & II Semesters (2022 Scheme)

B.E. Programs : AS, BT, CH, CS, CS - AI, CS - CD, CS - CY, CV, EC, EE, ET, IM, IS, ME. M. Tech (13) MCA, M.Sc. (Engg.) Ph.D. Programs : All Departments are recognized as Research Centres by VTU Except AI & AS



	TIMES HIGHER EDUCATION WORLD UNIVERSITY RANKINGS-2023	CURR		STRUC	TURE
99 NIRF RANKING IN ENGINEERING (2024)	15001+ TIMES HIGHER EDUCATION WORLD UNIVERSITY BANKINGS-2023 (ASIA) 501-6000	61 CREE PROFESSIO CORES (PC)	NAL		3 CREDITS C SCIENCE
	BEST PRIVATE ENGINEERING UNIVERSITY (SOUTH) BY ZEE DIGITAL	22 ENGINEERING SCIENCE	18 PROJECT INTERNS		12 CREDITS* OTHER ELECTIVES & AEC
1001+ SUBJECT RANKING (ENGINEERING)	801+ SUBJECT RANKING (COMPUTER SCIENCE)	12 PROFESSIONAL ELECTIVES	12 HUMANITIE SOCIAL SC	S &	160
IIRF 2023 ENGINEERING RANKING INDIA NATIONAL RANK-10 STATE RANK - 2 ZONE RANK - 5	QS-IGUAGE DIAMOND UNIVERSITY RATING (2021-2024)	*ABILITY ENHANCEN UNIVERSAL HUMAN INDIAN KNOWLEDG	I VALUES (UHV),	CREDITS TOTAL
17 Centers of Excellence	Centers of Competence	MOUS: 90 INSDUSTF INSTITUTI	RIES / AC		11C & ABROAD
212 Publications On Web Of Science	669 Publications Scopus				
1093 Citations	(2023 - 24)	EXECU RS.40 (SPONS RESEAR	CRORE ORED	ES W	ORTH
Skill Based Laboratories Across Four Semesters	Patents Granted 61 Published Patents	CONSU SINCE (/ORKS





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B.E. Programs : AS, BT, CH, CS, CS - AI, CS - CD, CS - CY, CV, EC, EE, ET, IM, IS, ME. M. Tech (13) MCA, M.Sc. (Engg.) Ph.D. Programs : All Departments are recognized as Research Centres by VTU Except AI & AS





ABBREVIATIONS

Sl. No.	Abbreviation	Meaning
1.	VTU	Visvesvaraya Technological University
2.	AI	Computer Science & Engineering–Artificial Intelligence & Machine Learning
3.	AS	Aerospace Engineering
4.	BT	Biotechnology
5.	CD	Computer Science & Engineering – Data Science
6.	СН	Chemical Engineering
7.	CS	Computer Science & Engineering
8.	CV	Civil Engineering
9.	СҮ	Computer Science & Engineering – Cyber Security
10.	EC	Electronics & Communication Engineering
11.	EE	Electrical & Electronics Engineering
12.	EI	Electronics & Instrumentation Engineering
13.	ET	Electronics & Telecommunication Engineering
14.	IM	Industrial Engineering & Management
15.	IS	Information Science & Engineering
16.	ME	Mechanical Engineering
17.	PY	Physics
18.	СМ	Chemistry
19.	MA	Mathematics
20.	ASC	Applied Sciences Course
21.	PC	Professional Core Course
22.	ES	Engineering Science Course
23.	PL	Programming Language Lab Course
24.	EM	Emerging Technology Course
25.	HSS	Humanities and Social Sciences
26.	CIE	Continuous Internal Evaluation
27.	SEE	Semester End Examination



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54.

55.

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Fundamentals of Indian Constitution

Scientific Foundations of Health: Yoga Practice

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2022 SCHEME - CREDITS AND COMPONENTS

			Doc	C	redit	Credit Allocation	ion		CIE	Max Marks	ırks	SEE	Max Marks SEF	arks
. NO.	DI. INU. COULSE COUE		8	Г	Т	Р	Total	category	(H)	Theory	Lab	(Hrs)	Theory	Lab
1	MA211TC	Fundamentals of Linear Algebra, Calculus and Statistics	MA	m	1	0	4	Theory	1.5	100	****	3	100	***
2	CM211IA	Chemistry of Smart Materials And Devices	CM	3	0	1	4	Theory+Lab	1.5	100	***	3	100	***
3	ME112GL	Computer Aided Engineering Graphics	ME	1	0	2	3	Lab	1.5	***	50	3	***	50
4	XX113XTX	Engineering Science Course - I	XX	3	0	0	3	Theory	1.5	100	***	3	100	***
ഹ	XX115XIX	Programming Languages Course	XX	2	0	1	3	Theory+Lab	1.5	100	***	3	100	***
9	HS111EL	Communicative English-I	SH	0	0	-	1	Lab	1	***	50	2	***	50
7	HS114TC	Fundamentals of Indian Constitution	SH	1	0	0	1	Theory	1	50	***	2	50	***
8	HS115YL	Scientific Foundations of Health-Yoga Practice	HS	0	0	1	1	Lab	1	***	50	2	***	50
	-			12	2	9	20							

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	Max Marks SEE	/ Lab	* * *	***	***	***	***	50	* *	50	
	Max N SE	Theory	100	100	100	100	100	***	50	* * *	
	SEE Duration	(Hrs)	3	3	3	33	°	2	2	2	
	ırks	Lab	***	***	***	***	***	50	**	50	
	Max Marks CIE	Theory Lab	100	100	100	100	100	***	50	***	
CY & IS	CIE Duration	(H)	1.5	1.5	1.5	1.5	1.5	1	1	2	
CYCLE (CS STREAM) AI, BT, CS, CD, CY & IS	Category	0	Theory	Theory+Lab	Theory+Lab	Theory	Theory	Lab	Theory	Lab	
I) AI, F	tion	Total	4	4	3	ŝ	ŝ	1	1	1	20
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STR	Credit Allocation	Т	1	0	0	0	0	0	0	0	2
(CS	C	L	ю	3	2	ŝ	3	0	1	0	14
YCLE	BoS	1	MA	ΡΥ	CS	XX	XX	SH	SH	ME	
II SEMESTER: PHYSICS C	Course Title		Number Theory, Vector Calculus and Computational Methods	Quantum Physics for Engineers	Principles of Programming Using C	Engineering Science Course-II	Emerging Technology Course	Communicative English-II	Samskrutika Kannada/ Balake Kannada	IDEA LAB (Idea Development, Evaluation & Application)	
	Sl. No. Course Code		MA221TC	PY221IC	CS222IA	XX123XTX	XX124XTX	HS121EL	HS122KS/ HS123KB	ME121DL	
	Sl. No.		1	2	с	4	ഹ	9	7	8	

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2022 SCHEME - CREDITS AND COMPONENTS

Course TitleBos <th be="" could="" th="" th<="" the=""><th>BoS L Is and MA 3 Is and MA 3 PY PY 3 E PY 3 E E 2 E E 2 XX B 3 XX HS 1 Is ME 0</th><th>Ilocation CIE Max Marks SEE Max Marks Category Duration CIE Duration SEE</th><th>(H) Theory Lab</th><th>0 4 Theory 1.5 100 *** 100 ***</th><th>1 4 Theory+Lab 1.5 100 *** 3 100 ***</th><th></th><th>-</th><th>0 3 Theory 1.5 100 *** 3 100 ***</th><th>0 3 Theory 1 100 *** 3 100 ***</th><th>1 1 Lab 1 *** 50 2 *** 50</th><th>0 1 Theory 1 50 *** 2 50 ***</th><th>1 1 Lab 2 *** 50 2 *** 50</th><th></th></th>	<th>BoS L Is and MA 3 Is and MA 3 PY PY 3 E PY 3 E E 2 E E 2 XX B 3 XX HS 1 Is ME 0</th> <th>Ilocation CIE Max Marks SEE Max Marks Category Duration CIE Duration SEE</th> <th>(H) Theory Lab</th> <th>0 4 Theory 1.5 100 *** 100 ***</th> <th>1 4 Theory+Lab 1.5 100 *** 3 100 ***</th> <th></th> <th>-</th> <th>0 3 Theory 1.5 100 *** 3 100 ***</th> <th>0 3 Theory 1 100 *** 3 100 ***</th> <th>1 1 Lab 1 *** 50 2 *** 50</th> <th>0 1 Theory 1 50 *** 2 50 ***</th> <th>1 1 Lab 2 *** 50 2 *** 50</th> <th></th>	BoS L Is and MA 3 Is and MA 3 PY PY 3 E PY 3 E E 2 E E 2 XX B 3 XX HS 1 Is ME 0	Ilocation CIE Max Marks SEE Max Marks Category Duration CIE Duration SEE	(H) Theory Lab	0 4 Theory 1.5 100 *** 100 ***	1 4 Theory+Lab 1.5 100 *** 3 100 ***		-	0 3 Theory 1.5 100 *** 3 100 ***	0 3 Theory 1 100 *** 3 100 ***	1 1 Lab 1 *** 50 2 *** 50	0 1 Theory 1 50 *** 2 50 ***	1 1 Lab 2 *** 50 2 *** 50	
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L TCredit AllocationCategoryIs andMATotalCategoryIs andMA3TheoryIs andMA3104Theory+LabEC2103Theory+LabEE2103TheoryEE2103TheoryEE2103TheoryMS100111ItMS0011ItME0011ItME0011	Course TitleBos $\overline{L T P Total}$ CategoryFundamentals of Linear Algebra, Calculus and Numerical MethodsMA3104TheoryFundamentals of Linear Algebra, Calculus and Numerical MethodsMA3104TheoryCondensed Matter Physics for EngineersPY3014TheoryBasic ElectronicsEC2103TheoryCommon to EC, El & ET Programs)EC2103TheoryElements of Electrical EngineeringEE2103TheoryCommon to EC, El & ET Programs)EE2103TheoryElements of Electrical EngineeringEE3003TheoryCommon to EC, El & ET Programs)EE2103TheoryElements of Electrical EngineeringEE3003TheoryEngineering Science Course - IXX3003TheoryEngineering Science Course - IHS003TheoryEngineering Science CourseHS0011LaboryEngineering Science CourseHS00111Engineering Science CourseHS0011InoryEngineering Science CourseHS0011InoryEngineering Science CourseHS00	Max Ma CIE	Theory	100	100	100	100	100	100	***	50	***		
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Course TitleBosCredit AllocationFundamentals of Linear Algebra, Calculus and Numerical Methods MA 3 1 p 7 totalFundamentals of Linear Algebra, Calculus and Numerical Methods MA 3 1 0 4 Condensed Matter Physics for Engineers PY 3 0 1 4 Basic Electronics (Common to EC, EI & ET Programs) EC 2 1 0 3 Elements of Electrical Engineering 	Course TitleBosLTPFundamentals of Linear Algebra, Calculus and Numerical MethodsMA310Fundamentals of Linear Algebra, Calculus and Numerical MethodsMA310Saste ElectronicsPY301Basic ElectronicsEC210Common to EC, El & ET Programs)EC210Elements of Electrical EngineeringEE210Common to EC, El & ET Programs)EE210Elements of Electrical EngineeringE210Common to EC, El & ET Programs)EE210Energing Technology CourseIXX3001Energing Technology CourseHSIHS1001Samskrutika Kannada/ Balake KannadaHSI0011IDEA LAB (Idea Development, Evaluation &ME001	Category	0	Theory	Theory+Lab	Theory	Theory	Theory	Theory	Lab	Theory	Lab		
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	Course Code MA211TA PY2111A EC112TA EC112TA EE112TA XX113XTX XX113XTX XX113XTX XX113XTX HS111EL HS112KS/ HS111BL ME111DL	Course Title	AL	Fundamentals of Linear Algebra, Calculus and Numerical Methods	Condensed Matter Physics for Engineers	Basic Electronics (Common to EC, El & ET Programs)	Elements of Electrical Engineering (Only for EE Program)	Engineering Science Course - I	Emerging Technology Course	Communicative English-I	Samskrutika Kannada/ Balake Kannada	IDEA LAB (Idea Development, Evaluation & Application)		

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	Max Marks SEE	/ Lab	****	***	50	***	***	50	***	50	
	Max I SI	Theory	100	100	***	100	100	***	50	***	
	SEE Duration	(Hrs)	3	3	3	3	3	2	2	2	
	ırks	Lab	***	***	50	***	***	50	***	50	
	Max Marks CIE	Theory	100	100	***	100	100	***	50	***	
I & ET	CIE Duration	(H)	1.5	1.5	1.5	1.5	1.5	1	1	1	
STRY CYCLE (EC STREAM) EC, EE, EI & ET	Category	0	Theory	Theory+Lab	Lab	Theory	Theory+Lab	Lab	Theory	Lab	
REAM	tion	Total	4	4	3	3	3	1	1	1	20
C ST	Alloca	Р	0	1	1	0	1	1	0	1	Ľ.
E (E	Credit Allocation	Т	1	0	0	0	0	0	0	0	2
YCL	0	L	3	3	2	3	2	0	1	0	13
FRY C	BoS	5	MA	CM	ME	ХХ	ХХ	SSH	SSH	SSH	
II SEMESTER: CHEMIST	Course Title		Vector Calculus, Laplace Transform and Numerical Methods	CM221IB Chemistry of functional materials	Computer Aided Engineering Graphics	Engineering Science Course-II	Programming Languages Course	Communicative English-II	Fundamentals of Indian Constitution	HS125YL Scientific Foundations of Health-Yoga Practice	
	Sl. No. Course Code		MA221TA	CM221IB	ME122GL	XX123XTX	XX125XIX	HS121EL	HS124TC	HS125YL	
	Sl. No.		1	2	33	4	ഹ	9	7	8	

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2022 SCHEME - CREDITS AND COMPONENTS

		I SEMESTER: PHYSIC	LO LY LLE (ME DI KEAM) AD, LH, IM & ME											
SI. No.	Sl. No. Course Code	Course Title	BoS	0	redit	Credit Allocation	tion	Category	CIE Duration	Max Marks CIE	arks	SEE Duration	Max Marks SEE	arks
		1	'n	L	г	Ь	Total		(H)	Theory Lab	Lab	(Hrs)	Theory	Lab
1	MA211TB	Fundamentals of Linear Algebra, Calculus and Differential Equations	MA	ю	1	0	4	Theory	1.5	100	***	3	100	***
2	PY211IB	Classical Physics for Engineers	ΡΥ	З	0	1	4	Theory+Lab	1.5	100	***	3	100	***
с	ME112TA	Elements of Mechanical Engineering	ME	2		0	e	Theory	1.5	100	***	3	100	***
4	XX113XTX	Engineering Science Course - I	XX	3	0	0	3	Theory	1.5	100	***	3	100	***
ഹ	XX114XTX	Emerging Technology Course	XX	З	0	0	e	Theory	1	100	***	3	100	***
9	HS111EL	Communicative English-I	HS	0	0	1	1	Lab	1	***	50	2	***	50
7	HS112KS/ HS113KS	Samskrutika Kannada/ Balake Kannada	SH	1	0	0	1	Theory	1	50	***	2	50	* * *
8	ME111DL	IDEA LAB (Idea Development, Evaluation & Application)	ME	0	0	1	1	Lab	2	* * *	50	2	* * *	50
				14	3	3	20							

Max Marks SEE Lab *** *** ** 20 20 *** 50 Theory 100100100100*** *** \$** Duration (Hrs) SEE c c 3 c ŝ \sim 2 2 Max Marks CIE Lab 50 *** 50 *** 50 *** *** *** Theory 100100 50 *** 100*** Duration II SEMESTER: CHEMISTRY CYCLE (ME STREAM) AS, CH, IM & ME CIE (H) 1.51.51.51.51.5Theory+Lab Theory+Lab Category Theory Theory Theory Lab Lab Lab Total 4 4 ŝ 3 e . **Credit Allocation** Ч 0 0 0 0 F 0 0 0 0 0 ო c 0 2 ന 2 0 BoS XX XX HS SH CM ME HS MA Scientific Foundations of Health-Yoga Practice Vector Calculus and Computational Methods **Computer Aided Engineering Graphics Fundamentals of Indian Constitution** Chemistry of Engineering materials **Course Title** Programming Languages Course **Engineering Science Course-II** Communicative English-II **Course Code** XX123XTX XX125XIX MA221TB CM221IC HS121EL **ME122GL** HS124TC HS125YL SI. No. ഹ 9 4 8 - \sim c 7

Bengaluru - 560059, Karnataka, India

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2022 SCHEME - CREDITS AND COMPONENTS

arks	Lab	***	***	***	***	***	50	* * *	50	
Max Marks SFE	Theory Lab	100	100	100	100	100	***	50	***	
SEE Duration	(Hrs)	3	3	3	3	3	2	2	2	
ırks	Lab	***	***	***	***	***	50	* *	50	
Max Marks CIF	Theory Lab	100	100	100	100	100	***	50	***	
CIE Duration	(H)	1.5	1.5	1.5	1.5	1	1	1	2	
Category	(1090000)	Theory	Theory+Lab	Theory	Theory	Theory	Lab	Theory	Lab	
tion	Total	4	4	3	3	3	1	1	1	20
Allocat	Р	0	1	0	0	0	1	0	1	3
Credit Allocation	Т	1	0	1	0	0	0	0	0	3
Roc Credit Allocation Category	Г	ę	m	2	m	m	0	1	0	14
Ros		MA	ΡΥ	ME	ХХ	XX	HS	SH	ME	
Course Title		Applied Mathematics – I	Applied Physics for Engineers	Engineering Mechanics	Engineering Science Course - I	Emerging Technology Course	Communicative English-I	Samskrutika Kannada/ Balake Kannada	IDEA LAB(Idea Development, Evaluation & Application)	
SI No Course Code		MA211TD	PY2111D	CV112TA	XX113XTX	XX114XTX	HS111EL	HS112KS/ HS113KB	ME111DL	
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	larks E	Lab	***	***	50	***	* *	50	***	50	
	Max Marks SEE	Theory	100	100	***	100	100	***	50	***	
	SEE Duration	(Hrs)	3	3	33	3	e	2	2	2	
	arks	Lab	***	***	50	***	***	50	***	50	
	Max Marks CIE	Theory	100	100	***	100	100	***	50	***	
	CIE Duration	(H)	1.5	1.5	1.5	1.5	1.5	1	1	1	
HEMISTRY CYCLE (CV STREAM) CV	Category	0	Theory	Theory+Lab	Lab	Theory	Theory+Lab	Lab	Theory	Lab	
CV ST	tion	Total	4	4	3	3	33	1	÷,	1	20
CLE (Alloca	Ρ	0	1	2	0	1	1	0	1	9
CVC	Credit Allocation	Т	1	0	0	0	0	0	0	0	2
TRY	C	Г	3	3	1	3	2	0	1	0	12
HEMIS	BoS		MA	CM	ME	XX	XX	SH	HS	SH	
II SEMESTER: CF	Course Title		MA221TD Applied Mathematics – II	CM221ID Engineering And Environmental Chemistry	ME122GL Computer Aided Engineering Graphics	Engineering Science Course-II	XX125XIX Programming Languages Course	HS121EL Communicative English-II	HS124TC Fundamentals of Indian Constitution	Scientific Foundations of Health-Yoga Practice	
	Sl. No. Course Code		MA221TD	CM221ID	ME122GL	XX123XTX	XX125XIX	HS121EL	HS124TC	HS125YL	
	SI. No.		1	2	ŝ	4	ഹ	9	7	8	

Applied Science Courses

- FUNDAMENTALS OF LINEAR ALGEBRA, CALCULUS AND NUMERICAL METHODS (MA211TA)
- FUNDAMENTALS OF LINEAR ALGEBRA, CALCULUS AND DIFFERENTIAL EQUATIONS (MA211TB)
- FUNDAMENTALS OF LINEAR ALGEBRA, CALCULUS AND STATISTICS (MA211TC)
- > APPLIED MATHEMATICS I (MA211TD)
- VECTOR CALCULUS, LAPLACE TRANSFORM AND NUMERICAL METHODS (MA221TA)
- VECTOR CALCULUS AND COMPUTATIONAL METHODS (MA221TB)
- NUMBER THEORY, VECTOR CALCULUS AND COMPUTATIONAL METHODS (MA221TC)
- > APPLIED MATHEMATICS II (MA221TD)
- > CONDENSED MATTER PHYSICS FOR ENGINEERS (PY211IA)

TITIO

- CLASSICAL PHYSICS FOR ENGINEERS (PY211IB)
- > QUANTUM PHYSICS FOR ENGINEERS (PY221IC)
- > APPLIED PHYSICS FOR ENGINEERS (PY211ID)
- CHEMISTRY OF SMART MATERIALS AND DEVICES (CM211IA)
- CHEMISTRY OF FUNCTIONAL MATERIALS (CM221IB)
- > CHEMISTRY OF ENGINEERING MATERIALS (CM221IC)
- > ENGINEERING AND ENVIRONMENTAL CHEMISTRY (CM221ID)



RV College of Engineering®)
Mysore Road, RV Vidyaniketan Post, Bengaluru - 560059, Karnataka, India	

FUND			Semester	:: I			
	AMENTALS			LCULUS AND NUMER	ICAL	METH	ODS
			tegory: Applied S				
	Strea	am: Electror	•	EC, EE, EI & ET Progra	ms)		
Course Code			(Theory		-	100 M	1
Course Code	.	MA211TA	<u> </u>		:	100 M	
Credits: L:T: Total Hours	P :	3:1:0 42L+14T		SEE SEE Duration	:	100 M 03 Hot	
Total Hours	•	42L+141		SEE DUIAUOI	•	05 10	ui s
			Unit – I				09 Hrs
Elementary L	inear Algebra	a: Rank of 1		a matrix by Echelon form	, consi	stency of	
•	0			ations, Gauss elimination		•	•
				, largest eigenvalue by			
Implementation	n using MATL	AB.	*	•••••••••••••••••••••••••••••••••••••••			
			Unit – II				09 Hrs
Differential (Calculus: Basi	cs of polar	coordinates, polar	curves, angle between	radius	vector	and tangent.
Curvature, radi	ius of curvatur	e-Cartesian,	polar & parametric	c forms (without proof), ce	entre ar	d circle	of curvature
				ries for a function of singl	e varial	ole (state	ements only)
and problems.	Simulation using	ng MATLAH		- 54.			
		1.68	Unit – III	Functions of several van			08 Hrs
Multiple Inte	grals: Double 1 change of v	integrals-Ir		- 12	1	Change	08 Hrs
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ventre of gravit Numerical M interpolation a interpolation f backward inter Numerical inter using MATLA Course Outco	ty. Simulation lethods: Finit nd extrapolatic formula, appli- golation, appli- gration-Newto B. mes: After co	duction and using MATL e difference on. Newton-C cation-orient cations-velo on-Cotes app mpleting the	method of evaluati <u>AB</u> . <u>Unit – V</u> es, concept of for Gregory (N-G) for ed problems. Nun- city and acceleration proach–Simpson's e course, the stude	Problems. Applications–A on and problems. Applica orward and backward d ward and backward interp merical differentiation ba on. 1/3 rd , 3/8 th rules and Wed	rea, vo ions-V ifference olation sed or dle's ru	olume a olume o ces, intr formula N-G ules. Imp	of order of nd centre of f a solid and 08 Hrs oduction to ae, Lagrange forward and plementation
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Refere	Reference Books					
1	Higher Engineering Mathematics, B. S. Grewal, 44th Edition, 2015, Khanna Publishers,					
	ISBN: 978-81-933284-9-1.					
2	Calculus, Saturinino L. Salas, Einar Hille and Garret J. Etgen, 10th Edition, 2022, Wiley India,					
	ISBN: 9789390421961.					
3	Schaum's Outline of Advanced Calculus, Robert Wrede and Murray Spiegel, 3rd Edition, 2010, McGraw-					
	Hill Education, ISBN -10: 0071623663, ISBN -13: 978-0071623667.					
4	Advanced Engineering Mathematics, E. Kreyszig, 10th Edition (Reprint), 2016, John Wiley & Sons,					
	ISBN: 978-0470458365.					
5	Calculus, James Stewart, 8th Edition, 2016, Cengage Learning, ISBN: 978-1-285-74062-1.					

#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	40
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (05), Program specific requirements (05), Video based seminar/presentation/demonstration (10), MATLAB (20) ADDING UPTO 40 MARKS .	40
	MAXIMUM MARKS FOR THE CIE THEORY	100

RUBRIC FOR SEMESTER END EXAMINATION (THEORY)				
Q. NO.	CONTENTS	MARKS		
	PART A			
1	Objective type questions covering entire syllabus	20		
	PART B			
	(Maximum of TWO Sub-divisions only)			
2	Unit – I: (Compulsory)	16		
3 & 4	Unit – II: Question 3 or 4	16		
5&6	Unit – III: Question 5 or 6	16		
7 & 8	Unit – IV: Question 7 or 8	16		
9 & 10	Unit – V: Question 9 or 10	16		
	MAXIMUM MARKS FOR THE SEE THEORY	100		



				Semester: I				
F	UNDAMENTALS	OF			LUS AND DIFFEREN	ГIAL	EQUA	ATIONS
Category: Applied Science Course Stream: Mechanical (Common to AS, CH, IM & ME Programs)								
	Str	ean	n: Mechanical (Co		CH, IM & ME Program	ns)		
Cours	e Code		MA211TB	(Theory)	CIE		100 N	Nortes
	ts: L:T:P	:	3:1:0		SEE	:	100 N	
Total 1			42L+14T		SEE SEE SEE Duration		03 Ho	
Total	Hours	:	42L+141		SEE Duration	:	03 H	Durs
			Ur	nit — I				09 Hrs
Eleme	ntary Linear Alge	ebra	Rank of matrice	s-Rank of a n	natrix by Echelon form,	consi	stency	of system of
					ons, Gauss elimination,			
Seidel	methods. Eigenval	lues	and Eigenvector	s-Properties, 1	argest eigenvalue by R	ayleig	gh's po	ower method.
Implen	nentation using MA	TL	AB.					_
				it – II				09 Hrs
Differ	ential Calculus: B	Basic	es of polar coordi	nates, polar c	urves, angle between ra	adius	vector	and tangent.
Curvat	ure, radius of curva	ture	e-Cartesian, polar &	z parametric fo	orms (without proof), cen	tre an	d circl	e of curvature
(formu	lae only) and proble	ems	s. Taylor's and Mac	claurin's series	for a function of single	varial	ole (sta	tements only)
and pro	oblems. Simulation	usir	ng MATLAB.	Voi nei l	A.S. N			
			Uni	it – III	-9/-			08 Hrs
Multiv	variable Functions	s ai	nd Partial Differ	entiation: Fu	nctions of several varia	ables,	Partia	l derivatives-
Multivariable Functions and Partial Differentiation: Functions of several variables, Partial derivatives- Definition and notations, higher order partial derivatives-problems, total differentials, total derivatives, composite								
	tion and notations, h	high	er order partial der	rivatives-probl	ems, total differentials, to	otal de	erivativ	es, composite
Definit					ems, total differentials, to n of two variables-Metho			
Definit functio		rob	lems. Extreme valu	es for function	n of two variables-Metho			
Definit functio	ons and chain rule-P	rob	lems. Extreme valublems. Simulation	es for function	n of two variables-Metho			
Definit functio Jacobia	ons and chain rule-P ans - Properties and	Prob pro	lems. Extreme valu blems. Simulation Un	tes for function using MATLA it – IV	n of two variables-Metho	od of I	Lagrang	ge multipliers.
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Definit function Jacobia Multip integra gravity center Linear equation nonhor on inp Cauchy	ons and chain rule-P ans - Properties and ole Integrals: Dou ation and change of 7. Triple integrals-In of gravity. Simulation of gravity. Simulation r Ordinary Different on with constant mogeneous equation out function (force for y equation. Applicat e Outcomes: After Explore the fundation integrals and different Apply theoretical	Prob pro ble f va atroo on u entist cons-C func- tion con ame eren cor	lems. Extreme valu blems. Simulation Un integrals–Introduc ariables to polar c duction and method ising MATLAB. Un al Equations of H coefficients. Solut concept of Inverse ction), method of s-Simple harmonic npleting the cours ntal concepts of lin tial equations. (PO ncept of linear alge	tes for function using MATLA it – IV tion and method oordinates-Pro- l of evaluation it – V ligher Order: tion of hom differential op variation of pa motion, LRC e, the students hear algebra, d 1, PO2) bra, differentia	n of two variables-Metho B. nod of evaluation-Proble blems. Applications-Ar- and problems. Application Standard form of highe nogeneous equations-co- erator, methods of findin arameters. Equations wit circuits. Implementation s will be able to ifferential calculus, partial l calculus, partial differe	ems. ea, vo ons-V er ord omple g part h fun using al diff	Change olume olume er line mentar icular ctional MATL Ferentia	08 Hrs e of order of and center of of a solid and 08 Hrs ar differential ry functions. integral based coefficients- AB.
Definit function Jacobia Multip integra gravity center Linear equation nonhor on inp Cauchy Course CO1	ons and chain rule-P ans - Properties and ole Integrals: Dou ation and change of 7. Triple integrals-In of gravity. Simulation of gravity	Prob pro pro ble f va ntroc on u entia t con func tion con ame eren cor quat	lems. Extreme valu blems. Simulation Un integrals–Introduc ariables to polar c duction and method using MATLAB. Un al Equations of H coefficients. Solut concept of Inverse ction), method of s-Simple harmonic npleting the cours ntal concepts of lin tial equations. (PO ncept of linear alge ions and evaluate t	ties for function using MATLA it - IV tion and method oordinates-Pro- l of evaluation it - V ligher Order: tion of hom differential op variation of para motion, LRC e, the students hear algebra, d 1, PO2) bra, differentia he problems ar	n of two variables-Metho B. nod of evaluation-Proble blems. Applications-Ar- and problems. Application Standard form of highe nogeneous equations-co erator, methods of findin arameters. Equations wit circuits. Implementation s will be able to ifferential calculus, parti l calculus, partial differe ising in engineering disci	ems. ea, vo ons-V er ord omple g part h fun using al diff ntiatio	Change olume olume er line mentar icular ctional MATL cerentia	08 Hrs e of order of and center of of a solid and 08 Hrs ar differential y functions. integral based coefficients- AB.
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Definit function Jacobia Multip integra gravity center Linear equation nonhor on inp Cauchy Course CO1	bins and chain rule-P ans - Properties and ble Integrals: Dou ation and change of 7. Triple integrals-In of gravity. Simulation of gravit	Prob pro pro ble f va ntroc on t entia t con function con con cor quat ion ial c	lems. Extreme valu blems. Simulation Un integrals–Introduc ariables to polar c duction and method ising MATLAB. Un al Equations of H coefficients. Solut concept of Inverse ction), method of s-Simple harmonic npleting the cours ntal concepts of lin tial equations. (PO neept of linear alge ions and evaluate the of the modern eng- alculus, partial diff	ties for function using MATLA it - IV tion and method oordinates-Pro- l of evaluation it - V ligher Order: tion of hom differential op- variation of pa- motion, LRC e, the students hear algebra, d 1, PO2) bra, differentia he problems and ineering problems and ineering problems and ineering problems and ineering of linear	n of two variables-Metho B. nod of evaluation-Proble blems. Applications-Ar- and problems. Application Standard form of highe nogeneous equations-co erator, methods of findin arameters. Equations wit circuits. Implementation s will be able to ifferential calculus, partial differe ising in engineering disci- ems solved using approp	ems. ea, vo ons-V er ord omple g part h fun using al diff ntiation ipline. riate t	Change olume olume er line mentar icular icular ctional MATL rerentia	08 Hrs 08 Hrs e of order of and center of of a solid and 08 Hrs ar differential ry functions. integral based coefficients- AB. tion, multiple tiple integrals PO2) ues of linear ons.



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#	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY) COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	40
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (05), Program specific requirements (05), Video based seminar/presentation/demonstration (10), MATLAB (20) ADDING UPTO 40 MARKS .	40
	MAXIMUM MARKS FOR THE CIE THEORY	100

Q. NO.	RUBRIC FOR SEMESTER END EXAMINATION (THEORY) CONTENTS	MARKS
Q. NO.		MAKAS
	PART A	
1	Objective type questions covering entire syllabus	20
	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit – V: Question 9 or 10	16
·	MAXIMUM MARKS FOR THE SEE THEORY	100



Semester: I	
FUNDAMENTALS OF LINEAR ALGEBRA, CALCULUS AND STATISTICS	
Category: Applied Science Course	
Stream: Computer Science (Common to AI, BT, CS, CY, CD & IS Programs)	
(Theory)	

Course Code	:	MA211TC	CIE	:	100 Marks
Credits: L:T:P	:	3:1:0	SEE	:	100 Marks
Total Hours	:	42L+14T	SEE Duration	:	03 Hours

Unit – I	09 Hrs
Elementary Linear Algebra: Rank of matrices-Rank of a matrix by Echelon form, consistency of	of system of
linear equations- homogeneous and non-homogeneous equations, Gauss elimination, Gauss-Jordan	and Gauss-
Seidel methods. Eigenvalues and Eigenvectors-Properties, largest eigenvalue by Rayleigh's pow	wer method.
Implementation using MATLAB.	
Unit II	00 IIma

Unit – II	09 Hrs
Differential Calculus: Basics of polar coordinates, polar curves, angle between radius vector	and tangent.
Curvature, radius of curvature-Cartesian, polar & parametric forms (without proof), center and circle	of curvature
(formulae only) and problems. Taylor's and Maclaurin's series for a function of single variable (state	ements only)
and problems. Simulation using MATLAB.	
	0.0 11

Unit – III08 HrsMultivariable Functions and Partial Differentiation: Functions of several variables, Partial Derivatives-
Definition and notations, higher order partial derivatives-problems, total differentials, total derivatives, composite
functions and chain rule-Problems. Extreme values for function of two variables-Method of Lagrange multipliers.
Jacobians - Properties and problems. Simulation using MATLAB.

Unit – IV08 HrsMultiple Integrals: Double integrals–Introduction and method of evaluation-Problems. Change of order of
integration and change of variables to polar coordinates-Problems. Applications–Area, volume and center of
gravity. Triple integrals-Introduction and method of evaluation and problems. Applications-Volume of a solid and
center of gravity. Simulation using MATLAB.

Unit – V08 HrsStatistics: Central moments, mean, variance, coefficients of skewness and kurtosis in terms of moments. Curve
fitting by method of least squares, fitting of curves–Polynomial, exponential and power functions. Correlation and
linear regression analysis–Problems. Applications. Implementation using MATLAB.

Course	e Outcomes: After completing the course, the students will be able to
CO1	Explore the fundamental concepts of linear algebra, differential calculus, partial differentiation, multiple
	integrals and Statistics. (PO1, PO2)
CO2	Apply theoretical concept of linear algebra, differential calculus, partial differentiation, multiple integrals
	and statistics and evaluate the problems arising in engineering discipline. (PO1, PO2)
CO3	Analyze the solution of the modern engineering problems solved using appropriate techniques of linear
	algebra, differential calculus, partial differentiation, multiple integrals and statistics. (PO5, PO6)
CO4	Enhance your comprehensive understanding of linear algebra, calculus, and statistics to effectively tackle
	and illustrate solutions to real-world problems. (PO6, PO11)

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	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)	1
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be	
	conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES	20
	WILL BE THE FINAL QUIZ MARKS.	
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity	
	levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying,	
	Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests	40
	and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto	
	100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and	
	practical implementation of the problem. Case study-based teaching learning (05), Program	40
	specific requirements (05), Video based seminar/presentation/demonstration (10),	40
	MATLAB (20) ADDING UPTO 40 MARKS.	
	MAXIMUM MARKS FOR THE CIE THEORY	100

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)	
Q. NO.	CONTENTS	MARKS
	PART A	
1	Objective type questions covering entire syllabus	20
	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7&8	Unit – IV: Question 7 or 8	16
9 & 10	Unit – V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100
	WSTITUTIONS	



				Semester: I				
				CD MATHEMATICS				
			0.	: Applied Science Co				
			Stream: C	ivil (Only to CV Pro	gram)			
				(Theory)			1	
Course		:	MA211TD		CIE	:	-	Aarks
	s: L: T: P	:	3:1:0		SEE	:		
Total I	Hours	:	42L+14T		SEE Duration	:	03 He	ours
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	/ T· /1	1		$\frac{\text{nit} - \mathbf{I}}{\mathbf{D} + \mathbf{I}}$			• ,	09 Hrs
	•			s-Rank of a matrix	•		•	•
				geneous equations, G s-Properties, largest				
	nentation using MA'			s-rioperties, largest	eigenvalue by r	caylei	gn's po	ower method.
mpien	iontation using wirt	1 1.7		it – II				09 Hrs
Multiv	ariable functions	an		entiation: Functions	of several varia	bles	Partial	
				rivatives-problems, to				
				ies for function of tw				
	ns-Properties and p						0 0	Î
	•			it – III	Mr. N			08 Hrs
Multip	le Integrals: Doul	ble	integrals-Introduc	tion and method of	evaluation-Probl	ems.	Change	e of order of
integrat	tion and change of	f va	ariables to polar c	oordinates-Problems.	Applications-Ar	ea, v	olume	and center of
gravity	. Triple integrals-In	troc	duction and method	l of evaluation and pr	oblems. Applicati	ons-V	/olume	of a solid and
center of	of gravity. Simulation	on u	using MATLAB.		121			
		- (it – IV	12			08 Hrs
				ligher Order: Stand				
				n of homogeneous				
				differential operator,				
				variation of parameter				
Cauchy	equation. Applicat	10n		motion, LRC circuits	s. Implementation	using	MAIL	
<u> </u>	•	Υ.		<u>vit – V</u>			C	08 Hrs
				pefficients of skewne				
				es–Polynomial, expo		func	ions. C	orrelation and
linear r	egression analysis-	Pro	blems. Application	s. Implementation usi	ng MAILAB.			
Course	Outcomes After	000	nulating the cours	a the students will b	a abla ta			
Course CO1				e, the students will b near algebra, differen		a1 d4	Formatio	tion multiple
COI	integrals and statis			lear argeora, unreren	tial calculus, parti	ai un	lelenua	aton, multiple
CO2				ora, differential calcul	lus partial differe	ntiati	n mul	inle integrals
002	11 2		1 0	evaluate the problems	· .			1 U ·
	(PO1, PO2)	0115	and statistics and c	valuate the problems	arising in enginee	ing	anserprin	ic.
CO3		ion	of the modern eng	ineering problems so	lved using approp	riate	technia	ues of linear
				differentiation, mul				
	statistics. (PO5, I				-r			The second second
CO4	. ,		7	anding of linear alg	gebra, calculus,	differ	ential e	quations and
	-	-		ate solutions to real-w				1
			•		L · · · · (-	- , -	,	

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	MAXIMUM MARKS FOR THE SEE THEORY	100



RV College of Engineering [®]
Mysore Road, RV Vidyaniketan Post,
Bengaluru - 560059, Karnataka, India

Vector Differentiation: Vector valued functions–2D and 3D scalar and vector fields. Gradient of a scalar f Normal vector to the surface, directional derivative, scalar potential. Divergence and curl of a vector Laplacian of scalar field, Solenoidal and irrotational fields, physical interpretations. Expressions for grad divergence, curl and Laplacian in cylindrical, spherical-polar coordinates. Simulation using MATLAB. Unit – II 091 Vector Integration: Line, surface and volume integrals. Green's theorem, Stokes theorem and Gauss diverg theorem (statements only)-Problems, solenoidal fields and irrotational fields. Work done by a force. Simul using MATLAB. 011 – III 081 Laplace Transform: Existence and uniqueness of Laplace transform (LT), transform of elementary funct region of convergence. Properties - linearity, scaling, s - domain shift, differentiation in the s - domain, division t, differentiation using MATLAB. 081 Interse Laplace Transform: Definition, properties, evaluation using different methods. Convolution the summary of the transform: Definition, properties, evaluation using different methods. Convolution the (without proof), problems. Application to solve ordinary linear differential equations. Implementation MATLAB. 081 Numerical Methods: Algebraic and transcendental equations–Roots of equations, intermediate value prog Regula-Falsi and Newton-Raphson methods. Methods of solving first order ordinary differential equations differential equations intermediate value prog Regula-Falsi and Newton-Raphson methods. Methods of solving first order ordinary differential equations ing MATLAB. 081 Course Outcomes: After completing the course, the students wil					Semester: I	[
Category: Applied Science Course Stream: Electronics (Common to EC, EE, EI & ET Programs) Course Code IMA221TA CIE : 100 Marks Tredits: LT:P : 100 Marks Total Hours CIE : 100 Marks Total Hours CIE : 100 Marks Stee Our and Laplacian is : Addition Marks Stee Our and Laplacian is cylindrical, spherical-polar coordinates. Simulation using MATLAB. OP1 Vector Integration: Line, surface and volume integrals. Green's theorem, Stokes theorem and Gauss divers theorem (statements only)-Problems, solenoidal fields and irrotational fields. Wysication of elementary function (statements only)-Problems, solenoidal fields and irrotational fields. Work doub by a force. Simulation and integration in the time domain. LT of special functions. Periodic functions (square vaw-tooth wave, triangular wave, full & half wave rectifier), Heaviside unit step function, unit impulse function inft propert		VECTOR CA	ALC	ULUS. LAPLA			ICAL M	ЕТ	THODS	
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Cheory CHeory Course Code : MA221TA CIE : 100 Marks Fotal Hours : 42L+14T SEE : 100 Marks Fotal Hours : 42L+14T SEE Data 03 Hours Vector Differentiation: Vector valued functions-2D and 3D scalar and vector fields. Gradient of a scalar for a scalar field, Solenoidal and irrotational fields, physical interpretations. Expressions for gradivergence, curl and Laplacian in cylindrical, spherical-polar coordinates. Simulation using MATLAB. 09 1 Vector Integration: Line, surface and volume integrals. Green's theorem, Stokes theorem and Gauss divergheorem (statements only)-Problems, solenoidal fields and irrotational fields. Work done by a force. Simulating MATLAB. 09 1 Unit – III Unit – III 08 1 Laplace Transform: Existence and uniqueness of Laplace transform (LT), transform of elementary funce egion of convergence. Properties - linearity, scaling, s - domain shift, differentiation in the s - domain, divisio, differentiation and integration in the time domain. LT of special functions Periodic functions (square v aw-tooth wave, triangular wave, full & half wave rectifier). Heaviside unit step function, unit impulse function if property. Implementation using MATLAB. 08 1 Unit – IV Unit – IV 08 1 100 Marks Inverse Laplace Transf		St	trean	0	• • •		orams)			
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4	Advanced Engineering Mathematics, E. Kreyszig, 10 th Edition (Reprint), 2016, John Wiley & Sons, ISBN: 978-04-704-5836-5.
5	Advanced Modern Engineering Mathematics, Glyn James and Phil Dyke, 5 th Edition, 2018, Pearson Education, ISBN-13 978-1292174341, ISBN-10 9780273719236.

