

Criterion 1 – Curricular Aspects

Key Indicator	1.1	Curriculum Design and Development
Metric	1.1.3	Average percentage of courses having focus on employability/ entrepreneurship/ skill Development offered by the Department of Computer Science and Engineering

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SYLLABUS COPY OF THE COURSES HIGHLIGHTING THE FOCUS ON EMPLOYABILITY/ ENTREPRENEURSHIP/ SKILL DEVELOPMENT

1. List of courses for the programmes in order of

S. No.	Programme Name
1.	B.Tech (Computer Science and Engineering)
2.	B.Tech .Computer Science and Engineering (Artificial Intelligence and
	Machine Learning)
3.	B.Tech .Computer Science and Engineering (Cyber Security)

2. Syllabus of the courses as per the list.

Legend :	Words highlighted with Blue Color	-	Entrepreneurship
	Words highlighted with Red Color	-	Employability
	Words highlighted with Green Color	-	Skill Development

Name of the Course	Course Code	Year of Introduction	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development
Calculus and Linear Algebra	XMA101	2008-09	Skill Development
Electrical and Electronic Engineering Systems	XBE102	2014-15	Skill Development
Applied Chemistry for Engineers	XAC103	2008-09	Skill Development
Workshop Practices	XWP104	2008-09	Skill Development
Speech Communication	XGS105	2015-16	Skill Development
Constitution of India	XUM106	2019-20	Skill Development
Electrical and Electronic Engineering Systems Lab	XBE107	2014-15	Skill Development
Applied Chemistry for Engineers Lab	XAC108	2008-09	Skill Development
Calculus, Ordinary Differential Equations and Complex Variable	XMA201	2008-09	Skill Development
Programming for Problem Solving	XCP202	2014-15	Employability
Applied Physics for Engineers	XAP203	2008-09	Skill Development
Technical Communication	XGS204	2016-17	Skill Development
Basics of Electronic Devices and Circuits.	XCS205	2008-09	Skill Development
Engineering Graphics and Design	XEG206	2008-09	Skill Development
Programming for Problem Solving Lab	XCP207	2014-15	Skill Development
Applied Physics for Engineers Lab	XAP208	2008-09	Employability
Probability and statistics	XMA301	2018-19	Skill Development
Digital Electronics	XCS302	2022-23	Employability
Data Structure & Algorithms	XCS303	2008-09	Employability
Object Oriented Programming	XCS304	2018-19	Employability
Signals & Systems	XCS305	2013-14	Employability
Entrepreneurship Development	XUM306	2018-19	Entrepreneurship
Universal Human Values 2: Understanding Harmony	XUM307	2022-23	Skill Development
Data Structure & Algorithms Laboratory	XCS308	2018-19	Employability

<u>1. LIST OF COURSES</u>

Object Oriented Programming Laboratory	XCS309	2018-19	Employability
In-plant Training - I	XCS310	2018-19	Skill Development
Discrete Mathematics	XCS401	2018-09	Skill Development
Computer Organization &	XCS401 XCS402	2008-05	Employability
Architecture	NGC 402	2012 14	
Operating Systems	XCS403	2013-14	Employability
Algorithms	XCS404	2014-15	Employability
Economics for Engineers	XCS405	2016-17	Skill Development
Disaster Management	XUM406	2015-16	Skill Development
IT Workshop Laboratory	XCS407	2019-20	Employability
Operating Systems Laboratory	XCS408	2013-14	Employability
Design & Analysis of Algorithms Laboratory	XCS409	2014-15	Employability
Formal Language & Automata Theory	XCS502	2013-14	Employability
Database Management Systems	XCS503	2013-14	Employability
Software Engineering	XCS504	2013-14	Employability
Computer Networks	XCS504	2014-15	Employability
Human Computer Interaction	XCSE54	2023-24	Employability
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Open Elective Course	XOE**	2018-19	****
Open Elective Course Introduction to Machine Learning	XOE** XCSHA3	2018-19 2023-24	**** Employability
Open Elective Course Introduction to Machine Learning Applied Artificial Intelligence	XOE** XCSHA3 XCSHD3	2018-19 2023-24 2023-24	**** Employability Employability
Open Elective CourseIntroduction to MachineLearningApplied ArtificialIntelligenceDatabase ManagementSystems Laboratory	XOE** XCSHA3 XCSHD3 XCS507	2018-19 2023-24 2023-24 2015-16	**** Employability Employability Employability
Open Elective CourseIntroduction to MachineLearningApplied ArtificialIntelligenceDatabase ManagementSystems LaboratorySoftware EngineeringLaboratory	XOE** XCSHA3 XCSHD3 XCS507 XCS508	2018-19 2023-24 2023-24 2015-16 2012-13	**** Employability Employability Employability Employability
Open Elective CourseIntroduction to MachineLearningApplied ArtificialIntelligenceDatabase ManagementSystems LaboratorySoftware EngineeringLaboratoryIn-Plant Training – II	XOE** XCSHA3 XCSHD3 XCS507 XCS508 XCS509	2018-19 2023-24 2023-24 2015-16 2012-13 2017-18	**** Employability Employability Employability Employability Skill Development
Open Elective CourseIntroduction to MachineLearningApplied ArtificialIntelligenceDatabase ManagementSystems LaboratorySoftware EngineeringLaboratoryIn-Plant Training – IIComplier Design	XOE** XCSHA3 XCSHD3 XCS507 XCS508 XCS509 XCS601	2018-19 2023-24 2023-24 2015-16 2012-13 2017-18 2013-14	**** Employability Employability Employability Employability Skill Development Employability
Open Elective CourseIntroduction to MachineLearningApplied ArtificialIntelligenceDatabase ManagementSystems LaboratorySoftware EngineeringLaboratoryIn-Plant Training – IIComplier DesignBig Data Analytics	XOE** XCSHA3 XCSHD3 XCS507 XCS508 XCS509 XCS601 XCS602	2018-19 2023-24 2023-24 2015-16 2012-13 2017-18 2013-14 2023-24	**** Employability Employability Employability Employability Skill Development Employability Employability
Open Elective CourseIntroduction to MachineLearningApplied ArtificialIntelligenceDatabase ManagementSystems LaboratorySoftware EngineeringLaboratoryIn-Plant Training – IIComplier DesignBig Data AnalyticsData Mining	XOE** XCSHA3 XCSHD3 XCS507 XCS508 XCS509 XCS601 XCS602 XCSE63	2018-19 2023-24 2023-24 2015-16 2012-13 2017-18 2013-14 2023-24 2018-19	**** Employability Employability Employability Employability Skill Development Employability Employability Employability
Open Elective CourseIntroduction to MachineLearningApplied ArtificialIntelligenceDatabase ManagementSystems LaboratorySoftware EngineeringLaboratoryIn-Plant Training – IIComplier DesignBig Data AnalyticsData MiningOpen Elective Course	XOE** XCSHA3 XCSHD3 XCS507 XCS508 XCS509 XCS601 XCS602 XCSE63 XOE**	2018-19 2023-24 2023-24 2015-16 2012-13 2017-18 2013-14 2023-24 2018-19 2018-19	****EmployabilityEmployabilityEmployabilityEmployabilitySkill DevelopmentEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployability
Open Elective CourseIntroduction to MachineLearningApplied ArtificialIntelligenceDatabase ManagementSystems LaboratorySoftware EngineeringLaboratoryIn-Plant Training – IIComplier DesignBig Data AnalyticsData MiningOpen Elective CourseProfessional Skills	XOE** XCSHA3 XCSHD3 XCS507 XCS508 XCS509 XCS601 XCS602 XCSE63 XOE** XGS605	2018-19 2023-24 2023-24 2015-16 2012-13 2017-18 2013-14 2023-24 2018-19 2018-19 2018-19	*****EmployabilityEmployabilityEmployabilityEmployabilitySkill DevelopmentEmployabilityEmployabilityEmployabilityEmployabilitySkill Development
Open Elective CourseIntroduction to MachineLearningApplied ArtificialIntelligenceDatabase ManagementSystems LaboratorySoftware EngineeringLaboratoryIn-Plant Training – IIComplier DesignBig Data AnalyticsData MiningOpen Elective CourseProfessional SkillsCyber Security	XOE** XCSHA3 XCSHD3 XCS507 XCS508 XCS509 XCS601 XCS602 XCSE63 XOE** XGS605 XCS606	2018-19 2023-24 2023-24 2015-16 2012-13 2017-18 2013-14 2023-24 2018-19 2018-19 2018-19 2018-19 2018-19	*****EmployabilityEmployabilityEmployabilityEmployabilitySkill DevelopmentEmployabilityEmployabilityEmployabilityEmployabilitySkill DevelopmentSkill DevelopmentSkill DevelopmentSkill Development
Open Elective CourseIntroduction to MachineLearningApplied ArtificialIntelligenceDatabase ManagementSystems LaboratorySoftware EngineeringLaboratoryIn-Plant Training – IIComplier DesignBig Data AnalyticsData MiningOpen Elective CourseProfessional SkillsCyber SecurityDeep Learning	XOE** XCSHA3 XCSHD3 XCS507 XCS508 XCS509 XCS601 XCS602 XCSE63 XOE** XGS605 XCS606 XCSHD4	2018-19 2023-24 2023-24 2015-16 2012-13 2017-18 2013-14 2023-24 2018-19 2018-19 2018-19 2018-19 2018-19 2015-16 2023-24	*****EmployabilityEmployabilityEmployabilityEmployabilitySkill DevelopmentEmployabilityEmployabilityEmployabilityEmployabilitySkill DevelopmentSkill DevelopmentSkill DevelopmentSkill DevelopmentSkill DevelopmentSkill DevelopmentSkill DevelopmentSkill DevelopmentSkill Development
Open Elective CourseIntroduction to MachineLearningApplied ArtificialIntelligenceDatabase ManagementSystems LaboratorySoftware EngineeringLaboratoryIn-Plant Training – IIComplier DesignBig Data AnalyticsData MiningOpen Elective CourseProfessional SkillsCyber SecurityDeep LearningInternet of Things	XOE** XCSHA3 XCSHD3 XCS507 XCS508 XCS509 XCS601 XCS602 XCSE63 XOE** XGS605 XCS606 XCSHD4 XCSHA5	2018-19 2023-24 2023-24 2015-16 2012-13 2017-18 2013-14 2023-24 2018-19 2018-19 2018-19 2018-19 2018-19 2015-16 2023-24 2023-24	*****EmployabilityEmployabilityEmployabilityEmployabilitySkill DevelopmentEmployabilityEmployabilityEmployabilitySkill DevelopmentSkill DevelopmentSkill DevelopmentSkill DevelopmentSkill DevelopmentEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployability
Open Elective CourseIntroduction to MachineLearningApplied ArtificialIntelligenceDatabase ManagementSystems LaboratorySoftware EngineeringLaboratoryIn-Plant Training – IIComplier DesignBig Data AnalyticsData MiningOpen Elective CourseProfessional SkillsCyber SecurityDeep LearningInternet of ThingsCompiler Design Laboratory	XOE** XCSHA3 XCSHD3 XCS507 XCS508 XCS509 XCS601 XCS601 XCS602 XCSE63 XOE** XGS605 XCS606 XCSHD4 XCSHA5 XCS607	2018-19 2023-24 2023-24 2015-16 2012-13 2017-18 2013-14 2023-24 2018-19 2018-19 2018-19 2018-19 2018-19 2018-19 2015-16 2023-24 2023-24 2023-24 2013-14	*****EmployabilityEmployabilityEmployabilityEmployabilityEmployabilitySkill DevelopmentEmployabilityEmployabilitySkill DevelopmentSkill DevelopmentSkill DevelopmentSkill DevelopmentEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployabilityEmployability
Open Elective CourseIntroduction to MachineLearningApplied ArtificialIntelligenceDatabase ManagementSystems LaboratorySoftware EngineeringLaboratoryIn-Plant Training – IIComplier DesignBig Data AnalyticsData MiningOpen Elective CourseProfessional SkillsCyber SecurityDeep LearningInternet of ThingsCompiler Design LaboratoryBig Data Analytics	XOE** XCSHA3 XCSHD3 XCS507 XCS508 XCS509 XCS601 XCS602 XCSE63 XOE** XGS605 XCS606 XCSHD4 XCSHA5 XCS607 XCS608	2018-19 2023-24 2023-24 2015-16 2012-13 2017-18 2013-14 2023-24 2018-19 2018-19 2018-19 2018-19 2018-19 2018-19 2015-16 2023-24 2023-24 2013-14 2023-24	*****EmployabilityEmployabilityEmployabilityEmployabilityEmployabilitySkill DevelopmentEmployability
Open Elective CourseIntroduction to MachineLearningApplied ArtificialIntelligenceDatabase ManagementSystems LaboratorySoftware EngineeringLaboratoryIn-Plant Training – IIComplier DesignBig Data AnalyticsData MiningOpen Elective CourseProfessional SkillsCyber SecurityDeep LearningInternet of ThingsCompiler Design LaboratoryBig Data Analytics	XOE** XCSHA3 XCSHD3 XCS507 XCS508 XCS509 XCS601 XCS601 XCS602 XCSE63 XOE** XGS605 XCS606 XCSHD4 XCSHD4 XCS607 XCS608 XCS0E3	2018-19 2023-24 2023-24 2015-16 2012-13 2017-18 2013-14 2023-24 2018-19 2018-19 2018-19 2018-19 2018-19 2018-19 2015-16 2023-24 2023-24 2013-14 2023-24 2015-16	*****EmployabilityEmployabilityEmployabilityEmployabilitySkill DevelopmentEmployability

Systems			
Machine Learning	XCSE78	2021-22	Employability
Biology	XUM704	2021-22	Skill Development
Disaster Management	XUM705	2015-16	Skill Development
Project Phase – I	XCS706	2013-14	Skill Development
In plant Training – III	XCS707	2012-13	Skill Development
R Programming	XCSM03	2021-22	Skill Development
In plant Training – III	XCS709	2012-13	Skill Development
Cyber Security	XUM801	2015-16	Employability
Open Elective -IV	XCSOE4	2015-16	****
Open Elective -V	XCSOE5	2015-16	****
Project – II	XCS804	2013-14	Skill Development
Calculus and Linear Algebra	XMA101	2008-09	Skill Development
Programming for Problem Solving using Python	XCS102	2014-15	Employability
Applied Chemistry for Engineers	XAC103	2008-09	Skill Development
Workshop Practices	XWP104	2008-09	Skill Development
Speech Communication	XGS105	2015-16	Skill Development
Constitution of India	XUM106	2019-20	Skill Development
Programming for Problem Solving using Python Laboratory	XCP107	2014-15	Employability
Applied Chemistry for Engineers Laboratory	XAC108	2008-09	Skill Development
Calculus, Ordinary Differential Equations and Complex Variable	XMA201	2008-09	Skill Development
Electrical and Electronics Engineering Systems	XBE202	2008-09	Skill Development
Applied Physics for Engineers	XAP203	2008-09	Skill Development
Technical Communication	XGS204	2016-17	Skill Development
Basics of Electronic Devices and Circuits.	XCS205	2008-09	Skill Development
Engineering Graphics and Design	XEG206	2008-09	Skill Development
Electrical and Electronics Engineering Systems Laboratory	XBE207	2008-09	Skill Development
Applied Physics Laboratory	XAP208	2008-09	Skill Development
Calculus and Linear Algebra	XMA101	2008-09	Skill Development
Programming for Problem Solving using Python	XCS102	2014-15	Employability
Applied Chemistry for Engineers	XAC103	2008-09	Skill Development
Workshop Practices	XWP104	2008-09	Skill Development

Speech Communication	XGS105	2015-16	Skill Development
Constitution of India	XUM106	2019-20	Skill Development
Programming for Problem Solving using Python Laboratory	XCP107	2014-15	Employability
Applied Chemistry for Engineers Laboratory	XAC108	2008-09	Skill Development
Calculus, Ordinary Differential Equations and Complex Variable	XMA201	2008-09	Skill Development
Electrical and Electronics Engineering Systems	XBE202	2008-09	Skill Development
Applied Physics for Engineers	XAP203	2008-09	Skill Development
Technical Communication	XGS204	2016-17	Skill Development
Basics of Electronic Devices and Circuits.	XCS205	2008-09	Skill Development
Engineering Graphics and Design	XEG206	2008-09	Skill Development
Electrical and Electronics Engineering Systems Laboratory	XBE207	2008-09	Skill Development
Applied Physics Laboratory	XAP208	2008-09	Skill Development

2. SYLLABUS

Bachelor of Technology (Computer Science and Engineering)(Full Time)

SEMESTER I

COURSE CODE XMA101					L	Т	Р	С
COU	RSE NA	ME	Mathematics I (Calculus and Linear Algebra	a)	3	1	0	4
С	Р	Α			L	Т	Р	Η
3	0.5	0.5			3	1	0	4
PREF	REQUIS	SITE: D	ifferentiation and Integration					
Cours	Domain		Level					
CO1Apply orthogonal transformation to reduce quadratic form to canonical forms.				Cognitive		Apply		
CO2	Cognitive		Apply					
CO3 Find the derivative of composite functions and Implicit functions. Euler's theorem and Jacobian				Cognitive		Remem	ıber	
CO4	Cognitive		Unders	tand				
CO5	Appl Curv	ly Differ ature an	ential and Integral calculus to notions of d to improper integrals.	Cognitive		Apply		

Unit 1: Matrices			9+3		
Linear Transformation - Eigen values and Eigen vectors - Properties of Eigen values and Eigen vectors -					
Cayley-Hamilton Theorem - Diagonalisation of Matrices - Real Matrices: Symmetric - Skew-Symmetric					
and Orthogonal Quadratic form - canonical form - Nature of Quadratic form and Transformation of					
Quadratic form to Canonical form (Orthogonal only).					
Unit 2: Sequences and series					
Sequences: Definition and examples-Series: Types and	l convergence- Se	ries of positive te	rms – Tests of		
convergence: comparison test, Integral test and D'Aler	mbert's ratio test-	Fourier series: H	alf range sine and		
cosine series- Parseval's Theorem.					
Unit 3: Multivariable Calculus: Partial Differentiation					
Limits and continuity –Partial differentiation – Total D	Derivative – Partia	l differentiation o	f Composite		
Functions: Change of Variables – Differentiation of an	Implicit Function	n - Euler's Theore	em-Jacobian.		
Unit 4: Multivariable Calculus: Maxima and Minima and Vector Calculus					
Taylor's theorem for function of Two variables- Maxim	ma, Minima of fu	nctions of two var	riables: with and		
without constraints - Lagrange's Method of Undetermine	ined Multipliers –	Directional Deriv	vatives - Gradient,		
Divergence and Curl.					
Divergence and Curr.					
Unit 5: Differential and Integral Calculus			9+3		
Unit 5: Differential and Integral Calculus Evolutes and involutes; Evaluation of definite and imp	roper integrals; B	eta and Gamma fi	9+3 unctions and their		
Unit 5: Differential and Integral Calculus Evolutes and involutes; Evaluation of definite and imp properties; Applications of definite integrals to evaluat	roper integrals; B te surface areas ar	eta and Gamma fund volumes of revo	9+3 unctions and their olutions.		
Unit 5: Differential and Integral Calculus Evolutes and involutes; Evaluation of definite and imp properties; Applications of definite integrals to evaluat	roper integrals; B te surface areas ar	eta and Gamma for ad volumes of revo	9+3 unctions and their olutions.		
Unit 5: Differential and Integral Calculus Evolutes and involutes; Evaluation of definite and imp properties; Applications of definite integrals to evaluat	roper integrals; B te surface areas ar LECTURE	eta and Gamma fu ad volumes of revo TUTORIAL	9+3 unctions and their olutions.		