#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	40
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (05), Program specific requirements (05), Video based seminar/presentation/demonstration (10), MATLAB (20) ADDING UPTO 40 MARKS .	40
	MAXIMUM MARKS FOR THE CIE THEORY	100

Q. NO.	CONTENTS	MARKS
	PART A	
1	Objective type questions covering entire syllabus	20
	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit – V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100



Semester: II VECTOR CALCULUS AND COMPUTATIONAL METHODS Category: Applied Science Course

Stream: Mechanical (Common to AS, CH, IM & ME Programs) (Theory)

			(Theory)			
Course Code	:	MA221TB		CIE	••	100 Marks
Credits: L:T:P	:	3:1:0		SEE	:	100 Marks
Total Hours	:	42L+14T		SEE Duration	••	03 Hours

Unit – I	09 Hrs
Vector Differentiation: Vector valued functions-2D and 3D scalar and vector fields. Derivative	ve of vector
function, tangent, velocity and acceleration. Gradient of a scalar field-Normal vector to the surface	e, directional
derivative, scalar potential. Divergence and curl of a vector field, Laplacian of scalar field, Sol	lenoidal and
irrotational fields, physical interpretations. Simulation using MATLAB.	
Unit – II	09 Hrs

	071115
Vector Integration: Line, surface and volume integrals. Green's theorem, Stokes theorem and Gaus	s divergence
theorem (statements only)-Problems, solenoidal fields and irrotational fields. Work done by a force	. Simulation
using MATLAB.	

 Unit – III
 08 Hrs

 Partial Differential Equations: Formation of partial differential equations by elimination of arbitrary constants/functions, solution of Lagrange's linear equation. Solution of partial differential equations by method of separation of variables. Solution to wave and heat equations in one dimension and Laplace equation in two dimensions by the method of separation of variables, problems.

 Unit – IV
 08 Hrs

 Numerical Methods – I: Algebraic and transcendental equations–Roots of equations, intermediate value property, Regula-Falsi and Newton-Raphson methods. Methods of solving first order ordinary differential equation– Taylor's series method, 4th order Runge-Kutta method and Milne predictor–corrector method. Implementation using MATLAB.

 Unit – V
 08 Hrs

 Numerical Methods – II: Finite differences, concept of forward and backward differences, introduction to interpolation and extrapolation. Newton-Gregory (N-G) forward and backward interpolation formulae, Lagrange interpolation formula, application-oriented problems. Numerical differentiation based on N-G forward and backward interpolation, applications-velocity and acceleration.

Numerical integration-Newton-Cotes approach–Simpson's 1/3rd, 3/8th rules and Weddle's rule. Implementation using MATLAB.

Course	e Outcomes: After completing the course, the students will be able to
CO1	Explore the fundamental concepts of vector calculus, partial differential equations and numerical
	methods. (PO1, PO2)
CO2	Apply the acquired knowledge of vector calculus, partial differential equations and numerical methods
	and evaluate the problems of engineering applications. (PO1, PO2)
CO3	Analyze the solution of the modern engineering problems solved using appropriate techniques of vector
	calculus, partial differential equations and numerical methods to the real - world problem and optimize
	the solution. (PO5, PO6)
CO4	Enhance your comprehensive understanding of vector calculus, partial differential equations and
	numerical methods to effectively tackle and illustrate solutions to real-world problems. (PO6, PO11)

Refere	ence Books
1	Higher Engineering Mathematics, B. S. Grewal, 44 th Edition, 2015, Khanna Publishers,
	ISBN: 978-81-933284-9-1.
2	Calculus, Saturnino L. Salas, Einar Hille and Garret J. Etgen, 10th Edition, 2022, Wiley India,
	ISBN: 9789390421961.
3	Advanced Engineering Mathematics, E. Kreyszig, 10th Edition (Reprint), 2016, John Wiley & Sons,



		ISBN: 978-0470458365.
	4	Numerical methods for scientific and engineering computation, M.K. Jain, S.R.K. Iyenger and R.K. Jain,
		6 th Edition, 2012, New Age International Publishers, ISBN: 9788122433234, 8122433235.
Γ	5	Advanced Modern Engineering Mathematics, Glyn James and Phil Dyke, 5th Edition, 2018, Pearson
		Education, ISBN-13 978-1292174341, ISBN-10 9780273719236.

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)	r
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS .	40
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	MAXIMUM MARKS FOR THE CIE THEORY	100

Q. NO.	CONTENTS	MARKS
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3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit – V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100



				Semester: II				
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			,	: Applied Science C				
	Stream: Co	omp		ommon to AI, BT, C		gra	ms)	
			`	(Theory)	, ,	0	,	
Course	e Code	:	MA221TC		CIE	:	100 M	arks
	s: L:T:P		3:1:0		SEE	:	100 M	
Total H			42L+14T		SEE Duration	:	03 Hot	
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			Uı	nit — I				09 Hrs
Numbe	er Theory: Divisil	oilit		mon divisor, prime	numbers, propertie	es	of prim	e numbers.
				e, linear congruence				
				on. Implementation u		•154		i s' incoroni,
		- p		it – II				09 Hrs
Vector	Differentiation: V	lect	-	ons–2D and 3D scal	ar and vector field	s T	Derivativ	
				adient of a scalar field				
				irl of a vector field.				
				ation using MATLA		1 11		enoidar and
motan	ondi neids, physical	me		it – III				08 Hrs
Veeter	Internation Line	annef		ntegrals. Green's the	nome Stalvas thaanan		d Cana	
	÷ .	Prot	blems, solenoidal	fields and irrotationa	al fields. Work done	by	a force	. Simulation
using N	MATLAB.	<u> </u>	N/		1121			
		-		it – IV	121			08 Hrs
				ligher Order: Stand				
-	on with constant	co		ion of homogeneo	ous equations-Com	iple	mentary	
						-		
				differential operator,				tegral based
	ut function (force fu	inct	ion), method of	differential operator, variation of parameter	ers. Equations with	fun	ctional o	tegral based
	ut function (force fu	inct	ion), method of	differential operator,	ers. Equations with	fun	ctional o	tegral based coefficients- AB.
Cauchy	ut function (force fu equation. Application	inct ons-	ion), method of <u>s</u> Simple harmonic Un	differential operator, variation of paramete motion, LRC circuits it – V	ers. Equations with a Implementation us	fun ing	ctional o MATLA	tegral based coefficients– AB. 08 Hrs
Cauchy	ut function (force fu equation. Application	inct ons-	ion), method of <u>s</u> Simple harmonic Un	differential operator, variation of parameter motion, LRC circuits	ers. Equations with a Implementation us	fun ing	ctional o MATLA	tegral based coefficients– AB. 08 Hrs
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KUUUU	Ince books
1	Higher Engineering Mathematics, B. S. Grewal, 44th Edition, 2015, Khanna Publishers,
	ISBN: 978-81-933284-9-1.
2	Schaum's Outline of Advanced Calculus, Robert Wrede and Murray Spiegel, 3rd Edition, 2010, McGraw-
	Hill Education, ISBN -10: 0071623663, ISBN -13: 978-0071623667.
3	Elementary Number Theory, David M. Burton, McGraw Hill, 7th Edition, ISBN: 978-0-07-338314-9.
4	Discrete and Combinatorial Mathematics, Ralph P. Grimaldi, 5 th Edition, 2006, Pearson Education,
	ISBN-13: 978-81-7758-424-0.



5 Advanced Modern Engineering Mathematics, Glyn James and Phil Dyke, 5th Edition, 2018, Pearson Education, ISBN-13 978-1292174341, ISBN-10 9780273719236.

#	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY) COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	40
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (05), Program specific requirements (05), Video based seminar/presentation/demonstration (10), MATLAB (20) ADDING UPTO 40 MARKS .	40
	MAXIMUM MARKS FOR THE CIE THEORY	100

Q. NO.	CONTENTS	MARKS
	PART A	
1	Objective type questions covering entire syllabus	20
	PART B (Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit – V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100
	WSTITUTIONS	



				Semester: II				
			APPLIE	D MATHEMATIC	S – II			
			Category	y: Applied Science (Course			
				ivil (Only to CV Pro				
				(Theory)				
Course	Code	:	MA221TD		CIE	:	100 N	Iarks
Credits	s: L:T:P	:	3:1:0		SEE	:	100 N	Aarks
Total H	Hours	:	42L+14T		SEE Duration	:	03 He	ours
							•	
			Ur	nit – I				09 Hrs
Vector	Differentiation:	Vec	tor valued function	ons-2D and 3D sca	lar and vector fi	elds. I	Derivat	ive of vector
functio	n, tangent, velocity	an	d acceleration. Gra	adient of a scalar fie	ld-Normal vector	to the	e surfac	e, directional
				rl of a vector field				
				ation using MATLA				
				it – II				09 Hrs
Vector	Integration: Line,	, sui	rface and volume i	ntegrals. Green's the	orem, Stokes theo	orem a	nd Gau	ss divergence
				fields and irrotation				
	IATLAB.		11	SHANA				
0			Uni	it – III				08 Hrs
Lanlac	e Transform: Exis	sten		of Laplace transform	n transform of el	ement	arv fun	
				s - domain shift, dif				
(withou	it proof), problems			n. rties, evaluation usi ve ordinary linear d				
(withou	it proof), problems		application to solv	rties, evaluation usi /e ordinary linear d				ntation using
(withou MATL	it proof), problems AB.	s. A	Application to solv	rties, evaluation usi ze ordinary linear d it – IV	ifferential equation	ons. Ir	npleme	ntation using
(withou MATLA Numer	it proof), problems AB. ical Methods – I	s. A	Application to solv Un Algebraic and Tra	rties, evaluation usi ze ordinary linear d it – IV inscendental equatio	ifferential equation	ons. Ir	npleme	ntation using
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(withou <u>MATL</u> Numer property Taylor	it proof), problems AB. ical Methods – I y, Regula-Falsi and s and Maclaurin's	s. A I: A I Ne ser	Application to solv Un Algebraic and Tra wton-Raphson met ies for a function	rties, evaluation usi ve ordinary linear d it – IV inscendental equatio hods. of single variable an	ifferential equations ns-Roots of equation nd problems. Met	ons. Ir ations, hods c	interr	ntation using 08 Hrs nediate value ng first order
(withou MATLA Numer property Taylor' ordinar	tt proof), problems AB. ical Methods – I y, Regula-Falsi and s and Maclaurin's y differential equa	s. A I: A I Ne ser	Application to solv Un Algebraic and Tra wton-Raphson met ies for a function n-Taylor's series	rties, evaluation usi ve ordinary linear d it – IV inscendental equation hods. of single variable and method, 4th order	ifferential equations ns-Roots of equation nd problems. Met	ons. Ir ations, hods c	interr	ntation using 08 Hrs nediate value ng first order
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Refere	Reference Books				
1	Higher Engineering Mathematics, B. S. Grewal, 44 th Edition, 2015, Khanna Publishers,				
	ISBN: 978-81-933284-9-1.				
2	Calculus, Saturnino L. Salas, Einar Hille and Garret J. Etgen, 10th Edition, 2022, Wiley India,				
	ISBN: 9789390421961.				



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3	Advanced Engineering Mathematics, E. Kreyszig, 10 th Edition (Reprint), 2016, John Wiley & Sons, ISBN: 978-0470458365.
4	Numerical methods for scientific and engineering computation, M. K. Jain, S. R. K. Iyenger and R. K.
	Jain, 6 th Edition, 2012, New Age International Publishers, ISBN: 9788122433234, 8122433235.
5	Advanced Modern Engineering Mathematics, Glyn James and Phil Dyke, 5th Edition, 2018, Pearson
	Education, ISBN-13 978-1292174341, ISBN-10 9780273719236.

#	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY) COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	40
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (05), Program specific requirements (05), Video based seminar/presentation/demonstration (10), MATLAB (20) ADDING UPTO 40 MARKS .	40
	MAXIMUM MARKS FOR THE CIE THEORY	100

Q. NO.	CONTENTS	MARKS
	PART A	
1	Objective type questions covering entire syllabus	20
	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit – V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100



			Semeste	r: I			
		CONDENS	ED MATTER PHY	SICS FOR ENGINEER	S		
			Category: Applied S	Science Course			
	St	ream: Electr	conics (Common to	EC, EE, EI & ET Progr	ams)		
			(Theory and I	Practice)			
Course	e Code	: PY21114	A	CIE	:	100 Marks	
Credits	s: L:T:P	: 3:0:1		SEE	:	100 Marks	
Total H	Hours	: 42 L + 3	OP	SEE Duration	1 :	03 Hours	
			Unit – I			08 H	Irs
Ouanti	m Mechanics: (le Broglie I		atter Waves, Phase Vel	ocity ar		
-	berg's Uncertainty	-	• •		erey a		<i>,</i>
				chrodinger wave equatio	n. Expe	ctation value. F	ligen
				limensional potential well			
problem		-,	- F	r		,	
<u> </u>			Unit – II		0	08 H	Irs
Basics	of Solid-State Phys	sics	JUCHA	NA	<u> </u>		
			Duantum free electro	on theory and failures. E	and the	orv of solids. F	ermi
			s, carrier concentrati			orj or somes, r	•••••
0.	-			intrinsic semiconductors,	Express	ion for concentra	ation
				ss action, Electrical cond			
				ni level with temperatu			
			efficient (derivation).		ie una	doping in ond	111010
senneon	inductor, mair effect	und man coc	Unit – III	13	1 -	09 H	Irs
Locore	and Optical Fiber		Cint III		-	071	115
Optical	I Fibers: Propagat			n Defence and Laser Prin			
	Discussion of block		oint-to-Point commu	ure derivation, Modes of nication, Optical fiber ser		nerical problems	S.
Semico							S.
	onductor devices	diagram of Po	oint-to-Point commu Unit – IV	nication, Optical fiber ser	isor. Nur	nerical problems 08 H	8. [rs
Diodes	nductor devices : Direct and indirect	diagram of Po t band gap, l	oint-to-Point commu Unit – IV Band gap engineerin	nication, Optical fiber ser	ward an	nerical problems 08 H d reverse bias, c	s. Irs liode
Diodes: equation	nductor devices Direct and indirect n, V-I characteristi	diagram of Po t band gap, l c, Applicatio	oint-to-Point commu Unit – IV Band gap engineerin on: bridge rectifier, b	nication, Optical fiber ser	ward an	nerical problems 08 H d reverse bias, c	s. Irs liode
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Diodes: equation breakdo Transis	onductor devices : Direct and indirect n, V-I characteristic own, Zener diode as stors: Bi-junction	diagram of Po et band gap, l c, Applicatio voltage regu	oint-to-Point commu Unit – IV Band gap engineerin on: bridge rectifier, b ilator. or, V-I characteristi	nication, Optical fiber ser g, P-N junction diode-for preakdown mechanism in cs in Common Emitter, 0	ward and diodes:	d reverse bias, c Avalanche & Z	s. Irs liode Zener
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Diodes: equation breakdo Transis Collecto Dielecto Dielecto Mossott Capacit problem Transd tempera	mductor devices Direct and indirect n, V-I characteristic own, Zener diode as stors: Bi-junction por or configuration, Clarity rics and Transduce ric Properties: Por ti equation (Derivant tors, Frequency depondent tors, Frequency depondent tors, Stress-Strant ature transducer – T e Outcomes: After Apply the princip design of Opto-elector	diagram of Period to band gap, I c, Application voltage regu- colar transiste configuration ers lar and non- tion), solid, endency of con- tin curve, methermocouple completing to the physics extronic device thing mecha	oint-to-Point commu Unit – IV Band gap engineerin on: bridge rectifier, b ilator. or, V-I characteristion on as an amplifier. N Unit – V polar dielectrics, Ty liquid and gaseous dielectric constant, E moduli of elasticity es. Numerical problect the course, the study s in the behavioral st ces. (PO1, PO2) misms of engineeric	nication, Optical fiber ser g, P-N junction diode-for preakdown mechanism in cs in Common Emitter, O umerical problems. pes of Polarization, inter dielectrics. Application o lectrical insulation – Die , strain gauge, ultrason ms.	ward and diodes: Common nal field f dielect lectric bi ic piezo	nerical problems 08 H d reverse bias, d Avalanche & Z Base and Com 09 H s in solid, Clau rics in transform reakdown Nume pelectric transdom eir properties form	s. Irs liode Zener mon Irs sius- ners, prical ucer, r the

CO3 Investigate the engineering problems associated with optoelectronic devices. (PO2)

CO4 Develop and propose experiments and sustainable solutions for the challenges in real time applications.



(PO3, PO5, PO6, PO8, PO11)

Refere	nce Books
1	Grob's basic electronics, Mitchel E Schultz, McGrahill editon, 10th edn, 2007, ISBN 978-0-07-3373874.
2	A Textbook of Engineering Physics, M. N. Avadhanulu and P G Kshirsagar, S. Chand publications, 2019, ISBN : 978-93-528-3399-3.
3	Physics for Degree students, C.L. Arora and Dr. P. S. Hemne, S Chand, revised 2010, ISBN: 978-81-219-33506.
4	Engineering Physics, R K Gaur and S L Gupta, Dhanpat Rai Publications, 2011, ISBN: 978-8-18-9928223.
5	Solid state electronic devices, Ben G Streetman and Sanjay Kumar Banerjee, 6 th edition, PHI learning, 2009, ISBN: 978-81-203-30207.

Labor	atory Experiments (EE stream)
1	Wavelength of laser by diffraction.
2	Numerical aperture of an optical fiber.
3	Transistor characteristics.
4	Band gap of thermistor.
5	Hall coefficient experiment.
6	Black box experiment.
7	Four probe experiment.
8	Fermi Energy.
9	Charging & discharging of a capacitor.
10	Photo Diode.
11	Exp Eyes experiment: LCR
12	Exp Eyes experiment: Wavelength of LED and I-V characteristics of Zener diode.

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY WITH LA	AB)
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	10
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 30 MARKS.	30
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (10) ADDING UPTO 30 MARKS .	30
4	LAB: Conduction of laboratory exercises, lab report, observation and analysis (30 Marks), lab test (10 Marks) and Innovative Experiment/ Concept Design and Implementation (10 Marks) adding up to 50 Marks. THE FINAL MARKS WILL BE REDUCED TO 30 MARKS	30
	MAXIMUM MARKS FOR THE CIE THEORY	100



	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)							
Q. NO.	. NO. CONTENTS MARKS							
	PART A							
1	Objective type questions covering entire syllabus	10						
	PART B							
	(Maximum of TWO Sub-divisions only)							
2	Unit – I: (Compulsory)	14						
3 & 4	Unit – II: Question 3 or 4	14						
5&6	Unit – III: Question 5 or 6	14						
7 & 8	Unit – IV: Question 7 or 8	14						
9 & 10	Unit – V: Question 9 or 10	14						
11	Lab Component (Compulsory)	20						
	MAXIMUM MARKS FOR THE SEE THEORY	100						





		Semester: I				
		CAL PHYSICS FC				
		gory: Applied Scie				
Str	eam: Mechanica		CH, IM & ME Program	IS)		
Course Code	: PY211IB	(Theory and Pra	CIE		100 Ma	mlra
Course Coue	: 3:0:1		SEE	:	100 Ma 100 Ma	
Total Hours	: 42 L+30P		SEE Duration	:	03 Hou	
	• 42 11 501		SEE Duration	•	05 1100	15
		Unit – I				06 Hrs
Free, Damped and Forc	ed Vibration: S		notion (SHM), differential	l equ		
derivation), Spring mass ar				-		
Theory of damped oscilla						
of damped oscillations, 7	Theory of forced	l oscillations (Qua	litative), resonance and	shar	pness of	resonance.
Numerical problems						0.011
Elastic Properties of Mat	miola. Tunos of	Unit – II	ross Strain aquivalance ra	latio	na Dalat	09Hrs
Elastic constants, Bending		the second s				
		States in the second	ai axis, expression for ben	ung	moment	of a beam.
Single cantilever (derivatio			1.1.1.6.4	1		
Forsion of a Shaft : Expre period and rigidity modulu		•	solid shaft, torsion pendu	lium:	expressi	on for time
berioù alla figiulty filodulu	s, Numerical proc	Unit – III	121			09 Hrs
Fundamentals of Therm	odynamics. Intr		odvnamics: Quasi – statio	nro	icess Zei	
Numerical problems. First law of thermodynar process and cyclic process System. Numerical probler	, Application of		· ·		•	
System. Numerical problem		Unit – IV				09 Hrs
Basic concepts of Fluid	Mechanics: Defi		ncept of continuum, class	sifica	tion of f	
Properties, Newton's Law cavitation, Bulk Modulus Numerical problems. Fundamentals of Fluid F in Integral form and three-o	and Compress lows: Types of F	ibility, Ultrasonic luid Flows, Stream	interferometer. Surface line, Streak line and Path	tens	ion and	capillarity.
		Unit – V	-			09 Hrs
Material Characterizatio	n: Mechanical C		ensile and yield strength,	Duct	ility, Tou	
Hardness), Optical Charact			• •		•	0
Crystallinity, particle distri			,		X • -	0
Instrumentation Technic	•		working of X-ray Diffra	ctom	eter. crv	stallite size
determination by Scherre					-	
Microscopy (AFM), X-1	•	•	e 11			
Transmission Electron Mic	• •			, II I		
	10500py (112101), 1					
Course Outcomes: After	completing the o	ourse the student	s will be able to			
CO1 Apply the princ	iples of Physics	s to study the f	Tundamental concepts of erization & instrumentatio			-



CO3	Investigate the engineering problems associated with mechanical, thermo dynamical and fluid properties
	of materials. (PO4)
CO4	
	sustainable solutions. (PO8, PO9, PO11)

Refere	nce Books
1	Basic & Applied Thermodynamics, P K Nag, McGraw Hill Education, 2 nd Edition, 2017,
	ISBN 10-0070151318, 13-978-0070151314.
2	Fluid Mechanics: Fundamentals and Applications, John. M. CimbalaYunus A. Cengel, McGraw-Hill
	Publications, 4th Edition, 2019, ISBN 10-9353166217, 13-978-9353166212.
3	A Textbook of Engineering Physics, M. N. Avadhanulu and P G Kshirsagar, S. Chand publications, 2019,
	ISBN : 978-93-528-3399-3.
4	Physics for Degree students, C.L. Arora and Dr. P. S. Hemne, S Chand, revised 2010,
	ISBN: 9788121933506.
5	Engineering Physics, R K Gaur and S L Gupta, Dhanpat Rai Publications, 2011, ISBN: 9788189928223.

	Laboratory Experim	nents (ME sti	ream)	
1	Spring constant experiment using expEYES17.	ANA D		
2	Moment of Inertia of irregular body and rigidity n	nodulus by To	rsion pendulum.	
3	Young's modulus by Single cantilever.		Mr.	
4	Young's modulus by Uniform bending.			
5	Ultrasonic Interferometer.		121	
6	Wavelength of laser by diffraction.		1-1	
7	Forced mechanical Oscillations and Resonance.		131	
8	Fermi Energy of copper	77 17	121	
9	Four Probe.	1.0/1	10	
10	Newton's rings.	V		
11	Exp Eyes experiment: LCR	VI		

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY WITH LA	AB)
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	10
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 30 MARKS.	30
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (10) ADDING UPTO 30 MARKS .	30
4	LAB: Conduction of laboratory exercises, lab report, observation and analysis (30 Marks), lab test (10 Marks) and Innovative Experiment/ Concept Design and Implementation (10 Marks) adding up to 50 Marks. THE FINAL MARKS WILL BE REDUCED TO 30 MARKS	30
	MAXIMUM MARKS FOR THE CIE THEORY	100



	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)								
Q. NO.	. NO. CONTENTS MARKS								
	PART A								
1	Objective type questions covering entire syllabus	10							
	PART B								
	(Maximum of TWO Sub-divisions only)								
2	Unit – I: (Compulsory)	14							
3 & 4	Unit – II: Question 3 or 4	14							
5&6	Unit – III: Question 5 or 6	14							
7 & 8	Unit – IV: Question 7 or 8	14							
9 & 10	Unit – V: Question 9 or 10	14							
11	Lab Component (Compulsory)	20							
	MAXIMUM MARKS FOR THE SEE THEORY	100							





Semester: II QUANTUM PHYSICS FOR ENGINEERS Category: Applied Science Course Stream: Computer Science (Common to AI, BT, CS, CY, CD & IS Programs)

(Theory and Practice)

Course Code	••	PY221IC	CIE	:	100 Marks
Credits: L:T:P	:	3:0:1	SEE	:	100 Marks
Total Hours	:	42 L+30P	SEE Duration	:	03 Hours

				Unit	– I							08 Hrs
Quantum	Mechanics:	De	Broglie	Hypothesis	and	Matter	Waves,	Phase	Velocity	and	Group	Velocity,
Heisenberg	g's Uncertainty	y Pri	nciple, an	d its applicat	ion.							
-			1				1.		· •		1	т.

Wave Mechanics: Wave Function, Time independent Schrodinger wave equation, Expectation value, Eigen functions and Eigen Values, Motion of a particle in a one-dimensional potential well of infinite depth, Numerical problems.

Unit – II	08 Hrs					
Principle of Quantum Computation: Matric Mechanics: Wave Function in Ket Notation: Matrix form	n of wave					
function, Identity operator, determination of $I \mid 0 >$ and $I \mid 1 >$, Pauli matrices and its operation on 0 and 1 states,						
mention of conjugate and transpose, unitary matrix U, Examples: Row and Column Matrices multiplication (Inner Product), Probability, Orthogonality.						
Principles of Quantum information and Quantum Computing: Introduction to Quantum Computing	, Moore's					
law and its end. Single particle quantum interference, classical and quantum information comparison. I	Difference					
between classical and quantum computing, quantum superposition and the concept of qubit.						
Properties of qubit: Mathematical representation, summation of probabilities, representation of qubit	by Bloch					
sphere.	-					
Quantum Gates: Single qubit gates: Quantum not gate, Pauli – Z gate, Hadamard gate, Pauli matrices, H	Phase gate					
(S gate), T gate. Multiple qubit gates: controlled gate, CNOT gate (discuss for 4 different input states).	-					
Unit – III	09 Hrs					
Lasers and Optical Fibers: Lasers: Characteristics of LASER, Interaction of radiation with matter, rec	quisites of					
a Laser system. Construction and working of semiconductor laser. Application of laser: Bar Code scan	ner, Laser					
Printer, Laser Cooling, Numerical problems.						
Optical Fibers: Propagation mechanism, Numerical aperture derivation, Modes of propagation. Atter						
fiber, Discussion of block diagram of Point-to-Point communication, Optical fiber sensor. Numerical problems.						
Unit – IV	08 Hrs					
Electrical Conductivity in Solids: Postulates of Classical free electron theory (CFET), Concept of Phonon,						
Matheissen's rule. Quantum free electron theory (QFET), Density of states in three dimensions (qualitative) and						
Fermi factor. Fermi energy: variation of Fermi factor with temperature.						
Band theory of solids (qualitative approach), electron concentration in metals at 0K. Intrinsic semiconductors:						
electronic concentration in conduction band and hole concentration (qualitative), Fermi level in intrinsic						
semiconductors, Extrinsic semiconductors: Variation of carrier concentration with temperature and Fermi energy						
with doping, Hall effect for metals and semiconductors, Numerical problems.						
Unit – V	09 Hrs					
Super Conductivity: Introduction to superconductors, temperature dependence of resistivity, Meissr	ner effect,					

Super Conductivity: Introduction to superconductors, temperature dependence of resistivity, Meissner effect, critical current, types of superconductors, temperature dependence of critical field.
 BCS theory (qualitative), Quantum tunneling, High temperature superconductivity, Josephson junction, DC and AC SQUIDs (qualitative), Applications in quantum computing, Numerical problems.

Course	e Outcomes: After completing the course, the students will be able to
CO1	Apply the principles of Quantum Physics in the behavioural study of materials and evaluating their
	properties for the design of opto-electronic and superconducting devices. (PO1)
CO2	Analyse the working mechanisms of quantum devices associated with lasers, optical fibers, qubits and
	superconducting devices. (PO2)



CO3	Investigate quantitatively the quantum mechanics-based engineering problems associated with opto-
	electronic and superconducting devices. (PO4)
CO4	Develop and propose experiments and sustainable solutions for the challenges in engineering
	applications. (PO1, PO8, PO9)

Refer	Reference Books			
1	Physics for Engineers, M R Srinivasan, New Age International Publishers, 2011,			
	ISBN: 978-81-224-2603-8.			
2	A Textbook of Engineering Physics, M. N. Avadhanulu and P G Kshirsagar, 2019, S. Chand publications,			
	ISBN: 978-93-528-3399-3.			
3	Physics for Degree students, C.L. Arora and Dr. P. S. Hemne, S Chand, revised 2010,			
	ISBN: 978-81-219-3350-6.			
4	Engineering Physics, R K Gaur and S L Gupta, DhanpatRai Publications, 2011,			
	ISBN: 978-81-899-2822-3.			

	Laboratory Experiments (CS Stream)				
1	Wavelength of laser by diffraction.				
2	Numerical aperture of an optical fiber.				
3	Transistor characteristics.				
4	Band gap of thermistor.				
5	Hall coefficient experiment.				
6	Black box experiment.				
7	Four probe experiment.				
8	Fermi Energy.				
9	Charging & discharging of a capacitor.				
10	Photo Diode.				
11	Exp Eyes experiment: LCR				
12	Exp Eyes experiment: Wavelength of LED and I- V characteristics of Zener diode.				

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY WITH LAB)		
#	COMPONENTS	MARKS	
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	10	
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 30 MARKS.	30	
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (10) ADDING UPTO 30 MARKS .	30	
4	LAB: Conduction of laboratory exercises, lab report, observation and analysis (30 Marks), lab test (10 Marks) and Innovative Experiment/ Concept Design and Implementation (10 Marks) adding up to 50 Marks. THE FINAL MARKS WILL BE REDUCED TO 30 MARKS	30	
MAXIMUM MARKS FOR THE CIE THEORY		100	



RUBRIC FOR SEMESTER END EXAMINATION (THEORY)				
Q. NO.	CONTENTS	MARKS		
PART A				
1	Objective type questions covering entire syllabus	10		
PART B				
(Maximum of TWO Sub-divisions only)				
2	Unit – I: (Compulsory)	14		
3 & 4	Unit – II: Question 3 or 4	14		
5 & 6	Unit – III: Question 5 or 6	14		
7 & 8	Unit – IV: Question 7 or 8	14		
9 & 10	Unit – V: Question 9 or 10	14		
11	Lab Component (Compulsory)	20		
MAXIMUM MARKS FOR THE SEE THEORY				





APPLIED PHYSICS FOR ENGINEERS Category: Applied Science Course Stream: Civil (Only to CV Program) (Theory and Practice) Course Code : IV211ID CIE : 100 Marks Credits: L:T:P : 3:0:1 SEE : 100 Marks Total Hours : 42 L+30P SEE Duration : 08 Hrs Oscillations: Simple Harmonic Motion (SHM), differential equation for SHM (No derivation), Sprig mass and its applications. Theory of damped oscillations (Derivation), Types of damping (Graphical Approach). Engineering applications of damped oscillations (Derivation), Types of damping (Graphical Approach). Engineering applications of damped oscillations, Theory of forced oscillations (Qualitative), resonance and sharpness of resonance. Numerical problems. 09 Hrs Elastic Properties of Materials: Stress-Strain Curve, Stress hardening and softening. Elastic Moduli, Poisson's ratio and its limiting values. Relation among elastic constants (qualitative), Bending of beams: neutral surface and socinetariation, fatigue and factors affecting fatigue (only qualitative explanation). 09 Hrs Torsion of a Cylinder: Expression for couple per unit twist of a solid cylinder, torsion pendulum: expression for time period and rigidity modulus. Failures of engineering materials – ductile fracture, stress concentration, fatigue and factors affecting fatigue (only qualitative explanation) Numerical problems. 08 Hrs Mint - II 08 Hrs				Semester: II			
Stream: Civit (Only to CV Program) (Theory and Practice) Course Code : PY211ID CIE : 100 Marks Credits: L:T:P : 3:0:1 SEE : 100 Marks Total Hours : 421.+30P SEE Duration : 03 Hours Oscillations: Simple Harmonic Motion (SHM), differential equation for SHM (No derivation), Sprig mass and its applications. Theory of damped oscillations (Derivation), Types of damping (Graphical Approach). Engineering applications of damped oscillations (Derivation), Types of damping (Graphical Approach). Engineering applications of damped oscillations, Theory of forced oscillations (Qualitative), resonance and sharpness of resonance. Numerical problems. 09 Hrs Elastic Properties of Materials: Stress-Strain Curve, Stress hardening and softening. Elastic Moduli, Poisson's ratio and its limiting values. Relation among elastic constants (qualitative). Bending of beams: neutral surface and neutral axis, expression for bending moment of a beam, Single cantilever (derivation). One Internal 09 Hrs Kinematics: Displacement, average velocity, instanceous velocity, speed, acceleration, average acceleration, variable acceleration, acceleration due to gravity, Newton's law of motion, rectilinear motion and numerical problems. 08 Hrs Mint - III 09 Hrs Pint Ost Harmonical problems. 108 Hrs Mint - III Notit - III Notit Notit			APPLIED P		INEERS		
Stream: Civit (Only to CV Program) (Theory and Practice) Course Code : PY211ID CIE : 100 Marks Credits: L:T:P : 3:0:1 SEE : 100 Marks Total Hours : 421.+30P SEE Duration : 03 Hours Oscillations: Simple Harmonic Motion (SHM), differential equation for SHM (No derivation), Sprig mass and its applications. Theory of damped oscillations (Derivation), Types of damping (Graphical Approach). Engineering applications of damped oscillations (Derivation), Types of damping (Graphical Approach). Engineering applications of damped oscillations, Theory of forced oscillations (Qualitative), resonance and sharpness of resonance. Numerical problems. 09 Hrs Elastic Properties of Materials: Stress-Strain Curve, Stress hardening and softening. Elastic Moduli, Poisson's ratio and its limiting values. Relation among elastic constants (qualitative). Bending of beams: neutral surface and neutral axis, expression for bending moment of a beam, Single cantilever (derivation). One Internal 09 Hrs Kinematics: Displacement, average velocity, instanceous velocity, speed, acceleration, average acceleration, variable acceleration, acceleration due to gravity, Newton's law of motion, rectilinear motion and numerical problems. 08 Hrs Mint - III 09 Hrs Pint Ost Harmonical problems. 108 Hrs Mint - III Notit - III Notit Notit			Category	: Applied Science C	ourse		
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Unit – I 08 Hrs Oscillations: Simple Harmonic Motion (SHM), differential equation for SHM (No derivation), Sprig mass and its applications. Theory of damped oscillations (Derivation), Types of damping (Graphical Approach). Engineering applications of damped oscillations, Theory of forced oscillations (Qualitative), resonance and sharpness of resonance. Numerical problems. 09 Hrs Elastic Properties of Materials: Stress-Strain Curve, Stress hardening and softening. Elastic Moduli, Poisson's ratio and its limiting values. Relation among elastic constants (qualitative), Bending of beams: neutral surface and neutral axis, expression for bending moment of a beam, Single cantilever (derivation). Op Hrs Torsion of a Cylinder: Expression for couple per unit twist of a solid cylinder, torsion pendulum: expression for time period and rigidity modulus. Failures of engineering materials – ductile fracture, brittle fracture, stress concentration, fatigue and factors affecting fatigue (only qualitative explanation) Numerical problems. O8 Hrs Kinematics: Displacement, average velocity, instantaneous velocity, speed, acceleration, average acceleration, variable acceleration, acceleration due to gravity, Newton's law of motion, rectilinear motion and numerical problems. Mol + TV 09 Hrs Fluid Mechanics: Definition of fluid and its properties, Fluid statics, buoyancy, Poiseuille's equation, determination of co-efficient of viscosity of liquids and gases with temperature. Bernoulli's theorem and its application. Description of fluid and its properties, Fluid statics, buoyancy, Poiseuille's equation, determination of co-efficient of viscosity of liquids and gases with temperature. Bernoulli's theorem and its application. Description	Credits: L:T:P	:	3:0:1		SEE	:	100 Marks
Oscillations: Simple Harmonic Motion (SHM), differential equation for SHM (No derivation), Sprig mass and its applications. Theory of damped oscillations (Derivation), Types of damping (Graphical Approach). Engineering applications of damped oscillations, Theory of forced oscillations (Qualitative), resonance and sharpness of resonance. Numerical problems. Unit – II 09 Hrs Elastic Properties of Materials: Stress-Strain Curve, Stress hardening and softening. Elastic Moduli, Poisson's ratio and its limiting values. Relation among elastic constants (qualitative). Bending of beams: neutral surface and neutral axis, expression for bending moment of a beam, Single cantilever (derivation). Torsion of a Cylinder: Expression for couple per unit twist of a solid cylinder, torsion pendulum: expression for time period and factors affecting fatigue (only qualitative explanation) Numerical problems. Vinit – III Vinit – III Vinit – III Os Hars Concentration fatigue and factors affecting fatigue (only qualitative editative). Bending ob beams: neutral surface and neutral axis, expression for couple per unit twist of a solid cylinder, torsion pendulum: expression for variable acceleration, average acceleration, fatigue and factors affecting fatigue (only qualitative), speed, acceleration, average acceleration, variable acceleration, average acceleration, unmerical problems, curvilinear motion, superelevation, projectile motion, relative motion, numerical problems, motion under gravity, numerical problems. 08 Hrs Fund Mechanics: Definition of fluid and its propert	Total Hours	:	42 L+30P		SEE Duration	:	03 Hours
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applications of damped oscillations, Theory of forced oscillations (Qualitative), resonance and sharpness of resonance. Numerical problems. 09 Hrs Unit – II 09 Hrs Elastic Properties of Materials: Stress-Strain Curve, Stress hardening and softening. Elastic Moduli, Poisson's ratio and its limiting values. Relation among elastic constants (qualitative), Bending of beams: neutral surface and neutral axis, expression for bending moment of a beam, Single cantilever (derivation). Or Stress-Or of a Cylinder: Expression for couple per unit twist of a solid cylinder, torsion pendulum: expression for time period and rigidity modulus. Failures of engineering materials – ductile fracture, brittle fracture, stress concentration, fatigue and factors affecting fatigue (only qualitative explanation) Numerical problems. On 108 Hrs Mint – II 08 Hrs Linit – III 08 Hrs Kinematics: Displacement, average velocity, instantaneous velocity, speed, acceleration, average acceleration, acceleration due to gravity, Newton's law of motion, rectilinear motion and numerical problems, curvilinear motion, superelevation, projectile motion, relative motion, numerical problems, motion under gravity, numerical problems. 09 Hrs Fluid Mechanics: Definition of fluid and its properties, Fluid statics, buoyancy, Poiseuille's equation, determination of co-efficient of viscosity of liquids and gases with temperature. Bernoulli's theorem and its application. Description of fluids (qualitative). Type of fluid flows- stream line, streak line, path line, turbulence. Numerical problems.							
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Unit – II 09 Hrs Elastic Properties of Materials: Stress-Strain Curve, Stress hardening and softening. Elastic Moduli, Poisson's ratio and its limiting values. Relation among elastic constants (qualitative), Bending of beams: neutral surface and neutral axis, expression for bending moment of a beam, Single cattilever (derivation). Torsion of a Cylinder: Expression for couple per unit twist of a solid cylinder, torsion pendulum: expression for time period and rigidity modulus. Failures of engineering materials – ductile fracture, brittle fracture, stress concentration, fatigue and factors affecting fatigue (only qualitative explanation). Numerical problems. 08 Hrs Kinematics: Displacement, average velocity, instantaneous velocity, speed, acceleration, average acceleration, acceleration due to gravity, Newton's law of motion, rectilinear motion and numerical problems, curvilinear motion, superelevation in-plane motion and connected bodies including pulleys. 09 Hrs Unit – IV 09 Hrs Fluid Mechanics: Definition of fluid and its properties, Fluid statics, buoyancy, Poiseuille's equation, determination of co-efficient of viscosity of liquid by Poiseuille's flow method. Error and correction applied to Poiseuille's formula. Variation in viscosity of liquids and gases with temperature. Bernoulli's theorem and its application. Description of fluids (qualitative). Type of fluid flows- stream line, streak line, path line, turbulence. Numerical problems. Kinematics of Sensors: Introduction to Sensors; RTD, Thermistor, Thermocouple. Vibration sensor, Classification of sensors scansor's characteristics. Sensors: principles & Applications: Temperature sensors: RTD, Thermistor, Thermocouple.			•		(Qualitative), 1050	iiuii	te une shurphess of
Elastic Properties of Materials: Stress-Strain Curve, Stress hardening and softening. Elastic Moduli, Poisson's ratio and its limiting values. Relation among elastic constants (qualitative), Bending of beams: neutral surface and neutral axis, expression for bending moment of a beam, Single cantilever (derivation). Torsion of a Cylinder: Expression for couple per unit twist of a solid cylinder, torsion pendulum: expression for couple per unit twist of a solid cylinder, torsion pendulum: expression for couple per unit twist of a solid cylinder, torsion pendulum: expression for couple per unit twist of a solid cylinder, torsion pendulum: expression for couple per unit twist of a solid cylinder, torsion pendulum: expression for couple per unit twist of a solid cylinder, torsion pendulum: expression for couple per unit twist of a solid cylinder, torsion pendulum: expression for couple per unit twist of a solid cylinder, torsion pendulum: expression for time period and rigidity modulus. Failures of engineering materials – ductile fracture, brittle fracture, stress concentration, fatigue and factors affecting fatigue (only qualitative explanation) Numerical problems. Kinematics: Dislacement, average velocity, instantaneous velocity, speed, acceleration, average acceleration, variable acceleration, acceleration for torigon in-plane motion and connected bodies including pulleys. Kinetics: D'Alembert's principle and its application in-plane motion and connected bodies including pulleys. Kinetics: D'Alembert's principle and its application in-plane motion. Inti - IV 09 Hrs Fluid Mechanics: Definition of fluid and its properties, Fluid statics, buoyancy, Poiseuille's equatin, determination				it – II			09 Hrs
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CO1 Apply the principles of Physics to comprehend the concepts of oscillations, elastic properties, kinematics, fluid dynamics and sensor technology to solve civil engineering problems. (PO1, PO2)	harvesting.						
CO1 Apply the principles of Physics to comprehend the concepts of oscillations, elastic properties, kinematics, fluid dynamics and sensor technology to solve civil engineering problems. (PO1, PO2)							
dynamics and sensor technology to solve civil engineering problems. (PO1, PO2)			· · ·				
						ope	ties, kinematics, fluid
						enso	or technology through

	analytical methods. (PO1, PO2)
CO3	Investigate and compute the material properties, concepts kinematics, fluid dynamics and sensor technology to
	enhance practical understanding and applications in civil engineering. (PO4)
CO4	Develop and design experiments and sustainable solutions through classical Physics and sensor technology for
	aivil anginaaring challenges (DO3 DO6 DO7 DO11)

civil engineering challenges. (PO3, PO6, PO7, PO11)

Refere	ence Books
1	A Textbook of Engineering Physics, M N Avadhanulu, P G Kshirsagar and TVS Arun Murthy, S Chand
	and Company Limited, New Delhi, Revised Edition 2019, ISBN: 978-93-528-3399-3.
2	Jacob Fraden, Handbook of Modern Sensors: Physics, Designs, and Applications, PHI Publication, 5 th



	Edition 2016, ISBN: 978-1-4419-6465-6.
3	Elements of Properties of matter, D S Mathur, S Chand and Company PVT LTD, 2010,
	ISBN-13:978-8121908153.
4	Engineering Physics, Gaur and Gupta, Dhanpat Rai Publications LTD, 2012, ISBN-13: 978-8189928223.
5	Physics for Degree students, C L Arora and P S Hemne, S Chand and Company PVT. LTD, 2016,
	ISBN: 978-81-219-4059-7.
6	Engineering Physics, Hitendra K Mallik and A K Singh, Tata McGraw Hill Education, 2010,
	ISBN 978-0-07-067153-9.

Laboratory Experiments (CV stream) Spring constant experiment using expEYES17. 1 Moment of Inertia of irregular body and rigidity modulus by Torsion pendulum. 2 Young's modulus by Single cantilever. 3 Young's modulus by Uniform bending. 4 5 Ultrasonic Interferometer. Wavelength of laser by diffraction. 6 7 Forced mechanical Oscillations and Resonance. 8 Fermi Energy of Copper. 9 Four Probe Experiment. 10 Newton's rings. 11 Exp Eyes experiment: LCR

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY WITH LA	AB)
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	10
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 30 MARKS.	30
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (10) ADDING UPTO 30 MARKS .	30
4	LAB: Conduction of laboratory exercises, lab report, observation and analysis (30 Marks), lab test (10 Marks) and Innovative Experiment/ Concept Design and Implementation (10 Marks) adding up to 50 Marks. THE FINAL MARKS WILL BE REDUCED TO 30 MARKS	30
	MAXIMUM MARKS FOR THE CIE THEORY	100

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)			
Q. NO.	CONTENTS	MARKS		
	PART A			
1	Objective type questions covering entire syllabus	10		
	PART B			
	(Maximum of TWO Sub-divisions only)			
2	Unit – I: (Compulsory)	14		
3 & 4	Unit – II: Question 3 or 4	14		
5&6	Unit – III: Question 5 or 6	14		
7 & 8	Unit – IV: Question 7 or 8	14		
9 & 10	Unit – V: Question 9 or 10	14		
11	Lab Component (Compulsory)	20		
	MAXIMUM MARKS FOR THE SEE THEORY	100		



			Semester					
	CHE			FERIALS AND DE	EVICES			
64	C		ory: Applied S		0 IC D			
Stream	n: Con		(Common to A (Theory and P	I, BT, CS, CY, CD &	x 15 Prog	gra	ms)	
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Total Hours	:	42L+ 30P		SEE Dura	tion	:	03 Hc	
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Sustainable Chemistr								
Biomaterials: Introdu			and bio-compat	ible polymeric mater	rials: syn	the	sis and	l applications
(Polymers and hydroge			11.0	1 1.1.7	C			
Green Chemistry: Int								at magazalin a)
E-waste: Hazards and Extraction of valuable								
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studies.		1.5	Unit – II	NA S				08 Hrs
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Bonded and non-bond	ed inter	ractions. Molect	ular topology, to	opological matrix rep	presentatio	on,	topolo	gical indices,
QSAR/QSPC concept		nsilico predictio	on of propertie	s. 3D co-ordinate g	generation	n fo	or sma	ll molecules,
geometry optimization		K/F						-
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Refere	nce Books
1	E-waste recycling and management: present scenarios and environmental issues, Khan, Anish, and
	Abdullah M. Asiri. 2019, Springer, Vol. 33. ISBN: 978-3-030-14186-8.
2	Essentials of computational chemistry: theories and models, Christopher J Cramer, 2013, John Wiley &
	Sons. ISBN: 978-0-470-09182-1.
3	Energy storage and conversion devices: Supercapacitors, batteries and hydroelectric cells, Anurag Gaur,
	A. L. Sharma, Anil Arya. 2021, CRC press, 1 st edition, ISBN: 978-1-003-14176-1.
4	Fundamentals of analytical chemistry: An introduction, Douglas A. Skooget etal., 2004 Thomson Asia pte
	Ltd., 8 th , ISBN: 978-0-495-55828-6
E-book	ίς
5	Functional and smart materials, Chander Prakash, Sunpreet Singh, J. Paulo Davim, 2020, CRC Press,
	ISBN: 978-036-727-510-5.
6	Electrical and electronic devices, circuits and materials: Technological challenges and solutions. Tripathi,
	S. L., Alvi, P. A., & Subramaniam, U, 2021, John Wiley & Sons, ISBN: 978-0367564261.

	Laboratory Experiments
1	Estimation of copper from PCB.
2	Determination of total acidity of the soft drinks using pH sensors.
3	Potentiometric estimation of iron.
4	Conductometric estimation.
5	Determination of viscosity coefficient of a given liquid using Ostwald's viscometer.
6	Flame photometric estimation of sodium.
7	Colorimetric estimation of copper from E-waste.
8	Electroplating of copper.
9	Synthesis and fabrication of conducting polyaniline and its application in gas sensing (Demonstration experiment).
10	Study the surface morphology of nanomaterials using scanning electron microscopy (Demonstration experiment).
11	Fabrication of thin-film gas sensors using spin coating and electro-spinning technique (Demonstration experiment).
12	Separation of organic compounds using column chromatographic technique and monitoring by thin layer chromatographic technique (Demonstration experiment).
13	Synthesis of metal oxide nanomaterials using solution combustion synthesis.
14	Green synthesis of nanomaterials.
	STITUTION

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY WITH LA	AB)
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	10
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 30 MARKS.	30
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (10) ADDING UPTO 30 MARKS .	30



4	LAB: Conduction of laboratory exercises, lab report, observation and analysis (30 Marks), lab test (10 Marks) and Innovative Experiment/ Concept Design and Implementation (10 Marks) adding up to 50 Marks. THE FINAL MARKS WILL BE REDUCED TO 30 MARKS	30
	MAXIMUM MARKS FOR THE CIE THEORY	100

MAXIMUM MARKS FOR THE CIE THEORY

RUBRIC FOR SEMESTER END EXAMINATION (THEORY)			
Q. NO.	CONTENTS	MARKS	
	PART A		
1	Objective type questions covering entire syllabus	10	
	PART B		
	(Maximum of TWO Sub-divisions only)		
2	Unit – I: (Compulsory)	14	
3 & 4	Unit – II: Question 3 or 4	14	
5&6	Unit – III: Question 5 or 6	14	
7 & 8	Unit – IV: Question 7 or 8	14	
9 & 10	Unit – V: Question 9 or 10	14	
11	Lab Component (Compulsory)	20	
	MAXIMUM MARKS FOR THE SEE THEORY	100	





RV College of Engineering [®]
Mysore Road, RV Vidyaniketan Post,
Bengaluru - 560059, Karnataka, India

			Semester: II				
		CHEMISTRY	OF FUNCTIONAL	MATERIALS			
		Categor	y: Applied Science (Course			
	Stream		Common to EC, EE,		ıs)		
			Theory and Practice)		<i>,</i>		
Course Code	:	CM221IB		CIE	:	100 M	Iarks
Credits: L:T:P	:	3:0:1		SEE	:	100 M	
Total Hours	:	42L+ 30P		SEE Duration	:	-	
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		τ	J nit – I				08 Hrs
Energy Storage and (Convers	ion Devices					•
Battery: Introduction,			omponents/materials,	working and appl	icatio	ns of Li	ithium cobal
oxide and metal air bat		· · · · · · · · · · · · · · · · · · ·	I I I I I I I I I I	8 11			
Super-Capacitors: Ir		ion. types (EDL	C. pseudo capacitor	s. asymmetric cap	acitor	s). mec	hanism with
examples and application		<i>J</i> I <i>i i i</i>	, F	,, 1		-,,	
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cells, amorphous Si an							
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Carbon Nanomateria	ls• Type	es synthesis pror	perties functionalizati	on and applications	of C	NT and	Granhene
Thin Film Deposition							
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Magnetic Materials.	Data Stu			amples, properties a	anu aj	pheatio	
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Advanced Electronic photochromic, thermo skin, e-nose devices. E-waste - Types, envir	chromic	, electrochromic	, electrostrictive, mag			· · ·	A
			nit – V				08 Hrs
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sensor, electrochemica			II II	· · · · · · · · · · · · · · · · · · ·		,	1
Instrumental Method			instrumentation: Colo	rimetry, potention	etrv. f	lame ph	otometry and
conductometry.		- j ~-~		J , I	<i>,</i>	·····I	,
Course Outcomes: Af	fter con	pleting the cour	se, the students will	be able to			
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			ic application in the fi				
			ineering problems ass		· · · · ·		
(PO1, PO6)	•						
CO4 Analyze the q	nality n	arameters of engi	neering materials asso	neigtad with alactro	nic de	11000	

(PO1, PO6, PO8, PO9, PO11)



Refer	ence Books
1	Chemistry in microelectronics, Yannick Le Tiec, 2013, Wiley Publications, ISBN: 9781848214361.
2	Electronics properties of materials, Rolf E, Hummel, 2012, Springer Publications New York, 4 th Edition, ISBN 9781441981639.
3	Smart nanomaterials for sensor application, Li S, Ge Y, Li H, 2012, Bentham Science Publishers, ISBN: 9781608055425.
4	Energy storage and conversion materials, Skinner S, 2019, Royal society of chemistry, ISBN: 9781788010900.
E-Bo	oks
5	Smart materials, Harvey, James A. Handbook of materials selection, 2002, John Wiley & Sons Canada, Limited, ISBN: 9780471359241.
6	Engineering Chemistry, Suba Ramesh, Vairam, Ananda Murthy, 2011, Wiley India, ISBN: 9788126519880.
7	Energy storage and conversion devices; Supercapacitors, batteries and hydroelectric Cells Editor: Anurag Gaur, 2021, CRC Press, ISBN: 9781000470512.
8	An overview of advanced nanomaterials for sensor applications, Rohilla D, Chaudhary S, Umar A. Engineered Science publisher. 2021, 16:47-70. DOI: 10.30919/es8d552.

	Laboratory Experiments (ME stream)
1	Estimation of copper in the E-waste.
2	Determination of pKa of a weak acid using pH sensor.
3	Potentiometric estimation of iron.
4	Colorimetric estimation of copper from PCBs.
5	Conductometric estimations.
6	Flame photometric estimation of sodium.
7	Determination of viscosity coefficient.
8	Electroplating of copper.
9	Preparation of polyaniline for sensor application (Demonstration experiment).
10	Preparation of semiconducting TiO ₂ nanoparticles for DSSC applications (Demonstration experiment).
11	Determination of band gap of semiconducting material using UV-vis spectrophotometer (Demonstration
	experiment).
12	Study the surface morphology of nanomaterials using scanning electron microscopy (Demonstration
	experiment).
13	Thin films fabrication using PECVD and sputtering technique (Demonstration Experiment).
14	Fabrication of coin cell super capacitor prototype (Demonstration experiment).
15	Synthesis of iron oxide nanomaterials using solution combustion synthesis.
16	Green synthesis of nanomaterials.

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY WITH LA	AB)
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	10
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 30 MARKS.	30
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (10) ADDING UPTO 30 MARKS .	30



4	LAB: Conduction of laboratory exercises, lab report, observation and analysis (30 Marks), lab test (10 Marks) and Innovative Experiment/ Concept Design and Implementation (10 Marks) adding up to 50 Marks. THE FINAL MARKS WILL BE REDUCED TO 30 MARKS	30
	MAXIMUM MARKS FOR THE CIE THEORY	100

MAXIMUM MARKS FOR THE CIE THEORY

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)				
Q. NO.	CONTENTS	MARKS			
	PART A				
1	Objective type questions covering entire syllabus	10			
	PART B				
	(Maximum of TWO Sub-divisions only)				
2	Unit – I: (Compulsory)	14			
3 & 4	Unit – II: Question 3 or 4	14			
5&6	Unit – III: Question 5 or 6	14			
7 & 8	Unit – IV: Question 7 or 8	14			
9 & 10	Unit – V: Question 9 or 10	14			
11	Lab Component (Compulsory)	20			
	MAXIMUM MARKS FOR THE SEE THEORY	100			





Semester: II
CHEMISTRY OF ENGINEERING MATERIALS
Category: Applied Science Course
Stream: Mechanical (Common to AS, CH, IM & ME Programs)
(Theory & Practice)

Course Code		CM221IC	CIE	:	100 Marks
Credits: L:T:P	:	3:0:1	SEE	:	100 Marks
Total Hours	:	42L+ 30P	SEE Duration	:	03 Hours

Unit – I	08 Hrs
Fuels: Thermochemistry, calorific value of fuels, numerical, knocking in internal combustion	n engines, reasons for
knocking, octane and cetane number, antiknocking agents. Biodiesel, power alcohol	
Alternative Fuels: Green fuel- hydrogen production and storage. Rockets Fuels: Propertie	s, characteristics and
types.	
Unit – II	09 Hrs
Energy Storage and Conversion Devices	
Batteries and Super Capacitors: Working principle, classification, fabrication and applic	ations of lithium-ior
battery, metal air batteries, supercapacitors and super batteries.	
Fuel cells and renewable energy: Hydrogen - oxygen fuel cell, direct methanol fuel cell a	nd their applications
Solar cell – principle, construction and working of Quantum Dot sensitized solar cells.	
Unit – III	08 Hrs
Corrosion Science and Management	
Corrosion: Electrochemical theory of corrosion. Types: differential aeration (pitting and wa	ater line), differentia
metal and stress corrosion. Factor affecting rate of corrosion. Case studies on corrosion failur	
Corrosion Control: Metal coating-galvanization and tinning, surface conversion coati	ng - anodizing and
phosphating. Cathodic protection - sacrificial anode method. Corrosion testing by weight los	ss method. Corrosion
penetration rate (CPR)-numerical problems. Metal finishing: Electroplating of chromium an	d Electroless plating
of copper:	
Unit – IV	08 Hrs
Chemistry of Nanomaterials	
Size dependent properties: Surface area, optical and catalytic properties. Classification	on of nanomaterials
Synthesis: Solution combustion and Sol-gel methods.	
Synthesis and applications: Synthesis, properties and applications of carbon nano tubes a	
Synthesis and applications: Synthesis, properties and applications of carbon nano tubes a lubricants: Types of nanoparticles as lubricant additives and their application in defen	
Synthesis and applications: Synthesis, properties and applications of carbon nano tubes a lubricants: Types of nanoparticles as lubricant additives and their application in defenspacecrafts.	nse, automobile and
Synthesis and applications: Synthesis, properties and applications of carbon nano tubes a lubricants: Types of nanoparticles as lubricant additives and their application in defense spacecrafts.	nse, automobile and 09 Hrs
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 Synthesis and applications: Synthesis, properties and applications of carbon nano tubes a lubricants: Types of nanoparticles as lubricant additives and their application in deferse spacecrafts. Unit – V Engineering Polymers and Nanocomposites: Thermosets-bakelite and epoxy, thermoplastic polyether sulfones- preparation and specific applications in industries. Biodegradable posynthesis, properties, and application of poly lactic acid (PLA). Significance of glass transit and factors affecting Tg. Reinforcements and testing: Glass, carbon and natural fiber - synthesis, properties and applications of polymer nanocomposites in injection moulded products, paints and 3D printin Course Outcomes: After completing the course, the students will be able to CO1 Apply principles of chemistry for the synthesis of materials and evaluation of their energy devices, polymer materials and corrosion science. (PO1, PO1) CO2 Evaluate the properties of materials for the engineering application. (PO1, PO6) CO3 Propose and interpret solutions for the challenges related to material performance 	nse, automobile and 09 Hrs cs- polycarbonate and olymer: Introduction ion temperature (Tg) plications in polymer and impact strength ng.
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CO4



Refere	Reference Books					
1	Understanding nanomaterials, Malkiat S. Johal, Lewis E. Johnson, 2017, CRC Press, Taylor and Francis					
	Group, ISBN: 9780815354383.					
2	Engineering chemistry, Shubha Ramesh et.al., 2011, Wiley India, 1 st Edition, ISBN: 9788126519880.					
3	Fundamentals of analytical chemistry, Douglas A. Skoog et.al., 2004, 9th edition,					
	Thomson Asia pte Ltd., ISBN: 9780495558286					
4	Energy storage and conversion devices, Anurag Gaur, A. L. Sharma, Anil Arya, 2021, CRC Press, Taylor					
	and Francis Group, 1 st Edition, ISBN: 9781003141761.					

	Laboratory Experiments
1	Volumetric analysis.
2	Analysis of alloy (Brass).
3	Ore analysis (Haematite).
4	Determination of pKa of a weak acid.
5	Potentiometric estimation of iron in rust.
6	Colorimetric estimation of copper.
7	Conductometric estimations.
8	Determination of viscosity coefficient of a given liquid using Ostwald's viscometer.
9	Flame photometric estimation of sodium in the given saline solution.
10	Preparation of nanomaterials by solution combustion method.
11	Preparation of thin films by dipcoating technique and characterization of thin film.
12	Determination of relative and kinematic viscosities of given lubricating oil at different temperatures using
	Redwood viscometer (Demonstration experiment).
13	To find of Tg of polymer using DSC (Demonstration Experiment).
14	Study of surface morphology of materials using SEM (Demonstration experiment).
15	Phase analysis of alloys by XRD (Demonstration experiment).
16	Synthesis of metal oxide nanomaterials using solution combustion synthesis (Demonstration experiment).
17	Green synthesis of nanomaterials (Demonstration experiment).

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY WITH LAB)		
#	COMPONENTS	MARKS	
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	10	
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 30 MARKS.	30	
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (10) ADDING UPTO 30 MARKS .	30	
4	LAB: Conduction of laboratory exercises, lab report, observation and analysis (30 Marks), lab test (10 Marks) and Innovative Experiment/ Concept Design and Implementation (10 Marks) adding up to 50 Marks. THE FINAL MARKS WILL BE REDUCED TO 30 MARKS	30	
	MAXIMUM MARKS FOR THE CIE THEORY	100	



	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)		
Q. NO.	CONTENTS	MARKS	
	PART A		
1	Objective type questions covering entire syllabus	10	
	PART B		
	(Maximum of TWO Sub-divisions only)		
2	Unit – I: (Compulsory)	14	
3 & 4	Unit – II: Question 3 or 4	14	
5&6	Unit – III: Question 5 or 6	14	
7 & 8	Unit – IV: Question 7 or 8	14	
9 & 10	Unit – V: Question 9 or 10	14	
11	Lab Component (Compulsory)	20	
	MAXIMUM MARKS FOR THE SEE THEORY	100	





			Semester: I				
	ENC	GINEERING AI	ND ENVIRONN	IENTAL CHEMISTRY	ζ		
		Catego	ry: Applied Scie	ence Course			
			Civil (Only to C				
			Theory and Pra				
Course Code	:	CM221ID		CIE	:	100 N	Iarks
Credits: L:T:P	:	3:0:1		SEE	:		
Total Hours	:	42L+ 30P		SEE Duration	:	03 Hc	
	1 -						
		-	Unit – I				08 Hrs
Green Chemistry:	Introduc	ction, principles	of green chem	nistry, E-factor, atom e	conor	ny, mi	crowave and
ultrasound assisted rea	actions, o	examples of gree	en synthesis.				
Water Chemistry: Im	npurities	s in water, emerg	ing pollutants, w	ater quality parameters as	s per E	BIS, det	ermination of
fluoride, DO, BOD an	d COD,	, numericals, desa	alination of water	by RO. Sewage treatment	nt pro	cess.	
			Unit – II	, ,			09 Hrs
Materials in Civil En	gineeri	ng		R	5		
			manufacturing p	rocess of portland ceme	nt. pr	ocess o	f setting and
hardening, types (Mor				A	, p		
Glass: Manufacture, p			,	ii upproutions.			
Ceramics and Refrac				nlications			
Cerunnes and Kerrae				pheudons:			08 Hrs
Correction Science on	d Engi		J nit – III	131			00 1115
Corrosion Science an		neering		(waterline and pitting) d	ifform	ntial me	-
Corrosion: Electroche	emical t	neering heory, types: diff	ferential aeration	(waterline and pitting), d	iffere	ntial me	-
Corrosion: Electroche corrosion (caustic emb	emical tl orittleme	neering heory, types: diff ent). Factors affec	ferential aeration cting rate of corr	osion.			etal and stress
Corrosion: Electroche corrosion (caustic emb Corrosion Control:	emical tl orittleme Metal	neering heory, types: diff ent). Factors affec coating-galvaniz	ferential aeration cting rate of corr cation and tinni	osion. ng, surface conversion	coatir	ng - ai	etal and stress
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Refere	Reference Books		
1	Chemistry for Engineers, Teh Fu Yen, Imperial college press, 2008, ISBN: 97818609747742.		
2	Advances in corrosion science and technology, M.G. Fontana, R.W. Staettle, Springer publications, 2012, ISBN: 9781461590620.		
3	Fundamentals of analytical chemistry, Douglas A. Skoog et.al., 8 th edition, 2004, Thomson Asia pte Ltd. ISBN: 9812435131.		
4	Engineering chemistry, Shubha Ramesh et al. Wiley India 1 st Edition, 2011, ISBN: 9788126519880		

	Laboratory Experiments
1	Volumetric analysis.
2	Estimation of water quality parameter: chemical oxygen demand.
3	Estimation of CaO in cement solution.
4	Determination of pKa of a weak acid using pH meter.
5	Potentiometric estimation of iron.
6	Colorimetric estimation of copper.
7	Conductometric estimation.
8	Determination of viscosity coefficient of a given liquid using Ostwald's viscometer.
9	Flame photometric estimation of sodium.
10	Determination of relative and kinematic viscosities of given lubricating oil at different temperatures using
	Redwood viscometer (Demonstration Experiment).
11	To find of Tg of polymer using DSC. (Demonstration Experiment).
12	Study of surface morphology of materials using SEM (Demonstration Experiment).
13	Synthesis of iron oxide nanomaterials using solution combustion synthesis
14	Green synthesis of nanomaterials.

#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	10
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 30 MARKS.	30
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (10) ADDING UPTO 30 MARKS .	30
4	LAB: Conduction of laboratory exercises, lab report, observation and analysis (30 Marks), lab test (10 Marks) and Innovative Experiment/ Concept Design and Implementation (10 Marks) adding up to 50 Marks. THE FINAL MARKS WILL BE REDUCED TO 30 MARKS	30
	MAXIMUM MARKS FOR THE CIE THEORY	100



	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)		
Q. NO.	CONTENTS	MARKS	
	PART A		
1	Objective type questions covering entire syllabus	10	
	PART B		
	(Maximum of TWO Sub-divisions only)		
2	Unit – I: (Compulsory)	14	
3 & 4	Unit – II: Question 3 or 4	14	
5&6	Unit – III: Question 5 or 6	14	
7 & 8	Unit – IV: Question 7 or 8	14	
9 & 10	Unit – V: Question 9 or 10	14	
11	Lab Component (Compulsory)	20	
	MAXIMUM MARKS FOR THE SEE THEORY	100	





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Professional Core Courses

- > BASIC ELECTRONICS (EC112TA)
- > ELEMENTS OF ELECTRICAL ENGINEERING (EE112TA)

SIKSHANA S

- > ELEMENTS OF MECHANICAL ENGINEERING (ME112TA)
- > PRINCIPLES OF PROGRAMMING USING C (CS221IA)
- > ENGINEERING MECHANICS (CV112TA)

WSTIT



	Semester:			
Stream: Electronics (Common to EC, ET & El Programs) (Theory) Course Code : EC112TA CIE : 100 Marks Course Code : 21:0 SEE : 100 Marks Total Hours : 401. SEE : 100 Marks Total Hours : 401. SEE : 100 Marks Total Hours : 401. OBHTS Bipolar Junction Transistors: Semiconductor Diode- Review, Regulated Power Supply. Bipolar Junction Transistor Construction and Operation, Load-Line Analysis, Operating Point, Fixed Bias, Voltage Divider Bias Configurations, Bias Stabilization, Transistor Switching Networks, Amplification in the AC Domain The re Transistor Model for CE Configuration, RC Coupled Amplifier, Gain, Input Resistance and Frequency Response, Cascaded Systems, Numerical Examples. Out Interacteristics Regions of Operation, Current Equation and Transfer Characteristic, Small Signal Equivalent, Calculation of Trans-Conductance and Voltage Gain, DS, Operation of CMOS Inverser, CMOS NAND and CMOS NOR Numerical Examples. Basic Principles and Advantages of Negative Feedback: Feedback Concept, Advantages of Negative Feedback, Feedback Concept, Advantages of Negative Feedback. Smalaysis of Gain and Gain Stability, Numerica				
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Unit – III 08 Hrs Digital Electronics Boolean Algebra and Simplification: Boolean Postulates and De-Morgan's Theorems. Simplification Using Postulates and Theorems. Simplification using K-Map up to 4-Variables. Basic and Universal Gates: Truth Tables of All Basic and Universal Gates. Half Adder, Full Adder, Realization Using Basic Gates and NAND Gates. Multiplexers, De-Multiplexers, Encoders and Decoders. Unit – IV 08 Hrs Introduction To OP-AMP: Block Diagram of Op-Amp, Characteristics of an Ideal Op-Amp: Gain, Bandwidth Input & Output Impedances, CMRR, PSRR, Slew Rate, Input Offset Voltage. Typical Parameters of a Genera Purpose Op-Amp, Pin Configuration of Op-Amp (741). Differential Amplifier, Applications: Inverting Amplifier Non Inverting, Amplifier, Voltage Follower, Summer, Integrator, Differentiator, Comparator, Difference Amplifier, Schmitt Trigger, Instrumentation Amplifier, Numerical Examples. Unit – V 08 Hrs Communication Systems, Sensors and Transducers 08 Hrs Introduction to Communication: Block Diagram of a General-Purpose Communication System, Need for Modulation, Types of Modulation: AM and FM. Modulation Index, Sideband Frequencies, Bandwidth and Power, Differences Between AM and FM, Numerical Examples. Digital Communication Block Diagram. Introduction to Transducers: Passive Electrical Transducers- Resistive Thermometer, Linear Variable Differential Transformer (LVDT), Proximity Transducer. Active Electrical Transducer- Piezo Electric Transducer Hall Effect Transducer. Introduction to Transducers. Active Electrical Transducer- Piezo Electric Transducer Hall Effect Transdu		aok concept, i la tantages ()1 1 (c	guille i coubuck,
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Communication Systems, Sensors and Transducers Introduction to Communication: Block Diagram of a General-Purpose Communication System, Need fo Modulation, Types of Modulation: AM and FM. Modulation Index, Sideband Frequencies, Bandwidth and Power, Differences Between AM and FM, Numerical Examples. Digital Communication Block Diagram. Introduction to Transducers: Passive Electrical Transducers- Resistive Thermometer, Linear Variable Differential Transformer (LVDT), Proximity Transducer. Active Electrical Transducer- Piezo Electric Transducer Hall Effect Transducer. Case Studies: i. Automatic Headlight System ii. Pick and Place Robots. Course Outcomes: After completing the course, the students will be able to		002		08 Hrs
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	Course Outcomes: After completing the course the studen			
A MARKED STORY THE KINDWIETWEITHER HER HER AUDITAL FUALALED VOLVED TO THE VEHICLE HER DEVICES SHOT WE THAT APPLIES IN THE STORY AND A STORY AN	A COMPANY AND A PRODUCT A CONTRACT A DESCRIPTION OF A DES	ts will be able to		

COI	Apply the knowledge on operational characteristics of the semiconductor devices such as Diodes, BJTs,
	MOSFETs, Sensors, Operational Amplifiers, Digital logic building blocks and Communication Systems
	for various electronic applications. (PO1, PO2, PO9)
CO2	Analyze the performance of electronic circuits for different applications of electronic systems designs.
	(PO1, PO2, PO5, PO6, PO8, PO9)

CO3 Investigate and adopt possible safety measures, societal and environmental considerations through



	experiential learning and literature survey. (PO1, PO2, PO5, PO6, PO8, PO9, PO11)
CO4	Evaluate the performance of the electronic systems designed for the given specifications using the modern
	design tools. (PO1, PO2, PO5, PO8, PO9, PO11)

Refere	nce Books
1	Electronic Devices and Circuit Theory, Robert L Boylestad, Louis Nashelsky, Prentice Hall India
	publication, 10 th Edition, 2009, ISBN: 978-317-2700-3.
2	Basic Electronics, D P Kothari, J Nagrath, Mc Graw Higher Ed, 2 nd Edition, ISBN: 9789352606467.
3	Digital Logic and Computer Design, Morris Mano, , Prentice Hall India publication, 54th Edition, 2007,
	ISBN: 978-81-317-1450-8.
4	Electronic Devices and Circuits, David A. Bell, Oxford University Press, 5th Edition, 2008.
	ISBN:9780195693409.
5	Basic Electronics, Ravish Aradhya H V, McGraw Hill Education; 3rd edition, ISBN: 978-0071333108.

RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)			
#	COMPONENTS	MARKS	
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20	
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	40	
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS.	40	
	MAXIMUM MARKS FOR THE CIE THEORY	100	

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)					
Q. NO.	CONTENTS	MARKS				
	PART A					
1	Objective type questions covering entire syllabus	20				
	PART B					
	(Maximum of TWO Sub-divisions only)					
2	Unit – I: (Compulsory)	16				
3 & 4	Unit – II: Question 3 or 4	16				
5&6	Unit – III: Question 5 or 6	16				
7 & 8	Unit – IV: Question 7 or 8	16				
9 & 10	Unit –V: Question 9 or 10	16				
	MAXIMUM MARKS FOR THE SEE THEORY	100				



Semester: I							
	ELEMENTS OF ELECTRICAL ENGINEERING						
	Category: Professional Core Course Stream: Electronics (Only to EE Program)						
	(Theory)						
Course	Course Code : EE112TA CIE : 100 Marks						
	: L:T:P	:	2:1:0		SEE	:	100 Marks
Total H	lours	:	40 L		SEE Duration	:	03 Hours
				nit — I			08 Hrs
				tities, Generation of			0
	· ·	-		circuits. Analysis with		R-L	L, R-C, R-L-C Series
			-	active power, apparent		. 1	11' 1 6
				EMF, phase sequence			
-	-		od (Balanced load)	and Δ connected systematics	ems, measurement	οιμ	ower in three phase
	by two wattineter in			it – II	<u> </u>		08 Hrs
DC Ma	chines: DC Gener	ato		, construction, Derivat	ion for induced FM	IF 1	
			eries, Application, a		Ion madeed Elv	,	, pes, eee and load
				gnificance of back EM	IF, types, Derivatio	on f	or power & Torque.
				sity of starters, 3-point			
		ľ		it – III	121		08 Hrs
Single I	Phase Transforme	rs:	Necessity of transf	former, principle of op	eration, Construction	on o	f core and shell type
				or induced EMF, transf			
constant	t and variable losse	s, (ciency & regulation, co	ondition for maximu	ım (
Unit – IV08 HrsThree phase Induction Motor: Concept of rotating magnetic field, Principle of operation, constructions, types,							
			-	ating magnetic field, I	Principle of operation	on,	constructions, types,
·	its significance, ap	•	-	den dia sectore de la construcción	c		levine for EME
				struction, advantage o listribution factor, win			
example	-	ι Ο.	i winding factor (c	ilsuibution factor, wh	nunig factor, breau	un i	actor), applications,
example		1	Un	it – V	/ /		08 Hrs
Power	transmission and	di		pt of power transmiss	sion and power di	stril	
				stic, commercial, and s			
only.			1.NS.	TITUTIONS			
	•		-	pliances including air			
			consumption of ele	ctrical energy, two-par	rt electricity tariff,	calc	ulation of electricity
	domestic consumer					Б	.1. 1
				are circuit breaker (MC	CB), Electric Shock	i, Ea	arthing and its types,
Salety P	Safety Precautions to avoid shock.						
Course	Outcomes: After	CO1	nnleting the cours	e, the students will be	able to		
CO1				C circuits using basic 1		al c	oncepts of Electrical
				stribution circuits with			
	(PO1, PO2, PO8,				-		-
CO2	Evaluate the elect (PO1, PO2, PO8,			circuits and perform	ance parameters of	AC	C and DC machines.
CO3				machines and their ap	plications.		
	(PO1, PO2, PO8,			and anoth up	r		
CO4				its, electrical paramete	ers to estimate elect	rici	ty consumption with
				n. (PO1, PO2, PO8, F			- •



Refere	nce Books
1	Electrical and Electronics Technology, E. Hughes, 10th Edition, 2010, Pearson, ISBN- 978-8131733660.
2	Basic Electrical Engineering, C.L. Wadhwa, 1st Edition, 2007, New Age international(P) Limited,
	ISBN- 10: 9788122421521.
3	Basic Electrical Engineering, M. V. Rao, 10th Edition, 2018, Subhas Publications, ISBN- 9789383214136.
4	Basic Electrical Engineering, D C Kulshreshtha, Revised First Edition, 2017, Tata McGraw Hill,
	ISBN- 13:978-0071328968.

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	MAXIMUM MARKS FOR THE CIE THEORY	100

	S D V S	
	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)	
Q. NO.	CONTENTS	MARKS
	PART A	
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	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit –V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100



				Semester: I				
				MECHANICAL EN				
	Star	n		Professional Core (mmon for AS, CH,		ma)		
	Sur	an	i: Mechanical (Co	(Theory)	ini & nie riograi	115)		
Course	e Code	•	ME112TA		CIE	•	100 M	larks
	s: L:T:P	:	2:1:0		SEE	:	100 N	
Total H		:	40T		SEE Duration	:	03 Ho	
			-					
			Ur	nit — I				08 Hrs
Nonfer				fication, fabrication osets and Elastomer				
Sensors	s, semiconductor		<u> </u>	nit – II				10 Hrs
Latha	and Latha anaroti	0100		ecifications of a lath	e Lathe operations	(Tur	ning T	
joints, causes,	Soldering & welding	ng,	types and applicat	: Introduction to me tions, accessories co rate testing, Magneti	nsumables and saf	ety, '	Welding	g defects and
current	tosting.		Uni	it – III	101			08 Hrs
	eration: Refrigerat ration, COP, refriger		ts and their properti		Compression refri	igerat	ion sys	1
				it – IV	-			08 Hrs
Charac Electri Perforn	teristics, Classificat cal Drives: Histor	ion y,	of gears, velocity r Well to Wheel and Characteristics, Co	gines, Working of ratio for simple and c alysis, Electric vehic incept of Hybrid Elec	ompound gear train cles, Configuration	is. s, EV	//ICEV	comparison, of hybrid
				nit – V				06 Hrs
control lock Br Roboti	system, Applicatio raking System (ABS ics: Robots- Basic S	ns- 5). Stru	water level control cture of Robots, R	atronic system, meas ller, washing machin obot Anatomy, Com ations and their Relati	e, Engine managen plete Classification	of R	system obots, I	(EMS), Anti-
Course	Outcomes. After	COF	nnleting the cours	e the students will l	he able to			
Course CO1	Understanding the	e fu	ndamentals of basic	e, the students will l c engineering materia	uls, manufacturing p	proce	sses, ref	rigeration
CO1	Understanding the systems, prime mo	e fu ove	ndamentals of basic rs, mechatronics, a	c engineering materiand automation. (PO1	lls, manufacturing p)		·	0
	Understanding the systems, prime mo Explain the class	e fu ove sifi	ndamentals of basic rs, mechatronics, and cation of enginee	c engineering materia nd automation. (PO1 ering materials, ma	lls, manufacturing p)		·	0
CO1 CO2	Understanding the systems, prime mo Explain the clas automation, and m	e fu ove sifi necl	ndamentals of basic rs, mechatronics, and cation of enginee hatronics systems.	c engineering materia nd automation. (PO1 ering materials, ma (PO1, PO5)	lls, manufacturing p) chine tools, refrig	gerati	on cyc	les, engines
CO1	Understanding the systems, prime mo Explain the clas automation, and m Apply knowledge	e fu ove sifi necl of	ndamentals of basic rs, mechatronics, and cation of engineer hatronics systems. (engineering materia	c engineering materia nd automation. (PO1 ering materials, ma	lls, manufacturing p) chine tools, refrig rocesses, and therm	gerati odyna	on cyc	les, engines

CO4 Assess and contrast the performance of engineering materials, manufacturing processes, and mechanical systems for various industrial applications. (PO2)



DC	
Kefere	ence Books
1	Elements of Mechanical Engineering, K. R. Gopalakrishna, Subhas Publications, 18th Edition.
	ISBN:5551234002884
2	Material Science & amp; Engineering- William D Callister, 2 / 10th Edition, ISBN 978-1-119-45520-2.
3	Welding Technology (PB), Khanna O P, Dhanpat Rai publication, 4th Edition, ISBN 9383182555.
4	Electric and Hybrid Vehicles, Design Fundamentals – Iqbal Husain, CRC Press, 2 nd Edition, 2010.
	ISBN – 13-978-1439811757.
5	Modern Electric, Hybrid Electric & amp; Fuel Cell Vehicles, Fundamentals, Theory and Design –
	Mehrdad Ehsani, CRC Press, 1 st Edition, 2005. ISBN – 13- 978-0849331541.
6	Mechatronics – Electronic control systems in Mechanical and Electrical Engineering, William Bolton,
	Pearson, 6 th Edition, ISBN: 978-1-292-07668-3, 2015.

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)	
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	MAXIMUM MARKS FOR THE CIE THEORY	100

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9 & 10	Unit –V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100



			Semester: II			
			OF PROGRAMMIN			
Category: Professional Core Course						
Stream:	Con		ommon to AI, BT, C	S, CY, CD & IS Pr	ogra	ams)
~ ~ .			neory and Practice)	~~~~	-	
Course Code	:	CS222AI		CIE	:	100 Marks
Credits: L:T:P	:	2:0:1		SEE	:	100 Marks
Total Hours	:	28L+30P		SEE Duration	:	03 Hours
		T.	nit – I			06 Una
Lariaal Descening and	A1~			onmont Enomals	~ ~~	06 Hrs
Logical Reasoning and	0		Solving: Skill devel	opment – Example	s re	lated to Arithmetical
Reasoning and Analytica			T	CC :	Due	
Introduction to Progra				fficient programs.	Pro	gram Design Tools:
Algorithms, Flowcharts a				ha finat muanum Fi	1	
Introduction to C: Intr						
Compiling and executing						
Data Types in C, Variat	bles,	Constants, I/O stat	ements in C. Operato	ors in C, Type conv	versi	on and type casting,
scope of variables.			nit – II	d		05 11
				1.	1 1	05 Hrs
Decision Control and I	-	0		the second se	iai c	ranching statements,
iterative statements, Nest						· o ··
Arrays: Introduction, D					ues	in arrays, Operations
on Arrays. Two dimensio	onal a			rays.		06 11
	_		it – III	121		06 Hrs
Strings: Introduction, C						
uppercase and lowercase				ng to another string	g, co	mparing two strings,
reversing a string, String				· · · · · · · · · · · · · · · · · · ·		1. Carlina Francisco
Functions: Introduction						
call, return statement, pas	ssing			ons. Passing arrays	to I	
Characterization Induction			it – IV		- 6	06 Hrs
Structures: Introduction						
members of a structures,						
Pointers: Introduction			· · · · · ·	·	1 po	inter arithmetic, null
pointers, passing argume	ents to					0.511
<u> </u>			nit – V			05Hrs
Dynamic memory allo	catio	n: Memory alloca	tion process, allocati	ng a block of mer	nory	v, releasing the used
space.	T /	1 1.1 1	A	11	11	
Linked List and Files:						
types of linked lists, sing					a fro	om files, writing data
to files, Detecting End-O)t-Fil	e, Functions for sel	ecting a record rando	mly, Remove ().		
		•	,	• • .		
Course Outcomes: Afte						
CO1 Apply logical sl	kills t	to solve the proble	ms using C programm	ning constructs acro	oss v	arious domains such

COI	Appry logical skins to solve the problems using C programming constructs across various domains such
	as engineering, mathematics and data processing. (PO1, PO2)
CO2	Design and implement a sustainable solution using C programming with societal and environmental
	concern by engaging in lifelong learning for emerging technology.
	(PO1, PO2, PO3, PO4, PO5, PO6, PO11)



CO3	Evaluate the appropriate method/data structure required in C programming to develop solutions by
	investigating the problem. (PO1, PO2, PO4, PO5, PO7, PO11)
CO4	Demonstrate programming skills to solve inter-disciplinary problems using modern tools effectively by
	exhibiting teamwork through oral presentation and written reports.
	(PO1, PO2, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11)

Refer	Reference Books				
1	Programming in C, Reema Thareja, 2018, Oxford University Press. ISBN: 9780199492282.				
2	Algorithmic Problem Solving, Roland Backhouse, 2011, Wiley, ISBN: 978-0-470-68453-5				
3	The C Programming Language, Kernighan B.W and Dennis M. Ritchie, 2015, 2 nd Edition, Prentice Hall, ISBN (13): 9780131103627.				
4	Turbo C: The Complete Reference, H. Schildt, 2000, 4 th Edition, Mcgraw Hill Education, ISBN-13: 9780070411838.				