	45	15	60
TEXT BOOKS	·		·
1. Ramana B.V., "Higher Engineering Mathema	tics", Tata McGra	w Hill New Delh	i, 11th Reprint, 2015.
(Unit-1, Unit-3 and Unit-4).			
2. N.P. Bali and Manish Goyal, "A text book of	Engineering Math	nematics", Laxmi	Publications, Reprint,
2014. (Unit-2).			
3. B.S. Grewal, "Higher Engineering Mathemat	ics", Khanna Publ	ishers, 40 th Editio	n, 2010. (Unit-5).
PFFFDENCES			

REFERENCES

1. G.B. Thomas and R.L. Finney, "Calculus and Analytic geometry", 9th Edition, Pearson, Reprint, 2002.

Veerarajan T., "Engineering Mathematics for first year", Tata McGraw-Hill, New Delhi, 2008.
 D. Poole, "Linear Algebra: A Modern Introduction", 2nd Edition, Brooks/Cole, 2005.
 Erwin kreyszig, "Advanced Engineering Mathematics", 9th Edition, John Wiley & Sons, 2006.

Mapping of COs with POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2	0	0	2	0	0	0	0	1	0	2
CO 2	3	1	0	0	0	0	0	0	0	1	0	1
CO 3	3	1	0	0	0	0	0	0	0	1	0	1
CO 4	3	2	0	0	0	0	0	0	0	1	0	1
CO 5	3	2	0	0	1	0	0	0	0	1	0	2
Total	15	8	0	0	3	0	0	0	0	5	0	7
Scaled	3	2	0	0	1	0	0	0	0	1	0	2
Value												

 $6-10 \rightarrow 2$, $11 - 15 \rightarrow 3$ $1-5 \rightarrow 1$,

0 - No Relation, 1 - Low Relation, 2- Medium Relation, 3- High Relation

COURSE		L	Т	P	С		
COURSE	NAME	ELECTRICAL AND ELECTRONICS ENG	INEERING	3 1 0		4	
		SYSTEMS					
PREREQU	UISITES	Physics		L	Т	Р	Η
C: P: A 3:0:0				3	1	0	4
Course Ou	Domain		Lev	el			
CO1	Define and	Cognitive	Understand				
	Using meas	uring devices					
CO2	Define an	d Explain the operation of DC and AC	Cognitive	U	nders	tand	
	machines.						
CO3	Recall and	Illustrate various semiconductor devices and	Cognitive Understand				
	their appl	ications and displays the input output					
	characteristics of basic semiconductor devices.						
CO4	Relate and	Explain the number systems and logic gates.	Cognitive	U	nders	tand	
	Construct	he different digital circuit.					

~ ~ ~		~	
CO5	Label and Outline the different types of microprocessors	Cognitive	Understan
	and then appreations.		
UNIT-I: F	UNDAMENTALS OF DC AND AC CIRCUITS, MEASU	REMENTS	9+.
Fundamen	als of DC- Ohm's Law - Kirchhoff's Laws - Sources - Volta	age and Current R	Relations –Star/D
Transform	ation - Fundamentals of AC - Average Value, RMS Value,	Form Factor - A	C power and Po
Factor, Ph	asor Representation of sinusoidal quantities - Simple Serie	es, Parallel, Serie	es Parallel Circu
type meter	(Watt meter and Energy meter)	meter, voltmeter) and Dynamom
type meter	s (wait meter and Energy meter).		1
UNIT -II:	ELECTRICAL MACHINES		9 +
Constructi	on, Principle of Operation, Basic Equations, Types and Appli	ication of DC Ger	nerators, DC mo
- Basics o	f Single-Phase Induction Motor and Three Phase Inductio	n Motor- Constr	uction, Principle
Operation	of Single-Phase Transformer, Three phase transformers, Auto	transformer.	0.
Classificat	ion of Semiconductors Construction Operation and Charact	eristics: PN June	\mathbf{y} + \mathbf{y}
Diode, PN	P, NPN Transistors, Field Effect Transistors and Silicon Cont	rolled Rectifier –	• Applications.
UNIT- IV	DIGITAL ELECTRONICS		9+
Basic of C	Concepts of Number Systems, Logic Gates, Boolean Algebra	ra, Adders, Subtr	actors, multiple
demultiple	xer, encoder, decoder, Flipflops, Up/Down counters, Shift Re	gisters.	-
UNIT. V.	MICROPROCESSORS		9+
Architectu	re, 8085, pin diagram of 8085, ALU timing and control u	nit, registers, dat	ta and address
timing and	control signals, Instruction types, classification of instruct	ions, addressing	modes, Interfac
Basics: Da	ta transfer concepts – Simple Programming concepts.		
	LECTUR	E TUTOR	RIAL TOTA
TEVT DO	45 OKS	15	60
1 Metha V	K Rohit Mehta 2020 Principles of Electronics 12 th ed. S C	hand Publishing	
2. Albert N	Ialvino, David J.Bates., 2017. Electronics Principles. 7th ed, 7	Tata McGraw-Hi	ll. New
Delhi.			
3. Rajakan	nal, 2014. Digital System-Principle & Design. 2nd ed. Pearson	n education.	
4. Morris I	Aano, 2015. Digital Design. Prentice Hall of India.	na and ita Annlia	otiona with
5. Kallesh the 8084	6 6 th ed India: Penram International Publications	ng and its Applica	ations with
REFERE	NCE BOOKS		
1. Corton,	H.,2004 Electrical Technology. CBS Publishers & Distributor	rs.	
2. Syed, A	Nasar, 1998, Electrical Circuits. Schaum Series.		
3. Jacob M 4. Millman	Iliman and Christos, C. Halkias, 1967, Electronics Devices, F L and Halkias, C. C. 1972, Integrated Electronics: Analog	new Delni: McGr	aw-Hill.
+. Iviiiiiiai	Crear II'll Kasalasha I th	g and Digital Ci	reuns and Syste
Tokvo: Mo	Graw-Hill, Kogakusna Ltd.		
Tokyo: Mo 5. Moham	med Rafiquzzaman, 1999. Microprocessors - Theory and	Applications: I	ntel and Motor
Tokyo: Mo 5. Moham Prentice H	med Rafiquzzaman, 1999. Microprocessors - Theory and all International.	Applications: I	ntel and Motor
Tokyo: Mo 5. Moham Prentice H E-REFER	med Rafiquzzaman, 1999. Microprocessors - Theory and all International.	Applications: I	ntel and Motor
Tokyo: Mo 5. Moham Prentice H E-REFER	Basic Electrical Technology (Web Course), Prof. N. K. Do	Prof T K Bbc	ntel and Motor
Tokyo: Mo 5. Moham Prentice H E-REFER 1. NTPEL G.D. Roy	med Rafiquzzaman, 1999. Microprocessors - Theory and all International. ENCES Basic Electrical Technology (Web Course), Prof. N. K. De IIT Kharagpur.	Applications: I	ntel and Motor
Tokyo: Mo 5. Moham Prentice H E-REFER 1. NTPEL G.D. Roy, 2. Prof	Basic Electrical Technology (Web Course), Prof. N. K. De IIT Kharagpur. L.Umanand, http://freevideolectures.com/Course/2335/Ba	Applications: I	attacharya and P
Tokyo: Mo 5. Moham Prentice H E-REFER 1. NTPEL G.D. Roy, 2. Prof Bangalore	med Rafiquzzaman, 1999. Microprocessors - Theory and all International. ENCES Basic Electrical Technology (Web Course), Prof. N. K. De IIT Kharagpur. L.Umanand, http://freevideolectures.com/Course/2335/Ba	Applications: I	ntel and Motor attacharya and P echnology#,
Tokyo: Mo 5. Moham Prentice H E-REFER 1. NTPEL G.D. Roy, 2. Prof Bangalore 3. http://np	med Rafiquzzaman, 1999. Microprocessors - Theory and all International. ENCES Basic Electrical Technology (Web Course), Prof. N. K. De IIT Kharagpur. L.Umanand, http://freevideolectures.com/Course/2335/Ba tel.ac.in/Onlinecourses/Nagendra/, Dr. Nagendra Krishnapura	Applications: I e, Prof. T. K. Bha asic-Electrical-Te a, IIT Madras.	attacharya and P echnology#,

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	1	1	1	1	0	0	1	1	1	0
CO 2	3	3	1	1	1	1	0	0	1	1	1	0
CO 3	2	2	2	1	2	2	1	1	1	1	1	0
CO 4	2	2	1	1	1	1	1	1	1	1	1	0
CO 5	2	2	1	1	1	1	1	1	1	1	1	0
Total	12	12	6	5	6	6	3	3	5	5	5	0
Scaled	3	3	2	1	2	2	1	1	1	1	1	0

COUR	SE CODE	CODEXAC103LTPC										
COUR	SE NAME	APPLIED CHEMISTRY FOR ENGINEERS	5	3	1	0	4					
PRERI	EQUISITES	NIL		L	Т	Р	Н					
C:P:A		2.5:1:0.5		3	1	0	4					
COUR	SE OBJECTIVI	ES										
• Un	derstand the appl	ication of chemistry in engineering.										
COUR	SE OUTCOME	8	DOMA	IN	I	LEVEI	Ĺ					
CO1	Identify the per- water quality pa	riodic properties and demonstrate the various rameters like hardness and alkalinity.	Cogniti	ve	F	Remember						
COL	Interpret the bu	alk properties and processes using	Cogniti	ve	U	Underst	tand					
02	thermodynamic											
CO3	ve	A	Apply									
CO4	Explain the theory, instrumentation, interpretation and Cognitive Analyse applications of Electronic, Vibrational, Rotational and NMR spectroscopy techniques											
CO5	Apply the stere Predict the vari- involved in orga	ochemistry concept in a proper perspective and ous types of fundamental reaction mechanisms inic reactions.	Cognitive			Apply						
UNIT I	I PERIOD	IC PROPERTIES AND WATER CHEMIST	RY				8L+3T					
Effective periodic electror bases, 1 hardnes	ve nuclear charge c table, electronionegativity, polarize molecular geome ss, determination	, penetration of orbitals, variations of s, p, d and c configurations, atomic and ionic sizes, ionizat tability, oxidation states, coordination numbers a tries. Water Chemistry -Water quality paramet of hardness by EDTA method-Introduction to alk	l f orbita ion energ nd geom cers-Defin calinity.	l ener gies, o etries nition	gies of electro , hard and	of aton on affi l soft a explar	ns in the inity and icids and ination of					
UNIT I	II USE OF	FREE ENERGY IN CHEMICAL EQUILIBR	IA				12L+3T					
Thermo	odynamic function	ns: energy, entropy and free energy. Estimations	of entrop	py and	d free	energ	ies. Free					
energy	and emf. Cell po	tentials, the Nernst equation and applications. A	Acid base	e, oxic	lation	reduc	ction and					
solubili	ty equilibria. Ĉo	rrosion-Types, factors affecting corrosion rate a	and Cont	trol m	ethoo	ls. Use	e of free					
energy	energy considerations in metallurgy through Ellingham diagrams. Advantages of electroless plating,											
electrol	electroless plating of nickel and copper on Printed Circuit Board (PCB).											
UNIT I	III ATOMIC	C AND MOLECULAR STRUCTURE					10L+3T					
Schrodi	inger equation. I	Particle in a box solution and their application	ns for c	onjug	ated	moleci	ules and					
nanopa	rticles. Molecular	orbitals of diatomic molecules and plots of the	multicen	ter or	bitals	. Equa	tions for					

atomic and molecular orbitals. Energy level diagrams of diatomic molecules. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Band structure of solids and the role of doping on band structures. Intermolecular forces and potential energy surfaces Ionic, dipolar and Vander waals interactions. Equations of state of real gases and critical phenomena. Potential energy surfaces of H₃, H₂F and HCN and trajectories on these surfaces. SPECTROSCOPIC TECHNIQUES AND APPLICATIONS UNIT IV 7L+3T Principles of spectroscopy and selection rules. Electronic spectroscopy-chromophore, auxochromes, types of electronic transition and application. Fluorescence and its applications in medicine. Vibrational spectroscopy-types of vibrations, Instrumentation and applications. Rotational spectroscopy of diatomic molecules. Nuclear magnetic resonance spectroscopy-concept of chemical shift and applications-magnetic resonance imaging. Diffraction and scattering. STEREOCHEMISTRY AND ORGANIC REACTIONS UNIT V 8L+3T Representations of 3 dimensional structures, structural isomers and stereoisomers, configurations and symmetry and chirality, enantiomers, diastereomers, optical activity, absolute configurations and conformational analysis. Isomerism in transitional metal compoundsOrganic reactions and synthesis of a drug molecule Introduction to reactions involving substitution, addition, elimination, oxidation, reduction, cyclization reactions and ring opening reactions. Synthesis of a commonly used drug molecule- Aspirin and paracetamol. **LECTURE:45 TUTORIAL:15 PRACTICAL:0** TOTAL:60 TEXT BOOKS Puri B.R. Sharma, L.R., Kalia K.K. Principles of Inorganic Chemistry, (23rd edition), New Delhi, 1. ShobanLalNagin Chand & Co., 1993. Lee. J.D. Concise Inorganic Chemistry, UK, Black well science, 2006. 2. Trapp. C, Cady, M. Giunta. C, Atkins's Physical Chemistry, 10th Edition, Oxford publishers, 2014. 3. Glasstone S., Lewis D., Elements of Physical Chemistry, London, Mac Millan & Co. Ltd, 1983. 4. Morrison R.T. and Boyd R.N. Organic Chemistry (6th edition), New York, Allyn 5. & Bacon Ltd., 1976. Banwell. C.N, Fundamentals of Molecular Spectroscopy, (3th Edition), McGraw-Hill Book 6. Company, Europe 1983. Bahl B.S. and ArunBahl, Advanced Organic Chemistry, (4th edition), S./ Chand & Company Ltd. 7. New Delhi, 1977. P. S. Kalsi, Stereochemistry: Conformation and mechanism, (9th Edition), New Age 8. International Publishers, 2017. REFERENCES Puri B R Sharma L R and Madan S Pathania, "Principles of Physical Chemistry", Vishalpublishing 1. Co., Edition 2004. Kuriocose, J C and Rajaram, J, "Engineering Chemistry", Volume I/II, Tata McGraw-Hill 2. Publishing Co. Ltd. New Delhi, 2000. **E- REFERENCES** http://www.mooc-list.com/course/chemistry-minor-saylororg 1. https://www.canvas.net/courses/exploring-chemistry 2. 3. http://freevideolectures.com/Course/2263/Engineering-Chemistry-I http://freevideolectures.com/Course/3001/Chemistry-I 4. http://freevideolectures.com/Course/3167/Chemistry-II 5. http://ocw.mit.edu/courses/chemistry/ 6. Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	2	2	2	1	2	1	1	1	0	1	1
CO 2	2	2	0	1	1	0	0	0	0	0	0	1
CO 3	2	2	2	1	1	2	0	0	0	0	0	1
CO 4	2	2	1	2	1	2	1	1	1	0	1	1
CO 5	2	2	1	3	1	2	0	0	0	0	1	1
Total	10	10	6	9	5	8	2	2	2	0	3	5
Scaled Value	2	2	2	2	1	2	1	1	1	0	1	1

COUR	SE CODE	XWP104		L	Т	P	С				
COUR	SE NAME	WORKSHOP PRACTICES		1	0	2	3				
PRE-R	REQUISITES			L	Т	Р	Н				
C:P:A		`1:2:0		1	0	4	5				
Course	e Outcome		Domain/Le	vel							
	1		C or P or	A							
CO1	Summarize the	machining methods and Practice	Cognitive		Unde	rstand					
	machining oper	ation.	Psychomotor	•	Guide	Guided Response					
CO2	Defining metal	casting process, moulding methods	Cognitive		Unde	Understand					
	and relates Cas	ting and Smithy applications.	Psychomotor	•	Guide	Guided Response					
CO3	Plan basic carp	entry operations and Practice	Cognitive		Unde	Understand					
	carpentry opera	tions.	Psychomotor	•	Guide	Guided Response					
CO4	Plan basic fittin	g operations and Practice fitting	Cognitive		Unde	Understand					
	operations.		Psychomotor	•	Guide	Guided Response					
CO5	Summarize me	Cognitive		Unde	Understand						
	welding operati	on.	Psychomotor	•	Guide	ed Resp	onse				
CO6	Illustrate the el	ectrical and electronics basics and	Cognitive		Unde	rstand					
	Makes appropri	iate connections.	Psychomotor	•	Guide	ed Resp	onse				
COUR	SE CONTENT										
EXP.N	NO	TITLE				(CO				
						RELA	ATION				
1	Introduction	n to machining process				C	:01				
2	Plain turnin	g using lathe operation				C	:01				
3	Introduction	n to CNC				C	01				
4	Demonstrat	ion of plain turning using CNC				C	:01				
5	Study of me	etal casting operation				C	02				
6	Demonstrat	ion of moulding process				C	O2				
7	Study of sn		CO2								
8	Study of ca	rpentry tools				C	03				
9	Half lap joi	nt – Carpentry				C	:03				
	1 1 5	- ·									

10	Mortise and Tenon joint – Carpentry	CO3
11	Study of fitting tools	CO4
12	Square fitting	CO4
13	Triangular fitting	CO4
14	STUDY OF WELDING TOOLS	CO5
15	Square butt joint – welding	CO5
16	Tee joint – Welding	CO5
17	Introduction to house wiring	CO6
18	One lamp controlled by one switch	CO6
19	Two lamps controlled by single switch	CO6
20	Staircase wiring	CO6

TEXT BOOKS

1. Workshop Technology I,II,III, by S K Hajra, Choudhary and A K Chaoudhary. Media Promoters and Publishers Pvt. Ltd., Bombay

2. Workshop Technology by Manchanda Vol. I,II,III India Publishing House, Jalandhar.

REFERENCES

1. Manual on Workshop Practice by K Venkata Reddy, KL Narayana et al; MacMillan India Ltd.

2. Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi

3. Workshop Technology by B.S. Raghuwanshi, Dhanpat Rai and Co., New Delhi.

4. Workshop Technology by HS Bawa, Tata McGraw Hill Publishers, New Delhi.

E RESOURCES

1. http://nptel.ac.in/courses/112107145/

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	1	1	0	1	0	1	0	2	1
CO2	2	1	2	1	1	0	1	0	1	0	2	1
CO3	2	1	2	1	1	0	1	0	1	0	2	1
CO4	2	1	2	1	1	0	1	0	1	0	2	1
CO5	2	1	2	1	1	0	1	0	1	0	2	1
CO6	2	1	2	1	1	0	1	0	1	0	2	1
Total	12	6	12	6	6	0	6	0	6	0	12	6
Scaled	3	2	3	2	2	0	2	0	2	0	3	2
value												