	Laboratory Experiments	
¢	PART A	

Implement the following programs using cc/gcc compiler

Practice Programs:

- a) Familiarization with programming environment: Concept of creating, naming and saving the program file in gedit/vi editor, Concept of compilation and execution, Concept of debugging in GDB environment.
- b) Implementation and execution of simple programs to understand working of
 - Printf, formatted printf, Escape sequences in C.
 - Using formula in a C program for specific computation.
 - Example: computing area of circle, converting Celsius to Fahrenheit, area of a triangle, converting distance in centimeters to inches, etc.
 - Preprocessor directives (#include, #define)
- c) Execution of erroneous C programs to understand debugging and correcting the errors like:
 - Syntax / compiler errors
 - Linker errors
 - Logical errors
 - Semantical errors
 - Implementation and execution of simple programs to understand working of operators like:
 - Unary

d)

- Arithmetic
- Logical
- Relational
- Conditional
- Bitwise

Programming Assignments:

- 1. Assignment statements.
- 2. Control Statements.
- 3. Loop Statements.
- 4. One dimensional Arrays Searching and sorting.
- 5. Two dimensional arrays Matrix operations.
- 6. Functions.

- 7. Recursion.
- 8. Structures.
- 9. Pointers
- 10. Linked Lists
- 11. Dynamic memory allocation
- 12. Files.



PART B

Design and development of a working model using any of the following combination of hardware and software.

- Develop a model that helps the user to monitor whether, health condition, environment parameters etc using Arduino board.
- Develop a simple Robot that can assist the user to perform simple activities home sanitization, lifting things etc using Raspberry pi.
- Hardware interfacing (Ardunio Board, Finch, Lego WeDo 2.0) with scratch to design various models to solve simple problems.

Develop applications using Nvidia Jetson Kit.

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY WITH LA	AB)
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	10
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 30 MARKS .	30
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (10) ADDING UPTO 30 MARKS .	30
4	LAB: Conduction of laboratory exercises, lab report, observation and analysis (30 Marks), lab test (10 Marks) and Innovative Experiment/ Concept Design and Implementation (10 Marks) adding up to 50 Marks. THE FINAL MARKS WILL BE REDUCED TO 30 MARKS	30
	MAXIMUM MARKS FOR THE CIE THEORY	100
	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)	
Q. NO.	CONTENTS	MARKS
L	PART A	
1	Objective type questions covering entire syllabus	10
	PART B	
	(Maximum of TWO Sub-divisions only)	1
2	Unit – I: (Compulsory)	14
3 & 4	Unit – II: Question 3 or 4	14
	Unit – III: Question 5 or 6	14
7 & 8	Unit – IV: Question 7 or 8	14
	Unit –V: Question 9 or 10	14
11	Lab Component (Compulsory)	20
	MAXIMUM MARKS FOR THE SEE THEORY	100



			ENGIN	Semester: II				
				EERING MECH				
	(Category: Professional Core Course) (Stream: Civil)							
				(Theory)				
Course	Code	:	CV112TA	(CIE	:	100 N	Iarks
Credits	s: L:T:P	••	2:1:0		SEE	:	100 N	Iarks
Total H	Iours	••	40L		SEE Duratio	n :	03 Ho	ours
				nit — I				08 Hrs
	ant of coplanar for							
	le of transmissibilit							
-	Resultant of copl cal examples.	lana	ar concurrent forc	e system, Resul	tant of coplanar n	ion-conc	urrent 1	force system,
Numen			T.					00 11
Fauilik	orium of coplanar	· f		it – II	anar concurrent for	rea syste	m Lar	08 Hrs
	rium of coplanar p							
	ns, Equilibrium of c							
	ed to various types				1 March		5	
				it – III	1.51			08 Hrs
-	is of Trusses: Intro				alysis of plane perf	ect truss	es by the	he method of
joints a	nd method of sectio	ns,			14	<u> </u>		00 11
Contro	id of plane areas:	In		it – IV	f roctongla triangle	airela	somioir	08 Hrs
and sec	tor of a circle usi	Π nσ	method of integra	tion centroid of	composite areas a	nd simr	sennen de built	up sections
	cal examples.	115	method of megra	don, controla of	composite areas i	ing shirp	de built	up sections,
			Un	nit – V				08 Hrs
	nt of inertia of pla							
	radius of gyration,							
-	lar and circular area			integration, mom	ent of inertia of cor	nposite a	ireas and	d simple built
up secti	ons, Numerical exa	mp	oles.	\sim	/ /			
Course	Outcomes: After	COT	nnleting the cours	e the students w	vill be able to			
CO1					alyze rigid bodies.	(PO1.)	PO2. P	011)
CO2	** *			and the second sec	ane and composite		,	011)
	(PO1, PO2, PO2			and a card tor pr	una composito			
CO3				hanics to solve	complex Engineer	ing prol	olems.	
		-	PO8, PO9, PO11		1 0	01		
			· · ·					
	nce Books							
1	Mechanics for Eng	gin	eers, Statics and Dy	namics, Beer F.I	P. and Johnston E. F	R., McGr	aw-Hill	Inc., US;
	4 th Revised Edition	n , 1	987, ISBN-13 : 97	78-0070045842.				
2				amics, Irving H.	Shames, Dorling K	indersley	y Pvt Lt	d. 4 th Edition,
3	2005, ISBN: 9788			totics and Duna	nics, Hibbler R. C.,	Doorsor	Dreas	1 Ath Edition
3	2017, ISBN-13 :		-	taues and Dynan	mes, moder K. C.,	rearson	riess.	. 14 Eultion,
4	Engineering Mech	nan	ics, Timoshenko S,	Young D. H., Ra	o J. V., Pearson Pre	ss. 5th E	dition, 2	2017,
	ISBN-13:978-125			_				
5								
		19n	ics Bhavikatti SS	New Age Interne	ational Private Limi	ted 8 th F	dition	2021



ISBN-13:978-9388818476.

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)	•
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	40
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS.	40
	MAXIMUM MARKS FOR THE CIE THEORY	100

Q. NO.	CONTENTS	MARKS
	PART A	
1	Objective type questions covering entire syllabus	20
	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit –V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100
	WSTITUTIONS	



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Courses Common to All Programs

SIKSHANA

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> IDEA LAB (IDEA DEVELOPMENT, EVALUATION & APPLICATION) (ME111DL / ME121DL)

 COMPUTER AIDED ENGINEERING GRAPHICS (ME112GL / ME122GL)

WSTITUTIO

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Semester: I / II							
	IDEA LAB (Idea Development, Evaluation & Application)						
		Category: Pro	fessional Core Cou	ırse			
			to all Programmes)			
		()	Practice)				
Course Code	:	ME111DL/ME121DL		CIE	:	50 Marks	
Credits: L:T:P	Credits: L:T:P : 0:0:1 SEE : 50 Marks						
Total Hours	:	30P		SEE Duration	:	03 Hours	

LABORATORY EXPERIMENTS				
Part-A: Basic Sensor and Actuator Interfacing Experiments				
1. a) LED On/Off				
• Objective: To control the ON/OFF state of a single LED using a microcontroller.				
b) Multiple LED On/Off				
o Objective: To control the ON/OFF state of multiple LEDs, demonstrating basic GPIO pin				
handling.				
2. LED with Switch Interface				
• Objective: To interface a physical switch with a microcontroller to control the ON/OFF state of an				
LED.				
3. Ultrasonic Sensor with LED and Buzzer Interface (Optional: DC Pump Control)				
• Objective: To measure distance using an ultrasonic sensor and trigger an LED and buzzer when an				
object is detected within a threshold. Optionally, control a DC pump based on sensor input.				
4. Temperature & Humidity Sensor with LCD Interface (Optional: DC Motor Control)				
• Objective: To read environmental data using a temperature and humidity sensor and display it on				
an LCD. Optionally, control a DC motor based on the sensor data.				
5. Flame Sensor Interfacing with Buzzer and LED (Optional: DC Motor/Pump Control)				
• Objective: To detect fire using a flame sensor, trigger an LED and buzzer, and optionally control a				
DC motor or pump for safety measures.				
6. Float Sensor Interfacing with Buzzer and LED (Optional: DC Pump Control)				
• Objective: To monitor liquid levels using a float sensor, activating a buzzer and LED when a				
certain level is reached. Optionally, control a DC pump to regulate liquid levels.				
Part-B: Advanced Sensor and Actuator Interfacing Experiments 7. Touch Sensor Interfacing with LED (Optional: Solenoid Lock Control)				
 Objective: To detect touch using a touch sensor and activate an LED. Optionally, control a solenoid lock for security applications. 				
8. Interfacing Magnetic Door Sensor with LED and Buzzer				
• Objective: To interface a magnetic door sensor for security purposes, activating an LED and				
buzzer when the door is opened or closed.				
9. Interfacing LDR Sensor with Arduino UNO to Control LED or 230V Bulb Using 5V Relay				
 Objective: To detect ambient light using an LDR sensor and control the state of an LED or a 230V 				
bulb via a 5V relay.				
10. Smoke Sensor Interfacing with LED and Buzzer				
• Objective: To detect smoke using a smoke sensor, triggering an LED and buzzer for safety and				
warning purposes.				
11. Interfacing Soil Moisture Sensor with Arduino UNO (Optional: DC Pump Control)				
• Objective: To measure soil moisture levels using a soil moisture sensor and control a DC pump				
for irrigation purposes based on the moisture readings.				
12. Interfacing Heartbeat Sensor with Arduino UNO				
• Objective: To monitor heart rate using a heartbeat sensor and display or process the data using				
Arduino.				
13. Robot Demonstration				
• Objective: To demonstrate the working of a robot that integrates various sensors and actuators,				
Common to all Programmes Page 51				



showcasing a complete automation solution.

Course	Course Outcomes: After completing the course, the students will be able to				
CO1	Apply fundamental principles of mathematics, science, and engineering to design and implement				
	interface circuits. (PO1, PO10)				
CO2	Develop creative solutions for sensor-based systems. (PO3, PO5)				
CO3	Investigate, analyze, and solve complex problems related to automation. (PO4, PO5, PO6)				
CO4	Demonstrate the ability to work collaboratively in diverse teams to design and implement				
	intelligent systems. (PO8, PO9, PO10)				

Refere	Reference Books				
1	Geddes, M. (Year). Arduino project handbook: Volume one: Complete guide to creating with the				
	Arduino. Sketch Publishing. ISBN-10: 0992952603.				
2	Blum, J. (Year). Exploring Arduino: Tools and techniques for engineering wizardry. Wiley.				
	ISBN-10: 1119405378.				
3	Schwartz, M. (Year). Internet of things with ESP8266. Packt. ISBN-13: 9781786468024.				
	https://www.arduino.cc/reference/en/				
	SINDINAR				

RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (LAB)				
#	COMPONENTS	MARKS		
1.	Conduction of laboratory exercises, lab report, observation, and analysis (30 marks), lab test (10 Marks) and Innovative Experiment/ Concept Design and Implementation (10 Marks) adding up to 50 Marks .	50		

MAXIMUM MARKS FOR THE CIE 50

	RUBRIC FOR SEMESTER END EXAMINATION (LAB)						
Q. NO.	CONTENTS	MARKS					
1.	TWO lab exercises with implementation of the program.	40					
2.	Viva	10					
	TOTAL	50					

WSTITUTIONS



Semester: I / II						
COMPUTER AIDED ENGINEERING GRAPHICS						
(Common for all Programs)						
			ry & Practice)			
Course Code : ME112GL/ME122GL CIE : 50 Marks						
Credits: L:T:P	:	1:0:2		SEE	:	50 Marks
Total Hours	:	15(T)+60 (P)		SEE Duration	:	03 Hours
		Unit –				12 Hrs
Introduction: Significant						
dimensioning, line conve						
riveted, welded, brazed an						
Use of Simple CAD tools	s: (Overview of CAD softwa	re [Menu bar, tabs	-sketch, modify, din	nen	sion, annotation
and commands].						
Orthographic Projection						
quadrants); Projection of	lir	nes (first angle projection	n); Projection of pl	anes - inclined to H	IP a	and VP (first angle
projection).		-14.5	SHANA	<u> </u>		
		Unit –				12 Hrs
Projection of Solids: Prisms, pyramids, cylinder & cone with axis inclined to HP and VP (first angle projection).						
	sm	s, pyramids, cylinder & c	one with axis inclin	ned to HP and VP (fi	rst	angle projection).
Projection of Solids: Pris (Computer Drafting)	sm	1 19		ned to HP and VP (fi	rst	
(Computer Drafting)		Unit –	ш			18 Hrs
(Computer Drafting) Isometric projection: Iso		Unit –	ш			18 Hrs
(Computer Drafting) Isometric projection: Iso (Computer Drafting).	om	Unit – etric scale, Isometric Pro	III jection of regular so	olids and combination	on c	18 Hrs If two simple solids
(Computer Drafting) Isometric projection: Iso (Computer Drafting). 3D modelling of comp	om	Unit – etric scale, Isometric Pro	III jection of regular so	olids and combination	on c	18 Hrs f two simple solids
(Computer Drafting) Isometric projection: Iso (Computer Drafting).	om	Unit – etric scale, Isometric Pro ents: Conversion of is	III jection of regular so ometric view to o	olids and combination	on c	18 Hrs of two simple solids d sectional views.
(Computer Drafting) Isometric projection: Iso (Computer Drafting). 3D modelling of comp (Computer Drafting)	om oon	Unit – etric scale, Isometric Pro ents: Conversion of is Unit –	III jection of regular so ometric view to o IV	olids and combination	on c an	18 Hrs of two simple solids d sectional views. 15 Hrs
(Computer Drafting) Isometric projection: Iso (Computer Drafting). 3D modelling of comp (Computer Drafting) Development of Lateral	om oon	Unit – etric scale, Isometric Pro ents: Conversion of is Unit – urfaces: Introduction to s	III jection of regular so ometric view to o IV section planes, meth	olids and combination orthographic views	on c an	18 Hrs of two simple solids d sectional views. 15 Hrs parallel line method
(Computer Drafting) Isometric projection: Iso (Computer Drafting). 3D modelling of comp (Computer Drafting) Development of Lateral and radial line method –	om oon	Unit – etric scale, Isometric Pro ents: Conversion of is Unit – urfaces: Introduction to s	III jection of regular so ometric view to o IV section planes, meth	olids and combination orthographic views	on c an	18 Hrs of two simple solids d sectional views. 15 Hrs parallel line method
(Computer Drafting) Isometric projection: Iso (Computer Drafting). 3D modelling of comp (Computer Drafting) Development of Lateral	om oon	Unit – etric scale, Isometric Pro ents: Conversion of is Unit – urfaces: Introduction to s rism and cylinder (trunca	III jection of regular second ometric view to explore IV section planes, methated), pyramid and	olids and combination orthographic views	on c an	18 Hrs If two simple solids d sectional views. 15 Hrs barallel line method ncated) (Computer
(Computer Drafting) Isometric projection: Iso (Computer Drafting). 3D modelling of comp (Computer Drafting) Development of Lateral and radial line method – Drafting).	oma oon . Su - pr	Unit – etric scale, Isometric Pro ents: Conversion of is Unit – urfaces: Introduction to s	III jection of regular second ometric view to explore IV section planes, methated), pyramid and	olids and combination orthographic views	on c an	18 Hrs of two simple solids d sectional views. 15 Hrs parallel line method
(Computer Drafting) Isometric projection: Iso (Computer Drafting). 3D modelling of comp (Computer Drafting) Development of Lateral and radial line method – Drafting). Engineering components	omo oon Su ss	Unit – etric scale, Isometric Pro- ents: Conversion of is Unit – urfaces: Introduction to s tism and cylinder (trunca Unit –	III jection of regular so ometric view to o IV section planes, methated), pyramid and V	olids and combination orthographic views	on c an	18 Hrs If two simple solids d sectional views. 15 Hrs barallel line method ncated) (Computer
(Computer Drafting) Isometric projection: Iso (Computer Drafting). 3D modelling of comp (Computer Drafting) Development of Lateral and radial line method – Drafting). Engineering components Assembly of Hexagonal b	oma oon Su - pr	Unit – etric scale, Isometric Pro ents: Conversion of is Unit – urfaces: Introduction to s tism and cylinder (trunca Unit – Unit –	III jection of regular so ometric view to o IV section planes, methated), pyramid and V 3D	olids and combination orthographic views	on c an	18 Hrs If two simple solids d sectional views. 15 Hrs barallel line method ncated) (Computer
(Computer Drafting) Isometric projection: Iso (Computer Drafting). 3D modelling of comp (Computer Drafting) Development of Lateral and radial line method – Drafting). Engineering component Assembly of Hexagonal b Riveted joint: - butt joint	omo oon Su - pr	Unit – etric scale, Isometric Pro- ents: Conversion of is Unit – urfaces: Introduction to s tism and cylinder (trunca Unit - Unit -	III jection of regular second ometric view to experimentation IV section planes, methated), pyramid and V 3D ain riveting): 3D	olids and combination orthographic views	on c an	18 Hrs If two simple solids d sectional views. 15 Hrs barallel line method ncated) (Computer
(Computer Drafting) Isometric projection: Iso (Computer Drafting). 3D modelling of comp (Computer Drafting) Development of Lateral and radial line method – Drafting). Engineering components Assembly of Hexagonal b Riveted joint: - butt joint Union joint, butt muff com	omo oon Su Su soolt wit	Unit – etric scale, Isometric Pro- ents: Conversion of is Unit – urfaces: Introduction to s rism and cylinder (trunc: Unit - twith nut (with washer)-: th two covering plate (chaing, socket and spigot joi	III jection of regular second frequences ometric view to experimentation IV section planes, methated), pyramid and V 3D ain riveting): 3D	olids and combination orthographic views nods of development	on c an	18 Hrs If two simple solids d sectional views. 15 Hrs barallel line method ncated) (Computer
(Computer Drafting) Isometric projection: Iso (Computer Drafting). 3D modelling of comp (Computer Drafting) Development of Lateral and radial line method – Drafting). Engineering components Assembly of Hexagonal b Riveted joint: - butt joint Union joint, butt muff cou Basic building drawing (F	ome oon Su - pr - soolt wit upl Plan	Unit – etric scale, Isometric Pro- ents: Conversion of is Unit – urfaces: Introduction to s tism and cylinder (trunca Unit - twith nut (with washer)-: th two covering plate (chaing, socket and spigot join and Elevation): 2D	III jection of regular second frequences ometric view to experimentation IV section planes, methated), pyramid and V 3D ain riveting): 3D	olids and combination orthographic views nods of development	on c an	18 Hrs If two simple solids d sectional views. 15 Hrs barallel line method ncated) (Computer
(Computer Drafting) Isometric projection: Iso (Computer Drafting). 3D modelling of comp (Computer Drafting) Development of Lateral and radial line method – Drafting). Engineering components Assembly of Hexagonal b Riveted joint: - butt joint Union joint, butt muff com	omo oon Su oolt wit upl Plan ting	Unit – etric scale, Isometric Pro- ents: Conversion of is Unit – urfaces: Introduction to s tism and cylinder (trunca Unit - twith nut (with washer)- th two covering plate (chai ing, socket and spigot joi and Elevation): 2D g drawing: 2D	III jection of regular second frequences ometric view to experimentation IV section planes, methated), pyramid and V 3D ain riveting): 3D	olids and combination orthographic views nods of development	on c an	18 Hrs If two simple solids d sectional views. 15 Hrs barallel line method ncated) (Computer

Course	Course Outcomes: After completing the course, the students will be able to			
CO1	Apply BIS standards to create technical drawings, incorporating conventions for symbols, dimensions,			
	and material representations. (PO1)			
CO2	Generate orthographic and isometric projections of solids using first-angle projection in both manual and			
	CAD environments. (PO1, PO5)			
CO3	Develop lateral surfaces of engineering solids and create 3D models and assemblies of engineering			
	components using CAD software. (PO5)			
CO4	Create 2D drawings for various engineering domains, including building plans, electrical wiring, and			
	electronic PCBs using CAD software. (PO1, PO5)			

Reference Books

Textbook of Engineering Graphics by K R Gopalakrishna, Sudhir Gopalakrishna, Subhash Publishers, 1 40th Edition, 2018; ISBN 978-9383214204.



2	SOLIDWORKS 2020 for Designers by Sham Tickoo Purdue University, CADCIM Technologies, 18th
	Edition, 2019; ISBN: 978-1640570849.
3	Machine drawing by N. D. Bhatt, V. M. Panchal, Charotar Publishing House, 50th Edition, 2016;
	ISBN: 978-9385039232.
4	NPTEL :: Mechanical Engineering - Engineering Drawing.

RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)

ASSESSMENT AND EVALUATION PATTERN Theory & quizzes questions are to be framed using Bloom's Taxonomy Levels - Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating.	MARKS
WEIGHTAGE	CIE (50%)
Practice session	
Manual Drawing: Practice session	10
Computer Drafting: Practice Session	15
A. TESTS: Each test will be conducted for 50 Marks adding upto 100 marks. Final test marks w reduced to 10	vill be
Test – I for 50 Marks Test – II for 50 Marks	10
B. EXPERIENTIAL LEARNING: Experiential Learning comprises of the modelling and simulation of various engineering components .	15
TOTAL MARKS FOR THE COURSE (Lab Course)	50

TOTAL MARKS FOR THE COURSE (Lab Course)

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)	
Q. NO.	CONTENTS	MARKS
	PART A	
	(TWO questions to be answered out of THREE Questions)	
Unit – I	One Question to be set from the chapters Points, Lines & Planes. Each question	10
Unit – I	carrying 5 marks.	10
	PART B	
	(TWO questions to be answered out of THREE Questions)	
Unit – II	Question on Projection of Solids (15 marks)	15
Unit -III	Question on Isometric Projection (15 marks)	15
Unit -IV	Question on Development of Surfaces (15marks)	15
	PART C	
	(ONE question to be answered out of FOUR Questions)	
	Question on Assembly of Hexagonal bolt and nut or Riveted Joint	10
TT:4 T7	Question on Basic building drawing	10
Unit – V	Question on Electrical wiring and lighting drawings	10
	Question on Electronic PCB drawings	10
	MAXIMUM MARKS FOR THE SEE THEORY	50

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Engineering Science Courses

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- FUNDAMENTALS OF PROGRAMMING USING C (CS113ATA/CS123ATA)
- ELEMENTS OF CIVIL ENGINEERING (CV113ATB/CV123ATB)
- PRINCIPLES OF ELECTRONICS ENGINEERING (EC113ATC/EC123ATC)
- BASICS OF ELECTRICAL ENGINEERING (EE113ATD/EE123ATD)
- FUNDAMENTALS OF MECHANICAL ENGINEERING (ME113ATE/ME123ATE)



Semester: I / II						
	FUNDAMENTALS OF PROGRAMMING USING C					
	Category: Engineering Science Course					
		(Common to all Programs	s Except CS Stream Programs)			
		[]	Theory)			
Course Code	Course Code : CS113ATA/CS123ATA CIE : 100 Marks					
Credits: L:T:P	Credits: L:T:P : 3:0:0 SEE : 100 Marks					
Total Hours	otal Hours : 40L SEE Duration : 03 Hours					

Unit – I	06 Hrs
Introduction to Programming: Definition of a computer. Components of computer system,	Programming
Languages. Design and implementation of efficient programs. Program Design Tools: Algorithms, F	
Pseudocodes. Types of Errors.	
Unit – II	08 Hrs
Introduction to C: Introduction, structure of a C program, Writing the first program, Files used in	a C program.
Compiling and executing C Programs using comments, C Tokens, Character set in C, Keywords, Ide	entifiers, Basic
Data Types in C, Variables, Constants, I/O statements in C.	
Operators in C, Type conversion and type casting, scope of variables.	
Unit – III	08 Hrs
Decision Control and Looping Statements: Introduction to decision control, conditional branchi	ng statements,
iterative statements, Nested loops, Break and continue statements, goto statements.	-
Arrays: Introduction, Declaration of Arrays, accessing elements of an array, storing values in arra	ys, Operations
on Arrays- Traversing, Inserting and Deletion of element in an array. Two dimensional arrays- Ope	rations on two
dimensional arrays.	
Unit – IV	10 Hrs
Strings: Introduction, Operations on strings- finding length of a string, converting characters of	÷
uppercase and lowercase, concatenating two strings, appending a string to another string, comparin	ng two strings.
reversing a string. String and character Built in functions.	
Functions: Introduction, using functions, Function declaration/function prototype, Function defini	tion, Function
call, Return statement.	
Unit – V	08 Hrs
Functions: Passing parameters to a function, Built-in functions. Passing arrays to functions. Recursi	
Structures and Pointers: Introduction: Structure Declaration, Typedef declaration, initialization	
accessing members of a structures, structure within structures. Introduction to pointers, dec	laring pointer
variables.	
	_
Course Outcomes: After completing the course, the students will be able to	
CO1 Apply logical skills to solve the problems using C programming constructs across various	domains such

Course	e Outcomes: After completing the course, the students will be able to
CO1	Apply logical skills to solve the problems using C programming constructs across various domains such
	as engineering, mathematics and data processing. (PO1, PO2)
CO2	Design and implement a sustainable solution using C programming with societal and environmental
	concern by engaging in lifelong learning for emerging technology.
	(PO1, PO2, PO3, PO4, PO5, PO6, PO11)
CO3	Evaluate the appropriate method/data structure required in C programming to develop solutions by
	investigating the problem. (PO1, PO2, PO4, PO5, PO7, PO11)
CO4	Demonstrate programming skills to solve inter-disciplinary problems using modern tools effectively by
	exhibiting teamwork through oral presentation and written reports.
	(PO1, PO2, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11)

Reference Books				
1	1 Programming in C, Reema Thareja, 2018, Oxford University Press. ISBN: 9780199492282.			
2	The C Programming Language, Kernighan B.W and Dennis M. Ritchie, 2015, 2 nd Edition, Prentice Hall,			
	ISBN (13): 9780131103627.			
3	3 Turbo C: The Complete Reference, H. Schildt, 2000, 4 th Edition, McGraw Hill Education,			



4	Let Us C: Authentic Guide to C PROGRAMMING Language, Yashavant Kanetkar 17th Edition, 2020,	
	BPB PUBN , ISBN- 9789389845686.	

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)	
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	40
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS.	40
	MAXIMUM MARKS FOR THE CIE THEORY	100

Q. NO.	CONTENTS	MARKS
	PART A	
1	Objective type questions covering entire syllabus	20
	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit –V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100



			Semester: I /	II		
				NGINEERING		
			: Engineering S			
		(Common to a	0	ccept CV Program)		
Course	Cada	\cdot CV112ATD/CV12	(Theory)	СЕ		100 Mortro
Course	: L: T: P	: CV113ATB/CV12 : 3:0:0	23ATB	CIE SEE		100 Marks 100 Marks
Total H		: 3:0:0 : 40L		SEE SEE Duratio		03 Hours
10tal 1.	10015	• 40L		SEE Durauo		03 110018
			Unit – I			08 Hrs
Introdu	iction to Civil I	Engineering: Surveyir	ng, Structural Ei	ngineering, Geotechnical	Engineer	ing, Hydraulics
				tal Engineering, Constru		
manage	ement.					
Analys	is of force sys	stems: Concept of i	idealization, sys	stem of forces, princip	oles of s	uperposition and
transmi	ssibility, Resolu	tion and composition	of forces, Law	of Parallelogram of force	es, Result	ant of concurrent
				s, couple, Varignon's th		ee body diagram,
equation	ns of equilibrium	n, equilibrium of concu	rrent and non-co	oncurrent coplanar force s	systems.	
		1.12.7	Unit – II	00.		08 Hrs
Basic I	Materials of Co	onstruction: Bricks,	Cement & mor	tars, Plain, Reinforced	& Pre-str	essed Concrete,
Structur	ral steel, Constru	ction Chemicals.		181		
Structu	iral elements o	f a building: foundation	tion, plinth, lin	tel, chejja, Masonry wa	ll, colum	n, beam, slab and
		netric design. Plinth a	rea, carpet area,	floor area ratio, numeric	al probler	ns, local building
byelaws	S	151		121		
			Unit – III	17 12		08 Hrs
				systems, Water quality		
				nagement- types, source	es, collect	ion and disposal
		ypes, causes and control				111 G L
			gs, recycling, Te	emperature and Sound co	ontrol in bi	uildings, Security
systems	s, Smart building		T TT7			00 11
			Jnit – IV		<u> </u>	08 Hrs
-	0	0 1		of roads and railways, ty	· ·	
			unnels, Harbour	s, Airport. Concepts of	Multimod	al transportation
system-	relevance and in		LI			00 11
Conton	hnical Engineer		Unit – V	oundations- Importance,	Tunos	08 Hrs
	red in selection (0 0	Iation of son, F	oundations- importance,	Types, a	nd ractors to be
			A Robotics in	Construction, Concept	of Sustai	nability in Civil
				oncept of Smart, Clean ar		•
Linginic	ing, introductio		Spinent goais, ee	Sheept of Smart, Crean an		.y.
Course	Outcomes. Aft	er completing the cou	rse, the student	s will be able to		
CO1				structural development of	f society	
	(PO1, PO2, PC	5	in the mild	stractural development of	i society.	
CO2			uction materials			(DO1 DO3)
CO3		Comprehend the importance of construction materials for Civil Engineering applications. (PO1, PO2) Illustrate the latest technologies in Civil Engineering for sustainable practices. (PO1, PO2)			plications.	(POI, PO2)
		est technologies in Civ	il Engineering f			
CO4	Exhibit the know			or sustainable practices. ((PO1, PO	
CO4					(PO1, PO	

Refere	Reference Books		
1	Principles of Transportation Engineering, Partha Chakroborty, Animesh Das, PHI Learning Pvt. Ltd., 2 nd		
	Edition, 2003, ISBN: 9788120320840.		
2	Engineering Mechanics, Bhavikatti S S, New Age International Private Limited, 8th Edition, 2021,		
	ISBN-13:978-9388818476.		



3	Basic Civil Engineering, <u>G.K. Hiraskar</u> , Dhanpat Rai Publications, 1 st Edition, ISBN-13 978-9383182022: .
4	Basic Civil Engineering and Engineering Mechanics, R.K. Bansal, Laxmi Publications, 3rd Edition, 2015, ISBN-13:978-9380856674
5	Basic Civil Engineering, B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain, Laxmi Publications; 1st Edition, 2003, ISBN-13 : 978-8170084037.

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)	
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS .	
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS.	40
	MAXIMUM MARKS FOR THE CIE THEORY	100

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)	
Q. NO.	CONTENTS	MARKS
	PART A	
1	Objective type questions covering entire syllabus	20
	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit –V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100



				ster: I / II				
			PRINCIPLES OF ELEC					
		(6		ering Science Cour				
		(L	Common to all Programs	-	I Programs)			
Course Cod	٥	•	EC113ATC/EC123ATC	heory)	CIE	:	100 N	Iarks
Credits: L:		•	3:0:0		SEE	•	100 N	
Total Hours			40L		SEE Duration	1	03 Ho	
Total Hours	8	:	40L	L.	DEE DUFALION	:	05 П	Jurs
			Unit – I					08Hrs
Regulated I	Power Supp	ly:]	Block Diagram, Bridge Re		ener diode as Vol	ltag	e Regu	
diode, LED.		v		,		U	U	
Amplifiers:	CE Ampli	fier	with and without feedba	ack, Multistage am	plifier, BJT as	a s	witch,	Cutoff and
Saturation m	nodes.				•			
			Unit – I		6			08 Hrs
Feedback A	And Signal	Ge	nerators: Feedback Con	cepts, Advantages	of Voltage serie	s N	legativ	e feedback,
	0		ausen Criterion, RC Phase		U U		•	
			Vaveforms, No mathematic		- C		2	
			Op-Amp basics, Practica		- Inverting Am	plifi	er, N	on-Inverting
			er, Summer, Integrator, I					
mathematica					KIX .	6	,	
		-/	Unit – II	T	12.1			08 Hrs
Boolean Al	gebra And	Log	ic Circuits: Binary numb		conversion and H	[exa	decim	
(Up-to 4 var		gital	Logic gates, Demorgan's	Laws, Ex-OR reali	zation using NAI	ND	and N	OR, Kmaps
1 •	11 · T			A 1.1 TT 10 11 T	7 11 1.1			
combinatio	nal logic: In	trod	uction, Design procedure,		Full adder.			0.0 11
			Unit – IV	7		•		08 Hrs
Communica	ation Syste	ms:	Unit – IN Introduction, Elements of	7 of Communication	system, Modulat			FM (Only
Communica concepts, w	ation System orking prince	ms:	Unit – IV	7 of Communication	system, Modulat			FM (Only
Communica concepts, w block diagra	ation System orking princ m.	ms: ciple	Unit – IN Introduction, Elements of e, waveform and Compar	7 of Communication ison), Super heteroo	system, Modulat lyne receiver, D	igita	al Con	FM (Only nmunication
Communica concepts, w block diagra Introductio	ation System orking princ im. n To Micr	ms: ciple	Unit – IV Introduction, Elements of e, waveform and Compar- rocessor and Microcont	7 of Communication ison), Super heteroo	system, Modulat lyne receiver, D	igita	al Con	FM (Only nmunication
Communica concepts, w block diagra Introductio working prir	ation System orking princ im. n To Micr nciple, and C	ms: ciple copr	Unit – IV Introduction, Elements of e, waveform and Compar- rocessor and Microcontr parison).	7 of Communication ison), Super heteroo coller: Microproces	system, Modulat lyne receiver, D	igita	al Con	FM (Only nmunication
Communica concepts, w block diagra Introductio working prir	ation System orking princ im. n To Micr nciple, and C	ms: ciple copr	Unit – IV Introduction, Elements of e, waveform and Compar- rocessor and Microcontr parison).	7 of Communication ison), Super heteroo coller: Microproces	system, Modulat lyne receiver, D	igita	al Con	FM (Only nmunication
Communica concepts, w block diagra Introductio working prin Case studies i. Developm	ation System orking princ im. n To Micr nciple, and C s: ent board ba	ms: ciple ropr Comp	Unit – IV Introduction, Elements of e, waveform and Compar- rocessor and Microcontr parison).	7 of Communication ison), Super heteroo coller: Microproces erry Pi).	system, Modulat lyne receiver, D	igita	al Con	FM (Only nmunication
Communica concepts, w block diagra Introductio working prin Case studies i. Developm	ation System orking princ im. n To Micr nciple, and C s: ent board ba	ms: ciple ropr Comp	Unit – IV Introduction, Elements of e, waveform and Compar- rocessor and Microcontu- parison). on Microprocessor (Raspb on Micro controller (Ardu	7 of Communication ison), Super heteroo coller: Microproces erry Pi).	system, Modulat lyne receiver, D	igita	al Con	FM (Only nmunication y concepts,
Communica concepts, w block diagra Introductio working prin Case studies i. Developm ii. Developm	ation System orking princ m. n To Micr nciple, and C s: ent board ba nent board ba	ms: ciple copr Comp used ased	Unit – IV Introduction, Elements of e, waveform and Compar- rocessor and Microcontr parison). on Microprocessor (Raspb on Micro controller (Ardu Unit – V	7 of Communication ison), Super heteroo coller: Microproces erry Pi).	system, Modulat lyne receiver, D ssor, Microcontro	igit:	al Con	FM (Only nmunication y concepts, 08 Hrs
Communica concepts, w block diagra Introductio working prin Case studies i. Developm ii. Developm Transducer	ation System orking prind im. n To Micr nciple, and C s: ent board ba nent board ba	ms: ciple ropr Comp used ased	Unit – IV Introduction, Elements of e, waveform and Compar- pocessor and Microcontr parison). on Microprocessor (Raspb on Micro controller (Ardu Unit – V to Transducers: Passive Ele	7 of Communication ison), Super heteroo coller: Microproces erry Pi). ino). ectrical transducers-	system, Modulat lyne receiver, D ssor, Microcontro Resistive thermo		il Con (Onl	FM (Only nmunication y concepts, 08 Hrs lear variable
Communica concepts, w block diagra Introductio working prin Case studies i. Developm ii. Developm Transducer differential	ation System orking princ im. n To Micr nciple, and C s: ent board ba nent board ba rs: Introducti transformer	ms: ciple ropr Comp used ased	Unit – IV Introduction, Elements of e, waveform and Compar- rocessor and Microcontr parison). on Microprocessor (Raspb on Micro controller (Ardu Unit – V	7 of Communication ison), Super heteroo coller: Microproces erry Pi). ino). ectrical transducers-	system, Modulat lyne receiver, D ssor, Microcontro Resistive thermo		il Con (Onl	FM (Only nmunication y concepts, 08 Hrs lear variable
Communica concepts, w block diagra Introductio working prin Case studies i. Developm ii. Developm Transducer differential Hall effect T	ation System orking print m. n To Micr nciple, and C s: ent board ba nent board ba rs: Introduction transformer Transducer.	ms: ciple copr Comj ased ased ion t (LV	Unit – IV Introduction, Elements of e, waveform and Compar- rocessor and Microcontr parison). on Microprocessor (Raspb on Micro controller (Ardu Unit – V to Transducers: Passive Elev /DT), Proximity transduce	7 of Communication ison), Super heteroo coller: Microproces erry Pi). ino). ectrical transducers- er. Active Electrical	system, Modulat lyne receiver, D ssor, Microcontro Resistive thermo transducer- Piez	igita oller met zo e	er, Lin	FM (Only nmunication y concepts, 08 Hrs lear variable transducer,
Communica concepts, w block diagra Introductio working prin Case studies i. Developm ii. Developm Transducer differential Hall effect T	ation System orking print m. n To Micr nciple, and C s: ent board ba nent board ba rs: Introduction transformer Transducer.	ms: ciple copr Comj ased ased ion t (LV	Unit – IV Introduction, Elements of e, waveform and Compar- pocessor and Microcontr parison). on Microprocessor (Raspb on Micro controller (Ardu Unit – V to Transducers: Passive Ele	7 of Communication ison), Super heteroo coller: Microproces erry Pi). ino). ectrical transducers- er. Active Electrical	system, Modulat lyne receiver, D ssor, Microcontro Resistive thermo transducer- Piez	igita oller met zo e	er, Lin	FM (Only nmunication y concepts, 08 Hrs lear variable transducer,
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Communica concepts, w block diagra Introductio working prin Case studies i. Developm ii. Developm ii. Developm differential Hall effect T Sensors: Int (Only conce	ation System orking princ m. n To Micr nciple, and C s: ent board ba nent board ba rs: Introducti transformer Fransducer. troduction to pts, working	ms: copr Comp ased ased ion t (LV c) set g prin	Unit – IV Introduction, Elements of e, waveform and Compar- pocessor and Microcontr parison). on Microprocessor (Raspb on Micro controller (Ardu <u>Unit – V</u> to Transducers: Passive Ele /DT), Proximity transduce	7 of Communication ison), Super heteroo roller: Microproces erry Pi). ino). ectrical transducers- er. Active Electrical ensor, Humidity ser matic Headlight Sys	system, Modulat lyne receiver, D ssor, Microcontro Resistive thermo transducer- Piez nsor, ultra sonic tem, Pick and Pla	igita oller met zo e Sen	er, Lin sor, To	FM (Only nmunication y concepts, y concepts, 08 Hrs hear variable transducer, puch Sensor
Communica concepts, w block diagra Introductio working prin Case studies i. Developm ii. Developm Transducer differential Hall effect T Sensors: Int (Only conce Course Out	ation System orking princ m. n To Micr nciple, and C s: ent board ba nent board ba nent board ba rs: Introducti transformer Fransducer. troduction to pts, working comes: Afte	ms: ciple copr Comp ased ased ion t (LV c) set g prin	Unit – IV Introduction, Elements of e, waveform and Compar- rocessor and Microcontr parison). on Microprocessor (Raspb on Micro controller (Ardu Unit – V to Transducers: Passive Ele /DT), Proximity transducer nsors: LDR, Biomedical S nciple). Case studies: Auto	7 of Communication ison), Super heteroo roller: Microproces erry Pi). ino). ectrical transducers- er. Active Electrical ensor, Humidity ser matic Headlight Sys students will be abl	system, Modulat lyne receiver, D ssor, Microcontro Resistive thermo transducer- Piez nsor, ultra sonic tem, Pick and Pla	igit: oller met zo e Sen ce I	er, Lin er, Lin er, Te sor, Te Robots	FM (Only nmunication y concepts, y concepts, 08 Hrs hear variable transducer, puch Sensor
Communica concepts, w block diagra Introductio working prin Case studies i. Developm ii. Developm ii. Developm Transducer differential Hall effect T Sensors: Int (Only conce Course Out CO1 App	ation System orking print m. n To Micr nciple, and C s: ent board ba nent board ba rs: Introducti transformer Transducer. troduction to pts, working comes: After ply the know	ms: ciple copr Comp ased ased ion t (LV c) set g prin	Unit – IV Introduction, Elements of e, waveform and Compar- pocessor and Microcontre parison). on Microprocessor (Raspb on Micro controller (Ardu Unit – V to Transducers: Passive Ele /DT), Proximity transducer nsors: LDR, Biomedical S nciple). Case studies: Auto ompleting the course, the ge on operational character	7 of Communication ison), Super heteroo coller: Microproces erry Pi). ino). ectrical transducers- er. Active Electrical ensor, Humidity ser matic Headlight Sys students will be abl istics of the semicon	system, Modulat lyne receiver, D ssor, Microcontro Resistive thermo transducer- Piez nsor, ultra sonic tem, Pick and Pla le to ductor devices su	igit: oller met zo e Sen ce I	er, Lin er, Lin electric sor, To Robots	FM (Only nmunication y concepts, y concepts, 08 Hrs hear variable transducer, buch Sensor
Communica concepts, w block diagra Introductio working prin Case studies i. Developm ii. Developm ii. Developm ii. Developm differential Hall effect T Sensors: Int (Only conce Course Out CO1 App Sen	ation System orking prince in To Micro nciple, and C s: ent board ba nent board ba rs: Introduction transformer Transducer. troduction to pts, working comes: After ply the know isors, Operat	ms: ciple copr Comp ased ased ion t (LV c) set g prin cp cc vledg	Unit – IV Introduction, Elements of e, waveform and Compar- rocessor and Microcontr parison). on Microprocessor (Raspb on Micro controller (Ardu Unit – V to Transducers: Passive Ele /DT), Proximity transducer nsors: LDR, Biomedical S nciple). Case studies: Auto	7 of Communication ison), Super heteroo coller: Microproces erry Pi). ino). ectrical transducers- er. Active Electrical ensor, Humidity ser matic Headlight Sys students will be abl istics of the semicon	system, Modulat lyne receiver, D ssor, Microcontro Resistive thermo transducer- Piez nsor, ultra sonic tem, Pick and Pla le to ductor devices su	igit: oller met zo e Sen ce I	er, Lin er, Lin electric sor, To Robots	FM (Only nmunication y concepts, y concepts, 08 Hrs hear variable transducer, buch Sensor



CO4	Evaluate the performance of the electronic systems designed for the given specifications using the modern
	design tools. (PO1, PO2, PO5, PO8, PO9, PO11)
Refere	ence Books
1	Basic Electronics, D P Kothari, I J Nagrath, 2 nd Edition, McGraw Hill Education (India), Private Limited,
	2018.
2	Electronic Devices and Circuit Theory, Robert L Boylestad, Louis Nashelsky, Prentice Hall India
	publication, 11 th Edition, 2009.
3	Digital Logic and Computer Design, Morris Mano, Prentice Hall India publication, 54 th Edition, 2007,
	ISBN: 978-81-317-1450-8.
4	Electronic Devices and Circuits, David A. Bell, Oxford University Press, 5th Edition, 2008, ISBN:
	9780195693409.

5 Microelectronics circuits: Theory and applications, Adel S Sedra & Kenneth C Smith, Oxford University Press, 5th Edition, ISBN: 9780198062257.

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)	
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20
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3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS.	40
	MAXIMUM MARKS FOR THE CIE THEORY	100

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)	
Q. NO.	CONTENTS	MARKS
	PART A	
1	Objective type questions covering entire syllabus	20
	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit –V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100



		Seme	ster: I / II		
		BASICS OF ELECT	RICAL ENGINEERING		
		Category: Engine	ering Science Course		
			ams Except EE Program))	
			heory)		<u>т</u>
Course Code	:	EE113ATD/EE123ATD	CIE	:	100 Marks
Credits: L:T:P	:	3:0:0	SEE	:	100 Marks
Total Hours	:	40L	SEE Du	aration :	03 Hours
		Unit – I			08 Hrs
DC circuits: Ohr	n's law a	and Kirchhoff's laws, analy	sis of series, parallel and s	eries-parallel	circuits excited b
		es. Derivation for Power an		m & Maxim	um Power Transf
Theorem applied	to the ser	ies circuit and its application			
		Unit – II			08 Hrs
		ration of sinusoidal voltage, pltage and current relationshi			
		nalysis of single-phase ac set			
circuit	cuits. A	harysis of single-phase ac set	ies circuits K, L, C, KL, KC	, KLC, 16801	lance in series KL
eneur		Unit – II	41	<u>.</u>	08 Hrs
Three phase circ	uits: Gei	neration of three-phase powe		ed star and de	
		ase and line values of volta			
		ent of three-phase power by t			
		ase transformers: Construc		g, EMF equa	ations, voltage ar
		ition of regulation and effici		51	e e
,		Unit – IV		CI	08 Hrs
	luction 1	gnificance of torque-slip cha Motor: Single-phase induct tors. Unit – V	ion motor. Construction, F	Principle of c	operation, Types of 08 Hrs
Power transmiss	ion and	distribution: Concept of		ower distribut	
diagrams only.	ion and	distribution. Concept of	power transmission and pe		uon. unougn bio
	alculatio	on of electricity bill for dome	stic consumers.		
		ures: Working principle of		uit breaker ((MCB), merits ar
demerits.	•	STIT	UTIONS/		
Personal safety n	neasures	: Electric Shock, Earthing an	d its types, Safety Precaution	ons to avoid s	shock.
Carrow Orthogram	A C4				
		completing the course, the laws and theorems of elect		ndomontal ac	maanta of alastria
		ited circuits, components and			
	-	ameters of electrical (AC/I	• ` ` `	, ,	, , , ,
1		orks. (PO1, PO2, PO8, PO9 ,		ters of cleen	itear machines ar
		cteristics of electrical machin		(PO1, PO2, I	PO8, PO9, PO11
		edge of electrical circuits, s	**		
		01, PO2, PO6, PO7, PO8, P			
r			_ , , , ,		
Reference Books					
	shreshth	a, Basic Electrical Engineeri	ng, McGraw-Hill Education	n, 1 st Edition,	2019,
ISBN-13	<u>:978-007</u>	71328968.			
		Nagrath Theory and Problem	s in electrical Engineering,	PHI Edition	2016,
ISBN 07	0 0 1 202	5270 7			



RV College of Engineering[®] Mysore Road, RV Vidyaniketan Post, Bengaluru - 560059, Karnataka, India

1

ISBN-13: 978-8121908719.

4 V. N. Mittal, Basic Electrical Engineering, TMH Publication, New Delhi, 2006, ISBN: 9780070593572.

1		MARKS
	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20
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3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS.	40

Q. NO.	RUBRIC FOR SEMESTER END EXAMINATION (THEORY) CONTENTS	MARKS
Q . 110.	PART A	
1	Objective type questions covering entire syllabus	20
	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit –V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	Y 100
	WSTITUTIONS	



		Seme	ester: I/II			
	FUNDAMENTALS OF MECHANICAL ENGINEERING					
		Category: Engine	ering Science Course			
	((Common to all Programs	Except ME Stream Programs)			
		(T .	heory)			
Course Code	:	ME113ATE/ME123ATE	CIE	:	100 Marks	
Credits: L:T:P	Credits: L:T:P : 3:0:0 SEE : 100 Marks					
Total Hours	:	40T	SEE Duration	:	03 Hours	

Unit – I	08 Hrs
Engineering Materials: Introduction, Classification, Metals (Magnetic and Non-Magnetic), Materials	
& applications: physical, mechanical, optical, electrical and electronics, thermal, Chemical,	
Applications: Aerospace, Automotive, Electronic and Biomedical.	
Unit – II	08 Hrs
Vision system in Manufacturing: Introduction, Role of human vision in computer interaction, importa	ance,
types of computer vision in manufacturing, Architecture of a Vision System, Artificial Intelligent v/	s Computer
vision, applications of Computer vision in various industries, A case study: Computer inspection of	f Two-stage
Soldering Defect in PCB board.	-
Joining process: Welding- Arc welding & amp; Gas welding, defects, types of flames, Soldering and b	razing.
Unit – III	10 Hrs
Automation in Manufacturing: Automation, Types of Automation, Historical Development,	Definitions,
Introduction to CNC Machines. Relative Merits and Demerits, CNC- Elements, merits, de-merits.	
Robotics in Manufacturing: Robots- Basic Structure of Robots, Robot Anatomy, Complete Class	
Robots, Fundamentals about Robot Technology, Basic Robot Configurations and their Relative	Merits and
Demerits.	
TT 74 TT 7	
Unit – IV	08 Hrs
Mechanical Drives: Classification of IC Engines, Working of 4-S direct injection engines, H	
Mechanical Drives: Classification of IC Engines, Working of 4-S direct injection engines, I characteristics, Classification of gears, velocity ratio for simple and compound gear trains.	Performance
Mechanical Drives: Classification of IC Engines, Working of 4-S direct injection engines, F characteristics, Classification of gears, velocity ratio for simple and compound gear trains. Electrical Drives: History, Well to Wheel analysis, Electric vehicles, Configurations, EV/ICEV of	Performance comparison,
Mechanical Drives: Classification of IC Engines, Working of 4-S direct injection engines, I characteristics, Classification of gears, velocity ratio for simple and compound gear trains.	Performance comparison,
Mechanical Drives: Classification of IC Engines, Working of 4-S direct injection engines, F characteristics, Classification of gears, velocity ratio for simple and compound gear trains. Electrical Drives: History, Well to Wheel analysis, Electric vehicles, Configurations, EV/ICEV of Performance, Traction Motor Characteristics, Concept of Hybrid Electric Drive Trains, Classification of electric vehicles.	Performance comparison,
Mechanical Drives: Classification of IC Engines, Working of 4-S direct injection engines, H characteristics, Classification of gears, velocity ratio for simple and compound gear trains. Electrical Drives: History, Well to Wheel analysis, Electric vehicles, Configurations, EV/ICEV of Performance, Traction Motor Characteristics, Concept of Hybrid Electric Drive Trains, Classification of electric vehicles. Unit - V	Performance comparison, of hybrid 06 Hrs
Mechanical Drives: Classification of IC Engines, Working of 4-S direct injection engines, I characteristics, Classification of gears, velocity ratio for simple and compound gear trains. Electrical Drives: History, Well to Wheel analysis, Electric vehicles, Configurations, EV/ICEV or Performance, Traction Motor Characteristics, Concept of Hybrid Electric Drive Trains, Classification of electric vehicles. Unit - V Mechatronics: Introduction: Evolution of Mechatronic system, measurement & amp; control system	Performance comparison, of hybrid 06 Hrs rstem, basic
Mechanical Drives: Classification of IC Engines, Working of 4-S direct injection engines, H characteristics, Classification of gears, velocity ratio for simple and compound gear trains. Electrical Drives: History, Well to Wheel analysis, Electric vehicles, Configurations, EV/ICEV of Performance, Traction Motor Characteristics, Concept of Hybrid Electric Drive Trains, Classification of electric vehicles. Unit - V	Performance comparison, of hybrid 06 Hrs rstem, basic
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Mechanical Drives: Classification of IC Engines, Working of 4-S direct injection engines, IC characteristics, Classification of gears, velocity ratio for simple and compound gear trains. Electrical Drives: History, Well to Wheel analysis, Electric vehicles, Configurations, EV/ICEV of Performance, Traction Motor Characteristics, Concept of Hybrid Electric Drive Trains, Classification of electric vehicles. Unit - V Mechatronics: Introduction: Evolution of Mechatronic system, measurement & amp; control system, Applications-water level controller, washing machine, Engine managem (EMS), Anti-lock Braking System (ABS).	Performance comparison, of hybrid 06 Hrs stem, basic nent system
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Mechanical Drives: Classification of IC Engines, Working of 4-S direct injection engines, IC characteristics, Classification of gears, velocity ratio for simple and compound gear trains. Electrical Drives: History, Well to Wheel analysis, Electric vehicles, Configurations, EV/ICEV of Performance, Traction Motor Characteristics, Concept of Hybrid Electric Drive Trains, Classification of electric vehicles. Unit - V Mechatronics: Introduction: Evolution of Mechatronic system, measurement & amp; control sy elements of control system, Applications-water level controller, washing machine, Engine managem (EMS), Anti-lock Braking System (ABS). Energy Sources: Introduction and applications of Energy sources like Fossil fuels, nuclear fuels, H	Performance comparison, of hybrid 06 Hrs stem, basic nent system
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Mechanical Drives: Classification of IC Engines, Working of 4-S direct injection engines, H characteristics, Classification of gears, velocity ratio for simple and compound gear trains. Electrical Drives: History, Well to Wheel analysis, Electric vehicles, Configurations, EV/ICEV of Performance, Traction Motor Characteristics, Concept of Hybrid Electric Drive Trains, Classification of electric vehicles. Unit - V Mechatronics: Introduction: Evolution of Mechatronic system, measurement & amp; control sy elements of control system, Applications-water level controller, washing machine, Engine managem (EMS), Anti-lock Braking System (ABS). Energy Sources: Introduction and applications of Energy sources like Fossil fuels, nuclear fuels, H wind, and bio- fuels, Environmental issues like Global warming and Ozone depletion. Course Outcomes: After completing the course, the students will be able to	Performance comparison, of hybrid 06 Hrs rstem, basic nent system Iydel, Solar,

CO2	Explain the classification of engineering materials, machine tools, refrigeration cycles, engines, Energy,
	automation, and mechatronics systems. (PO1, PO5)
CO3	Apply knowledge of engineering materials, manufacturing processes, and thermodynamic principles to
	solve problems, environmental issues and perform analyses in various industrial applications. (PO2, PO5)
CO4	Assess and contrast the performance of engineering materials, energy resources, manufacturing processes
	and mechanical systems for various industrial applications. (PO2)

Refere	Reference Books			
1	Elements of Mechanical Engineering, K. R. Gopalakrishna, Subhas Publications, 18th Edition.			
	ISBN 5551234002884.			
2	Material Science & amp; Engineering- William D Callister, 2 / 10th Edition, ISBN 978-1-119-45520-2.			



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3	Welding Technology (PB), Khanna O P, Dhanpat Rai publication, 4th Edition, ISBN 9383182555.
4	Electric and Hybrid Vehicles, Design Fundamentals – Iqbal Husain, CRC Press, 2 nd Edition, 2010.
	ISBN -13-978-1439811757.
5	Modern Electric, Hybrid Electric & amp; Fuel Cell Vehicles, Fundamentals, Theory and Design -
	Mehrdad Ehsani, CRC Press, 1 st Edition, 2005. ISBN – 13- 978-0849331541.
6	Mechatronics – Electronic control systems in Mechanical and Electrical Engineering, William Bolton,
	Pearson, 6 th Edition, ISBN: 978-1-292-07668-3, 2015.

RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)			
#	COMPONENTS	MARKS	
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20	
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	40	
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS.	40	
	MAXIMUM MARKS FOR THE CIE THEORY	100	

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)	
Q. NO.	CONTENTS	MARKS
	PART A	
1	Objective type questions covering entire syllabus	20
	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit –V: Question 9 or 10	16
·	MAXIMUM MARKS FOR THE SEE THEORY	100

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Emerging Technology Courses

- INTRODUCTION TO INTERNET OF THINGS (AI114ATA/AI124ATA)
- > INTRODUCTION TO DRONE TECHNOLOGY (AS114ATB/AS124ATB)
- > BIOINSPIRED ENGINEERING (BT114ATC/BT124ATC)
- GLOBAL CLIMATE CHANGE (CH114ATD/CH124ATD)
- ELEMENTS OF BLOCKCHAIN TECHNOLOGY (CS114ATE/CS124ATE)
- > INTRODUCTION TO CYBER SECURITY (CS114BTF/CS123BTF)
- GREEN BUILDINGS (CV114ATG/CV124ATG)
- > INFRASTRUCTURE FOR SMART CITIES (CV114BTH/CV124BTH)
- FUNDAMENTALS OF NANOSCIENCE AND TECHNOLOGY (CM114ATJ/CM124TJ)
- FUNDAMENTALS OF SEMICONDUCTOR DEVICES (EC114ATK/EC124ATK)
- INTRODUCTION TO EMBEDDED SYSTEMS (EC114BTM/EC124BTM)
- RENEWABLE ENERGY SOURCES (EE114ATN/EE124ATN)
- FUNDAMENTALS OF SENSOR TECHNOLOGY (EI114ATO/EI124ATO)
- > HUMAN FACTORS IN ENGINEERING (IM114ATP/IM124ATP)
- > DIGITAL HUMANITIES (IS114ATQ/IS124ATQ)
- > SMART MATERIALS AND SYSTEMS (ME114ATR/ME124ATR)
- > ELEMENTS OF INDUSTRY 4.0 (ME114BTS/ME124BTS)



				mester: I / II				
				TO INTERNE Comerging Techn on to all Program (Theory)	ologies			
Course	Code	•	AI114ATA/AI124AT		CIE	:	100 M	arks
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River Na Introduc Applicat Architec Models	avigation Safety ction to IoT Con- tion, Future IoT cture and Fune for IoT, Layere	v Sys cept Visi dam	tem. , Related Concepts to Io on. entals: Research on Io odel Proposed and Soc	Τ, The Intrinsic Γ Architecture, U ial Attributes Di	Characteristics of Io Jbiquitous IoT (U2 scussion for U2IoT	oT, IoT I IoT) Are	Develop	ment and re, Layered
Summar	ry and Discussio	on, S	cience Category and Su	pporting Techno	logies for IoT.	2		
			Unit	-П	1.2			07 Hrs
			r IoT: Introduction, S			Sensing	g, Netwo	orking and
Commu	nications, Mana	gem	ent and Data Centers (M		tudy for IoT.			
			Unit – 1		N			08 Hrs
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-			ings: Introduction, Loc	al Internet of Th	Ų.		0	
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Internet Resource Scheme Security	of Things, Tran ce Managemen e Naming, Rec in U2IoT. y and Privacy f	it: In cours	ional Internet of Things Unit –	al Internet of TI Application, Glo IV ding and Resolv ce Discovery, F -V ity Challenges in	obal Application Io ring, Resolving Dis Resource Allocation 1 U2IoT, The Secur	T and a ' scussion n, Resou ity Fram	for nIE for nIE urce Ma	Example. 08 Hrs 0 Objects, inagement 08 Hrs for U2IoT,
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RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY) # COMPONENTS MARK				
#	COMPONENTS	MARKS		
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be			
	conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES	20		
	WILL BE THE FINAL QUIZ MARKS.			
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity			
	levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying,			
	Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests	40		
	and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto			
	100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.			
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and			
e	practical implementation of the problem. Case study-based teaching learning (10), Program			
	specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2	40		
		40		
	will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO			
	40 MARKS.			
	MAXIMUM MARKS FOR THE CIE THEORY	100		
	SILOUTING			

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)	
Q. NO.	CONTENTS	MARKS
	PART A	
1	Objective type questions covering entire syllabus	20
	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit – V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100

IONS

INST





Semester: I / II						
	INTRODUCTION TO DRONE TECHNOLOGY					
		Category: Em	erging Technologies			
		(Common [*]	to all Programs)			
		[]	Theory)			
Course Code	:	AS114ATB/AS124ATB	CIE	:	100 Marks	
Credits: L:T:P	Credits: L:T:P : 3:0:0 SEE : 100 Marks					
Total Hours	otal Hours:40LSEE Duration:03 Hours					

Unit – I	08 Hrs
Basics of Drones: History of UAVs, need of unmanned aerial systems, India and drones, Overvie Systems-System Composition, Classes and Missions of UAVs-Classification of UAVs based on size	
endurance.	c, range and

Unit – II	08 Hrs			
Aerodynamics of Drones: Airfoil nomenclature, Generation of Lift on Airfoils and Wings, Basic aerodynamics				
of fixed, rotary and flapping wing UAVs.				
Unit - III	08 Hrs			
Drones Propulsion Systems: Thrust Generation, Powered Lift, Sources of Power for UAVs- Piston,	Rotary, Gas			
turbine engines, electric or battery powered UAVs.	-			
Unit – IV	08 Hrs			
Drone Airframe Systems: Loads on UAVs, Materials for UAV construction, and Construction Techni	iques			
Unit – V	08 Hrs			
Sensors and Payloads: Barometers, Accelerometer, Magnetometer, RADAR and range finder, non-	-dispensable			
and dispensable Payloads- Optical, electrical, weapon, imaging payloads.	_			
Regulations: DGCA regulations, Operational and procedural requirements, No drone zones.				

Course	Course Outcomes: After completing the course, the students will be able to			
CO1	Explore the fundamental concepts of UAVs in systems, sub-systems and components level. (PO1, PO2)			
CO2	Apply theoretical concept of UAVs in systems, sub-systems and components level and evaluate the			
	problems arising in engineering discipline. (PO1, PO2)			
CO3	Analyze the solution of the modern engineering problems solved using appropriate techniques pertaining			
	to UAVs in systems, sub-systems and components level. (PO3, PO6)			
CO4	Develop the overall knowledge of UAVs in systems, sub-systems and components level gained to			
	demonstrate the problems arising in real world situations. (PO6, P07)			

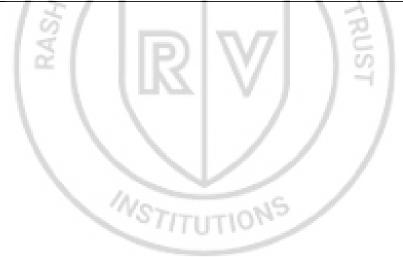
Refere	ence Books
1	Unmanned Aircraft Systems UAV design, development and deployment, Reg Austin, 1st Edition, 2010,
	Wiley, ISBN 9780470058190.
2	Introduction to UAV Systems, Paul G Fahlstrom, Thomas J Gleason, 4th Edition, 2012, Wiley,
	ISBN: 978-1-119-97866-4.
3	Advances in Unmanned Aerial Vehicles: State of the Art and the Road to Autonomy, Kimon P.
	Valavanis, 1 st Edition, 2007, Springer ISBN 9781402061141.
4	Design of Unmanned Air Vehicle Systems, Dr. Armand J. Chaput, 3 rd Edition, 2001, Lockheed Martin
	Aeronautics Company, ISBN: 978-1-60086-843-6.

RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)			
#	COMPONENTS	MARKS	
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.		
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying,	40	



	Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS.	40
	MAXIMUM MARKS FOR THE CIE THEORY	100

RUBRIC FOR SEMESTER END EXAMINATION (THEORY)				
Q. NO.	CONTENTS	MARKS		
	PART A			
1	Objective type questions covering entire syllabus	20		
	PART B			
	(Maximum of TWO Sub-divisions only)			
2	Unit – I: (Compulsory)	16		
3 & 4	Unit – II: Question 3 or 4	16		
5&6	Unit – III: Question 5 or 6	16		
7 & 8	Unit – IV: Question 7 or 8	16		
9 & 10	Unit – V: Question 9 or 10	16		
	MAXIMUM MARKS FOR THE SEE THEORY	100		





				ester: I / II									
				D ENGINEERIN									
	Category: Emerging Technologies (Common to all Programs)												
				Theory)									
Course (Code	:	BT114ATC/BT124ATC		CIE	:	100 N	/larks					
Credits:	L:T:P	:	3:0:0		SEE	:	100 N	/larks					
Total Ho	ours	:	40L		SEE Duration	:	03 Ho	ours					
			Unit – J					07 Hrs					
Introduce	tion to Dia	in			lon ontition Stor		aallar						
application	ons. Synthetic	2	spired Engineering: Pr Biology; Bottom-up' ock, Genetic Algorithms	and 'top-down'			aches.	Synthetic/					
			Unit – I	[08 Hrs					
			materials: Biological and o-composites, multi-function										
			rials, Microfluidics in biolo										
			Unit – Il	I	12.			10 Hrs					
Lessons	from Natur	e-l	Bioinspired Materials	and mechanism:	Firefly-Biolumin	esc	ence,	Cockleburs					
			lf-cleaning materials, Ge										
			ar, Shark skin - Frictio										
			Morpho butterfly- Struc				ollectir	ig, Termite					
mound pa	assive cooling, l	Bır	ds/Insects- flights/ aerodyn		ispired micro needlo	Э.		07.11					
Biomedi	al Incrinat	ior	Unit – F -Concept and appl		n gystam Ci	r011	latory-	07 Hrs artificial					
blood,	-		-Concept and appl pacemaker. Respirato	•	n system- Ci ungs. Excretory-		Artifici						
and ski			ipport and replacement					pancreas.					
			tificial limbs. Visual prosth			110	i uno	puncteus.					
10001 Joh			Unit – V					08 Hrs					
Biomime	etics: Inventio	ns	in nature for Humar		notosynthesis and	P	'hotovo						
Bionic/A			Bio-ink and 3D-Biop					and nose.					
Biomime	tic echolation	ı.	Insect foot adaptation	s for adhesion	a. Thermal insu	lati	on ai	nd storage					
materials	. Bees and	ŀ	loneycomb Structure. A	Artificial Intellige	ence, Neural Ne	etwo	orking	and bio-					
robotics.			1110	UTION									
Course (Jutcomes: Afte	r	ompleting the course the	students will be a	ble to								
			• • • • •			fun	ctions	Course Outcomes: After completing the course, the students will be able toCO1Envisage a deep understanding of biological systems, mimetics structures, and functions that inspire					
engineering innovations for adaptability and sustainability. (PO1, PO2, PO8, PO11)													
CO2	world challenge	l p s. (PO1, PO2, PO3, PO8, PO	011)	sign engineering sy	ster		solving real-					
CO2 // V CO3	world challenge Evaluate the bio environmental s	l p s. (oin ust	PO1, PO2, PO3, PO8, PO spired materials for their a ainability. (PO1, PO2, PO	11) advanced application 3, PO4, PO8, PO1	sign engineering sy ons in the domain 1)	ster of	health,	solving real- energy and					
CO2 // CO3 // CO4 //	world challenge Evaluate the bio environmental s Interpret biomin	l p s. (oin ust mie	PO1, PO2, PO3, PO8, PO spired materials for their a	11) advanced application 3, PO4, PO8, PO1 red engineering do	sign engineering sy ons in the domain 1) esigns, ensuring th	ster of	health,	solving real- energy and					

Refere	Reference Books					
1	Yoseph Bar-Cohen. Biomimetics: Biologically Inspired Technologies D. Floreano and C. Mattiussi, "Bio-					
	Inspired Artificial Intelligence", CRC Press, 2018. ISBN: 9781420037715.					
2	Guang Yang, Lin Xiao, and Lallepak Lamboni. Bioinspired Materials Science and Engineering. John					
	Wiley, 2018. ISBN: 978-1-119-390336.					
3	M.A. Meyers and P.Y. Chen. Biological Materials, Bioinspired Materials, and Biomaterials					



	Cambridge University Press, 2014 ISBN 978-1-107-01045.
4	Tao Deng. Bioinspired Engineering of Thermal Materials. Wiley-VCH Press, 2018. ISBN: 978-3-527-33834-4.

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)	1
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	40
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS.	40
	MAXIMUM MARKS FOR THE CIE THEORY	100

Q. NO.	151	CONTENTS	121	MARKS
	191	PART A	121	
1	Objective type questions covering	entire syllabus	C	20
	Ľ	PART B	0	
	(Maxir	num of TWO Sub-divisions	only)	
2	Unit – I: (Compulsory)			16
3 & 4	Unit – II: Question 3 or 4		/ /	16
5&6	Unit – III: Question 5 or 6		/ /	16
7 & 8	Unit – IV: Question 7 or 8			16
9 & 10	Unit – V: Question 9 or 10			16
		MAXIMUM MARK	S FOR THE SEE THEORY	100



Semester: I / II								
GLOBAL CLIMATE CHANGE								
	Category: Emerging Technologies (Common to all Programs)							
		(T	'heory)					
Course Code	:	CH114ATD/CH124ATD		CIE	:	100 Marks		
Credits: L:T:P	Credits: L:T:P : 3:0:0 SEE : 100 Marks							
Total Hours	:	40L		SEE Duration	:	03 Hours		

	Unit – I		08 Hrs
Introduction to the climate change: Clim	nate, climate change, ter	nperature anomalies, radiation	and energy
balance.			
	Unit – II		08 Hrs
Simple Climate models: Source of energy	, energy loss, greenhou	use effect, carbon cycle, atmos	sphere-land-
biosphere–ocean carbon exchange.		(R)	•
	Unit – III		08 Hrs
Prediction and impacts of climate change: abrupt climate changes.	Factors that control emiss	sions, emissions scenarios, physi	ical impacts,
1 64 1	Unit – IV	11	08 Hrs
Strategies to mitigate climate change: regulations, market-based regulations, inform			conventional
III	Unit – V	121	08 Hrs
Climate change conventions: Technical su protocols.	mmary of IPCC reports	, conference of parties and clir	nate change

Course Outcomes: After completing the course, the students will be able to					
CO1	Apply the fundamentals of science to understand climate change and its implications. (PO1, PO8)				
CO2	Analyze scientific reasons for climate change through simple models. (PO1, PO7, PO8)				
CO3	Identify the external factors contributing to climate change. (PO1, PO7)				
CO4	Ideate mitigation strategies. (PO1, PO2, PO6, PO7, PO8)				

Refere	ence Books						
1	Introduction to Modern Climate Change, Andrew E. Dessler, Cambridge University Press,						
	ISBN-10- 1108793878, ISBN-13- 978-1108793872, 3rd edition, 2021						
2	Introduction to Climate Science, Andreas Schmittner, Oregon State University,						
	https://open.oregonstate.education/climatechange/						
3	IPCC — Intergovernmental Panel on Climate Change						
	https://www.ipcc.ch						
4	UNFCC – United nations framework convention on climate change						
	https://unfccc.int						

RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)				
#	COMPONENTS	MARKS		
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20		
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	40		



3

EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS.

MAXIMUM MARKS FOR THE CIE THEORY

40 100

RUBRIC FOR SEMESTER END EXAMINATION (THEORY) Q. NO. CONTENTS MARKS PART A 20 1 Objective type questions covering entire syllabus PART B (Maximum of TWO Sub-divisions only) 2 Unit – I: (Compulsory) 16 3 & 4 Unit – II: Question 3 or 4 16 5&6 Unit – III: Question 5 or 6 16 Unit – IV: Question 7 or 8 7 & 8 16 9 & 10 Unit – V: Question 9 or 10 16 MAXIMUM MARKS FOR THE SEE THEORY 100





Semester: I / II							
ELEMENTS OF BLOCKCHAIN TECHNOLOGY							
	Category: Emerging T	Technologies					
	(Common to all Pr	ograms)					
	(Theory)						
:	CS114ATE/CS124ATE	CIE	:	100 Marks			
:	3:0:0	SEE	:	100 Marks			
:	36L	SEE Duration	:	03 Hours			
		ELEMENTS OF BLOCKCHA Category: Emerging T (Common to all Pr (Theory) : CS114ATE/CS124ATE : 3:0:0	ELEMENTS OF BLOCKCHAIN TECHNOLOGY Category: Emerging Technologies (Common to all Programs) (Theory) : CS114ATE/CS124ATE CIE : 3:0:0 SEE	ELEMENTS OF BLOCKCHAIN TECHNOLOGY Category: Emerging Technologies (Common to all Programs) (Theory) : CS114ATE/CS124ATE CIE : : 3:0:0 SEE :			

Unit – I	07 Hrs
Blockchain Fundamentals: Defining Blockchain, Elements of Blockchain, Qualities of Blockchain,	Blockchain
and Economics, Blockchain Technology, Origins of Bitcoin and Blockchain, Types of Blockchains, E	Business and
Blockchain, Use cases, Ethical issues with Blockchain.	
Unit – II	07 Hrs
Blockchain Technology: Blockchain technology stack, monetizing the Blockchain, Blockchain Wa	llet, Sorting
Blocks, Consensus, Blockchain as a Service, IT Use cases for Blockchain-Storage, IPFS, Edge Comp	puting, Web
3.0 and Blockchain, Obstacles in Blockchain.	
Unit – III	07 Hrs
Bitcoin and Crypto-assets: Introduction to Crypto-assets, Crypto-currencies, Crypto-commoditi	es, Crypto-
tokens, Bitcoin, Ethereum, Digital Token Exchanges, Financial modelling for cryptocurrencies.	
Unit – IV	07 Hrs
Ethereum and Smart Contracts: Basics of Ethereum, Ethereum Virtual Machine, Ether, Smart Contracts: Basics of Ethereum, Ethereum Virtual Machine, Ether, Smart Contracts: Basics of Ethereum, Ethere	ontract, On-
chain versus Off-chain versus Side chain, Mining Ethereum.	
Unit – V	08 Hrs
Blockchain Use Cases: Cross-functional Blockchain Use cases – Identity management, Asset Tr	
	acking, IoT
Blockchain Use Cases: Cross-functional Blockchain Use cases - Identity management, Asset Tr	acking, IoT apply Chain
Blockchain Use Cases: Cross-functional Blockchain Use cases – Identity management, Asset Tr integration; Functional Area Blockchain Use Cases for Business – Finance, Marketing/Sales, Su	acking, IoT apply Chain

Course	e Outcomes: After completing the course, the students will be able to
CO1	Define the core concepts of blockchain technology, including its structure, working principles, and
	consensus mechanisms. (PO1, PO2, PO3, PO5, PO6, PO11)
CO2	Compare major blockchain platforms such as Bitcoin, Ethereum, and others, understanding their
	architecture, use cases, and differences. (PO1, PO2, PO3, PO5, PO11)
CO3	Analyze the response of governments and regulatory bodies to blockchain innovations, cryptocurrencies,
	and decentralized finance (DeFi). (PO1, PO2, PO3, PO5, PO7, PO11)
CO4	Evaluate ethical implications and future trends in blockchain technology, including decentralized
	governance, data immutability, interoperability, and privacy-enhancing technologies in industrial and
	business applications. (PO1, PO2, PO3, PO4, PO5, PO8, PO10, PO11)

Text b	ooks
1	Basics of Blockchain - A guide for building literacy in the economics, technology and business of
	blockchain, Bettina Warburg, Bill Wagner, and Tom Serres, 2019, Animal Ventures LLC, Edition 1.0
Refere	ence Books
1	Mastering Blockchain - Distributed ledger technology, decentralization and smart contracts, Imran
	Bashir, 2018, Packt, Second Edition

RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)			
#	COMPONENTS	MARKS	
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.		



2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	40
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS.	40
	MAXIMUM MARKS FOR THE CIE THEORY	100

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)	
Q. NO.	CONTENTS	MARKS
	PART A	
1	Objective type questions covering entire syllabus	20
	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit – V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100

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			Semeste			
			INTRODUCTION TO			
			Category: Emerg			
			(Common to a	8		
0	<u> </u>		(The			100 M 1
Course		:	CS114BTF/CS124BTF		:	100 Marks
Total H	s: L:T:P	:	3:0:0	SEE SEE Duration	:	100 Marks 03 Hours
1 otal f	Hours	:	40L	SEE Duration	:	05 Hours
			Unit – I			08 Hrs
Introd	uction to Cy	ber S	pace: History of Internet, His	story and evolution of Infor	mation Se	ecurity and cyber-
			ber space and information secu			
Introd	uction to Cyb	oercri	me: Definition and Origins of t	he Word, Cybercrime and In	nformation	Security, who are
			cations of Cybercrimes, An		g and Ind	ian Laws. Global
Perspec	ctives. Differe	nt Ty	pes of Cyber Crimes, Scams and	d Frauds	_	
			Unit – II		R)	08 Hrs
•			iminals Plan Them: Introducti	· · · · · · · · · · · · · · · · · · ·		ocial Engineering,
			e & cybercrimes, Botnets: The			
			d Motivations: How Hackers		i-forensics	b), How and Why
Attacke	ers Use Proxie	es, Tui	nnelling Techniques, Fraud Tec	hniques.		08 Hrs
						UX Hrs
<u>a • 1</u>		•	Unit – III		· 1	
			and Security: Introduction to			edia, Social media
platform	ms, Social m	edia	and Security: Introduction to monitoring, Hashtag, Viral co	ontent, Social media marke	ting, Soci	edia, Social media al media privacy,
platforr Challer	ms, Social m nges, opportur	edia i nities	and Security: Introduction to monitoring, Hashtag, Viral co and pitfalls in online social ne	ontent, Social media marke twork, Security issues relate	ting, Soci ed to socia	edia, Social media al media privacy, al media, Flagging
platform Challer and rep	ms, Social m nges, opportur porting of inaj	edia nities pprop	and Security: Introduction to monitoring, Hashtag, Viral co and pitfalls in online social ne riate content, Laws regarding	ontent, Social media marke twork, Security issues relate	ting, Soci ed to socia	edia, Social media al media privacy, al media, Flagging
platform Challer and rep	ms, Social m nges, opportur	edia nities pprop	and Security: Introduction to monitoring, Hashtag, Viral co and pitfalls in online social ne riate content, Laws regarding studies.	ontent, Social media marke twork, Security issues relate	ting, Soci ed to socia	edia, Social media al media privacy, al media, Flagging st practices for the
platform Challer and rep use of s	ms, Social m nges, opportur porting of inap social media, (edia nities pprop Case s	and Security: Introduction to monitoring, Hashtag, Viral co and pitfalls in online social ne riate content, Laws regarding studies. Unit – IV	ontent, Social media marke twork, Security issues relate posting of inappropriate c	ting, Soci ed to socia ontent, Be	edia, Social media al media privacy, al media, Flagging est practices for the 08 Hrs
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platforn Challer and rep use of s E - Con of E-C	ms, Social m nges, opportur porting of inap social media, (mmerce and) Commerce sec	edia inities opropro Case s Digita curity,	and Security: Introduction to monitoring, Hashtag, Viral co and pitfalls in online social ne riate content, Laws regarding studies. Unit – IV al Payments: Definition of E- E-Commerce threats, E-Con	ontent, Social media marke twork, Security issues relate posting of inappropriate c Commerce, Main componen merce security best practi	ting, Soci ed to socia ontent, Be ts of E-Co cces, Intro	edia, Social media al media privacy, al media, Flagging est practices for the 08 Hrs mmerce, Elements duction to digital
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platforn Challer and rep use of s E - Con of E-C paymen Cards,	ms, Social m nges, opportur porting of inap social media, (mmerce and D Commerce sec nts, Componen Unified Payn	edia inities ppropr Case s Digita curity, nts of nent I	and Security: Introduction to monitoring, Hashtag, Viral co and pitfalls in online social ne riate content, Laws regarding studies. Unit – IV Al Payments: Definition of E- E-Commerce threats, E-Con digital payment and stake holde	ontent, Social media marke twork, Security issues relate posting of inappropriate c Commerce, Main componen imerce security best practi ers, Modes of digital paymer tructured Supplementary Se	ting, Soci ed to socia ontent, Be ts of E-Co cces, Intro nts- Bankir prvice Data	edia, Social media al media privacy, al media, Flagging est practices for the 08 Hrs mmerce, Elements duction to digital ng a (USSD), Aadhar
platforn Challer and rep use of s E - Con of E-C paymen Cards, enabled	ms, Social m nges, opportur porting of inap social media, (mmerce and l Commerce sec nts, Componen Unified Paym d payments, D	edia inities ppropr Case s Digita curity, nts of nent I rigital	and Security: Introduction to monitoring, Hashtag, Viral co and pitfalls in online social ne riate content, Laws regarding studies. Unit – IV al Payments: Definition of E- E-Commerce threats, E-Con digital payment and stake holde nterface (UPI), e-Wallets, Uns	ontent, Social media marke twork, Security issues relate posting of inappropriate c Commerce, Main componen merce security best practi ers, Modes of digital payment tructured Supplementary Se rauds and preventive measur	ting, Soci ed to socia ontent, Be ts of E-Co ces, Intro ats- Bankin ervice Data es. RBI gu	edia, Social media al media privacy, al media, Flagging est practices for the 08 Hrs mmerce, Elements duction to digital ng a (USSD), Aadhar uidelines on digital
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CO4 Investigate and evaluate modern tools and technologies used to mitigate cybercrime and utilize these solutions to protect systems from potential threats. (PO1, PO2, PO4, PO5, PO11)



Referen	nce Books
1	Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure
	and Nina Godbole, Wiley India Pvt. Ltd, 1st Edition 2011, Reprint 2022, ISBN:978-81-265-2179-1.
2	Cyber Security Essentials by James Graham, Richard Howard, Ryan Olson, CRC Press, 2011 Taylor and
	Francis Group. ISBN13: 978-1-4398-5126-5.
3	Information Systems Security: Security Management, Metrics, Frameworks and Best Practices by Nina
	Godbole, 2 nd Edition, Wiley publishers, 2017. ISBN: 9788126564057.
4	Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2 nd Edition, John Wiley & Sons, 2005,
	ISBN: 978-0764573972.
5	Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver, Create
	Space Independent Publishing Platform, Pearson, 2001, ISBN: 9781516821020.
6	Electronic Commerce by Elias M. Awad, Pearson, 1st edition, 2001, ISBN: 978-0130193223.
7	Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers & Distributors,
	2011, ISBN: 978-8187336891.