1-5 = 1, 6-10 = 2, 11-15 = 3

0- No Relation, 1-Low Relation, 2 - Medium Relation, 3- High Relation

COURSE CODEXGS105LTPSS									
COUI	RSE NAME	SPEECH COMMUNICATION		0	1	2	0	3	
PRE-	REQUISITES			L	Т	Р	SS	Н	
	C: P: A	2.6:0.4:0		0	1	4	0	5	
COU	RSE OUTCON	IES:	Do	mai	n		Leve	કો	
CO1	Ability to reca	ll the types of speeches	Cogn	itive		Rem	nembe	r	
CO2	Apply the tech	niques in public speaking	Cogn	itive	-	App	ly		
CO3	<i>Identify</i> the co	mmon patterns in organizing a speech	Cogni	itive		Ren	nembe	r	
CO4Construct the nature and style of speakingCognitiveCreate									
CO5 Practicing thespeaking skills Psychomotor Guided									
Response									
UNIT I – Types of Speeches									
1.1 – Four types of speeches									
1.2 - 1	Analyzing the a	idience							
1.3 - I	Developing idea	s and supporting materials					r		
UNIT	II – Public Sp	eaking						9	
2.1 - I	ntroduction to F	ublic Speaking							
2.2 - 0	Competencies N	eeded for successful speech making							
2.3 - 5	Speaking about	everyday life situations							
UNIT	III – Organiza	tion of Speech						9	
3.1 - 1	Developing a sp	eech out line							
3.2 - 0	Organizing the s	peech							
3.3 - 1	Introduction - de	evelopment – conclusion							
UNIT	IV – Presentat	ion						9	
4.1 - 1	Tips for preparin	g the draft speech							
4.2 - 1	Presentation tecl	nniques using ICT tools							
4.3 - 1	Using examples	from different sources							
UNIT	V – Activities							9	
5.1 – I	Reading activition	es							
5.2 - 0	Creative present	ations							
5.3 – 1	Media presentat	on techniques							
Sugge	sted Readings:	^							
(i) Mi	chael Swan. Pro	ectical English Usage, OUP, 2010							

(i) Michael Swan. *Practical English Usage*. OUP. 2010 (ii) Sanjay Kumar and Pushp Lata. *Communication Skills*. Oxford University Press. 2011

Mapping of COs with POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	0	0	0	1	0	0	1	1	3	0	3
CO2	0	0	0	0	1	0	0	1	1	3	0	3
CO3	2	0	0	0	1	0	0	1	1	3	0	3
CO4	3	0	0	0	1	0	0	1	3	3	1	3
CO5	3	0	0	0	1	0	0	1	1	2	1	3
Total	10	0	0	0	5	0	0	5	7	14	2	15
Scaled value	3	0	0	0	1	0	0	1	2	3	1	3

1-5=1, 6-10 = 2, 11-15=3

0-No Relation, 1- Low Relation, 2 – Medium Relation, 3- High Relation

COURS	SE CODE		L	T	Р	C						
COURS	SE NAME	CONST	TITUTION OF	INDIA		0	0	0	0			
PRERE	QUISITE:					L	Τ	Р	Η			
C:P:A		0:0:0				3	0	0	3			
COURS	SE OUTCO	MES			Domain	L	evel					
CO1	Understand	<i>l</i> the Con	stitutional Histor	y	Cognitive	U	nder	stand	t			
CO2	Understand	<i>l</i> the Pow	ers and Function	18	Cognitive	U	Inder	stand	t			
CO3	Understand	<i>l</i> the Legi	slature		Affective	R	eme	mber	•			
CO4	Understand	<i>the Judi</i>	ciary		Affective	R	eme	mber	•			
CO5	Understand	the Cen	re State relation	S	Cognitive	U	Inder	stand	b			
UNIT -	·I					1			8			
Constitutional History- The Constitutional Rights- Preamble- Fundamental Rights- Fundamental Duties- Directive principles of State Policy.												
UNIT - II 9												
The Union Executive- The President of India (powers and functions)- Vice-President of												
India-Th	ne Council of	[•] Minister	s-Prime Ministe	r- Powers and Fu	inctions.							
UNIT -	· III								10			
Union L	egislature- S	tructure	and Functions of	f Lok Sabha- Str	ucture and Fi	uncti	ions	of R	ajya			
Sabha-	Legislative F	rocedure	in India- Impor	tant Committes	of Lok Sabh	a- S	peak	er of	the			
Lok Sab	oha.		_				-					
UNIT -	IV								9			
The Ur	nion Judicia	y- Powe	ers of the Sup	reme Court- Or	riginal Jurisc	lictio	on-	Appe	elete			
jurisdict	tions- Adviso	ry Jurisdi	ction-Judicial r	eview.	-							
UNIT –	· V								9			
Centre S	State relation	ns- Politi	cal Parties- Role	e of governor, p	owers and fu	ıncti	ons	of C	hief			
Minister	r-Legislative	Assembly	y- State Judiciar	y- Powers and Fu	unctions of th	e Hi	gh C	ourts	3.			
			LECTURE	TUTORIAL	PRACTIC	AL]	гот	AL			
			45	0	0			45	;			
REFER	RENCES											
1. W.H.	Morris Shore	es- Gover	nment and politi	cs of India, New	Delhi,B.1.Pul	olish	ers,1	974.				
2. M.V.Pylee- Constitutional Government in India, Bombay, Asia Publishing House, 1977.												
3. R.Thanker- The Government and politics of India, London:Macmillon, 1995.												
4. A.C.F	Kapur- Select	Constitu	tions S,Chand&	Co., NewDelhi, 1	995							
5. V.D.N	Mahajan- Sel	ect Mode	rn Governments	,S,Chand&Co, N	ewDelhi,199	5.						
6. B.C.F	6. B.C.Rout- Democractic Constitution of India.											

7. Gopal K.Puri- Constitution of India, India 2005.

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	0	0	0	0	0	1	1	1	0	0	0	0
CO 2	0	0	0	0	0	0	0	0	0	0	0	0
CO 3	0	0	0	0	0	0	0	0	0	0	0	0
CO 4	0	0	0	0	0	0	0	0	0	0	0	0
CO 5	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	1	1	0	0	0	0
Scaled	0	0	0	0	0	1	1	1	0	0	0	0
Value												

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$

0 – No Relation, 1- Low Relation, 2- Medium Relation, 3- High Relation

COURSE CODE	XBE107	L	Т	Р	С
COURSE NAME	ELECTRICAL AND ELECTRONICS ENGINEERING SYSTEMS LABORATORY	0	0	1	1
PREREQUISITE	Physics	L	Т	Р	Η
C : P : A	0.3:0.3:0.3	0	0	2	2

COURSE OBJECTIVES:

The course helps to

- a. Learn the basic concepts of electrical and electronics components.
- b. Understand the basic wiring methods and connection.
- c. Study the characteristics of diodes, Zener diodes, NPN transistors.
- d. Verify the working of simple logic gates, adders and subtractors.

Course C	Outcomes:	Domain	Level
CO1	Apply the fundamental electrical concepts and differentiate the various electronic components.	Cognitive	Understand
CO2	Implement and execute the different types of wiring connections.	Cognitive	Apply
CO3	Demonstrate the Fluorescent lamp connection with choke.	Cognitive	Understand
CO4	Characterize and display the basic knowledge on the working of PN junction and Zener diode.	Cognitive	Understand
CO5	Implement and execute the various digital electronic circuits such as Adders and Subtractors.	Cognitive	Apply

List of Experiments:

- 1. Study of Electrical Symbols, Tools and Safety Precautions, Power Supplies.
- 2. Study of Active and Passive elements Resistors, Inductors and Capacitors, Bread Board.
- 3. Testing of DC Voltage and Current in series and parallel resistors which are connected in breadboard by using Voltmeter, Ammeter and Multimeter.
- 4. Fluorescent lamp connection with choke.
- 5. Staircase Wiring
- 6. Forward and Reverse bias characteristics of PN junction diode.
- 7. Forward and Reverse bias characteristics of zener diode.
- 8. Input and Output Characteristics of NPN transistor.
- 9. Construction and verification of simple logic gates.
- 10. Construction and verification of adders and subtractors.

PRACTICAL	TOTAL
30	30

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	1	1	1	1	0	0	1	1	1	0
CO 2	3	3	1	1	1	1	0	0	1	1	1	0
CO 3	2	2	2	1	2	2	1	1	1	1	1	0
CO 4	2	2	1	1	1	1	1	1	1	1	1	0
CO 5	2	2	1	1	1	1	1	1	1	1	1	0
Total	12	12	6	5	6	6	3	3	5	5	5	0
Scaled Value	3	3	2	1	2	2	1	1	1	1	1	0

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$

0 - No Relation, 1 - Low Relation, 2 - Medium Relation, 3 - High Relation

COUR	SE CODE	XAC108	L	Т	Р	С	
COUR	SE NAME	APPLIED CHEMISTRYFOR ENGINEERS	0	0	1	1	
		LABORATORY					
C:P:A		0.4: 0.4:0.2	L	Т	Р	Н	
PRER	EQUISITE:	Basic Physics in HSC level	0	0	2	2	
COUR	SE OUTCOME	Dor	nain]	Level		
CO1	Analyse quant	Cognit	ive	Ren	Remember		
	given solution	by volumetric method	Psycho	motor	Mec	Mechanism	
CO2	Estimate the ar	nount of substances present in the given solution using	Cognit	ive	Ana	Analyze	
	colorimeter, po	otentiometer and conductivity meter.	Psycho	motor	Mec	Mechanism	
CO3	Determine the constant of a cl	surface tension, viscosity of a given solution and rate hemical reaction and synthesize drugs/polymers.	Cognit Psycho	ive motor	App Mec	ly chanism	

Ex. No.	Experiments	COs

1.	Determination of chloride ion present in the water sample	by Argentometric	001						
	method		COI						
	methou.								
2.	Determination of total, temporary and permanent hardness of	f water sample by	001						
	EDTA mothod	× •	COI						
	EDTA Inculou.								
3.	Determination of cell constant and conductance of solutions.		CO2						
4.	4. Potentiometry - determination of redox potentials and emfs.								
5.	5. Determination of surface tension and viscosity.								
6.	Adsorption of acetic acid by charcoal.		CO3						
7.	Determination of the rate constant of a reaction.		CO4						
8.	Estimation of iron by colorimetric method.		CO4						
9.	Synthesis of a polymer/drug.		CO5						
10.	Saponification/acid value of oil.		CO5						
LECURE :	LECURE : 0 TUTORIAL: 0 PRACTICAL: 30 TOTAL:30								

TEXT BOOK

1. Laboratory Manual "Chemistry Lab", Department of Chemistry, PMIST, Thanjavur.

REFERENCES

1. Mendham, Denney R.C., Barnes J.D and Thomas N.J.K., "Vogel's Textbook of Quantitative 2. Chemical Analysis", 6th Edition, Pearson Education, 2004.

E-RESOURCES- MOOC's

1. http://freevideolectures.com/Course/2380/Chemistry-Laboratory-Techniques

2. http://ocw.mit.edu/courses/chemistry/5-301-chemistry-laboratory-techniques

3. http://freevideolectures.com/Course/2941/Chemistry-1A-General-Chemistry-Fall-2011

Mapping of COs with POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2	3	3	0	1	1	1	0
CO2	2	2	2	2	1	2	2	1	1	1	1	1
CO3	2	2	2	2	1	2	2	0	1	1	0	0
Total	7	7	7	7	4	7	7	1	3	3	2	1
Scaled value	2	2	2	2	1	2	2	1	1	1	1	1

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$

0-No Relation, 1- Low Relation, 2-Medium Relation, 3-High Relation

SEMESTER II

COUI	RSE COI		L	Т	Р	С			
COUI	RSE NAN	ИЕ	Calculus, Ordinary Differential Equations and Complex Variable		3	1	0	4	
С	Р	Α			L	Т	Р	H	
3	0.5	0.5			3	1	0	4	
PRER	EQUISI	TE : N	fathematics I (Calculus and Linear Algebra)		1				
Course outcomes.									
Cours	e outcon	nes:		Dom	ain		Lev	'el	
CO1: Find double and triple integrals and to find line, surface and volume C of an integral by Applying Greens, Gauss divergence and Stokes theorem.							pplyi	ng	
CO2: which	Solve first are solva	Cogn	itive	A	pplyi	ng			
CO3: Solve Second order ordinary differential equations with variable coefficients using various methods.CognitiveApplying									
CO4: Use CR equations to verify analytic functions and to find harmonicCognitiveApplyingfunctions and harmonic conjugate. Conformal mapping of translation and rotation. Mobius transformation.CognitiveApplying									
CO5: involv Liouvi singula	Apply ing sine illes the arities, La	Cauch and co orem. aurent's	y residue theorem to evaluate contour integrals sine function and to state Cauchy integral formula, Taylor's series, zeros of analytic functions, s series.	Cogn	itive	A	pplyi	ng	
Unit 1	: Multiv	ariable	Calculus (Integration)	L			9-	+3	
Multip Chang integra	ble Integr e of variants - scala	ation: 1 ables ((r surfa	Double integrals (Cartesian) - change of order of integ Cartesian to polar) - Triple integrals (Cartesian), Scala ce integrals - vector surface integrals - Theorems of Gr	gration r line i een, Ga	in do ntegr auss a	ouble als - y and St	integr vector okes.	rals - r line	
Unit 2	: First o	rder or	dinary differential equations				9-	+3	
Exact solvab	- linear a le for p -	and Be equation	rnoulli's equations - Euler's equations - Equations no ons solvable for y- equations solvable for x and Clairau	ot of fi it's typ	rst de e.	gree:	equa	tions	
Unit 3	: Ordina	ry diff	erential equations of higher orders				9-	+3	
Second Cauch and the	d order li y-Euler e eir prope	near di quation	fferential equations with variable coefficients- method n- Power series solutions- Legendre polynomials- Bess	of vari el func	ation tions	of pa of the	rame e first	ters - kind	
Unit 4	: Compl	ex Var	iable – Differentiation				9-	+3	
Difference conjug Confor	entiation- gate- elen rmal map	Cauchy nentary pings-	y-Riemann equations- analytic functions-harmonic analytic functions (exponential, trigonometric, logar Mobius transformations and their properties.	functio rithm)	ns-fir and t	nding heir J	harm prope	10nic rties-	

Unit 5: Comple	Variable – Integration	9+3
Contour integral Liouville's theor series – Residue	s - Cauchy-Goursat theorem (without proof) - C em (without proof)- Taylor's series- zeros of an s- Cauchy Residue theorem (without proof)- F	Cauchy Integral formula (without proof)- alytic functions- singularities- Laurent's Evaluation of definite integral involving
sine and cosine-	TUTORIAL	TOTAL
45	15	60
Text Book:		
1. B.S. Grewal, '	Higher Engineering Mathematics", Khanna Pul	blishers, 40th th Edition, 2008.
Reference Book	s:	
1.G.B. Thomas a	nd R.L. Finney, "Calculus and Analytic geomet	ry", 9 th Edition, Pearson,
Reprint, 2002.	(A) IT ' A (A) (' P) other	
2. Erwin kreyszi	g, "Advanced Engineering Mathematics", 9 th Ed	lition, John Wiley & Sons, 2006.
3.W. E. Boyce an	id R. C. DiPrima, "Elementary Differential Equ	ations and Boundary Value
A S L Bogg "D	Edn. Wiley India, 2009. ifforantial Equations" 2 rd Ed. Wiley India 108	Λ
4. S. L. ROSS, D 5. E. A. Caddina	ton "An Introduction to Ordinary Differential I	4. Zavationa" Prontico Holl India
3. E. A. Couuling	ion, An introduction to Ordinary Differentiar	squations, Plenuce Han India,
1773. 6 E I Ince "O	dinary Differential Equations" Dover Publication	ions 1958
7 I W Brown a	nd R. V. Churchill "Complex Variables and Ar	unications" 7 th Ed McGraw
Hill 2004	na R. V. Churchini, Complex Variables and Ap	prications, / La., McOraw

8. N.P. Bali and Manish Goyal, "A text book of Engineering Mathematics", Laxmi Publications, Reprint, 2008.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2	0	0	2	0	0	0	0	1	0	2
CO 2	3	1	0	0	0	0	0	0	0	1	0	1
CO 3	3	1	0	0	0	0	0	0	0	1	0	1
CO 4	3	2	0	0	0	0	0	0	0	1	0	1
CO 5	3	2	0	0	1	0	0	0	0	1	0	2
Total	15	8	0	0	3	0	0	0	0	5	0	7
Scaled Value	3	2	0	0	1	0	0	0	0	1	0	2

Mapping of Cos with POs:

 $1-5 \rightarrow 1, \qquad 6-10 \rightarrow 2, \qquad 11-15 \rightarrow 3$

0 - No Relation, 1 - Low Relation, 2- Medium Relation, 3- High Relation

Cour	se code		:	XCP202		L	Т	Р	C
Cour	se name		:	PROGRAMMING FOR PROBLEM SOLVING		3	0	0	3
Prere	equisite		:	Mathematics knowledge, Analytical and Logical skil	lls.	L	Т	Р	H
С	Р	Α				3	0	0	3
3	0	0							
Cour	se Objec	tives							
• D	esign sol ad basic r	utions t nathem	o sii atica	nple engineering problem by applying the basic program	ming princ	iples	of C I	angua	ıge
• C	hoose a s	uitable	C-c	onstruct to develop C code for a given problem					
• A	pply the	C-lang	uage	syntax rules to correct the bugs in the C program					
• D	evelop si	mple C	pro	grams to illustrate the applications of different data types	s such as ar	rays,	pointe	ers,	
fu	inctions.	1.0	.1				1	-	
Cours	e Outcon	ne: Afte	er the	e completion of the course, students will be able to	Doma Comitiv	in	A	Leve	<u>l</u>
COI	princip	ate and	i exj Tlan	plain the basic computer concepts and programming	Cognitive	2	App	biy	
CO2	Deterr	nine C	prog	grams to solve simple mathematical and decision	Cognitive	e	Apr	oly	
	making	g proble	ems.		C			5	
CO3	Demo	nstrate	the a	applications of derived data types such as arrays,	Cognitive	e	Арј	oly	
CO4	To sol	ve a pro	bler	n into functions and synthesize a complete program	Cognitive	e	App	oly	
CO5	Apply	program	mmi	ng concepts to solve programs using files and store and	Cognitive	<u>,</u>	Api	olv	
	retrieve	e data f	rom	it.					
COU	retrieve data from it. COURSE CONTENT UNIT- I PROGRAMMING FUNDAMENTALS AND I/O STATEMENTS 9 Introduction to components of a computer system, Program – Flowchart – Pseudo code – Software – Introduction 9								
UNIT	- I	PRO	GRA	MMING FUNDAMENTALS AND I/O STATEMEN	NTS				9
Introd	luction to	compo	onen	ts of a computer system. Program – Flowchart – Pseudo	code – So	ftwar	e – In	trodu	ction
to C	language	– Cha	aract	er set – Tokens: Identifiers, Keywords, Constants, and	d Operator	·s –	sample	e prog	gram
struct	ure -Head	ler files	s – D	Data Types- Variables - Output statements – Input stateme	ents.				
UNIT	- II	CON	TRC	DL STRUCTURE AND ARRAYS					9
Contr	ol Struct	ures –	Cor	nditional Control statements: Branching, Looping - U	ncondition	al co	ntrol	struct	ures:
switcl	n, break,	contin	ue,	goto statements - Arrays: One Dimensional Array -	- Declarati	on –	Initia	lizatio	on –
Acces	sing Arr	ay Elen	nents	s – Searching – Sorting – Two Dimensional arrays - Dec	laration – I	nitial	izatio	n - M	atrix
Opera	tions – I	Multı L	Jime	ensional Arrays - Declaration – Initialization. Storage	classes: au	ito –	exter	n – st	tatic.
Sumg	s. Dasic	operatio	JIIS C	on strings.					
UNIT	- III	FUN	CTI	ONS AND POINTERS					9
Funct	ions: Bu	ilt in fu	incti	ons – User Defined Functions - Parameter passing metho	ods - Passin	ng ar	ays to	funct	tions
– Rec	cursion -	Progra	ms ı	using arrays and functions. Pointers - Pointer declaration	on - Addre	ss op	perator	- Po	inter
expre	ssions &	pointer	arit	hmetic - Pointers and function - Call by value - Call by	Reference	- Po	ointer	to arra	ays -
	T Pointers	s in sell	-refe	ETERTIAL STRUCTURES INOTION OF LINKED LIST					0
Struct	ures and		<u>s - (</u>	Giving values to members - Initializing structure - Fur	octions and	stru	ctures	- Pas	<u> </u>
struct	ure to ele	ements	to fu	inctions - Passing entire function to functions - Arrays	of structure	e - Structure - Structure Structure - Structure Structure Structure - Structure Structure - Structur	ructur	e with	hin a
struct	ure and U	Jnion.		c ·					
UNIT	- V	FILE	S						9
File n	nanageme functions	ent in C - The f	2 - Fi forin	ile operation functions in C - Defining and opening a file tf&fscanf functions - fseek function – Files and Structure	e - Closing	a file	e - The	e getw	⁷ and
r			1						