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)	
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	40
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS.	40
	MAXIMUM MARKS FOR THE CIE THEORY	100

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)	
Q. NO.	CONTENTS	MARKS
	PART A	
1	Objective type questions covering entire syllabus	20
	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit – V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100



			Seme	ster: I / II			
			GREEN	BUILDINGS			
				rging Technologies			
				o all Programs)			
				heory)		-	I
Course			14ATG/CV124ATG		IE	:	100 Marks
	s: L:T:P	: 3:0:0)		EE	:	100 Marks
Total l	Hours	: 40L		S	EE Duration	:	03 Hours
 			Unit-I				08 Hrs
Introd	uction to the co	oncept o	of cost-effective cons	truction: Uses of d	lifferent types of	of n	naterials and the
	ility - Stone and l ana Cement - Gyp		blocks-M Sand- Burn	t Bricks - Concrete B	Blocks- Stabilize	ed N	Iud Blocks- Lime
	• •		Forced Cement Compo	nents- Fiber Reinford	ed Polymer Con	nno	site- Ramboo
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	•		ials- Recycling of to uilding materials.	building materials –	Brick- Concre	ele-	Steel- Plastics
LIIVIIO	innental issues fel		Ű.	ANA	0		0.0 -
T •			Unit – I			<u> </u>	08 Hrs
	•		st-effective Building	-			
			Ferro Concrete constru				
			- Columns - Door an		water tanks - Se	epti	c tanks - Alternat
c			mposite Beam and Par		Insting		
Pre-eng	gineered and ready	y to use I	building elements - wo		plastic.		00 II
Claba	Warming Dafin	ition (Unit – II		as towards Clab	o1 V	08 Hrs
	0		Causes and Effects - Co s to reduce carbon Em		gs towards Glob	ai v	varining.
	•		Features- Necessity –		it Economical	hai	nofite Upolth on
	benefits.	111011 - 1	- realures- necessity -		it - Economical	UCI	ilentis - meanin an
		reas for l	buildings – Embodied	Energy in Materials			
-			Initial cost of Green		lding - Life cycl	e co	st of Buildings
Green	indendis comp		Unit – IV			000	08 Hrs
Green	Building rating	System	s: BREEAM – LEEI		-GRIHA IGBC	1 fo	
	0 0		System with Different		ontini, iobe	10	i new buildings
			rinciples of sustainal		Building Design	n -	Characteristics of
	-		bly managed Material	-			
	epts only)		NO TIT	IITION	U		
	1 5/		Unit – V				08 Hrs
Utility	of Solar Energy	in Build	lings: Utility of Solar	energy in buildings -	concepts of Sola	ar Pa	assive Cooling an
			y Cooling. Case studi				
	•	•	gs: Concepts of Green				•
approa	ches to Water Ma	anageme	ent. Management of S	olid Wastes. Manage	ement of Sullag	e ai	nd Sewage. Urba
Enviro	nment and Green	Building	s. Green Cover and B	uilt Environment.			
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			eting the course, the				
CO1	Outline the conc (PO1, PO2, PO	.	ost effective, eco-frien)	dly building materials	s and technologi	es.	
CO2	· · ·	•	of energy efficient bu	ilding materials in s	sustainable cons	struc	ction technologies
CO3	(PO1, PO2, PO Apply the impor) design principles in g	reen huildings and rat	ting systems (D	01	PO2 PO11)
CO3			dge of emerging techn			<u>, 1</u>	102,1011)
004	(PO1, PO2, PO		0 0 0	orogres in green bullt	ungo.		
	101,102,70	5,100,	109,1011				



RV College of Engineering[®] Mysore Road, RV Vidyaniketan Post, Bengaluru - 560059, Karnataka, India

Refere	Reference Books					
1	Green Building Fundamentals, G Harihara Iyer, Notion Press, 1st Edition, 2022, ISBN-13:979-					
	8886416091.					
2	Green Building: Principles & Practices, Harshul Savla, Notion Press, 1st Edition, 2021, ISBN-13: 978-					
	1685866044.					
3	Green Building Guidance: The Ultimate Guide for IGBC Accredited Professional Examination, Karthik					
	Karuppu, Notion Press; 1 st Edition, 2019, ISBN-13: 978-1684667291.					
4	Handbook of Green Building Design and Construction LEED, BREEAM, and Green Globes, Sam Kubba,					
	Joe Hayton publisher, 1 st Edition, 2017, ISBN: 978-0-12-810433-0.					
5	Sustainable Construction: Green Building Design and Delivery, Charles J. Kibert, Wiley Publication, 5th					
	Edition, 2022, ISBN-13:978-1119706458.					

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)	
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20
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3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS.	40
	MAXIMUM MARKS FOR THE CIE THEORY	100

MAXIMUM M.	ARKS I	FOR THE	CIE THEORY	1
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	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)					
Q. NO. CONTENTS						
	PART A					
1	Objective type questions covering entire syllabus	20				
	PART B (Maximum of TWO Sub-divisions only)					
2	Unit – I: (Compulsory)					
3 & 4	Unit – II: Question 3 or 4	16				
5&6	Unit – III: Question 5 or 6	16				
7&8	7 & 8 Unit – IV: Question 7 or 8					
9 & 10	Unit – V: Question 9 or 10	16				
	MAXIMUM MARKS FOR THE SEE THEORY	100				



Semester: I / II							
	INFRASTRUCTURE FOR SMART CITIES						
		Category: Eme	erging Technologies	8			
		(Common t	to all Programs)				
		Г)	'heory)				
Course Code	:	CV114BTH/CV124BTH	(CIE		100 Marks	
Credits: L:T:P	Credits: L:T:P : 3:0:0 SEE : 100 Marks						
Total Hours	Total Hours : 40L SEE Duration : 03 Hours						

Unit-I	08 Hrs
Fundamental of smart city & Infrastructure: Importance of livability, Introduction of Smart C	ity, need and
concept of smart city systems, Challenges of managing infrastructure in India and world, varie	ous types of
Infrastructure systems. Various stake holders in smart city. IoT applications in smart cities.	
Unit – II	08 Hrs
Planning and development of Smart city Infrastructure: Affordable housing, smart and gree	en buildings-
Objectives, features, benefits, different parameters considered -photo voltaic, water, materials and env	vironment.
Unit –III AN	08 Hrs
Intelligent transport systems: Public transportation management, Smart vehicles and fuels, t	
management, mobility services, E-ticketing. Smart mobility requirements, Smart City cases of G.I.S smart roads.	in mobility,
	5 in mobility, 08 Hrs
smart roads.	08 Hrs
smart roads. Unit –IV Management of water resources and related infrastructure: Storage and conveyance syste	08 Hrs

Course	e Outcomes: After completing the course, the students will be able to
CO1	Outline the necessity and types of infrastructure in planning and management of smart cities.
	(PO1, PO6, PO11)
CO2	Apply the concept of smart cities in development and management of conveyance systems.
	(PO1, PO2, PO11)
CO3	Analyze the impact of national and global policies to implement smart cities development.
	(PO1, PO2, PO6, PO11)
CO4	Demonstrate the knowledge of emerging technology to provide solutions for smart cities.
	(PO1, PO2, PO8, PO9, PO11)

Refere	ence Books
1	Sustainable Smart Cities in India: Challenges and Future Perspectives, Poonam Sharma, Swati Rajput,
	Springer; 1 st Edition, 2017, ISBN-13: 978-3319471440.
2	Smart City in India Urban Laboratory, Paradigm or Trajectory?, Binti Singh, Manoj Parmar, , Routledge
	India, 1 st Edition, 2019, ISBN 9780367462598.
3	The Age of Intelligent Cities: Smart Environments and Innovation-for-all Strategies (Regions and Cities),
	Nicos Komninos, Routledge India, 1 st Edition, 2014, ISBN-13: 978-1138782198,
4	Smart Cities, Germaine Halegoua, The MIT Press, 1 st Edition, 2020, ISBN-13 : 978-0262538053.
5	Smart Cities, Smart Future: Showcasing Tomorrow, Mike Barlow , Cornelia Levy-Bencheton, Wiley; 1 st Edition, 2018, ISBN-13: 978-111951618.



RV College of Engineering®
Mysore Road, RV Vidyaniketan Post, Bengaluru - 560059, Karnataka, India

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	MAXIMUM MARKS FOR THE CIE THEORY	100
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	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)							
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7 & 8	Unit – IV: Question 7 or 8	16						
9 & 10	Unit – V: Question 9 or 10	16						
	MAXIMUM MARKS FOR THE SEE THEORY	100						

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INST



				ster: I / II				
	FUN	DA	MENTALS OF NANOSC					
				rging Technologi	es			
			(Common te	o all Programs)				
				heory)				
Course	Code	:	CM114ATJ/CM124ATJ		CIE	:	100 Mar	
Credits	: L:T:P	:	3:0:0		SEE	:	100 Mar	ks
Total H	lours	:	42L		SEE Duration	:	03 Hour	S
			Unit – I					00 11-1-2
History	of none coione	0.0		davial annuanta of r	anomatariala non	otoo		08 Hrs
•			nd technology: Historical of	A	ianomaterials, nano	otec	nnology 1	a ancient
			medicine, cosmetics, and me Gecko feet, spider web a		Eundemontals of		notochnol	ogy and
	ation of nanoma			and lotus lear.	runuamentais of	Па	Inotechnol	ogy and
classific	cation of nanoma	len	Unit – II					08 Hrs
Duanau	dian of non-	4.0.1			manitian (DVD)			
-			rials: Top-down approach:	physical vapor de	eposition (PVD), m	loie	cular beam	i epitaxy,
	ng and ion beam			D) and disidation a	usthed states have	:	1	a na d
	-up approach: Quite of nanon		emical vapor deposition (CV	D), precipitation i	nethod, electrochel	mca	a method	and
green sy	nunesis of nanon	nate	Unit – III	1	4.			09 Hrs
Charran	tomination of mo				motions Inter ductio			
			materials and their prope			on,	UV-VIS al	osorption
			ctron microscopy, scattering					a a 4 a 1 - 14 i a
-	• •	rop	perties: Size, surface area	and optical prop	berties), Chemical	pro	perties -	catalytic
properti	es.	÷	Unit – IV		121			00 TT
NT	- 4					1 .		08 Hrs
			lture and healthcare: Ag	riculture: Applic	ation of nanotechi	noio	gy in mo	dern day
	ure practices, mi				· · · · ·			
		-	y: Membrane technology, na		ater purifications.			
Nanom	aterials in healt	nca	are: Cosmetics and nano me		-//-			00 II
D •	• • •	-	Unit - V		1 1			09 Hrs
			of nanomaterials: Energy:					. 1
		eria	als for display technology,	circuit elements	and their advanta	ges	over con	ventional
materia		1.0						
			-cleaning surfaces, automobil		anocomposites			
Civil co	instruction : High	h st	rength materials and fire-ret	ardant materials.	/			
0				UII				
			completing the course, the s					
CO1			dge of material science winnents. (PO1, PO11)	th special empha	size on nanostruct	urec	1 material	s and its
CO2		ncip	ples of nanoscience for sy	nthesis/ fabrication	on of different ty	pes	of nanos	tructured
CO3			pret the nanomaterial propert	ies by characteriz	ation techniques. (1	PO1	, PO6)	
CO4		-	stainable solutions for envir					tructured
	-		O6, PO8, PO9, PO11)		J J	-	0	
		/	, , , , - ,					
Referen	nce Books							
			I nanomaterials synthesis n		~ .			

Reference Books							
1	Nanostructures and nanomaterials synthesis, properties, and applications, Guozhong Cao and Ying Wang,						
	2011, 2 nd , ISBN: 9789814324557.						
2	Nanoscience: The Science of the small in physics, engineering, chemistry, biology and medicine", Hans-						
	Eckhardt Schaefer, 2010, Springer. ISBN: 3642105580.						
3	Introduction to nanoscience and nanotechnology, Gabor L. Hornyak, H.F. Tibbals, Joydeep Dutta, John J.						
	Moore, 2020, CRC press, ISBN: 9781420047790.						
4	Nano biotechnology-concepts, applications in health, agriculture and environment, R. Tomar, 2020,						



Apple Academic Press: ISBN: 9780429292750.

E-book 5

Nanotechnology advances and real-life applications, Bhargava and Amit Sachdeva, 2021, CRC press, ISBN: 9780367536732.

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9 & 10	Unit – V: Question 9 or 10	16			
. <u> </u>	MAXIMUM MARKS FOR THE SEE THEORY	100			



Semester: I / II						
FUNDAMENTALS OF SEMICONDUCTOR DEVICES						
	Category: Emerging Technologies					
	(Common to all Programs)					
		[]	Theory)			
Course Code	Course Code:EC114ATK/EC124ATKCIE:100 Marks					100 Marks
Credits: L:T:P : 3:0:0 SEE : 100 Marks				100 Marks		
Total Hours	:	40L		SEE Duration	:	03 Hours

Unit – I	08 Hrs			
Semiconductor Basics: Energy Levels to Energy Bands, Crystalline, Polycrystalline, and	d Amorphous			
Semiconductors, Miller Indices, Properties of Common Semiconductors, Free Carriers in Se	miconductors,			
Doping.				
Unit – II 08 Hrs				
Semiconductor Quantum behaviour: The Wave Equation Quantum Confinement Quantum T	unnelling and			

Semiconductor Quantum benaviour: The wave Equation, Quantum Continement, Quantum Tunneting and			
Reflection, Electron Waves in Crystals, Density of States, Fermi Function, Carrier Concentrations			
Unit – III 08 Hrs			
Semiconductor Transport: Carrier Transport, Generation, and Recombination- The Landauer Approach, Current			
from the Nanoscale to Macroscale, Drift-Diffusion Equation, Carrier Recombination, Carrier Generation,			
Mathematical Formulation, Energy Band Diagrams, Quasi-Fermi Levels, Minority Carrier Diffusion Equation			
Unit – IV 08 Hrs			

 Quantum Computing Basics: Difference between classical & quantum computing, Quantum Qubits, Single

 Qubits states, Postulates of Quantum Mechanics

 Unit – V
 08 Hrs

Hardware of Quantum Computers: Quantum measurement, Quantum Gates and Circuits, Introduction to building blocks of a quantum computer, Quantum materials, Spin Qubits

Course	Course Outcomes: After completing the course, the students will be able to						
CO1	Comprehend and apply the fundamental principles of semiconductor materials with energy bands, doping,						
	wave equations and quantum tunnelling to classical and quantum computing hardware.						
	(PO1, PO5, PO11)						
CO2							
	confinement, transport phenomena as applied to the study of qubits and quantum computing systems.						
	(PO1, PO2, PO4, PO5, PO11)						
CO3	Investigate carrier transport, generation, and recombination processes in semiconductors with						
	mathematical formulations and energy band diagrams; analyse nanoscale semiconductor devices and						
	quantum computing hardware principles. (PO1, PO2, PO4, PO5, PO11)						
CO4	Examine the relationship between semiconductor physics and the hardware of quantum computers. Apply						
	these principles in practical scenarios involving real-world semiconductor devices, quantum gates, and						
	computing circuits. (PO1, PO3, PO4, PO5, PO11)						

Refere	Reference Books						
1	Semiconductor Device Fundamentals, Robert F. Pierret, 2006, Pearson, ISBN 9780201543933						
2	Advanced Semiconductor Fundamentals, R.F. Pierret, 2nd ed., Pearson Education, Inc., 2003, ISBN-0-13- 061792-X						
3	Operation and Modeling of the MOS Transitor, Y.P. Tsividis, Colin McAndrew, 3 rd Edition, 2014, Oxford Univ Press, ISBN:978-0195170153						
4	Nielsen, M., & Chuang, I. (2010). Quantum Computation and Quantum Information: 10th Anniversary Edition. Cambridge: Cambridge University Press.						
5	Lecture Notes, Quantum Computation, California Institute of Technology, http://theory.caltech.edu/~preskill/ph219/ph219_2021-22.html [accessed as on 30-11-2022]						
6	Learn Quantum Computation using Qiskit, Online Textbook, https://qiskit.org/textbook/preface.html,						



[accessed as on 30-11-2022]

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	MAXIMUM MARKS FOR THE CIE THEORY	100			

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7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit – V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100
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Semester: I / II						
INTRODUCTION TO EMBEDDED SYSTEMS						
	Category: Emerging Technologies					
(Common to all Programs)						
Come Colo			heory)	CIE		100 Maular
Course Code		114BTM/EC124BTM		CIE	:	100 Marks
Credits: L:T:P	: 3:0			SEE	:	100 Marks
Total Hours	: 401	_		SEE Duration	:	03 Hours
		Unit – I				08 Hrs
Introduction: Definition	on of E	Embedded Systems, T	pical examples, a	and Application d	lom	ains (Automotive,
Consumer, etc.), Char	acteristi	cs, Typical block dia	gram, Input, Core	e, Output, Comm	erci	ial Off the Shelf
Components (COTS).	Process	sing Components, Mi	croprocessors &	Microcontrollers,	Inc	licative Examples
(Microcontrollers on Ar	duino b	oards), Development b	oards (Arduino boa	ards), Concepts and	d bı	rief introduction to
Memory, Interrupts, Po			Case Studies: Wash	ning Machine, An	tilo	ck Brake Systems
(Block diagram & Work	ting Prin		JANA	<u> </u>		
		Unit – I		<u></u>		08 Hrs
Integrated Developme			0			0
Types, Arithmetic & Lo	U					U U
		Development Environn				
(Definitions only). Pract	ice: Wo	orking with Arduino ID Unit – II		s on Operators, Lo	ops	and Functions). 08 Hrs
Samal And Danallal In	tonfogo			Donallal Data Tran	for	
Serial And Parallel In (only block diagram an						
Interfacing Serial Mod		0		•		
Interfacing LCD Module		e USIVI, UFS, LEDS,	Switches, interrac	ing remperature	αι	fulliuity Selisois,
		Unit –IV		/ /		08 Hrs
Data Converters: Rea	al worl			dical signals, etc	.),	
conversion, Successive						
Analog Conversion, R-2	2R DAC	C type, (Block Diagram	and Explanation).	Selection criteria	of A	ADC and DAC for
different applications	ADC				•	
Practice : Programming of PWM Wave.	ADC 0	f Arduino Board, Interi	acing Analog Tem	perature Sensor, C	Jas	sensor, Generation
		Unit –V	ITTION -			08 Hrs
Electro Mechanical Ac	tuators		the second se	lotor Driver, Stepp	er I	
Operation, Stepper Mot						
and Typical Diagrams).						_
Planning, Design and In	-					
Practice: Interfacing, Speed Control and Direction control of DC motor, Servo Motor, Stepper Motors.						
Course Outcomes: Aft	er com	leting the course the	students will be al	ole to		
	-	racteristics and challe			al-w	orld applications:
		ensuring optimized per				
(PO1, PO4, PO						
-		d systems developmer	•		-	
		inication modules, and			or d	lrivers to develop
		ications. (PO1, PO4, P			nor	ante methode for
-	-	the of data sheets to ching safe, reliable, and fa			-	
		5, PO8, PO9, PO11)		act systems for re	/a1-\	
		ental board schematics	GPIO functionalit	ies and debugging	toc	ols to verify proper
				00-10		



	system performance on a dedicated target system. ((PO1, PO2, PO4, PO5, PO8, PO9, PO11)
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Refere	Reference Books					
1	Embedded System Design: A Unified Hardware / Software Introduction, Tony Givargis and Frank Vahid.					
	Wiley. ISBN-10: 812650837X.					
2	Designing Embedded Systems with Arduino: A Fundamental Technology for Makers, Tianhong Pan, Yi					
	Zhu, Springer, ISBN 978-981-10-4417-5.					
3	Embedded Systems: Architecture, Programming and Design, Raj Kamal, 2nd Edition, The McGraw Hill,					
	ISBN: 13:978-0-07-066764-8					
4	Introduction to Embedded Systems, Shibu K V, 2009, Tata McGraw Hill Education Private Limited,					
	ISBN: 10: 0070678790.					
5	Embedded System Design: A Unified Hardware / Software Introduction, Tony Givargis and Frank Vahid.					
	Wiley. ISBN-10: 812650837X.					

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	MAXIMUM MARKS FOR THE CIE THEORY	100

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7 & 8 Unit – IV: Question 7 or 8						
9 & 10 Unit – V: Question 9 or 10						
	MAXIMUM MARKS FOR THE SEE THEORY 100					

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	Semester: I / II									
				ENERGY SOURC						
				erging Technologi	es					
	(Common to all Programs) (Theory)									
Course	(Theory) Course Code : EE114ATN/EE124ATN CIE : 100 Marks									
-	s: L:T:P	:	3:0:0		SEE	: 100 Marks				
Total H		:	40L		SEE Duration	: 03 Hours				
		-								
			Unit-I				08 Hrs			
			ems model causes of Energ							
•••		-	nent, Energy Resources and	Classification, Rer	newable Energy –	Wo	rldwide Renewable			
0,	•		able Energy in India.		1 0 4 1	1.	1			
			Geometric Relationship, La							
convers		the	Earth's Surface, Solar Th	ermai Energy App	incation. Block di	agra	in of solar energy			
convers	51011.		Unit – I	LAN.			08 Hrs			
Photo V	Voltaic Systems	P	V Cell, Module and array, e		circuit OC Volta	ge s				
	•		ay design, peak power track			-				
			onnected, Hybrid, Applicati							
			iples of wind energy conver			forc	es on blades, wind			
			lata and energy estimation							
compor	nents of WECS, A	4dv	antages & disadvantages.		121					
			Unit – II		121		08 Hrs			
			ts of Hydrogen Energy, Hyd			gram	, Use of Hydrogen			
			ts, Problems Associated wit							
			iction, Biomass Production							
			asification, Gasifier and t							
Gasine	rs, Use of Bioma	ss c	Gasifier, Gasifier Biomass F Unit – I		, Applications of r	5101	08 Hrs			
Geothe	rmal Fnorav. Ir	ntro	duction to Geothermal Sys		m Classifications	Ge				
			ploration, Geothermal Ba							
	mental Effects.	2.1	produción, cootineminar De		er Generation,	100	oracea Troorenio,			
		tion	n, Tidal Energy Resource,	Block diagram, Ti	dal Power Genera	tion	in India, Leading			
Country	y in Tidal Power	· Pl	ant Installation, Energy Av	ailability in Tides	, Tidal Power Bas	sin,	Turbines for Tidal			
Power,	Advantages and	Dis	advantages of Tidal Power,	Issues Faced in Ex	ploiting Tidal Ene	rgy	•			
			Unit – V				08 Hrs			
			np Storage, Compressed Air				l Storage or Battery			
			torage, Inertial Storage, Supe							
			Energy Adoption: Energe energy monopoly, Lack of							
miasut	acture, mon-renew	aul	c energy monopory, Lack Of	KIIOWICUZE allu aWa	ichess, Lack of pol		5, 500510105.			
Course	Outcomose A ft	nr e	completing the course, the	studente will be a	ble to					
						0116	ranawahla sources			
COI	CO1 Analyze the concepts of energy generation, characteristics, and performance of various renewable sources & Energy storage. Apply these decentralized renewable energy systems to address the electrical energy									
		-	1, PO2, PO3, PO4, PO6, F		systems to addres	,5 u	e chechical chergy			
CO2			ers of different renewabl		like solar. wind	, h	vdrogen, biomass.			
			dal. Interpret their operati							
	•		PO4, PO8, PO9, PO11)		, r					
CO3		,	te power generated from t	he renewable sour	ces and different	way	ys to store energy.			
	Apply the know					-				
		lea	ige to design a renewable ba	ised system that sat	isfies the load requ	ure	ment.			
)3,]	PO4, PO8, PO9, PO11) lge to discuss new policies							



energy solution. Comprehend the global and local scenario of renewable sources, available infrastructure, resources and capital. (**PO6, PO7, PO8, PO9, PO11**)

Refere	Reference Books						
1	Non-conventional Energy Resources, Shobh Nath Singh, 1 st Edition, 2015, Pearson, ISBN- 978-93-325- 4357-7						
2	Solar photo voltaic Technology and systems, Chetan Singh Solanki, third edition(2013), 2 PHI, Learning Private limited New Delhi ISBN: 978-81-203-4711-3.						
3	Wind and solar Power system design, Analysis and operation, Mukund R. Patel, 2 nd Edition						
4	Non-Conventional sources of energy, G. D. Rai, 4 th Edition, 2009, Khanna Publishers, ISBN8174090738, 9788174090737						

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	MAXIMUM MARKS FOR THE CIE THEORY	100		

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)					
Q. NO. CONTENTS						
	PART A					
1	Objective type questions covering entire syllabus	20				
	PART B					
	(Maximum of TWO Sub-divisions only)					
2	Unit – I: (Compulsory)	16				
3 & 4	Unit – II: Question 3 or 4	16				
5 & 6 Unit – III: Question 5 or 6						
7 & 8 Unit – IV: Question 7 or 8						
9 & 10	Unit – V: Question 9 or 10	16				
	MAXIMUM MARKS FOR THE SEE THEORY 100					



		Semes	ter: I /II				
		(Common to	SENSOR TECHNOL ging Technologies all Programs) eory)	OGY			
Course Code	•	EI114ATO/EI124ATO	CIE		:	100 M	arks
Credits: L:T:P	•	3:0:0	SEE		:	100 M	
Total Hours	:	40L		Duration	:	03 Ho	
						1	
		Unit – I					08 Hrs
technologies, Classif Principle of operati Measurement of Te	ication on and mpera	ndamentals: Introduction of sensors, Characteristics l applications: sture: Thermistor, Thermoco ressure and Displacement: S	of sensors. uple, Pyroelectric senso	or.			
		Unit – II		(R)			10 Hrs
Photo sensors: Photo Tactile sensors: Cor	ovoltai Istructi	ensor, SpO ₂ sensor, Color sen c cell, Photo resistor, Phototr on and operation, types. Unit – III	ansistor.	<u>}</u>			07 Hrs
-		sensors and deposition techr Plastics, Metals, Ceramics, C	·	Principles and	apj	plication	
		Unit – IV		C			09 Hrs
Introduction to MEM MEMS Technology Surface processing:	IS Sen Sputte	Sensor Technology Compon- sors and Nano Sensors. ering, Chemical vapor deposi- hography, LIGA process.		tware Overvie	ew	: Sensoi	[•] platforms,
inter oteennorogj · i	notont	Unit – V		- /			06 Hrs
Case studies: Senso Sensors for mobile p		Smart home automation, Sen pplications.		oplications, Se	ens	ors for	
<u>C</u>	A 64	1.6. A					
		completing the course, the s lge of sensors to comprehend			2 1	200)	
	evalua	ate the performance of different			, 1	())	
(PO1, PO5,	PO8,		· · ·	•••			
CO4 Develop an	applica	ation to provide solutions for	sustainable development	nt goals. (PO1	l , P	PO5, PC)8, PO9)
Deferment D. 1							
		lern Sensors: Physics, Desig N: 978-1-4419-6465-6.	ns, and Applications,	Jacob Fraden,	, P	HI Pub	lication, 5 th
	Actua	tors: Control systems Instrur	nentation, Clarence W.	de Silva, CRC	C P	ress, 20	13 Edition

4 Sensor technologies, Michael J McGrath, Intel Labs, 2013 Edition, ISBN: 9781430260141.



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RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)						
#	COMPONENTS	MARKS				
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be					
	conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES	20				
	WILL BE THE FINAL QUIZ MARKS.					
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity					
	levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying,					
	Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests	40				
	and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto					
	100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.					
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and					
e	practical implementation of the problem. Case study-based teaching learning (10), Program					
	specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2	40				
		40				
	will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO					
	40 MARKS.					
	MAXIMUM MARKS FOR THE CIE THEORY	100				
	SILOUTING					

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)					
Q. NO.	Q. NO. CONTENTS					
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	(Maximum of TWO Sub-divisions only)					
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7 & 8 Unit – IV: Question 7 or 8						
9 & 10	Unit – V: Question 9 or 10	16				
MAXIMUM MARKS FOR THE SEE THEORY						

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		Semes	ter: I / II			
		HUMAN FACTOR	S IN ENGINEERING			
		Category: Eme	ging Technologies			
		(Common to	all Programs)			
			neory)			-
Course Code	:	IM114ATP/IM124ATP	CIE		:	100 Marks
Credits: L:T:P	:	3:0:0	SEE		:	100 Marks
Total Hours	:	42L	SEE I	Duration	:	03 Hours
						·····
		Unit – I				09 Hrs
		ic Design: Description of				
		esign, history of ergonomi				
-		n Performance, Macro erg		ndustry that	t in	npact Ergonomics,
Organizations associated	l wi	ith Ergonomics, Ergonomic	methods.			
		Unit – II		0		08 Hrs
		nts of human body, skeletal s		thropometry	у, В	ody movements,
Musculoskeletal system	s as		ANA			
		Unit – III	1 22 M			08 Hrs
Human System: Sensor	ry s	ub systems, Support subsyst	ems. Cognitive ergonon	nics: an ove	rvie	ew. Design of work
		ed Anthropometry, Drafting		work area	as a	and stations, Basic
ergonomic design princi	ple	s, principles for design of sea	ating, Office design.			
	_	Unit – IV		2.1		09 Hrs
		ment: Design of tools and e	equipment and related pr	inciples, Pr	otec	ctive equipment for
		ng people with disabilities.		21		
8		Physical Environment: Int				
Illumination, Conceptua	1 ov	verview of basic lighting prin	ciples, Noise (Conceptu	al Treatme	ent	
Unit – V 08 Hrs						
Assessment and Design of Physical Environment: Temperature and Humidity, Control strategies for hot and						
		ds and control measures.				
incorporating Ergonomics in design of workspaces, Ergonomics and Digital Transformation. statement &						
guidelines, Smart cities in India, Case studies of smart city.						
		completing the course, the s		/		
CO1 Recognize the importance of ergonomics and human factors in the design of workspaces.						
(PO1, PO4, PO)6,]	PO7, PO11)	UTION /			

CO2	Interpret human anatomy, physiology and psychology from a system's perspective. (PO5, PO6)
CO3	Analyze the role of anthropometric data and modeling techniques in the workplace design. (PO5, PO7)
CO4	Explain the importance of physical environment in ergonomic design of work settings. (PO6)

Refere	Reference Books				
1	Introduction to Human Factors and Ergonomics for Engineers, Lehto Mark, Steven J Landry, 2 nd Edition, 2013, CRC Press, ISBN:978-1-4398-5394-8				
2					
2	Ergonomics for Beginners-A quick reference guide, Jan Dul, Bernard Weerdmeester,3 rd Edition,2008,				
	CRC Press, ISBN 978-1-4200-7751-3				
3	Introduction to Ergonomics, R S Bridger, 3 rd Edition, 2008, CRC Press, ISBN: 9780849373060.				
4	Human Factors in Engineering and Design; Mark S. Sanders and Ernest J Mc Cormick; 7th Edition,				
	McGraw-Hill and Co. Singapore 1992. ISBN 0-07-112826-3.				

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)			
#	COMPONENTS	MARKS		
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	conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES	20		



	WILL BE THE FINAL QUIZ MARKS.	
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7 & 8	Unit – IV: Question 7 or 8	16			
9 & 10	Unit – V: Question 9 or 10	16			
	MAXIMUM MARKS FOR THE SEE THEORY	100			

NS

WS

09 Hrs



Semester: I / II							
DIGITAL HUMANITIES							
	Category: Emerging Technologies						
	(Common to all Programs)						
		(Theory)				
Course Code	:	IS114ATQ/IS124ATQ		CIE	:	100 Mark	IS .
Credits: L:T:P	:	3:0:0		SEE	:	100 Marks	
Total Hours	:	42L		SEE Duration	:	: 03 Hours	
		Unit –	Ι			(08 Hrs
Introduction to Digital Humanities: What is digital humanities? Principals and Scenarios for digital humanities. Reasons to Engage with the Digital Humanities: Defining the Digital Humanities, Motivations for Engaging with the Digital Humanities, Digital Futures.							
Unit – II 09 Hrs)9 Hrs				
Humanities to Digital Humanities: Designing digital humanities. Computational activities in digital							

humanities: Computation, Processing, Digitization, Classification, Organization, Navigation Unit – III

Generating Humanities: Humanities as the new core. Towards an Encounter between Humanities and
Computing: Formalisation in humanity computing, Cultures of formalization. Transdisciplinary and digital
humanity: Beyond interdisciplinarity, Methodological transformation and transdisciplinary.Unit – IV09 Hrs

Digital Methods: Five Challenges.

 Digital Humanities Mapping Change the Possibilities for the Spatial Humanities in India, Digital Space and Databases. Case study "Graphs, Maps, Trees abstract models for literary history", Franco Moretti.

 Unit – V
 07 Hrs

Designing class roam activities: Activity design, Digital events, Physical Computing and Critical Making

Course	Course Outcomes: After completing the course, the students will be able to				
C01	Demonstrate significant knowledge and understanding in subcategories of the digital humanities. (PO1, PO3, PO6, PO10)				
CO2					
CO3	Analyse, assess, and manage complex phenomena, questions, and situations related to the digital				
	humanities as a field of study and work. (PO2, PO4, PO5, PO7)				
CO4	Evaluate the prospects and limitations of science and technology in digital humanities.				
	(PO2, PO3, PO5, PO7)				

Refere	Reference Books				
1	Introduction to Digital Humanities by Kathryn C. Wymer, Taylor & Francis, ISBN: 978-0-367-71110-8				
	published in 2021				
2	An Introduction to Digital Methods for Research and Scholarship By Johanna Drucker, Taylor & Francis,				
	ISBN 9780367565756 Published March 25, 2021				
3	Understanding Digital Humanities by David M. Berry, Palgrave Macmillan, ISBN: 978–0–230–29264–2,				
	published in 2012				
4	Digital Humanities by Anne Burdick, Johanna Drucker, Peter Lunenfeld, Todd Presner & Jeffrey				
	Schnapp, The MIT Press Cambridge, Massachusetts London, England, ISBN 978-0-262-01847-0,				
	published in 2012				
5	Using Digital Humanities in the Classroom by Claire Battershill and Shawna Ross, Second Edition				
	Blooms Burt Academic, ISBN: HB: 978-1-3501-8090-1 published in 2017				



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#	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)	MADEC
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		40
	will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO	
	40 MARKS.	
	MAXIMUM MARKS FOR THE CIE THEORY	100
	SILOUTING	

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7 & 8	Unit – IV: Question 7 or 8	16				
9 & 10	Unit – V: Question 9 or 10	16				
	MAXIMUM MARKS FOR THE SEE THEORY	100				

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Bengaluru - 560059, Karnataka, India

			Seme SMART MATER	ster: I / II IALS AND SYSTE	EMS			
				rging Technologies	5			
				o all Programs)				
Course	Codo		ME114ATR/ME124ATR	heory)	CIE		100 M	lorka
	s: L:T:P	•	3: 0:0		SEE	:	100 M	
Total H		:	42T		SEE Duration	-	03 Ho	
Total I	10015	·	421		SEE DUI attoli	:	05 П0	Juis
			Unit – I					06 Hr
			cs of metals, polymers and					
	-		ents of a smart System,	Applications of S	Smart Materials	and	Smart	Materials
Manufa	cturing in Indust	tries						
<u>a</u>			Unit – Il					08 Hrs
			ectric materials, Electro stric			eria	ls, Magi	netoelectric
		0	cal fluids, Electrorheologica			. 11		
			erials: Semiconductors a				zation	techniques,
Cerami	cs and their proc	essi	ng, Polymers and their synth		curing of polymer	rs.	1	40.77
			Unit – II					10 Hrs
	ces in smart		<u> </u>	ezoelectric Transd	0.		•	Materials.
			-Healing Polymers, Intellig					
			nductometric sensors, Cap				0	
			sors, Optical sensors, sen	niconductor-based	sensors, Acoustic	se se	ensors,	polymerize
sensors	, Carbon nanotul	be se			121			10
• • •		_	Unit – IV		5			10 Hrs
			Electrostatic transducers, H			•		
			Electro-strictive transducers	, Magneto-strictive	transducers, Elec	ctro	therma	l actuators
-	rison of actuation							a 1
			tuators, Polymeric Actuat			ve	V1brat10	on Control
Active	Shape Control, F	'assi	ve Vibration Control, Hybr		1.			00 11
			Unit – V			~		08 Hrs
			n, Definition, Signal and S					stem: open
• •	• •		and Dynamic Measurement	Ū.	•			.1 1
			Calibration, Significance of			, C	alibratic	on method
Classifi	cation of calibra	tion	, Lab calibration, Curve fitti	ing method of calibi	ation,			
Course	Outcomos: Aft	or o	ompleting the course, the	studente will be ab	lo to			
COULSE CO1			ndamental characteristics a			Core	mice	nd various
COI			erials. (PO1, PO6)	na properties of III	cturs, porymers,		unics, a	ing various
CO2			ng principles and properties	of different types of	f emart motoriala	011/	h as ni	azoalactria
002			nd shape memory materials					
			zation, and polymer synthes		ocessing techniqu	105	INC SUI	nconductor
CO3			cements in smart materials		transducara calf	haa	ling not	umore or
005			systems, as well as their app					
		-		meanon in sensor te	chilology, locust	ng (m vario	us types of
CO4			art systems. (PO3, PO4)	t tachniques for w	ibration and abar	0.0	ontrol .	ning amor
CO4			sed systems and implement					
		•	nowledge of measurement	U	•	orat	ion tech	iniques 101
	ennancing cont	TOI S	systems in smart materials a	nu devices. (PO3, F	(010)			
Ketere	nce Books							

KUUU	IICE DOORS
1	Fundamentals of Smart Materials, (2020) Mohsen Shahinpoor, Print ISBN 978-1-78262-645-9, ePub
	eISBN, 978-1-78801-946-0
2	Smart Material Systems and MEMS: Design and Development Methodologies, V. K. Varadan,



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	K. J. Vinoy, S. Gopalakrishnan, John Wiley and Sons, England, 2006.
3	Smart Structures: Analysis and Design, A. V. Srinivasan, Cambridge University Press, Cambridge, New
	York, 2001.
4	Encyclopedia of Smart Materials, ISBN: 9780128157329, eBook ISBN: 97801281573
5	Functional and Smart Materials, Chander Prakash, Sunpreet Singh, J. Paulo Davim, 2021, ISBN
	9780367275105
6	Piezoelectric Sensorics: Force, Strain, Pressure, Acceleration and Acoustic Emission Sensors, Materials
	and Amplifiers, G. Gautschi, Springer, Berlin, New York, 2002.

RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)		
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	MAXIMUM MARKS FOR THE CIE THEORY	100

		100
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7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit – V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100



			Seme	ster: I / II				
				OF INDUSTRY 4.0				
			Category: Eme	rging Technologies				
			(Common t	o all Programs)				
			(T	heory)				
Course	e Code	:	ME114BTS/ME124BTS	CII	E	:	100 M	Iarks
Credit	s: L:T:P	:	3:0:0	SEI	E	:	100 M	Iarks
Total I	Hours	:	42L	SE	E Duration	:	03 Ho	ours
			Unit – I					06 Hrs
Definit	ion, Goals and E	Desig	on: The Various Industria on Principles – Interoperabi strial Internet of Things (IIC)	lity, Virtualization, De T).			•	Capability,
			Unit – I					10 Hrs
			nges: Lack of resources, ad Skills in the Industry 4.0		workers, Broa	adb	and inf	rastructure,
Horizo platforr	ntal and Vertic	cal 1	Integration: End-to-end e sensors, Sensing classificat	ngineering of the over				
			Unit –II		11			10 Hrs
Smart	Worker: Augme	ente	d and Virtual Reality, Indu	strial Applications – Ma	aintenance, As	sen	nbly, Co	ollaborative
operation	ons, Training.		N.		21			
Digital	-to-Physical: Ad	dditi	ve Manufacturing technolo	ogies, Advantages, imp	act on enviror	nme	nt, Apj	plications -
Autom	otive, Aerospace	, Ele	ectronics, and Medical.		201			
			Unit – IV		C I			08 Hrs
Cloud	Computing: Fu		y, Total Productive Mainte mentals, Cloud / Edge Con					
Securit	у.	Ļ.	1 1 1 1 1		4.0, The IT/O7	r co	nverge	-
		ł	Unit - V					08 Hrs
Artific convey Applica	ial Intelligence: or system, Intel ations. gent Objects (us	Fur	Unit - V ndamentals, Case Studies, nt commissioning system, riented functions), Techno	Technology paradigms Intelligent production logical realization of I	in production machine, In	log tell	gistics - gent lo	08 Hrs Intelligent oad carrier,
Artific convey Applica Intellig functio	ial Intelligence: or system, Intel ations. gent Objects (us ns).	Fur lige	Unit - V ndamentals, Case Studies, nt commissioning system, riented functions), Techno	Technology paradigms Intelligent production logical realization of I	in production machine, In Intelligent Obj	log tell	gistics - gent lo	08 Hrs Intelligent oad carrier,
Artific convey Applica Intellig functio	ial Intelligence: or system, Intel ations. gent Objects (us ns). Outcomes: Aft	Fur lige: ser-o	Unit - V ndamentals, Case Studies, nt commissioning system, riented functions), Techno ompleting the course, the	Technology paradigms Intelligent production logical realization of I students will be able t	in production 1 machine, In Intelligent Obj	log tell	gistics - gent lo	08 Hrs Intelligent oad carrier,
Artific convey Applica Intellig functio	ial Intelligence: or system, Intel ations. gent Objects (us ns). e Outcomes: Aft Apply the desig Analyze the c	Fur lige ser-o er co gn pr chall	Unit - V ndamentals, Case Studies, nt commissioning system, riented functions), Techno	Technology paradigms Intelligent production logical realization of I students will be able t modern manufacturing. uch as resource cons	in production n machine, In Intelligent Object o (PO1, PO6) traints, workf	l log telli	gistics - gent lo	08 Hrs - Intelligent bad carrier, uct-oriented
Artific convey Applica Intellig functio Course CO1 CO2 CO3	ial Intelligence: or system, Intel ations. gent Objects (us ns). • Outcomes: Aft Apply the desig Analyze the c technological in Utilize modern processes. (PO	Fur lige ser-o gn pr chall nfras i en 4 , P	Unit - V ndamentals, Case Studies, nt commissioning system, rriented functions), Techno ompleting the course, the finciples of Industry 4.0 in r enges of Industry 4.0, s structure, and propose possi gineering technologies, su O5)	Technology paradigms Intelligent production logical realization of I students will be able t nodern manufacturing. uch as resource cons ble solutions. (PO2, PC ch as cloud computing	in production n machine, In Intelligent Object (PO1, PO6) traints, workf D3, PO5) g, to simulate	log tell ects Forc	gistics - gent lo (produ e skill art ma	08 Hrs - Intelligent bad carrier, act-oriented gaps, and nufacturing
Artific convey Applica Intellig functio Course CO1 CO2	ial Intelligence: or system, Intel ations. gent Objects (us ns). e Outcomes: Aft Apply the desig Analyze the o technological in Utilize modern processes. (PO Evaluate the i	Fur lige: ser-o er co gn pi chall nfras a en; 4, P mpa	Unit - V ndamentals, Case Studies, nt commissioning system, priented functions), Techno ompleting the course, the rinciples of Industry 4.0 in r enges of Industry 4.0, s structure, and propose possi gineering technologies, su	Technology paradigms Intelligent production logical realization of I students will be able to modern manufacturing. uch as resource cons ble solutions. (PO2, PC ch as cloud computing on production logistic	in production n machine, In ntelligent Object o (PO1, PO6) traints, workf D3, PO5) g, to simulate	log tell ects Forc	gistics - gent lo (produ e skill art ma	08 Hrs - Intelligent bad carrier, act-oriented gaps, and nufacturing
Artific convey Applica Intellig functio Course CO1 CO2 CO3 CO4	ial Intelligence: or system, Intel ations. gent Objects (us ns). • Outcomes: Aft Apply the desig Analyze the of technological in Utilize modern processes. (PO Evaluate the i considerations	Fur lige: ser-o er co gn pi chall nfras a en; 4, P mpa	Unit - V ndamentals, Case Studies, int commissioning system, riented functions), Techno ompleting the course, the tinciples of Industry 4.0 in t enges of Industry 4.0, s structure, and propose possi gineering technologies, su O5) ct of intelligent systems	Technology paradigms Intelligent production logical realization of I students will be able to modern manufacturing. uch as resource cons ble solutions. (PO2, PC ch as cloud computing on production logistic	in production n machine, In ntelligent Object o (PO1, PO6) traints, workf D3, PO5) g, to simulate	log tell ects Forc	gistics - gent lo (produ e skill art ma	08 Hrs - Intelligent bad carrier, act-oriented gaps, and nufacturing
Artific convey Applica Intellig functio Course CO1 CO2 CO3 CO4	ial Intelligence: or system, Intel ations. gent Objects (us ns). e Outcomes: Aft Apply the desig Analyze the c technological in Utilize modern processes. (PO Evaluate the i considerations i nce Books Industry 4.0: N	Fur lige ser-o er co gn pr chall nfras i en; 4, P mpa in in	Unit - V ndamentals, Case Studies, int commissioning system, riented functions), Techno ompleting the course, the tinciples of Industry 4.0 in t enges of Industry 4.0, s structure, and propose possi gineering technologies, su O5) ct of intelligent systems	Technology paradigms Intelligent production logical realization of I students will be able t nodern manufacturing. uch as resource cons ble solutions. (PO2, PC ch as cloud computing on production logistic chnologies. (PO6, PO7	in production n machine, In Intelligent Object (PO1, PO6) (raints, workf D3, PO5) g, to simulate res and society 7, PO11)	i log telli ects Forc sm	gistics - gent lo (produ e skill art ma d iden	08 Hrs Intelligent oad carrier, act-oriented gaps, and nufacturing tify ethical
Artific convey Applica Intellig functio Course CO1 CO2 CO3 CO3 CO4 Refere	ial Intelligence: or system, Intel ations. gent Objects (us ns). • Outcomes: Aft Apply the desig Analyze the of technological in Utilize modern processes. (PO Evaluate the i considerations nce Books Industry 4.0: M ISBN 978-3-31 The Concept I	Fur lige: ser-o er co gn pp chall nfras in in mpa in in 9-57 indu	Unit - V ndamentals, Case Studies, int commissioning system, riented functions), Techno ompleting the course, the finciples of Industry 4.0 in r enges of Industry 4.0, s structure, and propose possi gineering technologies, su O5) ct of intelligent systems aplementing Industry 4.0 te	Technology paradigms Intelligent production logical realization of I students will be able t nodern manufacturing. uch as resource cons ble solutions. (PO2, PC ch as cloud computing on production logistic chnologies. (PO6, PO7 rmation, Alp Ustunda, 7870-5.	in production n machine, In Intelligent Object o (PO1, PO6) traints, workf D3, PO5) g, to simulate res and society 7, PO11) g, Emre Cevil ies and Applie	i log telli ects Forc sm r ar kcati	gistics - gent lo (produ e skill art ma d iden n, 2017 ons in	08 Hrs Intelligent oad carrier, act-oriented gaps, and nufacturing tify ethical 7, Springer, Production



Vermesan, 2016, River Publishers, ISBN 978-87-93379-81-7 ISBN 978-87-93379-82-4.

RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)		
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	20
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.	40
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS.	40
	MAXIMUM MARKS FOR THE CIE THEORY	100

Q. NO.	CONTENTS	MARKS
	PART A	
1	Objective type questions covering entire syllabus	20
	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	16
3 & 4	Unit – II: Question 3 or 4	16
5&6	Unit – III: Question 5 or 6	16
7 & 8	Unit – IV: Question 7 or 8	16
9 & 10	Unit – V: Question 9 or 10	16
	MAXIMUM MARKS FOR THE SEE THEORY	100
	WSTITUTIONS	

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Programming Language Lab Courses

- INTRODUCTION TO PYTHON PROGRAMMING (AI115AIA/AI125AIA)
- INTRODUCTION TO WEB PROGRAMMING (CS115AIB/CS125AIB)
- > BASICS TO JAVA PROGRAMMING (CS115BIC/CS125BIC)
- INTRODUCTION TO C++ PROGRAMMING (IS115AID/IS125AID)



			nester: I / II		
		Category: Progra (Commor	PYTHON PROGRAMMING mming Language Course to all Programs) ry & Practice)		
Course	code :		CIE	:	100 Marks
	s: L:T:P :	2:0:1	SEE	:	100 Marks
Total I			SEE Duratio		03 Hours
		Unit –	т		05 Hrs
System Types,	s, introducing IDLE. Variable, and Sim	ng Python, Setting Up	Python in windows, Setting Up vith Strings, Concatenating and	2	in other Operatin
with N	umbers, Understandi	<u>unit –</u>	Jser Input, Converting Values		05 Hrs
	creating while Loo	and Program Planning:	Using the If statement, Using the ops, Creating Intentional infinition		Clause, Using the el
Contait		Unit – J	TT AL		06 Hrs
Functi Parame	ons: Creating Funct eters Values, Using G	Unit – I ons, Using Parameters a lobal Variables and Cons	nd Return Values, Using Keyw	vord Arg	06 Hrs
		Unit –			06 Hrs
Constru Object a Base	actor, Using Class At -Oriented Program	tributes and Static Metho ming: Using Inheritance Derived Class, Using	ethod, Instantiating an Object, ds, Understanding Object Encap to Create New Classes, creating the Derived Class, extending a	sulation. a Base C	Class, inheriting from
Course	Outcomes: After c	ompleting the course, th	e students will be able to		
CO1			to solve multi-disciplinary prob	lems. (P	01)
CO2	Identify the problem programming. (PO		domains and solve them using	different	t concepts of Pytho
CO3			g to address some of the concern		
CO4	Demonstrate the us (PO8, PO9)	e of modern tools by exhi	biting teamwork and effective co	ommunic	cation skills.
Refere	nce Books				
1	ISBN-13:978-93-8	5668-00-4, ISBN-10: 93-8		-	
2			tation and Programming using 978-0-262-51963-2, 2013	g Pythor	n, The MIT Pres
3	Mark Summerfield	, Programming in Pytho	n 3: A Complete Introduction	to the Py	ython Language, 2

4 Paul Gries, Jennifer Campbell, Jason Montojo, Practical Programming: An Introduction to Computer Science Using Python 3.6, 3rd Edition, The Pragmatic Bookshelf, ISBN-13: 978-1-6805026-8-8, 2017.

Edition, ISBN-13: 978-0-321-68056-3, ISBN-10: 0-321-68056-1.



5	Mark Lutz, Learning Python, 5th Edition, 2013, Oreilly Media, ISBN: 978-1-449-35573-9.
6	Burkhard A. Meier, Python GUI Programming Cookbook, Packt Publishing, 2015,
	ISBN 978-1-78528-375-8.

	Laboratory Experiments		
	PART-A		
1	Introductory Lab-Installation and Working with the Sample Programs		
2	Write a program to find the largest prime factor of a given integer		
3	Write a program to find the height of the ball thrown by a basketball player.		
4	Write a program to find the Golden ratio.		
5	Read a paragraph from the user and count the number of words, and frequency of Words appearing, and		
	search for the specific word.		
6	Consider a sequence of numbers with some missing values. Write a python program for inserting the		
	missing values and remove some of the values from the sequence. Also, add a few more values to the		
	existing sequence.		
7	Create an Employee 'Employee' Database using dictionaries and perform the insert, search and display		
	operations.		
8	Implement Set and Tuple Operations		
9	Create a text file called my_file.txt with some content, capitalize the first letter of every word, and print		
	the content of the file in reverse order.		
	PROGRAMMING ASSIGNMENT		
Design	and develop a python GUI application connected to interested Sustainable Development Goals		
(SDG)	19/ 21		

#	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY WITH LA COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	10
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 30 MARKS.	30
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (10) ADDING UPTO 30 MARKS .	30
4	LAB: Conduction of laboratory exercises, lab report, observation and analysis (30 Marks), lab test (10 Marks) and Innovative Experiment/ Concept Design and Implementation (10 Marks) adding up to 50 Marks. THE FINAL MARKS WILL BE REDUCED TO 30 MARKS	30
	MAXIMUM MARKS FOR THE CIE THEORY	100



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	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)				
Q. NO.	O. CONTENTS				
	PART A				
1	Objective type questions covering entire syllabus	10			
	PART B				
	(Maximum of TWO Sub-divisions only)				
2	Unit – I: (Compulsory)	14			
3 & 4	Unit – II: Question 3 or 4	14			
5&6					
7 & 8	Unit – IV: Question 7 or 8	14			
9 & 10	Unit – V: Question 9 or 10	14			
11	Lab Component (Compulsory)	20			
	MAXIMUM MARKS FOR THE SEE THEORY	100			





Semester: I / II						
INTRODUCTION TO WEB PROGRAMMING						
	Category: Programming Language Course					
		(Common	to all Programs)			
	(Theory & Practice)					
Course Code	:	CS115AIB/CS125AIB	CIE	:	100 Marks	
Credits: L:T:P	Credits: L:T:P : 2:0:1 SEE : 100 Marks					
Total Hours	:	28L+28P	SEE Duration	:	03 Hours	

Unit – I	05 Hrs	
Introduction to Web Concepts: Fundamentals of Web -Introduction to Internet, World Wide	Web, Web	
Browsers and Web Servers, Uniform Resource Locators, MIME (Multipurpose Internet Mail	Extensions),	
Hypertext Transfer Protocol -HTTP Request Phase, HTTP Response Phase.		
Unit – II	06 Hrs	
XHTML: Basic syntax, Standard XHTML document structure, Basic text markup, Images, Hype	rtext Links,	
Lists, Tables, Forms, Frames, Syntactic differences between HTML and XHTML.		
Unit – III	06 Hrs	
CSS (Cascading Style Sheets): Introduction, Levels of style sheets, Style specification formats, Selector forms,		
Property value forms, Font properties, List properties, Color, Alignment of text, The box model,	Background	
images, The and <div> tags, Conflict resolution.</div>		
Unit – IV	06 Hrs	
The Basics of JavaScript: Overview of JavaScript; Object orientation and JavaScript; Gener	al syntactic	
characteristics; Primitives, operations, and expressions; Screen output and keyboard input; Control state	ements,	
Object creation and modification; Arrays; Functions; Constructor; Pattern matching using regular expre	essions.	
Unit – V	05 Hrs	
Database access through Web: Relational databases, Introduction to SQL, Architecture for database	access, The	
MySQL Database System, Programming Examples and Demonstration of Connectivity Example code.		

Course	Course Outcomes: After completing the course, the students will be able to		
CO1	Explain the fundamental concepts of web and syntax & semantics of different web programming tools		
	such as HTML, CSS and JavaScript. (PO1, PO2, PO5, PO11)		
CO2	Apply the concepts of different web frameworks to build static and dynamic web pages.		
	(PO1, PO2, PO5, PO7, PO11)		
CO3	Design and Develop client side of the application using an appropriate web programming tool and server-		
	side logic. (PO1, PO2, PO4, PO5, PO6, PO8, PO9, PO10, PO11)		
CO4	Demonstrate real world web-based applications for different domains.		
	(PO1, PO2, PO5, PO8, PO9, PO11)		

Refere	nce Books
1	Programming the World Wide Web – Robert W. Sebesta, 7th Edition, Pearson Education, 2013,
	ISBN-13:978-0132665810.
2	Web Programming Building Internet Applications – Chris Bates, 3 rd Edition, Wiley India, 2006,
	ISBN: 978-81-265-1290-4.
3	Internet & World Wide Web How to H program – M. Deitel, P.J. Deitel, A. B. Goldberg, 3 rd Edition,
	Pearson Education / PHI, 2004, ISBN-10: 0-130-89550-4
4	The Complete Reference to HTML and XHTML- Thomas A Powell, 4th Edition, Tata McGraw Hill,
	2003, ISBN: 978-0-07-222942-4.

	Laboratory Experiments			
1	Familiarization with IDE -Compilation, Debugging and execution considering simple programs.			
2	Implementation and execution of simple HTML/XHTML programs to understand working of			
	• Tables			



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	• Lists
	• Frames
	• Forms
3	Web page styling with CSS
	• Font Properties
	List Properties
	Color Properties
	Box Model
	Background Image
	Conflict Resolution
4	Web Page validation using JavaScript
	Data Types, Operators and Expressions
	Object creation, modification and Constructors
	Screen output and keyboard input
	Pattern matching using regular expressions
5	Web application using JavaScript with MySQL
	SKOTANA

	BUBBLO FOR THE CONTRACTORS INTERNAL EVALUATION (THEORY WITH L	(D)
	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY WITH LA	
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	10
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 30 MARKS.	30
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (10) ADDING UPTO 30 MARKS .	30
4	LAB: Conduction of laboratory exercises, lab report, observation and analysis (30 Marks), lab test (10 Marks) and Innovative Experiment/ Concept Design and Implementation (10 Marks) adding up to 50 Marks. THE FINAL MARKS WILL BE REDUCED TO 30 MARKS	30
	MAXIMUM MARKS FOR THE CIE THEORY	100

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)		
Q. NO. CONTENTS			
	PART A		
1	Objective type questions covering entire syllabus	10	
	PART B		
	(Maximum of TWO Sub-divisions only)		
2	Unit – I: (Compulsory)	14	
3 & 4	Unit – II: Question 3 or 4	14	
5&6	Unit – III: Question 5 or 6	14	
7 & 8	Unit – IV: Question 7 or 8	14	
9 & 10	Unit – V: Question 9 or 10	14	
11	Lab Component (Compulsory)	20	
	MAXIMUM MARKS FOR THE SEE THEORY	100	



Semester: I/II						
	BASICS TO JAVA PROGRAMMING					
		Category: Progra	mming Language Course			
		(Common	to all Programs)			
		(Theorem	ry & Practice)			
Course Code	:	CS115BIC/CS125BIC	CIE	:	100 Marks	
Credits: L:T:P : 2:0:1 SEE : 100 Marks						
Total Hours	:	28L+28P	SEE Duration	:	03 Hours	

Unit – I	06 Hrs
An Overview of Java: Object-Oriented Programming, The Java Class Libraries, Data Types,	Variables,
Operators, Control Statements, Arrays and Strings.	
Unit – II	05 Hrs
Introducing Classes: Class Fundamentals, Declaring Objects, Assigning Object Reference Variables, I	Introducing
Methods, Constructors, Method overloading.	-
Unit – III	06 Hrs
Inheritance: Inheritance Basics, Using Super, Method Overriding, Abstract Classes, Using final with I	nheritance.
Unit – IV	05 Hrs
Packages: Defining a Package, Importing Packages,	
Interfaces: Defining an Interface, Default Interface Methods.	
Exception Handling: Exception-Handling Fundamentals – Exception Classes, Exception Types.	
Unit – V	06 Hrs
Multithreaded Programming: The Java Thread Model, The Main Thread, creating a Thread, Creati	ng Multiple
Threads, Thread Priorities.	- *

Course	e Outcomes: After completing the course, the students will be able to					
CO1	Apply features of object-oriented programming of Java to solve real world problems.					
	(PO1, PO2, PO3, PO4, PO5, PO11)					
CO2	Design and develop the real-world models and entities using Java programming.					
	(PO1, PO2, PO3, PO4, PO5, PO11)					
CO3	Implement the object-oriented applications using features such as Inheritance, Packages, Interfaces,					
	Exception Handling, Multi-threaded Programming and Strings. (PO1, PO2, PO3, PO4, PO5, PO11)					
CO4	Demonstrate the real-world applications and programming skills to solve inter disciplinary problems					
	effectively and exhibit teamwork through presentations and reports using Java programming.					
	(PO1, PO2, PO3, PO4, PO5, PO6, PO10)					
<u>I</u>						

Refere	nce Books
1	The Complete Reference - Java, Herbert Schildt, 10 th Edition, 2017, McGraw Hill Education Publications,
	ISBN-10: 9789387432291, ISBN-13: 978-9387432291
2	Introduction to Java Programming, Y Daniel Liang, 10th Edition, 2014, Comprehensive Version Pearson
	education, ISBN 10: 0-13-376131-2, ISBN 13: 978-0-13-376131-3
3	Core Java – Vol 1, Cay S. Horstmann, 10th Edition, 2016, Pearson Education, ISBN-10: 9332582718,
	ISBN-13: 978-9332582712
4	Object-Oriented Analysis and Design With applications, Grady Booch, Robert A Maksimchuk, Michael
	W Eagle, Bobbi J Young, 3 rd Edition, 2013, Pearson education, ISBN :978-81-317-2287-9.

	Laboratory Experiments (ME stream)						
	PART A						
Familia	arization with IDE - compilation, debugging and execution considering simple Java programs.						
	nent programs on Fundamentals of Java Programming: Data Types, Variables and Arrays,						
Operato	ors, Control Statements.						
1	1 Classes, Objects and Methods						
	Create user defined classes and objects.						
	• Define class members and their properties.						
	• Define Methods, constructors, demonstrate method / constructor overloading.						
	• Make necessary changes to the classes by making all the instance variables private and adding getter and setter methods for the instance variables.						



2	Inheritance and Polymorphism
	Create user defined classes and objects using Inheritance concept
	Define class members to demonstrate Polymorphism
3	Package and Interfaces
	• Creation of simple package.
	• Accessing a package/ use of different Access Specifiers Implementing interfaces
4	Exception handling Handling predefined exceptions.
5	Multithreading Create multiple threads: a) Using Thread class. b) Using Runnable interface
	PART B

Design and develop an application to demonstrate appropriate Object-Oriented concepts and Core Java programming features:

Develop standalone Java application to demonstrate the important features of Object-Oriented approach (Abstraction/Encapsulation/Data Hiding, Inheritance and Polymorphism) and also the important features of Java such as Inheritance, Interfaces, Packages, Exception Handling, Multithreaded Programming and Collection Framework

#	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY WITH LA COMPONENTS	MARKS
		MAKKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	10
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 30 MARKS.	30
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4	LAB: Conduction of laboratory exercises, lab report, observation and analysis (30 Marks), lab test (10 Marks) and Innovative Experiment/ Concept Design and Implementation (10 Marks) adding up to 50 Marks. THE FINAL MARKS WILL BE REDUCED TO 30 MARKS	30
	MAXIMUM MARKS FOR THE CIE THEORY	100

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)				
Q. NO.	Q. NO. CONTENTS				
	PART A				
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9 & 10	Unit – V: Question 9 or 10	14			
11	Lab Component (Compulsory)	20			
	MAXIMUM MARKS FOR THE SEE THEORY	100			



			Son	nester: I / II				
			INTRODUCTION '		AMMING			
				mming Language				
				n to all Programs)				
				ry & Practice)				
Course	o Codo			ry & Flactice)	CIE	<u> </u>	100	Montro
	e Code		IS115AID/IS125AID		CIE			Marks
	s: L:T:P		2:0:1		SEE	:		Marks
Total]	Hours	:	28L+28P		SEE Duratio	on :	03 H	ours
			Unit –	- I				05 Hrs
Introd	uction to Objec	t O	Driented Programmin		nciples of ot	viect-ori	ented 1	
			ming Vs object-orient					
			applications of object or					
			l Data Type, The C+-					
							mmg	fundamentais,
mirodi	icing C++ Classes	x 01	bjects, Constructors and Unit -		J++ Keywords	<u>. </u>		06 11
					had an addition of the			06 Hrs
			ring Classes, Interfaces,					
			face, Structures and Cla					
			s Members, Static Data,					
			Nested Classes, Local	Classes, Passing	Objects to Fu	inctions	, Retur	ning Objects,
Object	Assignment and A	cces	ssing Data Fields.		121			_
			Unit – II	I	14	1		06 Hrs
Inhe	ritance and Polyn	norp	phism: Inheritance, Ac	cess Control in de	rived classes,	Encaps	ulation	& protected
			ns with inheritance, Fur					
			al functions and Abstrac		10	0	,	
opene	, in the second s		Unit – I					05 Hrs
Exce	ntion Handling	Exc	ception Handling Fund		ng Class Tyr	oes Us	ing Mi	
	- 0		ived-Class Exceptions,		• • • •		•	·
	rstanding terminate			Exception mand	ing options,	Caterin	ing 7111	Exceptions,
Onde	istanding terminat		Unit –	V				06 Hrs
Cara		. T.			him. Tomala	to Class		
			emplate Functions, comp					
	1		Arguments, Setting Bel					-
	-		emplate Class "vector",	-		te Class	"list",	Iterators and
Algo	rithms the Standard	1 Fui	nction Library and The	Standard C++ Clas	s Library.			
				10110				
			mpleting the course, th					
CO1			tence in designing and		ograms by se	electing	approp	priate Object-
			ng concepts. (PO1, PO2					
CO2	Design and analy	ze c	classes and objects using	g Object-Oriented	paradigms to	model a	nd solv	e real-world
			sing modular and reusab					
CO3			Driented solutions for				e conce	epts such as
			phism, encapsulation, en					
	(PO3, PO4, PO5		,, energentation, en	o chiefent pro			004	
CO4			such as templates and o	operator overloadir	o to enhance	the effi	ciency	and flexibility
004			tically evaluate their imp	*	•		•	•
	1 or programs, allu			Jact on Overall pell		- , 1 U3,		,
Refere	ence Books							
1		ofor	Q. H. 1 (Q.1.1)					
	The Complete K			At Su Haition (11)	0 Mc Grow U	G11		
	ISBN: 97800705		ence C++, Herbert Schil 65.	ldt, 5 th Edition, 202	20, Mc Graw H	Iill,		

3 Big C++, Cay S. Horstmann, Timothy Budd, 1st Edition, 2020, Wiley India (P.) Ltd

Programming Language Lab Course



	ISBN: 9788126509201.							
4	Thinking in C++-Introduction to standard C++, Bruce Eckel, http://iacs-courses							
	seas.harvard.edu/courses/cs207/resources/TIC2Vone.pdf Vol 1, 2 nd Edition, 2002, Pearson,							
	ISBN:10: 8131706613							
	Laboratory Experiments Implement the following programs using cc/gcc compiler							
1	Implement the following requirement: An electricity board charges the following rates to domestic users							
-	to discourage large conceptions of energy.							
	0 - 100 units: Rs 1.50 per unit							
	101 - 200 units: Rs 1.80 per unit							
	Beyond 200 units: Rs 2.50 per unit							
	All users are charged a minimum of Rs 50. If the total amount is more than Rs 300 then an additional							
	surcharge of 15% is added. The C++ program must read the names of users, number of units consumed							
	and display the calculated charges.							
2	Design and implement a class STUDENT with attributes like roll number, name, 3 tests marks.							
	Implement member functions							
	a. to read student data like name and test marks,							
	b. to compute average marks (considering best two out of three test marks) and							
	c. to display the student information.							
	Declare an array of STUDENT objects in the main function, use static data member to generate unique							
	student roll number.							
3	Design and implement a C++ program using class to process Shopping list for a departmental store. The							
	list includes details such as the Code No., Name, Price of each item and operations like adding, deleting							
	items to the list and printing the total value of an order.							
4	Design and implement a C++ class POLYNOMIAL. The internal representation of a POLYNOMIAL is							
	an array of terms. Each term contains a coefficient and an exponent, e.g., the term $2x^4$ has the coefficient 2							
	and the exponent 4. Implement a class containing constructors and the following capabilities:							
	a. Overload the addition operator (+) to add two polynomials							
	b. Overload the assignment operator to assign one polynomial to another							
	c. Overload the multiplication operator (*) to multiple two polynomials							
	d. Overload the >> operator to enable input through in.							
	e. Overload the << operator to enable output throughout.							
	f. Member function to compute value of the polynomial, given the value of x.							
5	Design and implement a C++ program to create an abstract class - SHAPE to represent any shape							
	in general. The class should have two pure virtual functions to read dimensions and to compute							
	the area. Create three derived classes - CIRCLE, RECTANGLE, and SQUARE by inheriting the							
	features of class SHAPE. Implement the functions to read and compute the area. Add							
6	constructors, method to display the results as required. (Assume appropriate attributes). Write a C++ program using generic class to implement queue of integers, floating point numbers and							
U	strings. Support the queue operations like insert, delete and display in the queue class.							
7	Write a C++ program to create a vector of integers. Copy the vector contents into a list, sort the contents,							
,	then copy selected items into another vector (like elements less than 10 etc).							
8	Write a template function to search for a given key element from an array. Illustrate how you perform							
9	search in integer, character as well as double arrays using the same template function.							
	search in meger, character as wen as double arrays using the same template function.							



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Mysore Road, RV Vidyaniketan Post, Bengaluru - 560059, Karnataka, India

#	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY WITH LA COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	10
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). THREE tests will be conducted (Two regular tests and one optional improvement test). Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 30 MARKS.	30
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (10) ADDING UPTO 30 MARKS .	30
4	LAB: Conduction of laboratory exercises, lab report, observation and analysis (30 Marks), lab test (10 Marks) and Innovative Experiment/ Concept Design and Implementation (10 Marks) adding up to 50 Marks. THE FINAL MARKS WILL BE REDUCED TO 30 MARKS	30
	MAXIMUM MARKS FOR THE CIE THEORY	100

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)	
Q. NO.	CONTENTS	MARKS
	PART A	
1	Objective type questions covering entire syllabus	10
	PART B	
	(Maximum of TWO Sub-divisions only)	
2	Unit – I: (Compulsory)	14
3 & 4	Unit – II: Question 3 or 4	14
5&6	Unit – III: Question 5 or 6	14
7 & 8	Unit – IV: Question 7 or 8	14
9 & 10	Unit – V: Question 9 or 10	14
11	Lab Component (Compulsory)	20
	MAXIMUM MARKS FOR THE SEE THEORY	100
	STITUTIONS	

RV College of Engineering[®] Mysore Road, RV Vidyaniketan Post, Bengaluru - 560059, Karnataka, India

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Humanities and Social Science Courses



- > COMMUNICATIVE ENGLISH II (HS121EL)
- > SAMSKRUTIKA KANNADA(HS112KS/HS122KS)
- > BALAKE KANNADA (HS113KB/HS123KB)
- FUNDAMENTALS OF INDIAN CONSTITUTION (HS114TC/HS124TC)
- SCIENTIFIC FOUNDATIONS OF HEALTH: YOGA (HS115YL/HS125YL)



Semester: I							
COMMUNICATIVE ENGLISH - I							
		Category: H	umanities & Social	Sciences			
		(Com	mon to all Programs	s)			
		(On	line English Course)				
Course Code	Course Code : HS111EL CIE : 50 Marks						
Credits: L:T:P	Credits: L:T:P : 0:0:1 SEE : 50 Marks						
Total Hours							

Online English Course: Standardized Test of English Proficiency – From The Hindu Gro	000
Unit – I	06 Hrs
Identifying main ideas and details in a reading text - Understanding places on a map - Understanding	
using Punctuation Clues - Previewing Vocabulary - Organizing, drafting, editing, and writing	•
Researching and Documenting, Listening for and visualizing directions, Listening to an advertisem	
play: talking about places on campus, Role-play: returning merchandise to a store - Comparing shoppi	
and online shopping - Conducting research and giving a presentation.	8
	06 Hrs
Skimming a text using headings, subheadings, and images, identifying text organization - Reading an	d answering
a questionnaire - Brainstorming and making notes on pros and cons, writing a paragraph using the w	
and shouldn't - Listening for conversation starters, advice, instructions, complaints, Voice mail messag	es - Leaving
voicemail messages, describing people, changing nouns to adjectives - Using model verbs to give advid	
Unit – III	06 Hrs
Reading and Understanding graphs, identifying a good summary - Reading faster: reading in	n phrases -
Summarizing facts and ideas in a written text, Identifying narrative sequence, Recognizing	and writing
conclusions, Understanding pronouns and pronoun reference - Thinking critically about cultural	events and
celebrations - Recognizing polite and impolite expressions of disagreement.	
Unit – IV	06 Hrs
Understanding chronological events, Using Organizers to organize ideas in reading text - Summarizing	
Describing feelings, Writing a summary statement, Understanding paragraph function - Listening to	work-place
complaints, Job interviews, future plans, Listening for expressions used in restaurant, instruction in	following a
recipe - Discussing future plans, careers, and work-related issues, healthy and unhealthy eating	; habits and
nutrition.	1
Unit – V	06 Hrs
Understanding relationships between ideas - writing a questionnaire and an opinion blog post - posting	g a comment
- Expressing an opinion - Listening to conversations about travel plans, travel information, activities,	· •
agreement and disagreement - Discussing travel plans, fares, transportation, sights, and activ	ities, Using
conditional forms to support an argument, Using parts of speech to classify word families.	
Course Outcomes: After completing the course, the students will be able to	

Course	Course Outcomes: After completing the course, the students will be able to						
CO1	Understand the fundamental concepts of Academic English LSRW skills with Grammar - Articles,						
	Pronouns, Prepositions, Nouns, Verbs and Tenses.						
CO2	Use appropriate Vocabulary in real-life scenarios that students might face in professional and social						
	situations.						
CO3	Construct grammatically correct sentences, Learn basics of professional e-mail writing, Blog post.						
CO4	Introduce Oneself in detail, preparing for interview, small talk, conversations, voice email messages,						
	discussing future plans, careers, work related issues, environmental problem and travel conversations.						



Reference Books

1 Standardized Test of English Proficiency-from The Hindu Group: e-books.

About the Course: STEP (Standardized Test of English Proficiency) train is a 20 hours of adoptive course. designed to improve every aspect of English language learning – Listening, Speaking, Reading and Writing skills. The STEP train course assesses learner's current language level as well learning intent against global standards. The online course includes the following:

- 1. 45-minute Diagnostic test (baseline) to ascertain the current level of English proficiency.
- 2. Personalized course content (50-Hours) based on baseline levels including Detailed instructions, practice sessions, interactions, feedback and assessments.

The course begins with a baseline test which determines the learner's current language levels. Based on their language levels, the course will provide the learner with webisodes suitable to their language levels. The course is also interspersed with exercises and mid-line tests. Based on the learner's performance in these tests, and their strengths and challenges/gaps, the course will adaptively provide webisodes matching their performance profile.

ASSESSMENT AND EVALUATION	PATTERN (ONLINE MODE	E)
SILOUN	CIE	SEE
WEIGHTAGE	50%	50%
Test – I	Each test will be conducted	
Test – II	for 50 Marks adding upto 100 marks. Final test marks will be reduced to 40 MARKS	
EXPERIENTIAL LEARNING		
Communication Skills- Activity based test – Script writing,	V/ 0	Final Assessment
Essay Writing, Role plays. Any other activity that enhances	VIIII	will be conducted
the Communication skills. The students will be assigned	· / / /	for 50 marks
with a topic by the faculty handling the batch. The students		(ONLINE MODE)
can either prepare a presentation/write essay/role play etc.	10	
for the duration (4-5 minutes per student.	/ / /	
Parameters for evaluation of the Presentation		
a. Clarity in the presentation/ Speaking/Presentation skills.		
b. Concept / Subject on which the drama is enacted/	.c.	
scripted.	ONP	
MAXIMUM MARKS	50 MARKS	50 MARKS
TOTAL MARKS FOR THE COURSE	50	50

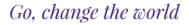


Semester: II								
COMMUNICATIVE ENGLISH - II								
		Category: H	umanities & Social	Sciences				
		(Com	mon to all Program	s)				
		(On	line English Course))				
Course Code	:	HS121EL		CIE	:	50 Marks		
Credits: L:T:P : 0:0:1 SEE : 50 Marks								
Total Hours	:	30P		SEE Duration	:	2 Hours		

	Online English Course: Standardized Test of English Proficiency – From The Hindu Group							
Unit – I	06 Hrs							
Describing a weather phenomenon - Using transition words and phrases to connect cause and effect -	- Vocabulary							
words related to weather and climate situations - Listening to weather forecast - Introduction yourself	and others –							
speaking from notes and discussing study habits and body language - Assessing good study habits an								
why some students may not graduate - Casual expressions for making new friends - Distinguish betv								
can't - Identifying the meaning and importance of sign - Words related to learning from history.								
Unit – II	06 Hrs							
Identifying and Expressing opinions, Using arguments and examples to support an opinion, Creating	an outline or							
mind map - Vocabulary on words related to food, healthy and unhealthy eating habits - Using mod								
as should, must and have to - Identifying paragraph, main text and supporting ideas - Drafting, editir								
and finalizing the text and Blogging – Speaking about food shopping and recipes.	<i>U</i> , <i>U</i>							
Unit – III	06 Hrs							
Verbs and expression used to explain home maintenance - Comparing reduced and unreduced pro								
Identifying True or false information – Using idioms and discourse markers. Expression for ap								
Identifying and practicing stressed words and reduced forms - Giving and receiving apologies -								
words related to homes through time, ancestry, home and family – Recognizing punctuation and phras	•							
Unit – IV	06 Hrs							
Conducting a interview – Using a graphic organizer: Problem – Solution chart – Discussing the								
healthy lifestyle - Vocabulary words on health and stress issues and fitness issues - Describing								
Summarizing a story plot – Vocabulary words and phrases about TV and Social Media – Us	• •							
pronunciation.	ing reducing							
Unit – V	06 Hrs							
Role-playing - Preparing a 30 second speech - Expression of like and Dislikes - Reporting sur								
Conducting a review - Identifying and practicing stresses words and reduced forms - Identifying spea	aker attitudes							
Role-playing – Preparing a 30 second speech – Expression of like and Dislikes – Reporting sur- Conducting a review – Identifying and practicing stresses words and reduced forms – Identifying spea- - Understanding left-out words and reference - Understanding literal meaning and reference - Inter-	aker attitudes							
Conducting a review - Identifying and practicing stresses words and reduced forms - Identifying spea	aker attitudes							
Conducting a review – Identifying and practicing stresses words and reduced forms – Identifying spear- - Understanding left-out words and reference - Understanding literal meaning and reference - Inter-	aker attitude							

Course Outcomes: After completing the course, the students will be able to						
CO1	Understand the fundamental concepts of Academic English LSRW skills with Grammar - Articles,					
	Pronouns, Prepositions, Nouns, Verbs and Tenses					
CO2	Use appropriate Vocabulary in real-life scenarios that students might face in professional and social					
	situations.					
CO3	Construct grammatically correct sentences, Learn basics of professional e-mail writing, Blog post.					
CO4	Introduce Oneself in detail, preparing for interview, small talk, conversations, voice email messages,					
	discussing future plans, careers, work related issues, environmental problem and travel conversations.					
	F F F F F F F F F F					

Refere	nce Books
1	Standardized Test of English Proficiency-from The Hindu Group: e-books.





About the Course: STEP (Standardized Test of English Proficiency) train is 20 hours of adoptive course. designed to improve every aspect of English language learning – Listening, Speaking, Reading and Writing skills. The STEP train course assesses learner's current language level as well learning intent against global standards. The online course includes the following:

- 1. 45-minute Diagnostic test (baseline) to ascertain the current level of English proficiency.
- 2. Personalized course content (50-Hours) based on baseline levels including Detailed instructions, practice sessions, interactions, feedback and assessments.

The course begins with a baseline test which determines the learner's current language levels. Based on their language levels, the course will provide the learner with webisodes suitable to their language levels. The course is also interspersed with exercises and mid-line tests. Based on the learner's performance in these tests, and their strengths and challenges/gaps, the course will adaptively provide webisodes matching their performance profile.

ASSESSMENT AND EVALUATION PATTERN (ONLINE MODE)					
	CIE	SEE			
WEIGHTAGE	50% R	50%			
Evaluation of CIE					
(Bloom's Taxonomy Levels: Remembering, Understanding	g, Applying, Analyzing, Evalua	ating, and Creating)			
Test – I	Each test will be conducted				
1 04	for 50 Marks adding upto				
Test – II	100 marks. Final test				
iest – II	marks will be reduced to 40				
121	MARKS				
EXPERIENTIAL LEARNING	- 2				
Communication Skills- Activity based test – Script writing,	171 161	Final Assessment			
Essay Writing, Role plays. Any other activity that enhances	V/ 0	will be conducted			
the Communication skills. The students will be assigned		for 50 marks			
with a topic by the faculty handling the batch. The students	V I I I	(ONLINE MODE)			
can either prepare a presentation/write essay/role play etc.	10				
for the duration (4-5 minutes per student.					
Parameters for evaluation of the Presentation	/ / /				
a. Clarity in the presentation/ Speaking/Presentation skills.					
b. Concept / Subject on which the drama is enacted/					
scripted.					
MAXIMUM MARKS	50 MARKS	50 MARKS			
TOTAL MARKS FOR THE COURSE	50	50			



Semester: I / II									
SAMSKRUTHIKA KANNADA									
Category: Humanities & Social Sciences (Common to all Programs)									
Course Code : HSS112SK / HSS122SK CIE : 50 Marks									
Credits: L:T:P : 1:0:0 SEE : 50 Marks									
Total Hours : 15 SEE Duration : 1 Hrs									
Uni	t-I	- ಲೇಖನಗಳು & ಆಧುನಿಕ	ಕ ಪೂವಃ	-ದ ಕಾವ್ಯ ಭಾಗ			06 Hrs		
1. ಕರ್ನಾಟಕ ಸಂ	ುಸ್ಕ	ೃತಿ - ಹಂಪ ನಾಗರಾಜಯ್ಯ							
2. ಕರ್ನಾಟಕದ	කර	(ಕರಣ [:] ಒಂದು ಅಪೂರ್ವ ಜ	ಕರಿತ್ರೆ - ಜಿ	ತಿ ವೆಂಕಟಸುಬ್ಬಂ	ನ್ಯು				
3. ಆಡಳಿತ ಭಾಶ	್ಷೆಯ	ುಾಗಿ ಕನ್ನಡ - ಡಾ. ಎಲ್. ತಿಷ	ಮ್ಮೇಶ ಮ	ತ್ತು ಪ್ರೋ.ವಿ. ಕೇಶ	ಶವ	ಮೂರ್ತಿ			
1. ವಚನಗಳು: ಒ	ಸ	ವಣ್ಣ, ಅಕ್ಕಮಹಾದೇವಿ, ಅಲ್ಲ	್ಲಮ ಪ್ರಭ	ಗು, ಜೇಡರ ದಾಸಿಷ	ಗುರ	ಗ್ಯು, ಆಯ್ದಕ್ಕಿ	ಲಕ್ಕಮ್ಮ		
2. ಕೀರ್ತನೆಗಳು:	ಆ	ದರಿಂದೇನು ಫಲ ಇದರಿಂದೇ	ೇನು ಫಲ	- ಪುರಂದರದಾಸ	ರು				
ತಲ್ಲಣಿಸಡ	ರು	ಕಂಡ್ಯ ತಾಳು ಮನವೇ - ಕನ	ಕದಾಸಂ	ರು	~				
3. ತತ್ವಪದಗಳು:	ಸಾ	ಎರ ಕೊಡಗಳ ಸಿಟ್ಟು - ಶಿಶು	ನಾಳ ಶಣ) (क					
Unit	-11	I ಆಧುನಿಕ ಕಾವ್ಯ ಭಾಗ &	ತಾಂತಿ	ಗ್ರ ಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿ	ಚ	ಯ	06 Hrs		
1. ಡಿವಿಜಿರವರ ನ	ಮಂ	ರಕುತಿಮ್ಮನ ಕಗ್ಗದಿಂದ ಆಯ್ಗ	್ದ ಕೆಲವು	ಭಾಗಗಳು					
2. ಕುರುಡು ಕಾಂ	ಚಾ	ಣ: ದಾ.ರಾ. ಬೇಂದ್ರೆ		7151					
3. ಹೊಸಬಾಳಿನ	26	ತೆ: ಕುವೆಂಪು		13	1				
1. ಡಾ. ಸರ್. ಎಂ). c)ಶ್ವೇಶ್ವರಯ್ಯ [:] ವ್ಯಕ್ತಿ ಮತ್ತು ಇ	ುತಿಹ್ಯ- ಂ	ು.ಎನ್. ಮೂರ್ತಿ <mark>ರ</mark>	ञ्ब	హ			
2. ಕರಕುಶಲ ಕಲ	2. ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ: ಕರೀಗೌಡ ಬೀಚನಹಳ್ಳಿ								
	Unit –V ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ 03 Hrs								
1. ಯುಗಾದಿ: ವ	ನುರ	ೇಂ ದ್ರ							
2. ಮೆಗಾನೆ ಎಂಬ	2. ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ: ಹಿ.ಚಿ.ಬೋರಲಿಂಗಯ್ಯ								

Course Outcomes: After completing the course, the students will be able to:-						
ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯವಾಗುತ್ತದೆ.						
ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಆಸಕ್ತಿಯು ಮೂಡುತ್ತದೆ.						
ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಆಧುನಿಕ ಕಾವ್ಯಗಳ ಬಗ್ಗೆ ಆಸಕ್ತಿಯು ಮೂಡುತ್ತದೆ.						
ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ. ಕನ್ನಡ ಭಾಷಾಭ್ಯಾಸ, ಸಾಮಾನ್ಯ ಕನ್ನಡ ಹಾಗೂ						
ಆಡಳಿತ ಕನ್ನಡದ ಪದಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ.						
7773						

Reference Books (ಪರಾಮರ್ಶನ ಪುಸ್ತಕ) 1 ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಪ್ರಸಾರಾಂಗ, ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ.