		L	Τ	Р	Total					
		45	0	0	45					
TEXT BOOKS										
1. Byron Gottfried, "Programming with C", Schaum's Outlines Series, M	cGraw	Hill Edu	catio	n, 3rd	Edition,					
2017.	2017.									
2. ReemaThareja, "Programming in C", Oxford university press, 2nd Edition, 2016										
REFERENCE BOOKS										
1. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill, 7 th edit	ion 201	7.								
2. R. S. Bichkar, "Programming with C", Universities Press, 2nd Edition, 20	012.									
3. Stephen G. Kochan, "Programming in C", Addison-Wesley Professional,	4th Ed	ition, 201-	4.							
E-REFERENCES										
1. https://onlinecourses.nptel.ac.in/noc19_cs42/preview										
2. https://www.javatpoint.com/c-programming-language-tutorial										
3. https://www.w3schools.in/c-tutorial/										

Mapping of CO with PO's

	P01	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	6 Od	P010	PO 11	PO 12	PSO1	PSO2
CO 1	2	2	0	0	2	0	0	0	0	0	2	2	1	0
CO 2	2	2	0	0	2	0	0	0	0	0	2	2	1	0
CO 3	2	2	1	2	2	0	0	0	0	0	2	2	1	0
CO 4	2	2	1	2	2	0	0	0	0	0	2	2	1	0
CO 5	2	2	1	0	2	0	0	1	0	0	2	2	1	0
Total	10	10	3	4	10	0	0	1	0	0	10	10	5	0
Scaled Value	2	2	1	1	2	0	0	1	0	0	2	2	2	0

 $1-5 \rightarrow 1$, $6-10 \rightarrow 2$, $11-15 \rightarrow 3$ 0 - No Relation, 1 - Low Relation, 2- Medium Relation, 3- High Relation

COURSE	CODE	XAP203	T.	Т	Р		C
COURSE		APPLIED PHYSICS FOR ENGINEERS	3	1			4
			J I	Т	0 P		ч
PREREO	IIISITE.	Basic Physics in HSC level	3	1	I		<u> </u>
TREREQ			5		•		
COURSE	OUTCOM	ES		Doma	in		Level
CO1	Identify the	e basics of mechanics, explain the principles of elasticity	Cog	nitive			
	and deter	mine its significance in engineering systems and				Und	erstand
	technologic	al advances.					
02	Illustrate	the laws of electrostatics, magneto-statics and	Cog	nitive		A	1
	electromagi	netic induction; use and locate basic applications of				Ana	Iyze
CO3	Understan	d the fundamental phenomena in optics by measurement.	Cog	nitivo			
005	and describ	u the fundamental phenomena in optics by measurement	Cog	muve		Δnn	lv
	and fibre or	the working principle and application of various fasers				лрр	1y
CO4	Analyse en	ergy hands in solids discuss and use physics principles	Cog	nitive		Ana	lvze
0.04	of latest tec	hnology using semiconductor devices	05	inti ve		7 1114	1920
CO5	Develon k	Knowledge on particle duality and solveSchrodinger	~				
200	equation for	r simple potential.	Cog	nitive		App	ly
UNIT - I	MECHAN	ICS OF SOLIDS				9+	-3
Mechanic	s: Force - N	Newton's laws of motion - work and energy - impulse a	nd mo	oment	um - to	orque	- law of
conservati	on of energy	and momentum - Friction.				1	
Elasticity	: Stress - St	rain - Hooke's law - Stress strain diagram - Classification	on of	elastic	modu	lus -	Moment,
couple an	d torque - T	orsion pendulum - Applications of torsion pendulum - B	endin	g of t	beams -	Expe	erimental
determina	tion of Youn	g's modulus: Uniform bending and non-uniform bending.					
UNIT -II	ELECTRO	OMAGNETIC THEORY				9+	.3
Laws of e	electrostatics	- Electrostatic field and potential of a dipole; Dielectric	Polar	isatior	ı, Diele	ctric	constant,
internal f	ield - Claus	ius Mossotti Equation - Laws of magnetism - Amper	e's Fa	araday	's law;	Lenz	z's law -
Maxwell's	equation - 1	Plane electromagnetic waves; their transverse nature - exp	pressi	on for	plane,	circu	larly and
elliptically	polarized l	ight - quarter and half wave plates - production and d	etectio	on of	plane,	circu	larly and
elliptically	polarized lig	ght.					2
UNIT –II	I OPTICS,	LASERS AND FIBRE OPTICS				9+	.3
Optics: D	ispersion- O	ptical instrument: Spectrometer - Determination of refracti	ve inc	lex an	d dispe	rsive	power of
a prism- I	nterference o	f light in thin films: air wedge - Diffraction: grating.					
LASER:	Introduction	- Population inversion -Pumping - Laser action - Nd-YAG	laser	- CO	laser -	- App	lications.
Fibre Op	tics: Principl	e and propagation of light in optical fibre - Numerical aper	ture a	nd acc	entance	angle	e - Types
of optical	fibre - Fibre	ontic communication system (Block diagram)			- F	8-	- JP
or optical		opue communication system (brock diagram).					
		NDUCTOD DIIVEICE				0.	2
			1	1		1	· <u>5</u>
Semicond	luctors: End	ergy bands in solids - Energy band diagram of ge	od c	conduc	ctors, 1	nsula	tors and
semicondi	ictors - Con	cept of Fermi level - intrinsic semiconductors - Conce	pt or	noies	- dopi	ng -	Extrinsic
semicondi	ictors - P typ	e and N type semiconductors - Hall effect.					
Diodes a	nd Transisto	prs: P-N junction diode - Forward bias and reverse bias	- Rec	tificat	ion act	ion o	f diode -
Working	of full way	e rectifier using P N junction diodes - PNP and NF	N tra	insisto	ors - T	hree	different
configurat	ions - Adva	ntages of common emitter configuration - working of N	PN tr	ansist	or as a	n am	plifier in
common e	mitter config	guration.					
						<u>r</u>	_
UNIT –V	QUANTU	M PHYSICS				9+	.3
Introducti	on to quantu	m physics, black body radiation, Compton effect, de Bro	oglie l	nypotł	nesis, w	vave -	- particle
duality, u	ncertainty pr	inciple, Schrodinger wave equation (Time dependent and	Time	indep	pendent), par	ticle in a
box, Exter	nsion to three	e dimension - Degeneracy.		-			
l							

TEXT BOOKS

1. Gaur R. K. and Gupta S. L., "Engineering Physics", Dhanpat Rai Publications, 2009.

2. Avadhanulu M. N. "Engineering Physics" (Volume I and II), S. Chand & Company Ltd., New Delhi, 2010. **REFERENCE BOOKS**

- 1. Palanisamy P. K., "Engineering Physics", Scitech Publications (India) Pvt. Ltd, Chennai.
- 2. Arumugam M., "Engineering Physics" (Volume I and II), Anuradha Publishers, 2010.
- 3. Senthil Kumar G., "Engineering Physics", 2nd Enlarged Revised Edition, VRB Publishers, Chennai, 2011.
- 4. Mani P., "Engineering Physics", Dhanam Publications, Chennai, 2007.

E RESOURCES

NPTEL, Engineering Physics, Prof. M. K. Srivastava, Department of Physics, IIT, Roorkee.

LECTURE	TUTORIAL	PRACTICAL	TOTAL HOURS
45	15	-	60

Mapping of CO's with PO's:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	0	0	0	1	0	0	1
CO2	3	0	1	0	1	0	0	0	0	0	0	1
CO3	3	2	2	2	1	0	0	0	1	0	0	1
CO4	3	2	2	2	1	0	0	0	1	0	0	1
CO5	3	0	2	0	0	0	0	0	0	0	0	1
Total	15	6	9	6	4	0	0	0	3	0	0	5
Scaled value	3	2	2	2	1	0	0	0	1	0	0	1

COUR	SE CODE	XGS204		L	Т	Р	SS	С					
COUR	SE NAME	TECHNICAL COMMUNICATION		2	0	0	0	2					
PRE-F	REQUISITES			L	Т	Р	SS	Н					
C: P: <i>A</i>	4	3:0:0		2	0	0	0	2					
COUR	SE OUTCOM	ES:	Do	omai	in		Leve	l					
CO1	Ability to und	erstand the basic principles	Co	gniti	ve	R	Remember						
CO2	Apply the tech	iniques in writing	Co	gniti	ve		Apply	ý					
CO3	Identify comm	Co	gniti	ve	R	Rememb							
CO4	Construct the	Co	gniti	ve		Creat	e						
UNIT	I – Basic Princ						8						
1.1 - B	asic Principles	of Technical Writing											
1.2 - S	 1.1 – Basic Principles of Technical Writing 1.2 – Styles used in Technical Writing 1.3 – Language and Tone 												
1.3 – L	1.2 – Styles used in Technical Writing 1.3 – Language and Tone												
UNIT	II – Technique	8						8					
2.1 - S	pecial Techniqu	es used in writing											
2.2 - D	Definition & Des	cription of mechanism											
2.3 - D	Description- Clas	sification-Interpretation											
UNIT	III – Communi	cation						8					
3.1 - N	Iodern developi	nent in style of writing											
3.2 - N	New letter writin	g formats											
UNIT	UNIT IV – Report Writing												
4.1 - T	ypes of Report	writing											
4.2 – Project writing formats													
Sugges	sted Readings:												

(i) John Sealy, Writing and Speaking Author; Oxford University Press, New Delhi, 2019.

(ii) Williams K.S, Communicating Business. Engage Learning India Pvt Ltd, 2012.

Mapping of COs with POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	0	0	0	2	0	0	1	1	3	0	3
CO2	2	0	0	0	1	0	0	1	2	3	0	3
CO3	2	0	0	0	2	0	0	1	3	3	0	3
CO4	3	0	0	0	2	0	0	1	3	3	0	3
Total	10	0	0	0	7	0	0	4	9	12	2	12
Scale	3	0	0	0	2	0	0	1	2	3	1	3

1-5 = 1, 6-10 = 2, 11-15 = 3

0-No Relation, 1- Low Relation, 2 - Medium Relation, 3- High Relation

COURS	E COD	E	XCS205				L	Т	Р	С			
COURS	E NAM	IE	BASICS OF	ELECTRONIC DE	EVICES AND		3	0	0	3			
PREREC	QUISIT	res	PHYSICS A	ND MATHEMATIC	CS		L	Т	Р	Н			
С	Р	А					3	0	0	3			
3	0	0					5	U	U	5			
LEARN	ING O	BJECT	IVES										
• To in	troduce	e the ope	eration of differ	rent types of semicon	ductor devices.								
• To fa	miliari	ze the ir	ntegrated circui	ts technology.									
• To p	ovide l	knowled	lge on the chara	acteristics of up to ele	ectronic devices								
COURS	E OUT	COME	S:			D	omai	in	Lev	vel			
CO1	Defi	ne the pr	rinciples of sem	niconductor physics.		Co	gnitiv	re l	Remen	ıber			
CO2	Desc	ribe the	operation and	characteristics of sen	niconductor diodes.	Cog	gnitiv	re 1	Unders	tand			
CO3	Unde	erstand	the operation a	nd Characteristics of	BJT and FET	Cog	gnitiv	re 1	Unders	tand			
CO4 Discuss the operation and characteristics of power electronic and Cognitive Understand													
optoelectronic diodes CO5 Ubstrate the Integrated Circuit fabrication processes Cognitive Us denotes													
UNIT - I	Intro	duction	To Semicond	uctor Technology	23503.		giiitiv		Jucis	9			
Review of extrinsic design of	of Quan silicon resisto	ntum M i; Carrie ors.	echanics, Electer transport: di	trons in periodic La ffusion current, drif	tices, E- k diagrams. t current, mobility an	Energ d resi	y ba stivit	nds in y; she	intrins et resis	sic and stance,			
UNIT - I	I Junc	tion Dic	odes And Appl	ications						9			
Generation character Full wave	on and istics, a e Recti	recomb and sma fier, Bri	vination of carr all signal switc dge Rectifier a	iers; Poisson and co hing models; Avala nd Voltage Regulat	ontinuity equation P-N nche breakdown, Zeno ors.	N junc erdiod	tion e , H	charac alf wa	teristic ve Re	s, I-V ctifier,			
UNIT - I	II Tra	nsistors	And Applicat	ions						9			
Bipolar capacitor character	Junctio , C-V istics, a	n Tran chara and sma	sistor, I-V ch cteristics, Jur Il signal model	aracteristics, NPN action Field Trails and Stransistor	and PNP Transistors ansistor, VI Cha	, Eb racte:	ers-N ristio	Aoll N cs, N	/Iodel, /IOSFI	MOS ET,I-V			
UNIT - IV Special Electronic Devices 9													
SCR, DIAC, TRIAC, LED, LDR,LCD, Photodiode, Photo Transistor and solar cell.													
UNIT - V	/ Intro	ductio	n To Integrate	d Circuit Technolog	SY					9			
Integrate chemical	d circu vapor	iit fabr depositi	ication proces	s: oxidation, diffus twin-tub CMOS pro	ion, ion implantation cess.	n, pho	otolit	hograp	ohy, et	ching,			
			HUIBE	LECTURE	TUTORIAL	PRA	CTI	CAL	TC	TAL			
			HOURS	45			0			45			

TEXT BOOKS

 Robert L. Boylestad and Louis Nashelsky, "Electronics devices and Circuit Theory" 11th Edition, UBS Publishers, New Delhi, 2013.

2. G.Streetman, and S.K.Banerjee, "Solid State ElectronicDevices," 7thedition, Pearson, 2014.

3. D.Neamen, D.Biswas"Semiconductor Physics and Devices," McGraw-Hill Education Jacob

4. Millman and Christos C.Halkias, "Electronic Devices and Circuits" 3rd Edition, Tata McGraw Hill, New Delhi,

2010.

REFERENCES

- 1. C.T.Sah, "Fundamentals of solid state electronics," World Scientific publishing Co.Inc,1991.
- 2. S.M.SzeandK.N.Kwok, "Physics of Semiconductor Devices," 3rdedition, John Wiley &Sons, 2006.
- 3. Y.TsividisandM.Colin, "Operation and Modeling of the MOSTransistor," Oxford University .Press, 2011.
- 4. David A. Bell ,"Electronic devices and circuits", Prentice Hall of India, 2004.
- 5. S.Salivahanan, "Electronics devices and circuits". 2nd Edition, Tata McGraw Hill, 2008.

E-REFERENCES

- 1. https://www.digimat.in/nptel/courses/video/108101091/L01.html
- 2. http://nptel.ac.in/courses/117103063/ (Prof. Chitralekha Mahanta, NPTEL, Basic Electronics, IIT-Guwahati)
- 3. <u>http://nptel.ac.in/video.php?subjectId=117103063</u> (Prof. Gautam Barua, NPTEL, Basic Electronics, IIT-Guwahati)
- 4. <u>http://nptel.ac.in/courses/117101106/</u> (Prof. A N chandorkar, NPTEL, Analog Electronics, IIT-Bombay)
- 5. <u>https://www.digimat.in/nptel/courses/video/108108112/L01.html</u>

	P01	P02	P03	P04	P05	P06	P07	PO8	P09	P010	P011	P012	PSO1	PSO2
CO 1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CO 2	1	2	0	0	0	0	0	0	0	0	0	0	0	0
CO 3	2	1	2	0	0	0	0	0	0	0	0	0	0	0
CO 4	1	1	2	0	0	0	0	0	0	0	0	0	0	0
CO 5	0	0	3	0	1	0	0	0	0	0	0	0	0	0
Total	5	4	7	0	1	0	0	0	0	0	0	0	0	0
Scaled value	3	3	3	0	1	0	0	0	0	0	0	0	0	0

Mapping of COs with POs:

0 - No Relation 1 - Low Relation , 2 - Medium Relation, 3- High Relation

Cours	se Code	XEG206								
Cours	se Name	Engineering	Graphics and Design							
	L –T -	- P - C	C:P:A	L –T –P –H						
	1-0-	- 2- 3	1.75:1:0.25	1-0-4-5						
Cours	se Outcor	ne		Domain/Level						
				C or P or A						
CO1	Apply constru	the national ctand practice v	and international standards, various curves	Cognitive (Apply) Psychomotor (Guided response) Affective (Responding to a Phenomena)						
CO2	Interpr projection	et, construct ons of points, str	and practice orthographic aight lines and planes.	Cognitive (Understand) Psychomotor (Mechanism) Affective (Responding to a Phenomena)						
CO3	CO3 Construct Sketch and Practice projection of solids in various positions and true shape of sectioned solids. Cognitive (Apply) Various positions and true shape of sectioned solids. Psychomotor (Complex overt response) Affective (Responding to a Phenomena) CO4 Interpret, Sketch and Practice the development of lateral surfaces of simple and trupested solids Cognitive (Understand)									
CO4	Interpr lateral intersec	et, Sketch and surfaces of s tion of solids.	Practice the development of imple and truncated solids,	Cognitive (Understand) Psychomotor (Complex overt response) Affective (Responding to a Phenomena)						
CO5	Constru perspect	ict sketch a ive views of sim	nd practice isometric and apple and truncated solids.	Cognitive (Apply) Psychomotor (Complex overt response) Affective (Responding to a Phenomena)						
Objec	ctives:			(Responding to a Phenomona)						
* * COU	 to preparent to pr	are the student to c constraints such manufacturabilit are the student to are the student to ering practice NTENT	o design a system, component, or p h as economic, environmental, soc y, and sustainability o communicate effectively o use the techniques, skills, and me	process to meet desired needs within cial, political, ethical, health and odern engineering tools necessary for						
UNIT	LI INJ	RODUCTION	, FREE HAND SKETCHING	OF ENGG 12+6 hrs						
	OB	JECTS AND C	CONSTRUCTION OF PLANE (CURVE						
	Imp spec Pict in t thro Poly ellij con	ortance of grap cifications and co orial representat wo dimensional ough free hand sk ygons & curves ose, parabola an struction – draw	hics in engineering applications onventions as per SP 46-2003. ion of engineering objects – repro- lementia – need for multiple vio tetching of three dimensional objects used in engineering practice – me d hyperbola by eccentricity mething of tangents to the above curve	 use of drafting instruments – BIS esentation of three dimensional objects ews – developing visualization skills exts. thods of construction – construction of od – cycloidal and involute curves – s. Practice on basic tools of CAD 						

UNIT II	PROJECTION OF POINTS, LINES AND PLANE SURFACES	12+6 hrs
	General principles of orthographic projection – first angle projection – projections of points, straight lines located in the first quadrant – deter lengths of lines and their inclinations to the planes of projection – trac- polygonal surfaces and circular lamina inclined to both the planes of p practice on points and lines	layout of views – mination of true es – projection of rojection-CAD
UNIT III	PROJECTION OF SOLIDS AND SECTIONS OF SOLIDS	12+6 hrs
	Projection of simple solids like prism, pyramid, cylinder and cone where to one plane of projection – change of position & auxiliary projection of above solids in simple vertical positions by cutting plane inclined and perpendicular to the other and above solids in inclined position parallel to one reference plane – true shapes of sections-CAD practice	en the axis is inclined methods – sectioning to one reference plane n with cutting planes on solid models
UNIT IV	DEVELOPMENT OF SURFACES AND INTERSECTION OF SOLIDS	12+6 hrs
	Need for development of surfaces – development of lateral surfaces o solids – prisms, pyramids, cylinders and cones – development of above solids with square and circular cutouts perpendicular to their solids and curves of intersection –prism with cylinder, cylinder & cyl- with normal intersection of axes and with no offset-CAD practice on i	f simple and truncated ateral surfaces of the axes – intersection of inder, cone & cylinder ntersection of solids.
UNIT V	ISOMETRIC AND PERSPECTIVE PROJECTIONS	12+6 hrs
L = 30 hrs	Principles of isometric projection – isometric scale – isometric project truncated prisms, pyramids, cylinders and cones – principles of per projection of prisms, pyramids and cylinders by visual ray and van CAD practice on isometric view T = 0 hrs P=60 hrs Total = 90 hrs	tions of simple solids, spective projections – ishing point methods-
TEXT BC	OOKS	
1. Bł	natt, N.D, "Engineering Drawing", Charotar Publishing House, 46 th Editi	on-2003.
2. Na 2006 . 3. Di	atarajan,K.V, "A Textbook of Engineering Graphics", Dhanalakshm r. P.K. Srividhya, P. Pandiyaraj, "Engineering Graphics", PMU Publicat	Publishers, Chennai, ions, Vallam, 2013
REFERE	NCES	
1. Lu Ec 2. Ve	izadder and Duff, "Fundamentals of Engineering Drawing" Prentice Ha lition - 2001. enugopal,K. and Prabhu Raja, V., "Engineering Graphics", New Age	all of India PvtLtd, XI International(P) Ltd.,
20 3. Go	08. opalakrishnan.K.R,. "Engineering Drawing I & II", Subhas Publications	, 1998. 5
4. Sr E-REFER	RENCES	J.
1. <u>htt</u> 2. <u>htt</u>	tp://periyarnet/Econtent tp://nptel.ac.in/courses/112103019/	

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	3	2	3	1	1	2	3	3	3	
CO2	3	3	3	1	3	1	3	1	1	1	2	3	3	
CO3	3	3	3	1	3	1	3	1	1	1	2	3	3	
CO4	3	3	3	1	3	1	3	1	1	1	2	3	3	
CO5	3	3	3	1	3	1	3	1	1	1	2	3	3	
Total	15	15	15	6	15	6	15	5	5	6	11	15	15	

COUR	SE CO	DE	XCP207	L	Т	Р	С
COUR	SE NAI	ME	PROGRAMMING FOR PROBLEM SOLVING	0	0	1	1
			LABORATORY				
PRER	EQUIS	ITES	Basic Mathematics knowledge, Analytical, Logical skill	L	Т	Р	Η
С	Р	Α		0	0	2	2
1	0	0					

LEARNING OBJECTIVES

- Acquire knowledge about to solve basic problems by understanding basic concepts in C like operators, control statements etc.
- To develop modular, reusable and readable C Programs using the concepts like functions, arrays etc.
- Design and implement programs to store data in structures and files.

COURS	SE OUTCOMES	DOMAIN	LEVEL
CO1	Apply the concepts of variables, data types, operators and expressions.	Cognitive	Apply
CO2	Demonstrate the usage of Conditional and Unconditional statements.	Cognitive	Apply
CO3	Demonstrate the usage of functions and relate functions with respect to arrays and strings.	Cognitive	Apply
CO4	Implement the concept of pointers and structures.	Cognitive	Apply
CO5	Demonstrate the usage of files and Command Line Arguments.	Cognitive	Apply

S.NO	List of Experiments	COs
1	Program to display a Leave Letter as per proper format	CO1
2	i. Program for addition of two numbersii. Program to solve any mathematical formula.	CO1
3	Program to find greatest of 3 numbers using Branching Statements	CO2
4	Program to display divisible numbers between n1 and n2 using looping Statement	CO2
5	Program to search an array element in an array.	CO2

6	Program to find largest / smallest eleme	ent in an array.		CO2				
7	Program to perform string operations.			CO3				
8	Program to find area of a rectangle of a	given number use	e four function types.	CO3				
9	Programs to pass and receive array and	pointers using for	ar function types	CO3				
10	10 Programs using Recursion for finding factorial of a number							
11	Program to read and display student mark sheet of a student structures with variables							
12	Program to read and display student marks of a class using structures with arrays							
13	Program to create linked list using struc	tures with pointer	°S	CO4				
14	Program for copying contents of one fil	e to another file.		CO5				
15	Program using files to store and display	y student mark lis	t of a class using structures with	CO5				
	array							
	HOLDS	TUTORIAL	PRACTICAL	ТОТА				
	HOURS	0	30	L 30				

Mapping of CO with PO's

	P01	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS01	PSO2
CO 1	2	2	0	0	2	0	0	0	0	0	2	2	1	0
CO 2	2	2	0	0	2	0	0	0	0	0	2	2	1	0
CO 3	2	2	1	2	2	0	0	0	0	0	2	2	1	0
CO 4	2	2	1	2	2	0	0	0	0	0	2	2	1	0
CO 5	2	2	1	0	2	0	0	0	0	0	2	2	1	0
Total	10	10	3	4	10	0	0	0	0	0	10	10	5	0
Scaled Value	2	2	1	1	2	0	0	0	0	0	2	2	1	0

0- No relation

1- Low relation 2- Medium relation

3- High relation

COURSE	CODE	XAP208	L	Т	Р	С
COURSE	NAME	APPLIED PHYSICS FOR ENGINEERS	0	0	1	1
		LABORATORY				
C:P:A		0:2:0	L	Т	Р	Η
PREREQ	UISITE:	Basic Physics in HSC level	0	0	2	2
COURSE	OUTCOM	Domain		Level		
CO1	Determine	the significance of elasticity in engineering systems and	Cognitiv	e	Unders	tand
	technologic	al advances.	Psychom	notor	Mecha	nism
CO2	use and lo	cate basic applications of electromagnetic induction to	Cognitiv	e	Understand	
	technology.		Psychom	notor	Mecha	nism
CO3	Describe th	ne working principle and application of various lasers and	1 Cognitive Unders			tand
	fibre optics		Psychomotor Mechanis			

CO4	use p	hysics principles of 1	atest technology usin	ng semiconductor	Cognitive	Understand					
	device	28.			Psychomotor	Mechanism					
			LABORATO	<u>RY</u>							
1.	Forsional P wire.	endulum - determination	n of moment of inertia	and rigidity modulu	us of the given m	aterial of the					
2. I	Uniform Bending - Determination of the Young's Modulus of the material of the beam.										
3. Non-Uniform Bending - Determination of the Young's Modulus of the material of the beam.											
4.	4. Meter Bridge - Determination of specific resistance of the material of the wire.										
5.	5. Spectrometer - Determination of dispersive power of the give prism.										
6.	Spectromet	er - Determination of wa	avelength of various co	lours in Hg source	using grating.						
7.	Air wedge ·	- Determination of thick	ness of a given thin wi	re.							
8. I	Laser - Deto grating.	ermination of wavelengt	h of given laser source	and size of the give	en micro particle	using Laser					
9. I	Post office	Box - Determination of	band gap of a given se	miconductor.							
10. I	PN Junction	n Diode - Determination	of V-I characteristics	of the given diode.							
REFE	RENCE B	OOKS									
1. 2. 3.	Samir Ku Arora C.I UmayalS	mar Ghosh, "A text boo L., "Practical Physics", S undari AR., "Applied Ph	k of Advanced Practic 5. Chand & Company I nysics Laboratory Man	al Physics", New Co .td., New Delhi, 20 ual", PMU Press, T	entral Agency (P 13. 'hanjavur, 2012.) Ltd, 2008.					
		LECTURE	TUTORIAL	PRACTICAL	TOTAL	HOURS					

Mapping of CO's with POs

0

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	0	0	0	1	0	0	1
CO2	3	0	1	0	1	0	0	0	0	0	0	1
CO3	3	2	2	2	1	0	0	0	1	0	0	1
CO4	3	2	2	2	1	0	0	0	1	0	0	1
Total	12	6	7	6	4	0	0	0	3	0	0	5
Scaled value	3	2	2	2	1	0	0	0	1	0	0	1

0

30

30

SEMESTER – III

COU	RSE C	ODE	XPS301		L	Т	Р	C
COU	RSE N	AME	PROBABILITY AND STATISTICS		3	0	0	3
С	Р	Α			L	Т	Р	Н
3	0	0			3	0	0	3
PRE	REOUI	SITE:Ni	1		-	-	-	-
Lear	ning Ol	viectives						
1	. Appi	eciate th	e importance of probability and statistics in computing a	and research.				
2	. Deve	lop skill	s in presenting quantitative data using appropriate diagra	ams, tabulations a	nd su	mma	ries	and
	to us	e approp	riate statistical method in the analysis of simple datasets	S.				
3	. Inter	pret and	clearly present output from statistical analyses in a clear	concise and unde	rstand	lable	e	
	manı	ner.						
4	. The	main obj	ective of this course is to provide students with the foun	dations of probabi	lities	and		
	statis	tical ana	lysis mostly used in varied applications in engineering a	and science like di	sease	moc	eling	5,
	clima	ate predic	ction and computer networks etc.					
Cour	se outc	omes:		Domain	Level			
CO1	Exp	lain cond	litional probability, independent events; find expected	Cognitive	Und	ersta	nd	
	valu	es and M	oments of Discrete random variables with properties.	C				
CO2	Find	l distribu	tion function, Marginal density function, conditional	Cognitive	Rem	emb	er	
	dens	ity functi	on, Define density function of conditional distribution					
	func	tions nor	mal, exponential and gamma distributions.					
CO3	Find	measu	res of central tendency, statistical parameters of	Cognitive	Rem	emb	er	
	Bino	mial, Po	isson and Normal, correlation, regression.					
	Ranl	c Correla	tion coefficient of two variables.					
CO4	Exp	l ain larg	e sample test for single proportion, difference of	Cognitive	Und	ersta	nd	
	prop	ortion, s	ingle mean, difference of means and difference of					
	stand	lard devi	ations with simple problems.					
CO5	Exp	l ain smal	l sample test for single mean, difference of mean and	Cognitive	Und	ersta	nd	
	corre	elation co	befficients, variance test, chi-square test with simple					
	l prob	lems						

UNIT I: Basic Probability	9
Probability spaces, conditional probability, independence, Discrete random variables, Inde	pendent random
variables, Poisson approximation to the binomial distribution, sums of independent random varial	bles; Expectation
of Discrete Random Variables, Moments, Variance of a sum.	
UNIT II: Continuous Probability Distributions & Bivariate Distributions	9
Continuous random variables and their properties, distribution functions and densities, normal,	exponential and
gamma densities. Bivariate distributions and their properties, conditional densities.	
UNIT III: Basic Statistics	9
Probability distributions: Binomial, Poisson and normal - evaluation of statistical parameters for t	hese three
distributions, Correlation and regression – Rank correlation.	
UNIT IV: Test for Large Sample	9
Test of significance: large sample test for single proportion, difference of proportions, single me	an, difference of
means, and difference of standard deviations.	
UNIT V: Test for Small Sample	9

Test for single mean, difference of means and correlation coefficients, test for ratio of variances - Chi-square test for goodness of fit and independence of attributes.

LECTURE	TUTORIAL	TOTAL
45	-	45

TEXTBOOKS

1. Veerarajan T., "Probability, Statistics and Random Processes", Tata McGraw-Hill, New Delhi, 2010.

2. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 43rd Edition, 2015.

REFERENCES

- 1. Erwin Kreyszig, "Advanced Engineering Mathematics", 9th Edition, John Wiley & Sons, 2006.
- 2. P. G. Hoel, S. C. Port and C. J. Stone, "Introduction to Probability Theory", Universal Book Stall, 2003 (Reprint).
- 3. S. Ross, "A First Course in Probability", 6th Ed., Pearson Education India, 2002.
- 4. W. Feller, "An Introduction to Probability Theory and its Applications", Vol. 1, 3rd Ed., Wiley, 1968.
- 5. N.P. Bali and Manish Goyal, "A text book of Engineering Mathematics", Laxmi Publications, Reprint, 2010.

E – REFERENCE - (Nptel)

Probability and Statistics by Prof.Someshkumar, Department of Mathematics, IIT Kharagpur. (http://nptel.ac.in/noc/noc_courselist.php)

Mapping of COs and GAs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2	1	0	0	0	0	0	1	1	0	1
CO 2	3	2	1	0	0	0	0	0	1	1	0	1
CO 3	3	2	1	1	0	0	0	0	1	1	0	1
CO 4	3	2	1	1	1	1	0	0	1	1	1	1
CO 5	3	2	1	1	1	1	1	0	1	1	1	1
Total	15	10	5	3	2	2	1	0	5	5	2	5
Scaled value	3	2	1	1	1	1	1	0	1	1	1	1

 $1 \text{-} 5 \rightarrow 1, \quad 6 \text{-} 10 \rightarrow 2, \quad 11 \text{-} 15 \rightarrow 3$

0 - No Relation, 1 - Low Relation, 2 - Medium Relation, 3 - High Relation

Semester :		:	III	L	Т	Р	С	
Course Code :			:	XCS302	3	1	0	4
Co	urse	Name	:	DIGITAL ELECTRONICS				
Prerequisite			:	Nil				
С	Р	Α			L	Т	Р	Н
3	0	0			3	1	0	4
	Co	urse Ob	ojectives	5				
•		Recall	and Rec	ognize number system conversions				

Recall and Recognize number system conversions

- • Demonstrate the operation of logic gates, Boolean algebra simplification and karnaugh map reduction
- • Describe, Illustrate and Analyze Combinational, Sequential logic circuits and memory devices

Course Outcome: After the completion of the course, students will be able to Domain Level **Describe**the numerical values in various number systems and perform Cognitive Understand **CO1** number conversions between different number systems. CO2 **Demonstrate** the operation of logic gates, Boolean algebra simplification Cognitive Apply and karnaugh map reduction Identify, Analyze and Design the combinational and sequential circuits CO3 Cognitive Analyze Analyze and Design the sequential digital circuits like flip-flops, **CO4** Cognitive Analyze registers, counters Explain the nomenclature and technology in the area of memory devices **CO5** Cognitive Understand

COURSE CONTENT

UNIT I NUMBER SYSTEMS

Review of Number Systems– Binary Arithmetic – Binary addition – Unsigned and Signed numbers – one's and two's complements of Binary numbers – Arithmetic operations with signed numbers – Number system conversions – Digital codes.

UNIT II BOOLEAN ALGEBRA & LOGIC SIMPLIFICATION

Logic gates – AND, OR,NOT,NAND, NOR, XOR and XNOR Gates – Laws and Rules of Boolean algebra – DeMorgan's Theorems – Standard forms of Booleans Expressions – Sum of products – Product of sums – Boolean Expression and Truth Tables – Boolean Expression Minimization using Boolean laws – The kamaugh Map – Sum of Products and Products of Sum Minimization.

UNIT III COMBINATIONAL LOGIC

Combinational circuits – Analysis and design procedures – Circuits for arithmetic operations - Code conversion - Decoders and encoders - Multiplexers and Demultiplexers – Introduction to Hardware Description Language (HDL) - HDL for combinational circuits.

UNIT IV SEQUENTIAL LOGIC

SynchronousSequential Logic

Sequential circuits – Flip flops – Analysis and design procedures - State reduction and state assignment - Shift registers – Counters - HDL for sequential logic circuits.

Asynchronous Sequential Logic

Analysis and design of asynchronous sequential circuits - Reduction of state and flow tables - Race-free state assignment - Hazards.

UNIT V MEMORY AND PROGRAMMABLE LOGIC

RAM and ROM- Memory Decoding – Error Detection and Correction – Programmable Logic Array – Programmable Array Logic – Sequential Programmable Devices – Application Specific Integrated Circuits.

L	Т	Р	Total
45	15	0	60

TEXT BOOKS

- 1. M.Morris Mano, "Digital Design", 6th edition, 2018, Pearson Education.
- 2. Peter Norton. "Introduction to Computers". 6th Edition, Tata Mc Graw Hill, New Delhi, 2006.
- 3. Thomas L.Floyd and R.P.Jain, "digital Fundamentals", 8thEdition,Pearson Education,2007.

REFERENCE BOOKS

- 1. Charles H.Roth, Jr. "Fundamentals of Logic Design", 6th Edition, Jaico Publishing House.
- 2. Raj kamal, "Digital System: Principles and Design", 1st Edition, Pearson Educaion, 2007.
- 3. Albert Paul Malvino, Donald P.Leech,"Digital Principles and Applications", 6th Edition, Mc Graw

Publishers, 2007.