	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)					
#	COMPONENTS	MARKS				
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	10				
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). TWO tests will be conducted. Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 20 MARKS.	20				
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) adding upto 40 marks. THE FINAL EL MARKS IS REDUCED TO 20 MARKS .	20				
	MAXIMUM MARKS FOR THE CIE THEORY	50				

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)				
Q. NO.	CONTENTS	MARKS			
1	Objective type questions (MCQs) covering the entire syllabus	50			
	MAXIMUM MARKS FOR THE SEE THEORY	50			





Semester: I							
	BALAKE KANNADA						
			Category: Hum	anities & Social Sc	ciences		
			(Common	n to all Programs)			
Course	Course Code:HA113KB/HS123KBCIE:50 Marks						
Credits: L:T:P		:	1:0:0		SEE	:	50 Marks
Total Hours		:	16		SEE Duration	:	90 Minutes
Course Learning Objectives of Vyavaharika Kannada: The students will be able to							
1	1 Motivate students to learn Kannada language with active involvement.						
2	2 Learn basic communication skills in Kannada language (Vyavaharika Kannada).						
3	3 Importance of learning local language Kannada.						

Unit – I	04 Hrs
Parichaya (Introduction): Necessity of learning local language, Tips to learn the language with easy r	nethods,
Hints for correct and polite conversation, History of kannada language.	
Unit -II AN	04 Hrs
Kannada alphabtets and Pronunciation: Kannada aksharmale, Kannada stress letters (vattaks	hara),
Kannada Khagunitha, Pronunciation, memorisation and usage of the Kannada letters.	
Unit – III	04 Hrs
Kannada vocabulary for communication: Singular and Plural nouns, Genders, Interrogative words,	, Antonyms
Inappropriate pronunciation, Number system, List of vegetables, Fractions, Menu of food items, N	ames of th
food items, words relating to time, words relating to directions, words relating to human's feelings a	nd emotion
Parts of the human body, words relating to relationship.	
Unit – IV	04Hrs
Kannada Grammar in Conversations: Nouns, Pronouns, Use of pronouns in Kannada sentences,	2
Adjectives and its usage, Verbs, Adverbs, Conjunctions, Prepositions, Questions constructing words,	
communicative sentences in kannada. Activities in Kannada, Vocabulory, Conversation.	1
Sommanicative Sentences in Raimada. Treatines in Raimada, Vocabulory, Conversation.	

Course	Course Outcomes: After completing the course, the students will be able to					
CO1	Usage of local language in day today affairs.					
CO2	Construction of simple sentences according to the situation.					
CO3	Usage of honorific words with elderly people.					
CO4	Easy communication with everyone.					
	STITUTION					

Referen	Reference Books							
1	Vyavaharika Kannada patyapusthaka, L. Thimmesh, and V. Keshavamurthy, Prasaranga							
	Visveshvaraya University, Belgaum.							
2	Kannada Kali, K. N. Subramanya, S. Narahari, H. G. Srinivasa Prasad, S. Ramamurthy and S.							
	Sathyanarayana, 5th Edition, 2019, RV College of Engineering Bengaluru.							
3	Spoken Kannada, Kannada Sahithya Parishat, Bengaluru.							



#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	10
2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). TWO tests will be conducted. Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 20 MARKS.	20
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) adding upto 40 marks. THE FINAL EL MARKS IS REDUCED TO 20 MARKS .	20
	MAXIMUM MARKS FOR THE CIE THEORY	50

	RUBRIC FOR SEMESTER END EXAMINATION (THEORY)				
Q. NO.	CONTENTS	MARKS			
1	Objective type questions (MCQs) covering the entire syllabus	50			
	MAXIMUM MARKS FOR THE SEE THEORY	50			





Semester: I / II							
FUNDAMENTALS OF INDIAN CONSTITUTION							
	Category: Humanities & Social Sciences						
		(Commo	n to All Programs))			
(Theory)							
Course Code	:	HS114TC/HS124TC		CIE	:	50 Marks	
Credits: L:T:P	Credits: L:T:P : 1:0:0 SEE : 50 Marks						
Total Hours	:	15		SEE Duration	:	1 Hours	

Unit - I	05 Hrs
Indian Constitution- Necessity of Constitution, Societies before and after the constitution adoption,	Introduction
to Indian Constitution, Making of the constitution, Role of constituent assembly, Salient feature	es of Indian
Constitution ,Preamble to the Indian Constitution and key concept of preamble. Fundamental Ri	ghts and its
restrictions.	-

Unit – II	05 Hrs
Directive Principles of State Policy and its present relevance in Indian Society, Fundamental Duties a	and its scope
and significance in nation. Union Executive: Parliamentary system, President, Prime minister, Un	ion Cabinet,
Parliament- LS & RS, Parliamentary committees, Important Parliamentary terminologies. Judicial Systematics	em of India,
Supreme court of India, and other courts, Judicial Reviews and Judicial activism.	

 Unit –III
 05 Hrs

 State Executive: Governor, CM, State cabinet Legislature: VS & VP, Election Commission, Election and
 Electoral Process, Amendment to Indian Constitution and Important constitutional amendments till today. Emergency provisions. 121 - 57 121

Course	Outcomes: After completing the course, the students will be able to
CO1	Navigate their academic and personal lives more effectively & principles derived from the Constitution,
	such as equality, justice, and non-discrimination which make them to uphold these principles in project
	management, teamwork, and ethical decision-making. (PO6)
CO2	Understand the mechanisms available for addressing grievances and ensuring compliance with
	constitutional rights & they will be familiar with how to seek legal remedies if their rights are infringed
	and engage with constitutional bodies for redress. (PO7)
CO3	Analyze and evaluate the impact of executive policies and decisions on various sectors and demographics,
	enhancing their ability to contribute to policy discussions & participation in democratic processes,
	including voting, advocacy, and public discourse. (PO8)
CO4	Understanding the administrative process will prepare students for roles in public administration, law and
	policymaking relating to constitutional and managerial issues. (PO8)

Refere	nce Books
1	Dr. J. N Pandey, Constitutional Law of India, Central Law Agency, 2020 edition
2	Avtar Singh: Law of Consumer Protection: Principles and Practice, Eastern Book Company, 5th Edition,
	2015, ISBN -13:978-9351452461
3	S.C. Srivastava: Industrial Relation and Labour Laws, Vikas Publishing House, 6th Edition,
	2012, ISBN: 9789325955400
4	Jr. Charles E Harris, Michael. S. Pritchard and Michael J Rabins, Engineering Ethics, Wadsworth
	Cengage Learning, 5th Edition, 2009, ISBN-978-0495502791

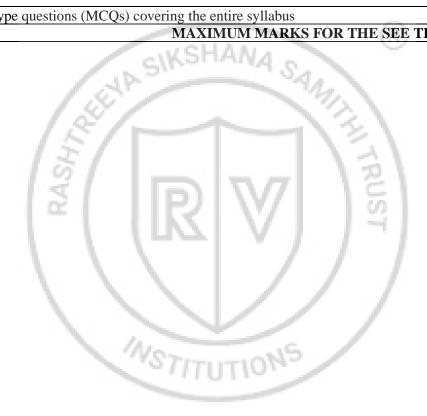
RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)			
#	COMPONENTS	MARKS	
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.		

Humanities and Social Science Course



2	TESTS: Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). TWO tests will be conducted. Each test will be evaluated for 50 Marks, adding upto 100 Marks. FINAL TEST MARKS WILL BE REDUCED TO 20 MARKS.	20
3	EXPERIENTIAL LEARNING: Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (20) adding upto 40 marks. THE FINAL EL MARKS IS REDUCED TO 20 MARKS .	20
	MAXIMUM MARKS FOR THE CIE THEORY	50

RUBRIC FOR SEMESTER END EXAMINATION (THEORY)				
Q. NO.	CONTENTS	MARKS		
1	Objective type questions (MCQs) covering the entire syllabus	50		
	MAXIMUM MARKS FOR THE SEE THEORY	50		





Semester: I / II SCIENTIFIC FOUNDATIONS OF HEALTH: YOGA PRACTICE **Category: Humanities & Social Sciences (Common to all the Programs)**

(Pra	otio	D)
(гга	cue	e)

Course Code	••	HS115YL/HS125YL	CIE	:	50 Marks
Credits: L:T:P	••	0:0:1	SEE	••	50 Marks
Total Hours	:	30	SEE Duration	:	2 Hours

10 Hrs
ent of Yoga,
1

Prayers: Shanthi Mantra and Loka Kalyana Mantra.

Starting Practice –Swasa Kriya, Marjalaswasa, Swanaswasa, Urasandhi chalane, Greeva sandhi chalane, Kati chalane, Super Brain yoga.

Suryanamaskara/Pragya Yoga: With Mantras & Breathing pattern.

Unit – II 10 Hrs Standing Asanas: Trikonasana, Veerabhadrasana, Vrikshasana, Tadasana, Tiryak Tadasana, Sarvangapushti, Utkatasana.

Sitting Asanas: Baddhakonasana, Bharadwajasana, Mandukasana, Ushtrasana, SuptaVeerasana, Vakrasana, Gomukhasana, Janushirasana, Dhanurasana, Shashankasana.

Unit – II 10 Hrs Bhujangasana, Lying Asanas: Pawanamuktasana, Sarvangasana, Naukasana, Halasana, Chakrasana, Shalabhasana, Dhanurasana, Yoga Nidra.

Relaxative/ Meditative Asanas: Shavasana, Balasana, Makarasana, Sukhasana, Padmasana, Vajrasana. Pranayama: Mantra, Breathing - Chest, Abdominal & Yogic, Puraka, Rechaka and Kumbhaka, Anulom-Vilom, Nadishodhan, Suryabhedan, Chadrabhedan, Bhastrika, Bhramri, Sheetali, Shitkari and Kapalabhati.

Course	e Outcomes: After completing the course, the students will be able to
CO1	Gain knowledge of yoga, its asanas, its benefits and practice for holistic growth. (PO6)
CO2	Demonstrate various postures of Yoga and know the scientific way to improve health. (PO6, PO11)
CO3	Develop physical and mental coordination and enhance confidence through multiple yoga practices. (PO6, PO11)
CO4	Analyse, assess, the performance of Pranayama (Breathing exercises) and improve Respiratory Health which in turn enhances social harmony and world peace and thereby by training to be good citizens. (PO6, PO11)

Refere	Reference Books				
1	Light on Yoga, B.K.S. Iyengar, 2017, Harper Collins Publishers, ISBN: 9780008267919.				
2	Light on Pranayama, B.K.S. Iyengar, 2013, Harper Collins Publishers, ISBN: 978-8172235413.				
3	Asana Pranayama Mudra Bandha, Swami Satyananda Saraswathi, 12 th Edition, 2002, Published by Yoga				
	Publications Trust, Bihar School of Yoga, ISBN:9788186336144.				
4	Yoga Nidra, Swami Satyananda Saraswathi, 2009, Published by Yoga Publications Trust, ISBN: 9788185787121.				

	RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (PRACTICE)	
#	COMPONENTS	MARKS
1	QUIZZES: Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. THE AVERAGE OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.	
2	TESTS: One Demonstration Test will be conducted for 30 Marks	30

Humanities and Social Science Course

Go, change the world



 ACTIVITY BOOK: Students are asked to maintain an Activity Book, THE TOTAL MARKS FOR THE COMPILATION OF THE BOOK (05 Marks) AND STUDENT'S INVOLVEMENT IN THE ACTIVITY (05 Marks) WILL BE THE FINAL MARKS. 	0
MAXIMUM MARKS FOR THE CIE THEORY	0

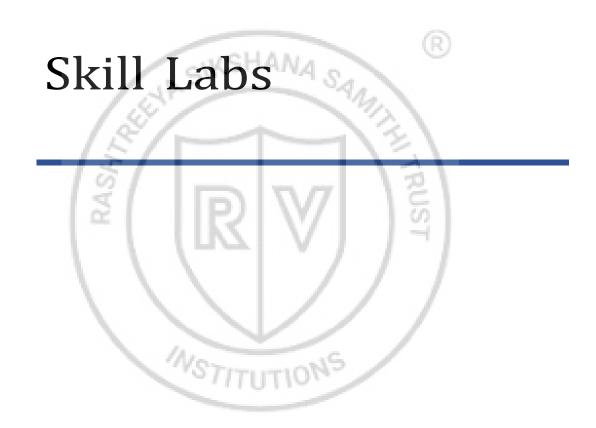
Q. NO.	CONTENTS	MARKS
1	Demonstration of Asanas and Pranayama SEE for 50 marks is executed by	50
	means of an examination. The Question paper for the course contains two parts, Part	
	- A and Part - B. Part - A consists of only objective type questions for 40 marks	
	covering the complete syllabus. Part - B consists of essay type questions for 10	
	marks.	
MAXIMUM MARKS FOR THE SEE THEORY		



Humanities and Social Science Course



Go, change the world





BASIC FABRICATION AND SERVICE

SKILL LAB

For First Year Students

Organized by Departments of Mechanical, Aerospace Engineering & Industrial Engineering



krishnam@rvce.edu.in

9980480001

8th Mail, Mysure Road Bengaluru

SUMMARY

Improving the skills of engineering students is critical for the nation's economic development. Engineering students' adequate skills can help businesses to transform themselves structurally in the ways that are necessary to adapt to the emerging technologies. The future of skilled jobs requires attention to the labour market and to the employer needs for developing newer technologies. Training policies as per NEP 2020 for the skill development are addressed in this program.

Welding and Fabrication: Welding standards Design consideration, Mathematical calculation, Safety & checklist, cutting, joining, rebuilding, Filler material consumption, Arc welding, TiG welding and Gas welding, Fabrication, Design considerations, fabrication materials, Metal fabricator's toolbox, Occupation hazards and workplace

Plumbing work : Plumbing standards, Piping materials, Valve type, Common Sanitary Fixture, Fittings, Plumber chart, Fountain system, Garden water irrigation, Water management system, Drain Waste vent

Use of Hand tools

Pliers and Locking Devices, Clamps and Vices, Locking Nut Devices, Mallets and Non-Threaded Fasteners, Key Fasteners, Press Fit Assembly, Torque Wrench, Torque-Controlled Portable Power Tools,Drill/Drivers, etc

2|₹

Sheet Metal Work: Basic hand tools for sheet metal works, Design of Basics, CADD basics, Sheet metal equipment, Material selection, Patterns and layouts, Metal shaping, Hammerforming, Riveting , brazing, Restoration, Occupational hazards

Tyre repair Identification of tyre repair tools, Disassemble and assemble wheel from vehicles (only tubed wheels). Type of tyre damages, Examines and probes tyre with awl to determine extent of defect; Apply the puncher, replaces treads by cutting defective tread from plies,

Acceptance

In order to accept and start the training of the program, students are required to sign in the provided space. Please remember that after signatures, the proposal will be set into action by RVCE/ For any queries, it is advised to discuss with the appointed representatives before the signing and making it

Terms and Condition

Only students who have paid a special lab fee to the institution The students must maintain 90 % attendance for obtaining the skill lab certificate Students must attend training as per scheduled time

Coordinators:

Dr. S K Harisha, Dept of Mech Engg, Phone: 9538300040, e-mail: harishsk@rvce.edu.in

Prof. Pranesh Kumar S R, Dept of Aerospace Egg. Phone: 8904484360, e-mail: praneshkumarsr@rvce.edu.in

Dr. Vijayakumar, Dept of IEM, Phone:973193233, e mail: <u>vijayakumar@rvce.edu.in</u>

Student Details

Name {______ USN:_____ Branch: _____ Phone: _____ e-mail: _____ Signature of Student

Job Opportunity

After training, the student Careers in Welding may include Automotive, Maintenance, Construction, Fabrication and Designing sectors. Despite limited employment growth, about 13,100 openings for sheet metal workers are projected each year on an average, over the decade. Plumbers, pipefitters, and steamfitters work in factories, homes, businesses, and other places where there are pipes and related systems

IT ESSENTIALS SKILL LAB

Organized by

Departments of Information Science and Engineering

ploring visualization tools - 5 HrsFor First Year Students



sagarbm@rvce.edu.in

9886332226

RV College of Engineering[®]

lysore Road, RV Vidyaniketan Post, engaluru - 560059, Karnataka, India

> 8th Mail, Mysuru Road Bengaluru

SUMMARY

Improving the skills of engineering students is critical for the nation's economic development. Engineering students' adequate skills can help businesses to transform themselves structurally in the ways that are necessary to adapt to the emerging technologies. The future of skilled jobs requires attention to the labour market and to the employer needs for developing newer technologies. Training policies as per NEP 2020 for the skill development are addressed in this program.

Exploring visualization tools - 5 Hrs

- Google data Studio
 - M S Excel
 - Tableau
 - Power Bl

Data Processing Essentials - 5 Hrs

- Poster Design Using Canva
- Video Editing

Acceptance

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remember that after signatures,

the proposal will be set into action by RVCE/ For any

queries, it is advised to discuss

representatives before the

signing and making it officially

the

with

 Advanced features of MS word, MS Excel and MS Power Point



Terms and Condition

Only students who have paid a special lab fee to the institution. The students must maintain 90 % attendance for obtaining the skill lab certificate

Coordinators:

Dr. Anala M R, Dept of ISE, Phone8618687573, e-mail: <u>analamr@rvce.edu.in</u>

Dr. Padmashree T, Dept of ISE. Phone: 9632076605, e-mail: <u>padmashreet@rvce.edu.in</u>

Prof. Priya D, Dept of ISE, Phone:9986997603 e-mail: priyad@rvce.edu.in

Basics of Operating System and Configuration - 5 Hrs • OS Installation and Basics

- of Networking
- Dual OS Installation
- Virtual Box
- Antivirus installation and Scheduling
- Remote Login

Student Details

Name	\
USN:	
Branch:	
Phone:	<u></u> _
e-mail:	/
Signature of Student	

Job Opportunity

appointed

After training, the student will be able to take up roles such as IT Assistant, Computer Operator, Programmer, Assistant Engineer, Network Administrator and Data Analyst.



What you learn here Students apply skills and procedures to install, configure, and troubleshoot computers, mobile devices, and software.

Benefits Learn the fundamentals of connecting computers to networks. Plus, you'll enjoy working with advanced simulation tools with hands-on labs to hone your troubleshooting skills and immediately practice what you learn!



Mode of Conduction of each Module:

2 Hours Theory, 2 Hours Demo, 3 Lab Sessions of 2.5 Hours each Prepare for Careers / Employability options. Develop skills for entry-level technical support roles (IT Support Jobs, LevelT and Level2, Voice support Executive Jobs, IT service Engineer Jobs, Network Engineer Jobs, Cloud support Executive Jobs), Prepare for Certification exams like CompTIA A+ and CCNA-level courses.

Module 1: Basics of PC, Laptops & Components Introduction to PC Hardware: PC Components - CPUs and cooling system, Memory, Adapter cards and extension slots, Hard disk drives and SSDs, Optical storage devices, ports, cables and adapters, Input devices and output devices. Computer disassembly & Assembly, Preventive maintenance and trouble shooting. Advanced computer Hardware: Advanced computers. Laptops and other Mobile Devices: Laptop hardware and component installation and configuration, Preventive Maintenance and troubleshooting process.

Module 2: Networking Concepts and Components Network components and types, Internet connection types, Networking protocols & standards, Network services & Network Devices (Basic network devices like Network interface cards, repeaters, bridges and hubs, switches, wireless Access points, Routers)

Applied Networking: Device to network connection (network addressing, configure a NIC, configure a wired and wireless networks, firewall settings, IoT device configuration), Basic trouble shooting process for networks, network problems and solutions

Acceptance

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are required to sign in the

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it is advised to discuss with the

appointed representatives before

the signing and making it



Module 3: Basics of OS with Installations & Configurations

Windows Installation & Upgrades (Disk cloning, other installation methods, Remote network installation), Disk Management (storage device types, Hard drive partitioning, Partitions and logical drives), Windows Configuration - Configure Windows with Control Panels, System Administration Linux OS tools and features, Linux OS best practices, BASIC CLI

Linux OS tools and features, Linux OS best practices, BASIC CLI commands, Basic troubleshooting solutions for Linux operating systems.

Module 4: Basics of Virtualization, Cloud Computing & Security

Virtualization and Cloud Computing: Introduction to Virtualization, client side virtualization, type1, Type2 hypervisors, Virtual Machine Requirements, Cloud computing Applications: How we use clouds, cloud services, cloud Models.

Security: Security threats, Security Procedures (security Policy, Protecting Physical Equipment, Protecting Data, Data Destruction, Securing Devices and Data), Securing Windows Work station, Windows local security Policy, Managing users and groups, Windows Firewalls, Web security, Security Maintenance.

Terms and Condition

Only students who have paid a special lab fee to the institution.

The students must maintain 90% attendance for obtaining the skill lab certificate. Students must attend training as per scheduled time.

Coordinators:

Dr. Vinay V Hegde,

Associate Professor, Department of CSE, RVCE

Mobile: 9449782211, E-mail: vinayvhegde@rvce.edu.inn

Dr. K Badari Nath,

Assistant Professor, Department of CSE, RVCE Mobile: 9945124747, E-mail: badarinath:kb@rvce:edu.inn

Prof. Pavithra H,

Assistant Professor, Department of CSE, RVCE

Mobile: 9591830273, E-mail: pavithrah@rvce.edu.in

Student Details

Signature of Student

Name: _____ USN: _____ Branch: _____ Phone: _____ e-mail: _____

Job Opportunity:

officially.

IT Support Jobs, Level 1 and Level2, Voice support Executive Jobs, IT service Engineer Jobs, Network Engineer Jobs, Cloud support Executive Jobs.

Course Delivery:

- 18 Interactive Lectures with demos followed by practice labs.
- Hands on PC Hardware, Laptops, OS Installations (Windows & Linux Installations), virtual laptop, and virtual desktop learning tools, IT Preventive Maintenance & Troubleshooting.

RV College of Engineering Mysore Road, RV Vidyaniketan Post, Bengaluru - 560059, Karnataka, India

BASIC HARDWARE AND SERVICE SKILL LAB

For First Year Students

Organized by **Departments of**

Electrical and Electronics Electronics and Communication Electronics and Instrumentation Electronics and Telecommunication

SUMMARY

Skills are most demanded and perishable resource in all sectors of life. Engineering skills encompass the ability to use the insights, to conceive, model and scale an appropriate solution to a problem. In the era of rapid changes and fierce competition, efforts to learn new things and acquire certain skills not only make students confident and self-assured, but also give them an advantage in the career building. Laboratory courses are essential in skills and knowledge for all engineering programs. Training policies as per NEP 2020 for the skill development are addressed in this program.

Measurement of Solar cell parameters: Measurement of current and voltage due to varying radiation and temperature levels, shading, and tilt angle. Measuring Instruments : Multi meter: AC Measurements, DC Measurement, Component Testing, Continuity Testing. CRO: Blocks Identification, Signal Display, Measurements and Lissajous Figures.

Installation of Home appliances: Assembling and Dis-assembling of parts, Circuit testing, Testing the working condition of appliance. Basics of Computer Networking: Identification of network components, CAT6 cable color code and crimping, RJ-45 connectors, Network cable testing. **Electrical ratings, wiring, and controlling of lamps:** Wiring skills and multi way control of lamps, Selection of lamp ratings, Relation between current, voltage and power.

HANA



Regulated Power Supply(RPS) : RPS BlocksIdentification,Signal measurement andtroubleshooting at different stages.

Circuit rig up and testing on PCB: Identification of Circuits and components. Component placement rules: Placement and Soldering of components on the board, Wiring of components, Circuit testing and De soldering

Basics of Optical Fiber Communication

Identification of different types of optical cables, Transmission and receptions of analog and digitals signals via optical cable, Optical cable testing.

Acceptance

In order to accept and start the training of the program, students are required to sign in the provided space. Please remember that after signatures, the proposal will be set into action by RVCE/ For any queries, it is advised to discuss with the appointed representatives before the signing and making it officially

Job Opportunity

Terms and Condition

Only students who have paid a special lab fee to the institution The students must maintain 90 % attendance

for obtaining the skill lab certificate Students must attend training as per scheduled time

Coordinators:

Dr. Kariyappa B S, Prof., ECE Dept., RVCE *E-mail:* kariyappabs@rvce.edu.in, *M: 9449223582* Dr. Chayapathy V, Asso. Prof., EEE Dept., RVCE *E-mail:* chayapathiv@rvce.edu.in, *M: 7899638568* Dr. Ramesh K B, Asso. Prof., EIE Dept., RVCE *E-mail:* rameshkb@rvce.edu.in, *M: 9342522399* Dr. Premananda B S, Asso. Prof., ETE Dept., RVCE *E-mail:* premanandabs@rvce.edu.in. *M: 9844531730*

Student Details

Name _____ USN:_____ Branch: ______ Phone: _____ e-mail: _____

Signature of Student

After the completion of Skill Lab training, the candidate may:

- Enter into Electrical, Electronics and Solar energy power generation industries.
 - Start their own service centres for servicing and installation of Home appliances.
- Become IT technicians and networking support staff.



SUMMARY

Improving the skills of engineering students is critical for the nation's economic development. Engineering students' adequate skills can help businesses to transform themselves structurally in the ways that are necessary to adapt to the emerging technologies. The future of skilled jobs requires attention to the labour market and to the employer needs for developing newer technologies. Training policies as per NEP 2020 for the skill development are addressed in this program.



Business Intelligence

6

01

Introduction to Business Intelligence, Understanding dataset, Introduction to Data Visualization

Excel

Overview of Excel features, Excel Plots, Introduction to VBA, Anatomy of Macros, Creating Personal macro-Workbook, Introduction to Visual Basic Editor

Power BI

Overview of Power BI, setting up the Power BI Environment, Data Sources and Visual Types, Constructing Bar, Column, and Pie, Charts, Building Line and Scatter Charts, Creating the Map-based Visualization, Creating the dashboard

Tableau

Overview of Tableau, Setting up the Tableau Environment Live Data Connection, Filtering and sorting the data Creating Basic Visualization, Creating dashboard

Terms and Condition

Only students who have paid a special lab fee to the institution. The students must maintain 90 % attendance for obtaining the skill lab certificate. Students must attend training as per scheduled time

Coordinators

Dr. Vijayalakshmi M N Dept of AIML Phone: 9986551776 e-mail: vijayalakshmi@rvce.edu.in

Prof. Narasimha Swamy S Dept of AIML Phone: 9986232400 e-mail: narasimhaswamys@rvce.edu.in Acceptance

In order to accept and start the training of the program, students are required to sign in the provided space. Please remember that after signatures, the proposal will be set into action by RVCE. For any queries, it is advised to discuss with the appointed representatives before the signing and making it official

NAME: USN: **BRANCH**: PHONE: EMAIL:

SIGNATURE

Job Opportunity

After training, the student Careers in Data Visualization may include Data Visualization Analyst, BI Designer, Data Visualization Engineer, Business Intelligence Developer. There are about 14,000+ Data Visualization Jobs in India.



WATER TESTING AND SKILL **BASED LAB**

For First Year Students

Organized by **Departments of BIOTECHNOLOGY**

9945465657

SUMMARY

the

8th Mail, Mysure Road Bengaluru





vidya.n@rvce.edu.in

Biological Characterisation and assay: Escherichia coli, Coliform Bacteria, Coliform Bacteria, Staphylococcus aureus, Sulphite Reducing Anaerobes, Pseudomonas aeruginosa, Aerobic Microbial Count, Yeast & Mould, Salmonella and Shigella, Vibrio cholera

Details about water filter and its components: Types of water filters, advancements in water filters, conventional and advanced water filters, candles, cartridges, columns, types of membranes, membrane materials, structural and other allied components, radiationsources

development are addressed in this program.

Improving the skills of engineering students is critical for nation's economic development. Engineering

students' adequate skills can help businesses to transform themselves structurally in the ways that are necessary to adapt to the emerging technologies. The future of skilled jobs requires attention to the labour market and to the employer needs for developing newer technologies. Training policies as per NEP 2020 for the skill

Tools for accessing various parameters for water testing: conductivity, odor, sediment, and turbidity, PH Meter, Conductivity Meter, Turbidity Meter, Dissolved Oxygen Meter, Flame Photo Meter, Spectrophotometer and Vis). Colorimeter, portable digital meters, colorimeters, and photometers



Maintenance of filters: Types of filters, Mechanical Filters, Absorption Filters, Sequestration Filters, Ion Exchange Filters, Reverse Osmosis Filters. Durability, common problems and trouble shoots, nature of filters, columns and cartridges, filtration, softening, desalination, coagulation, flocculation, clarification, durability of filters

Analysis of Physical, Organoleptic properties and toxic substances: Taste, Colour, Odour, Turbidity, Total dissolved solids. Temperature testing, pH testing, Chloride test, Salinity testing, Dissolved Oxygen Test, Turbidity test, Nitrate and Phosphate, Pesticides, Heavy metals; Arsenic, Fluorine, Cadmium, mercury, lead. Iron, Barium, and other heavy and toxic metals

to the institution

The students must maintain 90 % attendance for obtaining the skill lab certificate students must attend training as per scheduled

Terms and Condition Only students who have paid a special lab fee

Coordinator:

Dr, Nagashree N Rao, Associate Professor, Department of Biotechnology nagashreenrao@rvce.edu.in 6360962828

Student Details

Name { USN:_____ Branch: Phone: e-mail: **Signature of Student**

Acceptance

In order to accept and start the training of the program, students are required to sign in the provided space. Please remember that after signatures, the proposal will be set into action by RVCE/ For any queries, it is advised to discuss with the appointed representatives before the signing and making

Job Prospects

Water and its manifestations in any form for the survival of the living being is the demand of the day. Water to be supplied in its purest form that to be consumed needs a master plan, After the completion of the course, students finds the avenues in Water treatment plant operator, Microbiologist for any of the industries, Water quality specialist or analyst, Start-ups and Social Enterprises, Food and allied industries, Water packaging and sampling Industries, Pharmaceutical and cosmetics industry,



BASIC SKILLS OF ENGINEERING

SKILL LAB

For First Year Students

Organized by Departments of Civil & Chemical Engineering

Bengaluru



radhakrishna@rvce.edu.in

SUMMARY

Improving the skills of engineering students is critical for the nation's economic development. Engineering students' adequate skills can help businesses to transform themselves structurally in the ways that are necessary to adapt to the emerging technologies. The future of skilled jobs requires attention to the labor market and to the employer needs for developing newer technologies. Training policies as per NEP 2020 for the skill development are addressed in this program.





Paint & Accessories Handling Painter tapes, Rollers, Brush, Putty Knife and Taping Knife, Color Mixing Combinations

Applying Surface preparation, wall putty, primer coat, Paint mixing and applying

Tools Handling

Plumb Bob, Sprit Level, Bubble Tube, Hand Saw (Wood, PVC, CPVC and Steel), Spanners, Allen key & Wrench (Flat, Ring, Adjustable) Area and Measurements

Plinth Area, Carpet area, Floor area, Floor Space Index, Built up area, Deductions in area calculations



Fire Safety

Fire Safety and Fire Extinguishers, General Safety and Personal Protective Equipments (PPE) Safety Wares & First Aid, Material Safety data sheets Chemicals/Acid spills and handling

Terms and Condition

- Only students who have paid a special lab fee to the Institution
- The students must maintain 90 % attendancefor obtaining the skill lab certificate
- Students must attend training as per scheduled time

Acceptance

In order to accept and start the training of the program, students are required to sign in the provided space. Please remember that after signatures, the proposal will be set into action by RVCE/ For any queries, it is advised to discuss with the appointed representatives before the signing and making it officially



Anand Kumar B.G of Civil Engg, Phone:9844755956, e-mail: anandkumarbg@rvce.edu.in

Dr. Vidya C, Dept of Chemical Engg, Phone:9620166222, e-mail:<u>vidyac@rvce.edu.in</u>

Student Details

Name {	
USN:	
Branch:	
Phone:	
e-mail:	
	/

Signature of Student

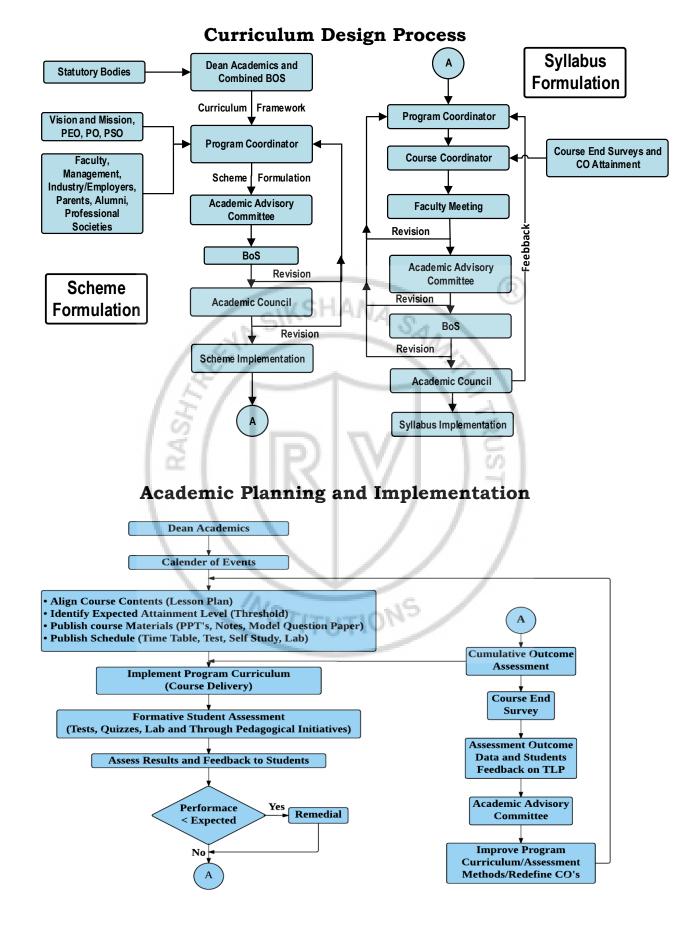
After training, the student can find employment in the area of building services, area calculations and property tax calculations. Supervision based employment in building repair/services civil and chemical laboratories.

Job Opportunity



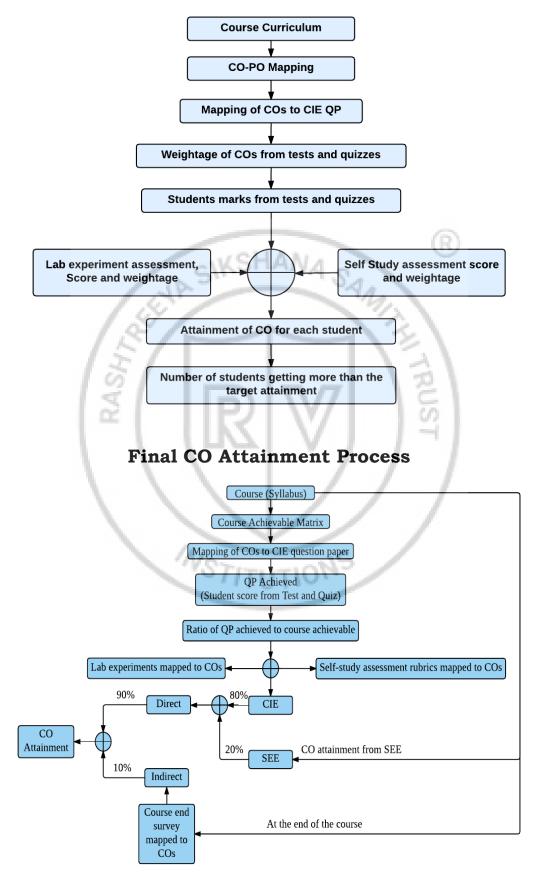








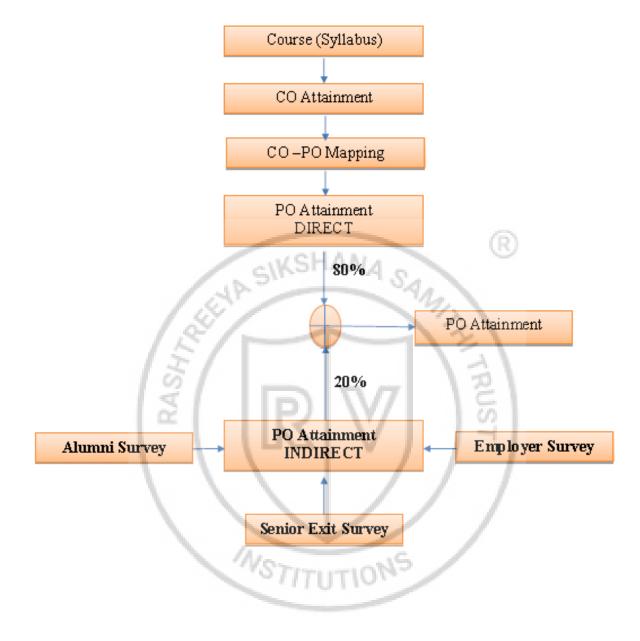
Process For Course Outcome Attainment







Program Outcome Attainment Process





Knowledge and Attitude Profile (WK)

- ➢ WK1: A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences.
- ➤ WK2: Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline.
- WK3: A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.
- WK4: Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.
- WK5: Knowledge, including efficient resource use, environmental impacts, whole-life cost, re-use of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area.
- WK6: Knowledge of engineering practice (technology) in the practice areas in the engineering discipline.
- WK7: Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development.
- ➤ WK8: Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues.
- **WK9:** Ethics, inclusive behaviour and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes.



RV College of Engineering® Mysore Road, RV Vidyaniketan Post, Bengaluru - 560059, Karnataka, India

New Program Outcomes (PO)

- PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.
- PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)
- PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)
- PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).
- PO5: Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)
- PO6: The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).
- PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)
- PO8: Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
- ➢ PO9: Communication: Communicate effectively and inclusively within the community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences
- PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
- PO11: Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

INNOVATIVE TEAMS OF RVCE

Ashwa Mobility Foundation (AMF): Designs and fabricates Formula-themed race cars and mobility solutions to address urban transportation issues.

Astra Robotics Team: Focuses on designing and building application-specific robots.

Coding Club: Helps students gain coding skills and succeed in competitions like GSoC and ACM-ICPC.

Entrepreneurship Development Cell (E-Cell): Promotes entrepreneurship through workshops, speaker sessions, and mentoring for startups.

Frequency Club Team: Works on software and hardware, emphasizing AI and Machine Learning.

Team Garuda: Develops a supermileage urban concept electric car and E-mobility products.

Team Jatayu: Builds low-cost UAVs with autonomous capabilities for various tasks.

Solar Car Team: Aims to create a solar electric vehicle for sustainable transportation.

Team Antariksh: Focuses on space technology and the development of operational rockets.

Team Chimera: Builds a Formula Electric Car through R&D in E-Mobility.

Helios Racing Team: Designs and tests All-Terrain Vehicles, participating in SAE's BAJA competitions.

Team Hydra: Develops autonomous underwater vehicles for tasks like water purification.

Team Krushi: Creates low-cost farming equipment to assist farmers in cultivation and harvesting.

Team Vyoma: Designs and tests radio-controlled aircraft and UAVs.

Team Dhruva: Engages in astronomy-related activities and collaborates on projects with organizations like ICTS and IIA.

Ham Club: Promotes Amateur Radio and explores technical innovations in communications, especially for disaster response.

Cultural Activity Teams

- AALAP (Music club)
- DEBSOC (Debating society)
- CARV (Dramatics club) 3.
- FOOTPRINTS (Dance club) 4.
- QUIZCORP (Quizzing society) ROTARACT (Social welfare club)
- RAAG (Youth club)
- EVOKE (Fashion team) 8.
- f/6.3 (Photography club)
- 10. CARV ACCESS (Film-making



NSS of RVCE

NCC of RVCE



Leadership in Quality Technical Education, Interdisciplinary Research & Innovation, with a Focus on Sustainable and Inclusive Technology



- To deliver outcome based Quality education, emphasizing on experientiallearning with the state of the art infrastructure.
- To create a conducive environment for interdisciplinary research and innovation.
- To develop professionals through holistic education focusing on individual growth, discipline, integrity, ethics and social sensitivity.
- To nurture industry-institution collaboration leading to competency enhancement and entrepreneurship.
- To focus on technologies that are sustainable and inclusive, benefiting all sections of the society.



QUALITY POLICY

Achieving Excellence in Technical Education, Research and Consulting through an Outcome Based Curriculum focusing on Continuous Improvement and Innovation by Benchmarking against the global Best Practices.



Professionalism, Commitment, Integrity, Team Work, Innovation



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