4. Donald D.Givone, "Digital Principles and Design", Tata McGraw-Hill, 2003.

E-REFERENCES

Digital System Design, Dr.S.Srinivasan, IIT Madras
 <u>www.deploy.virtual-labs.ac.in/labs/cse15</u>

	P01	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	9 O J	PO 10	PO 11	PO 12	PS01	PSO2
CO 1	3	2	1	0	0	1	0	0	1	0	3	2	1	0
CO 2	0	2	1	0	0	0	0	0	0	1	0	2	1	0
CO 3	1	3	2	0	1	1	0	1	0	2	1	3	2	0
CO 4	3	1	0	0	0	2	0	0	0	1	3	1	0	0
CO 5	0	3	0	2	0	0	0	0	1	1	0	3	0	2
Total	7	11	4	2	1	4	0	1	2	5	7	11	4	2
Scaled Value	2	3	1	1	1	1	0	1	1	1	2	3	1	1
Note:	Total			0		1-5		6-10					1	1-15
	Scaled value			0		1		2						3
	Rel	ation		No		Low		Medium					I	High

SEN	MES '	TER		:	III											
CO	URS	E CO	DE	:	XCS	5303										
CO	URS	E NA	ME	:	DAT	FA STRU	CTUR	ES & Al	LGORI	THMS						
PRI	ERE	QUIS	ITE	:	PRO	ROGRAMMING FOR PROBLEM SOLVING										
	L	Т	Р	С			С	Р	А			L	Т	Р	Η	
	3	0	0	3			3	0	0			3	0	0	3	
Cou	irse	Objec	tives													
•	To iı	npart	the basi	c con	cepts	of data st	ructures	and alg	orithms							
•	To u	nderst	tand bas	ic co	ncepts	s about lir	ear data	structur	es stack	, queue a	nd list	S				
•	To u	nders	tand bas	ic co	ncepts	s about no	onlinear	data stru	ctures tr	ees and g	graphs					
Cou able	Course Outcome: After the completion of the course, students will be able toDomain C or P or ALevel								vel							
CO	1 (2	Obser algorit	ve the thms	con	cept	of data	structu	res and	analys	sis of	Cogn	itive		Unde	erstan	d
CO	2 (F	C lassi proble	fy and (ms	Choo	ose th	ne linear (data stru	ctures f	or solvi	ng the	Cogn	itive		Unde	rstan	d

CO3															
	Classolv	ssify and Choose the nonlinear data structures trees for Cognitive Understand Ving the problems													
CO4	Clas solv	ssify and Choose the nonlinear data structures graphs for Cognitive Understand													
CO5	Stat	te and Illustrate appropriate abstract data types and Cognitive Understand													
COUL		CONTENT													
			0												
UNII	1	Proliminarias of algorithm Algorithm analysis and complexity. Data structure. Definition	9												
		types of data structures.													
UNIT	II	LINEAR DATA STRUCTURE	9												
		List – Representation of List – Stacks, Representation of stack using array and linked list													
	TTT	– Queue, Representation of queue using array and linked list	0												
UNIT	III	NON LINEAR DATA STRUCTURE - TREES	9												
		Basic Tree concept – Operations on Binary trees – Tree traversals – Binary search tree, Implementation – AVL tree – Application.													
UNIT	IV	NÔN LINEAR DATA STRUCTURE - GRAPHS	9												
		Basic terminology – Representation of Graph- Graph traversal – Graph Algorithms.													
UNIT	V	ALGORITHM DESIGN TECHNIQUES	9												
		Divide and Conquer algorithms, Dynamic Programming, Greedy algorithms, Backtracking and Branch & bound.													
			Total												
			45												
TEXT	BOC	OKS													
2.	Mar	rk Allen Weiss "Data Structures and Algorithm Analysis in C" Second Edition Pearson Educ													
3. 4.	200 Ellis Pub Jear Pub	7. s Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, "Computer Algorithms", Ga dications Pvt. Ltd., 2002. n-Paul Tremblay & Paul G. "An Introduction to Data Structures with Applications". Sor disher-Tata McGraw Hill.	cation, Ilgotia renson												
3. 4. REFE	200 Ellis Pub Jear Pub	7. s Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, "Computer Algorithms", Ga blications Pvt. Ltd., 2002. n-Paul Tremblay & Paul G. "An Introduction to Data Structures with Applications". Som blisher-Tata McGraw Hill. CE BOOKS	cation, Ilgotia renson												
3. 4. REFE 1.	2007 Ellis Pub Jear Pub CREN	 7. rs Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, "Computer Algorithms", Ga blications Pvt. Ltd., 2002. n-Paul Tremblay & Paul G. "An Introduction to Data Structures with Applications". Sorblisher-Tata McGraw Hill. CE BOOKS 7. Aho, J.E. Hopcroft and J.D. Ullman "Data Structures and Algorithms" Pearson Education I 	cation, Ilgotia renson Delhi,												
3. 4. REFE 1.	200 [°] Ellis Pub Jear Pub CREN A.V 200	 7. s Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, "Computer Algorithms", Ga blications Pvt. Ltd., 2002. n-Paul Tremblay & Paul G. "An Introduction to Data Structures with Applications". Sordisher-Tata McGraw Hill. CE BOOKS 7. Aho, J.E. Hopcroft and J.D. Ullman "Data Structures and Algorithms" Pearson Education I 2 a Structures and Algorithms 2008 G. A. V. Pai, TMH 	cation, algotia renson Delhi,												
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3. 4. REFE 1. 2. E-REI 1. 2. 3. 4. Mapp	200 Ellis Pub Jear Pub CREN A.V 200 Data FERE WW WW WW	 7. s Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, "Computer Algorithms", Ga dications Pvt. Ltd., 2002. n-Paul Tremblay & Paul G. "An Introduction to Data Structures with Applications". Sordisher-Tata McGraw Hill. CE BOOKS 7. Aho, J.E. Hopcroft and J.D. Ullman "Data Structures and Algorithms" Pearson Education I 2 a Structures and Algorithms, 2008, G. A. V. Pai, TMH ENCES w.tutorialspoint.com w.nptel.com w.virtuallab.ac.in w.mhhe.com/engcs/compsci/forouzan/ 	cation, Ilgotia renson Delhi,												
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CO 3		3	1	1	1	1	0	0	0	1	0	1	1	3	2
----------	-------	------------	------	----	---	-----	---	------	----	------	---	---	---	----	---
CO 4		3	2	1	2	1	0	0	0	1	0	1	1	3	2
CO 5		3	1	1	2	0	0	0	0	1	0	1	2	3	2
Total		15	7	5	7	4	0	0	0	4	0	5	6	15	8
Scaled V	Value	3	2	1	2	1	0	0	0	1	0	1	2	3	2
Not	e:	Т	otal	0		1-5	5	6-10	C	11-1	5				
	Se	caled valu	e	0		1		2		3					
		Relat	ion	No		Lov	V	Medi	um	Hig	h				

SEN	AEST	ΓER			:	II	III											
CO	URS	E CO	DE		:	X	CS304											
CO	URS	E NA	ME		:	0	BJECT ()RIENT	ED PR	OGRA	MMI	١G						
PRI	ERE	QUIS	ITE		:	PI	ROGRAN	MMING	FOR F	ROBL	EM S	OL	VINC	r T				
	L	Т	Р	С				С	Р	Α				L	Т	Р	Н	
	3	0	0	3				3	0	0				3	0	0	3	
Cou	rse ()bjec	tives		•									•		•		
	• 7	o exp	plore the	e Ob	oject	Or	iented Pro	ogrammi	ng conc	epts and	l Java							
Cou	rse O	Dutcome: After the completion of the course, students will be able to Domain Leve												vel				
CO	1 T	o un	derstand	the	bas	ic c	concepts c	of OOP.					С	ogniti	ve	U	Inders	tand
CO	2 T	o un	derstand	the	e con	iceț	ot of Java.						С	ogniti	ve	A	pply	
CO	3 Т	'o app	ply the c	onc	epts	of	Inheritan	ce and P	ackages	•			С	ogniti	ve	A	pply	
CO	4 T	'o app	ply the c	onc	epts	of	Applets a	nd Swin	g.				С	ogniti	ve	A	pply	
CO	O5 To create a Database Connectivity and Networking. Cognitive Apply																	
CO	URS	E CO	NTEN	Г														
UN	IT I]	INTRO	DU	СТІ	ON	TO OO	Р										9
		C A)bject (Abstract	Orie data	entec a typ	ł F bes,	Programm ADT imp	ing, Cl plementa	asses antion- C	und obj onstruct	ects, ors an	Enc d de	capsu estruc	latior tors,	i, In Fund	herita ction	nce, and	
		0	perator	ove	rloa	ding	g, Overrid	ling, inh	eritance	, functio	ons and	l po	lymo	rphis	m.			
UN	IT II	Ι	NTROI	DU(CTI	ON	TO JAV	Ά										9
		II S S S	ntroduct tatemen pecial S tring M	tion Its, Strin odif	to . Con Ig O ficat	Jav ntro per ion	a, Data 5 ol Flow S ations; Ch , String B	Types in Statemen naracter uffer	1 Java, its, Arra Extracti	Variable ys and on; Strii	es in String ng Co	Java gs: A mpa	, Op Array: rison	eratoi s; Sti ; Sea	rs and ring l rchin	d Cor Hand g Stri	ntrol ling; ngs;	
UN	T II	I	INHERITANCE AND PACKAGES										9					
		Inheritance, Package and Interface, Types of Relationships, Significance of Generalization, Inheritance in Java, Access Specifiers, The Abstract Class; Packages, defining a Package, Classpath, Interface, Defining an Interface, Some Uses of Interfaces, Interfaces versus Abstract Classes. Exception Handling in Java, Thread.																

UNIT IV	APPLETS AND SWING													9
	The Applet C Painting the AWT (Abs Foundation Example; Sv	Class; ' Apple tract V Class ving C	The Ap t; User Windov (JFC); ompon	oplet a Inter wing Swi ents.	and HTI faces fo Toolkit ng Pac	ML; L or App t) Con kages	ife Cyc olet; Ad ntrols, and C	le of a lding (Swing Classes	n Appl Compoi g: Conc ; Worl	et; The nents to epts co cing w	e graph o user of Swa vith Swa	ics Cla interfa ing; J wing-	ass; ace; ava An	
UNIT V	DATABASI	E CON	INEC	FIVI	FY ANI	D NEI	WOR	KING						9
	Java Data Base Connectivity, Java Data Base Connectivity; Database Management; Mechanism for connecting to a back end database; Loading the ODBC driver, RMI, CORBA and Java Beans,Servlet,JSP - Web Application,Web Architecture.													
										Ι]]	Γ	P	Total
										4	5 ()	0	45
TEXT BOO	OKS													
 Java Schi Cay 2013 Java 	ldt, 11 th Editic S. Horstman 3. 8 Black Boo	n, Mc n, Gar k, 8 th e	Graw I y corne	, Elev Hill Ed ell, — D.T.	ducation Core Ja	n, 2019 ava Vo al Serv	9, ISBN olume - vices, IS	N: 978- -I Fun SBN-1	126044 dament 3: 978-	40232. alsl, 91 935119	th Edit 97584	ion, Pi	rentice	e Hall,
REFEREN	CE BOOKS													
Elev 2. Paul 3. Stev 4. Tim Edu	enth Edition, Deitel, Harvo en Holzner, J othy Budd, U cation, 2000.	ISBN ey Dei ava 2 I nderst	-13:978 tel, Jav Black b anding	8-0134 a SE 2 book, 1 Objec	4743350 8 for pr Dreamt ct-orien	6 ogram ech pr ted pro	mers, 3 ess, 201 ogramm	ord Edi 11. ning w	tion, Pe ith Java	earson, 1, Upda	2015. ated Ec	lition,	Pearso	on
E-REFERE	NCES													
https://java-i	itd.vlabs.ac.ii	n/List%	620of%	620ex	perimei	nts.htn	nl							
Monning of	CO with PO	/java/												
	P01	P02	PO 3	PO 4	PO 5	9 Od	PO 7	PO 8	6 Od	PO 1(PO 11	PO 13	PS01	PS02
CO 1	3	3	3	3	3	2	2	2	1	0	0	2	1	1
CO 2	3	3	3	3	3	2	2	2	1	0	0	2	1	1
CO 3	2	2	2	3	3	3	2	2	1	0	0	1	1	1
CO 4	2	2	2	2	0	0	0	0	0	0	0	0	1	1
CO 5	3	2	3	3	3	0	2	2	2	0	0	0	1	1
Total	13	12	13	14	12	7	8	8	5	0	0	5	5	5
Scaled Val	ue 3	3	3	3	3	2	2	2	1	0	0	1	1	1
														1
Note:	Te	otal	0		1-5		6-1	0	11-1	5				
ŀ	Scaled va	lue	0		1		2		3					
	Relat	ion	No		Lov	V	Medi	um	Hig	h				

COURS	E CODE	XCS305				L	Τ	Р	C	
COURS	E NAME	SIGNALS	S AND SYSTEMS			3	1	0	4	
C:P:A		3:0:0				L	Т	Р	Н	
						3	1	0	4	
PRERE	QUISITE	S DIGITAI	L SIGNAL PROCES	SSING						
COURS	E OUTCO	OMES			Don	nain		Lev	'el	
CO1	Describe	e and classify the sign	als & systems		Cogni	itive	U	Understand		
CO2	Find and	analyze the properti	es of continuous time	e signal	Cogni	itive	A	nalyze		
	using Fo	ourier and Laplace Tr	ansform,	C	U			2		
CO3	Find and	l solve the continuous	s time LTI system per	formance of	Cogni	itive	A	pply		
	Fourier a	and Laplace Transform	n.		U			11 2		
CO4	Find, a	oply and analyze the	properties of discrete	time signal	Cogni	itive	A	nalyze		
	using Fo	ourier and Z Transform	m.	U	0			5		
CO5	Explain	Solve and determin	e the performance of	Discrete	Cogni	itive	A	pply		
	Time L1	T system in Fourier a	nd Z Transform.							
UNIT I	- CLASS	IFICATION OF SIG	SNALS AND SYSTE	EMS					9	
Continuc	ous time s	ignals (CT signals) -	Discrete time signal	ls (DT signals)) - Ste	ep, Ra	mp,	Pulse,I	mpulse,	
Sinusoid	al, Expor	nential, Classification	n of CT and DT	signals - Pe	eriodic	c &	Ape	riodic	signals,	
Determir	nistic& Ra	ndom signals, Energy	y & Power signals -	CT systems an	d DT	syster	ns C	Classific	ation of	
systems	– Static &	k Dynamic, Linear &	& Nonlinear, Time-v	ariant &Time-	invari	ant, C	lausa	al& No	ncausal,	
Stable &	Unstable.									
LINIT II	ANATX	SIS OF CONTINU	OUS TIME SICNAL	1					0	
Equipion	- AILALI	usis spectrum of Cor	tinuous Time (CT) a	u ignala Equipion	and I	oplaa	о Т <i>т</i>	noform	va in CT	
Fourier a	series anal	ysis-spectrum of Con	itiliuous Tille (CT) s	ignals- rounei	and L	aprac		ansiorm	SIICI	
		A D TIME INVADIA		C TIME CVC	FEMG	I			0	
		AK TIME INVAKIA		5 1 IIVIE 51 51				1 5	9	
Different	hal Equati	on-Block diagram re	presentation-impulse	e response, con	nvolut	ion in	tegra	als-Fou	mer and	
Laplace	transforms	in Analysis of CI sy	stems.							
UNIT IV	/ - ANAL	YSIS OF DISCRET	E TIME SIGNALS						9	
Baseband	d Samplin	g of CT signals- Al	iasing, Reconstruction	on of CT signa	al fron	n DT	sign	nals DT	FT and	
propertie	s, Z-transf	form & properties.								
UNIT V	- LINEA	R TIME INVARIAN	NT-DISCRETE TIM	IE SYSTEMS					9	
Difference	ce Equatio	ns-Block diagram rep	presentation-Impulse	response - Cor	nvoluti	on su	m- D	Discrete	Fourier	
and Z Transform Analysis of Recursive & Non-Recursive systems.										
		LECTURE	TUTORIAL	PRACTIC	CAL		,	TOTAI	La	
HOU	URS	45	0	0				45		
TEXT B	OOKS									
1. Ram	esh Babu	"Signals And System	s"Scitech Publication	ns (India) Pvt I	_td.201	18. IS	BN-	10:		
9385	983407 I	SBN-13.978-938598	3405		,20.	, 10				
		Dec. "Cincels and C			T'11 D	1.1	•	2012		

- P.Ramakrishna Rao, "Signals and Systems" 2nd Edition, Tata McGraw Hill Publications, 2013.
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- 2. <u>http://tutorialspoint.com/signals_and_systems/index.htm</u>
- 3. <u>http://ocw.mit.edu/resources/res-6-007-signals-and-systems-spring-2011/lecture-notes/</u>

Mapping of CO with PO's

	P01	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS01	PSO2
CO 1	2	3	2	3	2	1	0	0	2	1	0	2	3	2
CO 2	2	3	2	3	2	1	0	0	2	1	0	1	3	2
CO 3	1	3	3	2	1	1	0	0	1	1	0	2	3	2
CO 4	2	2	2	2	2	2	0	0	1	1	0	1	3	2
CO 5	2	3	3	1	1	1	0	0	1	1	0	1	3	2
Total	9	14	12	11	8	6	0	0	7	5	0	7	15	10
Scaled Value	2	3	3	3	2	2	0	0	2	1	0	2	3	2

 $1-5 \rightarrow 1, \qquad 6-10 \rightarrow 2, \qquad 11-15 \rightarrow 3$

0 - No Relation, 1 - Low Relation, 2- Medium Relation, 3- High Relation

COURSE	E CODE	XUM306		L	Т		Р	С		
COURSE	ENAME	ENTREPRENEURSHIP DEVELOPMENT		2	0		0	2		
PREREC	DUISITE:	-		L	Т	Р	SS	Н		
C:P:A		2.7:0:0.3		2	0	0	1	2		
CO1	Recognise a	and describe the role of innovation and motivation for an r.	Cogni	tive	U	nde	rstand			
CO2 Self-assess and appraise your entrepreneurship interest with your Cognitive Evalu- chosen entrepreneur.										
CO3 Outline the importance of generation of new ideas for Cognitive Analyst entrepreneurship and illustrate market assessment										
CO4	Explain the business mo	competition in business and sketch/demonstrate/comply odel for dealing with competition.	Cogni	tive	U	nde	rstand			
CO5	Describe a business and	nd Explain venture creation and launching of small d its management.	Cogni	tive	U	nde	rstand			
CO6	Describe a opportunitie	and Discuss various government policies and global es for Entrepreneurship Development	Cogni	tive	U	nde	rstand			
UNIT I-	INNOVATI	ON AND ENTREPRENEURSHIP					5 hours			
Definition	n of Innovati	on. Creativity and Entrepreneurship: role of innovation i	in entre	eprene	urshi	p				
developm of Family	ent(2)- Entre and Society;	preneurial motivation (1)-Competencies and traits of an en Entrepreneurship as a career and its role in national develop	trepren oment (eur (1 1))-Ro	le				
UNIT II -	- SELF ASS	ESSMENT OF ENTREPRENEURIAL INCLININATIO	DN				4 hours			
Self-asses	sment of en	trepreneurial inclination (1)-Presentation by students on the	neir ent	repre	neuri	al				
inclination	n rating (2)-C	Case study of successful entrepreneurs (1)		_						
UNIT III	- NEW IDI	EA GENERATION TO MARKET ASSESSMENT					9 hou	irs		
Importance	e of Idea g	eneration-filtering-refinement (1)-opportunity recognition	(1)- De	scrip	tion of	of				
chosen id	lea - value p	proposition, customer-problem-Solution statement) (1)-ber	nefits; c	levelo	pme	nt				
status; IP	ownership (1)-Market Validation- Technology/ user/decision makers/	partners	s (1)-	mark	et				
need; seg	mentation (1	1)-market TAM,SAM and SOM (1)-case study on market	et segm	nentat	ion b	y				
popular c	ompanies (1)									
UNIT IV- CUSTOMER – COMPETITION- BUSINESS MODEL								irs		
Customer-Target primary customer research, Decision making unit/ process-Beach head market; Cost										
of Custor	mer Acquisi	tion (2)-Competition- comparative analysis, competitive	advan	tages	-; (2)-				
BUSINESS	MODEL (1) -FI	CDEATION AND LAUNCHING OF SMALL PUST		AND	тт	C	0 hay	110		
MANAG	EMENT	CREATION AND LAUNCHING OF SMALL BUSI	UNE 33	AND	, 11	o	9 NOL	115		
New ente	erprise creat	ion - organizational and legal matters (1)-Operational j	plan (1)-Sale	es an	d				
distribution plan (1)-Accounting (1)-Team recruitment and management (1)-Fund raising and										
managem	management (1)-Profile of a startup – case studies (2)									

UNIT VI- GOVERNMENT INITIATIVES AND GLOBAL OPPORTUNITIES	9 hour
Incubators and accelerators - capacity building (2)-Startup policies- Startup India (2)-Support for MSME; GeMPortal(2) Funding–national and international sources(2)-Bilateral programmes by Govt. of India -Global reach for promoting cross-cultural entrepreneurship (1)	
Total	45 Hours
References	in not
 A.F.Atuna, Lecture Notes on Entrepreneursing Development, available as softcopy (a) www.ora Thomas W. Zimmerer, Norman M. Scarborough, "Essentials of Entrepreneurship and Small Management", Pearson; 3rd edition, 2001. 	Business
2 Jahn Dymett "Introducing Medicating" Onen Tayt Dealy sysilah	de a

- http://soir.bccampus.ca:8001/bcc/file/ddbe3343-9/96-4801-a0cb-7af7b02e3191/1/Core%20Concepts%20of%20Marketing.pdf
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- 5. Alexander Osterwalder and Yves Pigneur, "Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers", Wiley; 1st edition, 2010.
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CO/GA	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	0	0	0	0	0	2	0	0	0	0	0
CO2	0	0	0	0	0	0	0	0	0	0	0	2
CO3	1	3	2	1	0	0	1	0	0	0	0	0
CO4	0	2	0	1	0	0	0	1	0	0	0	0
CO5	0	0	0	0	0	0	0	0	1	0	3	0
CO6	0	0	0	2	0	0	0	0	0	0	0	3
Original	4	5	2	4	0	0	3	1	1	0	3	5
Scaled	1	1	1	1	0	0	1	1	1	0	1	1

Mapping of CO with GAs

COURS	SE CODE	XUM307		L	Т	Р	C	
COURS	2	1	0	3				
PRE-R	EQUISITES	UNIVERSAL HUMAN VALUES-I (DESIRABLE)	L	Т	Р	Н	
C:P:A=	= 3:0:0			3	0	0	3	
CO1	CO1Explore about the need of value educationCognit							
CO2	CO2 Interpret self and body needs and responses to ensure harmony within self Cognit							

CO3	Explore the harmony in the family and society	Cognitive	Understand
CO4	Explore about the harmony in the nature/existence	Cognitive	Understand
CO5	Discuss about the holistic understanding	Cognitive	Understand

1. COURSES ON HUMAN VALUES

During the Induction Program, students would get an initial exposure to human values through Universal Human Values-I. This exposure is to be augmented by this compulsory full semester foundation course.

Objective

This introductory course input is intended:

- 1. To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspiration so fall human beings.
- 2. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
- 3. To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature.

Thus, this course is intended to provide a much needed orientation input in value education to the young enquiring minds.

Salient Features of the Course

The salient features of this course are:

- 1. It presents a universal approach to value education by developing the right understanding of reality (i.e. a worldview of the reality "as it is") through the process of self-exploration.
- 2. The whole course is presented in the form of a dialogue whereby a set of proposals about various aspects of the reality are presented and the students are encouraged to self-explore the proposals by verifying them on the basis of their natural acceptance within oneself and validate experientially in living.
- 3. The prime focus throughout the course is toward affecting a qualitative transformation in the life of the student rather than just a transfer of information.
- 4. While introducing the holistic world view and it simplications, a critical appraisal of the prevailing notions is also made to enable the students discern the difference on their own right.

Course Methodology

1. The methodology of this course is explorational and thus universally adaptable. It involves a systematic and rational study of the human being vis-à-vis the rest of existence.

- 2. The course is in the form of 28lectures (discussions) and14 practice sessions.
- 3. It is free from any dogma or value prescriptions.
- 4. It is a process of self-investigation and self-exploration, and not of giving sermons. Whatever is found as truth or reality is stated as a proposal and the students are facilitated to verify it in their own right, based on their Natural Acceptance and subsequent Experiential Validation – the whole existence is the lab and every activity is a source of reflection.
- 5. This process of self-exploration takes the form of a dialogue between the teacher and the students to begin with, and then to continue within the student in every activity, leading to continuous self-evolution.
- 6. This self-exploration also enables them to critically evaluate their pre-conditionings and present beliefs.

2. COURSE TOPICS

The course has 28 lectures and 14 tutorials in 5 modules. The lectures and tutorials are of 1-hour duration. Tutorial sessions are to be used to explore and practice what has been proposed during the lecture sessions.

The Teacher's Manual provides the outline for lectures as well as practice sessions. The teacher is expected to present the issues to be discussed as propositions and encourage the students to have a dialogue.

The syllabus for the lectures and practice sessions is given below:

Module 1 – Introduction to Value Education (6 lectures and 3 tutorials for practice session)

Lecture1: Understanding Value Education

Lecture2: Self-exploration as the Process for Value Education

 Tutorial 1: Practice Session PS1
 Sharing about Oneself

Lecture3: Continuous Happiness and Prosperity- the Basic Human Aspirations

Lecture 4: Right Understanding, Relationship and Physical Facility

Tutorial 2: PracticeSessionPS2Exploring Human Consciousness

Lecture 5: Happiness and Prosperity– Current Scenario **Lecture 6:** Method to Fulfill the Basic Human Aspirations

 Tutorial 3: Practice Session PS3
 Exploring Natural Acceptance

Expected outcome:

The students start exploring themselves: get comfortable with each other and with the teacher; they start appreciating the need and relevance for the course.

The students start finding that technical education without study of human values can generate more problems than solutions. They also start feeling that lack of understanding of human values is the root cause of most of the present-day problems; and a sustained solution could emerge only through understanding of value-based living. Any solution brought out through fear, temptation of dogma will not be sustainable.

The students are able to see that verification on the basic of natural acceptance and experiential validation through living is the only way to verify right or wrong, and referring to any external source like text or instrument or any other person cannot enable them to verify with authenticity; it will only develop assumptions.

The students are able to see that their practice in living is not in harmony with their natural acceptance most of the time, and all they need to do is to refer to their natural acceptance to overcome this disharmony.

The students are able to see that lack of right understanding leading to lack of relationship is the major cause of problems in their family and not the lack of physical facility in most of the cases, while they have given higher priority to earning of physical facility in their life giving less value to or even ignoring relationships and not being aware that right understanding is the most important requirement for any human being.

Module 2 – Harmony in the Human Being (6 lectures and 3 tutorials for practice session)Lecture7: Understanding Human being as the Co-existence of the Self and the BodyLecture8: Distinguishing between the Needs of the Self and the BodyTutorial 4: Practice Session PS4 Exploring the difference of Needs of Self and BodyLecture9: The Body as an Instrument of the SelfLecture10: Understanding Harmony in the SelfLecture11: Harmony of the Self with the BodyLecture12: Programme to ensure self-regulation and HealthTutorial 6: Practice Session PS6Exploring Harmony of Self with the Body

Expected outcome:

The students are able to see that they can enlist their desires and the desires are not vague. Also they are able to relate their desires to 'I' and 'Body' distinctly. If any desire appears related to both, they are able to see that the feeling is related to I while the physical facility is related to the body. They are also able to see that 'I' and Body are two realities, and most of their desires are related to 'I' and not body, while their efforts are mostly centered on the fulfillment of the needs of the body assuming that it will meet the needs of 'I' too.

The students are able to see that all physical facility they are required for a limited time in a limited quantity. Also they are able to see that in case of feelings, they want continuity of the naturally acceptable feelings and they do not want feelings which are not naturally acceptable even for a single moment.

The students are able to see that activities like understanding, desire, though and selection are the activities of 'I' only the activities like breathing, palpitation of different parts of the body are fully the activities of the body with the acceptance of 'I' while the activities they do with their sense organs like hearing through ears, seeing through eyes, sensing through touch, tasting through tongue and smelling through nose or the activities they do with their work organs like hands, legs etc. are such activities that require the participation of both 'I' and body.

The students become aware of their activities of 'I' and start finding their focus of attention at different moments. Also they are able to see that most of their desires are coming from outside (through preconditioning or sensation) and are not based on their natural acceptance

The students are able to list down activities related to proper upkeep of the body and practice them in their daily routine. They are also able to appreciate the plants wildly growing in and around the campus which can be beneficial in curing different diseases.

Module 3 – Harmony in the Family and Society (6 lectures and 3 tutorials for practice session)

Lecture13: Harmony in the Family –the Basic Unit of Human Interaction
 Lecture14: Values in Human-to-Human Relationship
 Lecture 15: "Trust' – the Foundational Value in Relationship
 Tutorial 7: Practice Session PS 7 Exploring the Feeling of Trust
 Lecture16: 'Respect'–as the Right Evaluation
 Tutorial 8: Practice Session PS 8 Exploring the Feeling of Respect
 Lecture17: Understanding Harmony in the Society
 Lecture18: Vision for the Universal Human Order
 Tutorial 9: Practice Session PS 9 Exploring Systems to fulfill Human Goal

Expected outcome:

The students are able to note that the natural acceptance (intention) is always for living in harmony, only competence is lacking! We generally evaluate ourselves on the basis of our intention and others on the basis of their competence! We seldom look at our competence and others' intention as a result we conclude that I am a good person and other is a badperson.

The students are able to see that respect is right evaluation, and only right evaluation leads to fulfillment in relationship. Many present problems in the society are an outcome of differentiation (lack of understanding of respect), like gender biasness, generation gap, caste conflicts, class struggle, dominations through power play, communal violence, clash of isms and so on so forth.

All these problems can be solved by realizing that the other is like me a she has the same natural acceptance, potential and program to ensure a happy and prosperous life for them and for others through he may have different body, physical facility or beliefs.

The students are able to use their creativity for education children. The students are able to see that they can play a role in providing value education for children. They are able to put in simple words the issues that are essential to understand for children and comprehensible to them. The students are able to develop an outline of holistic model for social science and compare it with the existing model.

Module 4 – Harmony in the Nature/Existence (4 lectures and 2 tutorials for practice session)

Lecture19: Understanding Harmony in the Nature

Lecture 20: Interconnectedness, self-regulation and Mutual Fulfillment among the Four Orders of Nature

Tutorial 10: Practice Session PS10 Exploring the Four Orders of Nature

Lecture21: Realizing Existence as Co-existence at All Levels

Lecture 22: The Holistic Perception of Harmony in Existence

Tutorial11: Practice Session PS 11Exploring Co-existence in Existence

Expected outcome:

The students are able to differentiate between the characteristics and activities of different orders and study the mutual fulfillment among them. They are also able to see that human being s are not fulfilling to other orders today and need to take appropriate steps to ensure right participation (in terms of nurturing, protection and right utilization) in the nature. The students feel confident that they can understand the whole existence; nothing is a mystery in this existence. They are also able to see the interconnectedness in the nature, and point out how different courses of study relate to the different units and levels. Also they are able to make out how these courses can be made appropriate and holistic.

Module 5 – Implications of the Holistic Understanding – a Look at Professional Ethics (6lectures and 3 tutorials for practice session)

Lecture23: Natural Acceptance of Human Values

Lecture24: Definitiveness of (Ethical) Human Conduct

Tutorial 12: Practice Session PS 12 Exploring Ethical Human Conduct

Lecture 25: A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order Lecture 26: Competence in Professional Ethics

Tutorial 13: Practice Session PS13 Exploring Humanistic Models in Education

Lecture 27: Holistic Technologies, Production Systems and Management Models-Typical Case Studies

Lecture28: Strategies for Transition towards Value-based Life and Profession

Tutorial 14: Practice Session PS 14 Exploring Steps of Transition towards Universal Human Order

Expected outcome:

The students are able to present sustainable solutions to the problems in society and nature. They are also able to see that these solutions are practicable and draw roadmaps to achieve them.

The students are able to grasp the right utilization of their knowledge in their streams of Technology/Engineering/Management/any other area of study to ensure mutual fulfilment. E.g. mutually enriching production system with rest of nature.

The students are able to sincerely evaluate the course and share with their friends. They are also able to suggest measures to make the course more effective and relevant. They are also able to make use of their understanding in the course for the happy and prosperous family and society.

Guidelines and Content for Practice Sessions (Tutorials)

In order to connect the content of the proposals with practice (living), 14 practice sessions have been designed. The full set of practice sessions is available in the Teacher's Manual as well as the website.

Practice Sessions for Module 1 - Introduction to Value Education

- PS1 Sharing about Oneself
- PS2 Exploring Human Consciousness
- PS3 Exploring Natural Acceptance

Practice Sessions for Module 2 - Harmony in the Human Being

- PS4 Exploring the difference of Needs of Self and Body
- PS5 Exploring Sources of Imagination in the Self
- PS6 Exploring Harmony of Self with the Body

Practice Sessions for Module 3 – Harmony in the Family and Society

PS7	Exploring the Feeling of Trust
PS8	Exploring the Feeling of Respect
PS9	Exploring Systems to fulfil Human Goal
Practice Sessions	for Module 4 – Harmony in the Nature (Existence)
PS10	Exploring the Four Orders of Nature
PS11	Exploring Co-existence in Existence
Practice Sessions Ethics	for Module 5 – Implications of the Holistic Understanding – a Look at Professional
PS12	Exploring Ethical Human Conduct
PS13	Exploring Humanistic Models in Education
PS14	Exploring Steps of Transition towards Universal Human Order

As an example, PS7 is a practice session in module 3 regarding trust. It is explained below:

PS 7: Form small groups in the class and in that group initiate dialogue and ask the eight questions related to trust. The eight questions are:

1a.DoIwan	t to make myself happy?	1b. Am I able to make myself always I	happy?
2a.DoIwan	t to make the other happy?	2b. Am I able to make the other alway	s happy?
3a.Does the	e other want to make him happy?	3b. Is the other able to make him alway	ys happy?
4a.Does the	e other want to make me happy?	4b. Is the other able to make me alway	vs happy?
Inte	ention(Natural Acceptance)	Competence	
	What is the answer?	What is the answer?	

Let each student answer the questions for himself and everyone else. Discuss the difference between intention and competence. Observe whether you evaluate your intention and competence as well as the others' intention and competence.

Expected outcome of PS 7: The students are able to see that the first four questions are related to our Natural Acceptance i.e. intention and the next four to our Competence. They are able to note that the intention is always correct, only competence is lacking! We generally evaluate ourselves on the basis of our intention and others on the basis of their competence! We seldom look at our competence and others' intention, as a result we conclude that I am a good person and other is a bad person.

3. READINGS:

3.1 Text Book and Teachers Manual

a. The Textbook

A Foundation Course in Human Values and Professional Ethics, R R Gaur, RAsthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN978-93-87034-47-1

b. The Teacher's Manual

Teachers' Manual for A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, NewDelhi, 2019.ISBN978-93-87034-53-2

3.2 Reference Books

- 1. Jeevan Vidya: EkParichaya, A Nagaraj, Jeevan VidyaPrakashan, Amarkantak, 1999.
- 2. HumanValues, A.N. Tripathi, NewAgeIntl.Publishers, NewDelhi, 2004.
- 3. The Story of Stuff (Book).
- 4. The Story of My Experiments with Truth-by Mohandas Karam chand Gandhi
- 5. Small is Beautiful -E. F Schumacher.
- 6. Slow is Beautiful-Cecile Andrews
- 7. Economy of Permanence-JC Kumarappa
- 8. Bharat Mein Angreji Raj –Pandit Sunderlal
- 9. Rediscovering India- by Dharampal
- 10. Hind Swarajor Indian Home Rule-by Mohandas K.Gandhi
- 11. India Wins Freedom-Maulana Abdul Kalam Azad
- 12. Vivekananda-Romain Rolland (English)
- 13. Gandhi-Romain Rolland(English)

4. MODE OF CONDUCT (L-T-P-C2-1-0-3)

- Lecture hours are to be used for interactive discussion, placing the proposals about the topic sat hand and motivating students to reflect, explore and verify them.
- Tutorial hours are to be used for practice sessions.
- While analysing and discussing the topic, the faculty mentor's role is in pointing to essential elements to help in sorting them out from the surface elements. In other words, help the students explore the important or critical elements.
- In the discussions, particularly during practice sessions (tutorials), the mentor encourages the student to connect with one's own self and do self-observation, self-reflection and self-exploration.
- Scenarios may be used to initiate discussion. The student is encouraged to take up "ordinary" situations rather than" extra-ordinary" situations. Such observations and their analyses are shared and discussed with other students and faculty mentor, in a group sitting.

Tutorials (experiments or practical) are important for the course. The difference is that the laboratory is everyday life, and practical are how you behave and work in real life.

Depending on the nature of topics, worksheets, home assignment and/or activity are included. The practice sessions (tutorials) would also provide support to a student in performing actions commensurate to his/her beliefs. It is intended that this would lead to development of commitment, namely behaving and working based on basic human values.

It is recommended that this content be placed before the student as it is, in the form of a basic foundation course, without including anything else or excluding any part of this content.

Additional content may be offered in separate, higher courses.

This course is to be taught by faculty from every teaching department, including HSS faculty. Teacher preparation with a minimum exposure to at least one 8-day Faculty Development Program on Universal Human Values is deemed essential.

5. SUGGESTEDASSESSMENT:

This is a compulsory credit course. The assessment is to provide a fair state of development of the student, so participation in classroom discussions, self-assessment, peer assessment.

etc. will be used in evaluation.

Example: Assessment by faculty mentor: 10 marks Self-assessment: 10 marks Assessment by peers: 10marks Socially relevant project/Group Activities/Assignments: 20 marks Semester End Examination: 50 marks The overall pass percentage is 40%. In case the student fails, he/she must repeat the course.

6. OUTCOME OF THE COURSE:

By the end of the course, students are expected to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.

They would have better critical ability. They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society). It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

This is only an introductory foundational input. It would be desirable to follow it up by

a) Faculty-student or mentor-mentee programs throughout their time with the institution

b) Higher level courses on human values in every aspect of living.

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	0	2	1	0	0	2	2	3	0	0	0	2
CO2	0	0	0	0	0	2	2	3	0	0	0	2
CO3	0	0	0	0	0	2	2	3	0	0	0	2
CO4	0	0	0	0	0	2	2	3	0	0	0	2
CO5	0	0	0	0	0	2	2	3	0	0	0	2
Total	0	2	1	0	0	10	10	15	0	0	0	10
Scaled Value	0	1	1	0	0	2	2	3	0	0	0	2

COURSE CODE	XCS308	L	Т	Р	С
COURSE NAME	DATA STRUCTURES & ALGORITHMS LABORATORY	0	0	1	1
PREREQUISITES	PROGRAMMING FOR PROBLEM SOLVING	L	Т	Р	Η
C:P:A	0.5:0.5:0	0	0	2	2

LEARNING OBJECTIVES

To impart the basic concepts of data structures and algorithms

To understand basic concepts about linear data structures stack, queues and lists

To understand basic concepts about nonlinear data structures trees and graphs

COURSE	EOUTCOMES	DOMAIN	LEVEL
CO1	Compute the concept of analysing of algorithms	Cognitive Psychomotor	Apply Guided Response
CO2	Use and Solve the linear data structures for the problems	Cognitive Psychomotor	Apply Guided Response
CO3	Use and Solve the non-linear data structures trees for the problems	Cognitive Psychomotor	Apply Guided Response
CO4	Use and Solve the non-linear data structures graphs for the problems	Cognitive Psychomotor	Apply Guided Response
CO5	Compute the appropriate abstract data types and algorithm techniques	Cognitive Psychomotor	Apply Guided Response

S.No	List of Experiments			COs
1	Analysing Searching Algorithm			CO1
	Analysing Sorting Algorithm			
2	Application of List			CO2
	Stack using Array and Linked List			
	Queue using Array and Linked List			
3	Tree Traversal			CO3
	Binary Tree Creation			
4	Graph Traversal			CO4
	Shortest Path Algorithms			
5	Applications of Algorithm Design Techniques			CO5
	S	TUTORIAL	PRACTICAL	TOTAL
	3	0	30	30

Mapping	Mapping of CO with PO's													
	P01	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS01	PSO2
CO 1	3	1	1	1	1	0	0	0	0	0	1	1	3	0
CO 2	3	2	1	1	1	0	0	0	1	0	1	1	3	2
CO 3	3	1	1	1	1	0	0	0	1	0	1	1	3	2
CO 4	3	2	1	2	1	0	0	0	1	0	1	1	3	2
CO 5	3	1	1	2	0	0	0	0	1	0	1	2	3	2
Total	15	7	5	7	4	0	0	0	4	0	5	6	15	8
Scaled Value	3	2	1	2	1	0	0	0	1	0	1	2	3	2

 Total	0	1-5	6-10	11-15		
Scaled value	0	1	2	3		
Relation	No	Low	Medium	High		

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Mapping of CO with PO's														
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CO 5	2	3	3	1	1	1	0	0	1	1	0	1	1	2
CO 4	2	2	2	2	2	1	0	0	1	1	0	1	1	2
CO 3	1	3	2	2	1	1	0	0	1	1	0	2	1	2
CO 2	2	1	1	1	1	1	0	0	2	1	0	1	2	2
CO 1	2	2	2	2	1	1	0	0	2	1	0	2	1	2

COURSE CODE	XCS310	L	Т	Р	С
COURSE NAME	IN-PLANT TRAINING – I	0	0	0	1
C:P:A	0.5:0.5:0				
		L	Т	Р	Η
		0	0	0	0

COUR	SE OUTCOMES	Domain	Level
CO1	Relate classroom theory with workplace practice	Cognitive	Understand
CO2	Comply with Factory discipline, management, and business practices.	Psychomotor	Guided Response
CO3	Demonstrates teamwork and time management.	Psychomotor	Guided Response
CO4	Describe and display hands-on experience on practical skills obtained during the programme.	Psychomotor	Perception
CO5	Summarize the tasks and activities done by technical documents and oral presentations	Psychomotor	Guided Response

CO Vs PO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	2	0	0	0	0	0	0	0	0	0	0	0
CO2	0	0	0	0	0	0	1	3	0	0	1	0
CO3	0	0	0	0	0	0	0	0	3	1	3	1
CO4	0	1	2	1	3	0	0	0	0	0	0	3
CO5	0	0	0	3	0	0	0	0	0	3	0	1
Total	2	1	2	4	3	0	1	3	3	4	4	5
Scaled	1	1	1	1	1	0	1	1	1	1	1	1

SEMESTER - IV

COURSE CODE IC SAT I	COU	DSE CO	DF	VCS/01		т	т	D	C					
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exclusion, pigeon-hole principle, permutation and combination.Combination.CO3Define and Explain the Laws of Logic, Logical Implication, Rules of Inference, The use of Quantifiers. Disjunctive and Conjunctive Normal FormCognitiveUnderstandCO4Define and Explain Algebraic Structures with one Binary Operation and two Binary Operations.CognitiveUnderstandCO5Define and Explain Graphs and their properties.CognitiveUnderstand	CO2	Defin	e and E	xplain Basic counting techniques- inclusion and	Cognitive	Unde	ersta	nd						
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Rules of Inference, The use of Quantifiers. Disjunctive and Conjunctive Normal FormConjunctive Normal FormCO4Define and Explain Algebraic Structures with one Binary Operation and two Binary Operations.CognitiveUnderstandCO5Define and Explain Graphs and their properties.CognitiveUnderstand	CO3	Defin	e and E	xplain the Laws of Logic, Logical Implication,	Cognitive	Unde	ersta	nd						
Conjunctive Normal FormConjunctive Normal FormCO4Define and Explain Algebraic Structures with one Binary Operation and two Binary Operations.CognitiveUnderstandCO5Define and Explain Graphs and their properties.CognitiveUnderstand		Rules	of Infer	ence, The use of Quantifiers. Disjunctive and										
CO4Define and Explain Algebraic Structures with one Binary Operation and two Binary Operations.CognitiveUnderstandCO5Define and Explain Graphs and their properties.CognitiveUnderstand		Conju	nctive N	Normal Form										
Operation and two Binary Operations. Cognitive Understand CO5 Define and Explain Graphs and their properties. Cognitive Understand	CO4	Defin	e and E	xplain Algebraic Structures with one Binary	Cognitive	Unde	ersta	nd						
CO5 Define and Explain Graphs and their properties. Cognitive Understand		Opera	tion and	two Binary Operations.										
	CO5	Defin	e and E	xplain Graphs and their properties.	Cognitive	Unde	ersta	nd						

UNIT I: SETS, RELATION AND FUNCTION	9										
Operations and Laws of Sets, Cartesian Products, Binary Relation, Partial Ord	ering Relation, Equivalence										
Relation, Sum and Product of Functions, Bijective functions, Inverse and Composite	site Function, Countable and										
uncountable Sets, Cantor's diagonal argument and The Power Set theorem.											
UNIT II: PRINCIPLES OF MATHEMATICAL INDUCTION	9										
The Well-Ordering Principle, Recursive definition, The Division algorithm: Prime N	Numbers, The Greatest										
Common Divisor: Euclidean Algorithm, Basic counting techniques- inclusion and e	exclusion, pigeon-hole										
principle, permutation and combination.											
UNIT III: PROPOSITIONAL LOGIC 9											
Basic Connectives and Truth Tables, Logical Equivalence: The Laws of Logic, Logical Implication, Rules of											
Inference, The use of Quantifiers. Proof Techniques: Proof by Contradiction, Proof	Inference, The use of Quantifiers. Proof Techniques: Proof by Contradiction, Proof by Contraposition, Proof of										
Necessity and Sufficiency, Disjunctive and Conjunctive Normal Form.											
UNIT IV: ALGEBRAIC STRUCTURES 9											
Algebraic Structures with one Binary Operation, Semi Groups, Monoids, Group	os, Congruence Relation and										
Quotient Structures, Groups, Permutation Groups, Normal Subgroups, Algebraic	Structures with two Binary										
Operation, Rings, Integral Domain and Fields.											
UNIT V: GRAPHS AND TREES	9										
Graphs and their properties, Degree, Connectivity, Path, Cycle, Sub Graph, Isomorphism, Eulerian and											
Hamiltonian Walks, Graph Colouring, Colouring maps and Planar Graphs-Shortest Distances.											
LECTURE TUTO	RIAL TOTAL										
45 -	45										
TEXTBOOKS											

- 1. Kenneth H. Rosen, "Discrete Mathematics and its Applications", seventh edition, Tata McGraw Hill, (12th reprint) 2015.
- 2. J.P. Tremblay and R. Manohar, "Discrete Mathematical Structure and It's Application" to Computer Science", 2nd edition, Tata Mcgraw-Hill, 1988.
- 3. C L Liu and D P Mohapatra, "Elements of Discrete Mathematics A Computer Oriented Approach", 3rd Edition, Tata McGraw Hill, 1985.

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- 1. Susanna S. Epp, "Discrete Mathematics with Applications", 5th edition, Cengage Learning India Private Limited, 2021.
- 2. C.V. Sastry, Rakesh Nayak, "A Textbook on Discrete Mathematics", Wiley, 2020.
- 3. Seymour Lipschutz, Marc Lipson, "Schaum's Outline of Discrete Mathematics", Fourth Edition (Schaum's Outlines) 4th Edition, 2021.

E REFERENCES

Nptel: Mathematical Logic by Prof.Arindama Singh, Department of Mathematics, IIT Madras.

Mapping of CO with GA's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2	1	0	0	0	0	0	1	1	0	1
CO 2	3	2	1	0	0	0	0	0	1	1	0	1
CO 3	3	2	1	1	0	0	0	0	1	1	0	1
CO 4	3	2	1	1	1	1	0	0	1	1	1	1
CO 5	3	2	1	1	1	1	1	0	1	1	1	1
Total	15	10	5	3	2	2	1	0	5	5	2	5
Scaled value	3	2	1	1	1	1	1	0	1	1	1	1

1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3

0 - No Relation, 1 - Low Relation, 2 - Medium Relation, 3 - High Relation

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CO3	;	Inter devie	rpret t	he di	iffere	nt w	ays of	commun	ication	with I/O		Cogn	itive		Unde	erstai	nd
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COS	CO5Categorize the functioning of different sub systems, such as processor, Input/output, and memoryCognitiveAnalyze																
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COURSE CONTENT														9			
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Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage.													he nt				
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			Access Standa	sing I rd I/(I/O de O Inte	evice erfac	es – In es (PC	terrupts – CI, SCSI,	- Direct USB).	Memory	Access	– Buse	es – In	terfa	ce cir	cuits	, —
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TEXT/	REFEI	RENCE B	OOKS	5											
1.	Carl H Hill,	amacher, 2012	Zvonko	oVrane	sic ar	nd Safw	vatZak	y, 6thE	dition	n "Comj	puter	Organi	zation	", Mc0	Graw-
2.	John L Editi	Henness on, Morga	ey and in Kauf	David fmann,	A. P. 2017.	atterson	," Co	mputer	Archi	tecture:	A Qu	antitat	ive Ap	proach	1", 6 ^{tl}
3.	Willian Edit	n Stallings ion, Pears	, "Con on Edu	puter (cation,	Organ 2010	ization	and A	rchitect	ure –	Designi	ng for	Perfor	mance	", 9th	
4.	John P.	Hayes, "C	omput	er Arch	itectu	re and	Organ	ization"	, 3rd	Edition,	McGı	aw Hi	11,2017	1	
Mapping of CO with PO's													1		
		P01	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	9 O 4	PO 10	PO 11	PO 12	PS01	PSO2
CO 1		3	0	2	0	0	1	1	0	0	0	1	1	2	1
CO 2		3	3	3	2	2	1	1	0	0	0	1	1	2	1
CO 3		3	0	2	0	0	1	1	0	0	0	1	1	2	1
CO 4		3	3	3	2	2	1	1	0	0	0	1	1	2	1
CO 5		3	3	3	2	2	1	1	0	0	0	1	1	2	1
Total		15	9	13	6	6	5	5	0	0	0	5	5	10	5
Scaled	Value	3	2	3	2	2	1	1	0	0	0	1	1	2	1
Note:	T	otal		0		1-5	5	6-1	0	11-1	5				
	Se	caled valu	e	0		1		2		3					
	R	elation		No		Lov	v	Medi	um	Hig	h				

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• '	To ui	nders	tand the t	funct	tions of operations	ating sys	tem and	their se	rvices.						
• '	To le	arn d	ifferent p	proce	ss scheduling	g algorit	hms and	l process	synchr	onizatio	on tec	hniq	ues.		
• '	To ui	nders	tand the	conce	ept of deadlo	cks and	various	memory	' manag	ement s	chem	nes.			
To learn I/O management and file systems.															
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CO3 Develop solutions toprocess synchronization problems and cognitive Apply deadlock. Apply Apply															
deadlock. CO4 Identify the role of paging, virtual memory in operating Cognitive Apply															
systems.															1
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Intro	oduct	ion:	Concept	of	Operating S	ystems,	Genera	tions of	f Opera	ting sy	stem	s, T	ypes	of O	perating
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avoidance, Deadlock detection, Recovery from deadlock. UNIT IV MEMORY MANAGEMENT															
Mer	norv	Mar	190emen	t:	Basic	concept	Logic	al and I	Physical	addree	s m	an N	Vemor	v all	ocation:
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Hardware and control structures - Locality of reference, Page fault, Working Set, Dirty page/Dirty bit – Demand paging, Page Replacement algorithms: Optimal, First in First Out (FIFO), Second Chance (SC), Not Recently Used (NRU) and Least Recently Used (LRU). **I/O SYSTEMS** 9 UNIT V I/O Hardware: I/O devices, Device controllers, Direct memory access Principles of I/O Software: Goals of Interrupt handlers, Device drivers, Device independent I/O software, Secondary-Storage Structure: Disk structure, Disk scheduling algorithms. Disk Management: Disk structure, Disk scheduling - FCFS, SSTF, SCAN, C-SCAN, Disk reliability, Disk formatting, Boot-block, Bad blocks. File Management: Concept of File, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods (contiguous, linked, indexed), Free-space management (bit vector, linked list, grouping), directory implementation (linear list, hash table), efficiency and performance.

L	Т	Р	Total
45	0	0	45

TEXT BOOKS:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", 10thEdition, John Wiley and Sons Inc., 2018.

2. William Stallings, "Operating Systems – Internals and Design Principles", 7thEdition, Prentice Hall, 2012.

REFERENCE BOOKS:

1. Charles Crowley, "Operating Systems: A Design-Oriented Approach", Tata McGraw Hill Education, 2012.

Gary J. Nutt ,"Operating Systems: A Modern Perspective", 2nd Edition, Addison-Wesley,2002.
 Maurice Bach ,"Design of the Unix Operating Systems", 8th Edition, Prentice-Hall of India, 2012.

4. Daniel P. Bovet, Marco Cesati, "Understanding the Linux Kernel", 3rd Edition, O'Reilly and Associates,

2005.

E-RESOURCES:

https://nptel.ac.in/courses/106108101

Mapping of CO with PO's

mapping of ee w		5												
	POI	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	6 Od	PO 10	PO 11	PO 12	PSO1	PSO2
CO 1	2	1	0	0	0	0	0	0	0	0	0	0	3	2
CO 2	3	2	1	1	1	0	0	0	0	0	0	0	3	2
CO 3	3	2	1	1	1	0	0	0	0	0	0	0	3	2
CO 4	3	2	1	1	1	0	0	0	0	0	0	0	3	2
CO 5	2	1	0	0	1	0	0	0	0	0	0	0	3	2
Total	13	8	3	3	4	0	0	0	0	0	0	0	15	10
Scaled Value	3	2	1	1	1	0	0	0	0	0	0	0	3	2

Note:	Total	0	1-5	6-10	11-15		
	Scaled value	0	1	2	3		
	Relation	No	Low	Medium	High		

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Com		icati																
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•	• To	be co	onvers	ant wi	ith alg	gorithms f	or comm	on prob	lems.									
•	о То	analy	se the	e algoi	ithms	for time/	space co	mplexit	/.									
	• То	learn	to wr	ite alg	gorith	ms for a g	iven prol	blem usi	ng diffe	erent d	esign	para	dign	ns.				
	• To	unde	rstand	l comp	outatio	onal comp	lexity of	problem	ns.					-				
Cour	se Ou	tcome	es: Aft	er the	comp	oletion of	the cours	se, the st	udents	will be	able	to		I	Domain		Leve	<u>!</u>
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$\frac{cos}{cos}$	An	alyse	the co	mnle	xity o	f the prob	lems usi	ng hackt	racking	algori	thm			C	ognitive	An	alvze	
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		– Fi	undam	entals	s of th	ne Analys	is of Al	gorithm	Efficie	ncy –	Anal	ysis	Fran	newo	ork – A	sympto	otic	
		Nota	ations	and E	Basic	Efficiency	V Classes	s- Mathe	ematical	Anal	ysis c	of No	on-Ro	ecurs	sive Alg	orithm	ns –	
		Non	-recur	sive	soluti	on to th	e Matri	x Multi	plicatio	n - N	lathe	matio	cal	analy	sis of	recurs	sive	
		algo	orithms	s – Re	cursiv	ve solution	to the T	Cower of	Hanoi	Puzzle	•							
UNI	ΤII	DIV	IDE A	AND	CON	QUER T	ECHNIC	QUE										!
		Divi	ide ar	nd Co	onque	r Techni	que –	Multipli	cation	of La	rge	Integ	gers	– S	strassen'	s Ma	trix	
		Mul	tiplica	tion -	- Clos	est Pair a	nd Conv	ex Hull	Problem	ns – G	reedy	v Met	thod	– Pr	im's Al	gorith	m –	
		Kru	skal's	Algor	rithm	– Dijkstra	's Algor	ithm.										
UNI	TIII	DY	NAMI	IC PR	OGF	AMMIN	G											(
		Dyn	amic	Progra	ammi	ng - Com	outing a	Binomia	al Coeff	icient	– Wa	rshal	ll's a	nd F	loyd's A	Igorit	thm	
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		Bac	ktrack	ing –	N-Q	ueens Pro	blem –	Hamilto	onian C	ircuit	Prob	lem -	– Sı	ıbset	Sum P	robler	n –	
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UNI	τν	NP	COM	PLET	TENE	SS												
		P, N	P and	NP-c	ompl	ete proble	ms – Ap	proxima	tion alg	orithn	ns for	NP-	hard	prot	olems –	Travel	ling	
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										L	Т	P	P T	otal
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ГЕХТ ВООН	KS													
 Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, "Introduction to Algorithms", Third Edition, MIT Press, 2014. Anany Levitin "Introduction to the Design and Analysis of Algorithms", 3rd Edition, Pearson Education 2009. REFERENCE BOOKS S.K. Basu, "Design methods and Analysis of Algorithms", 2nd Edition, Prentice Hall, 2013. Steven S. Skiena, "The Algorithm Design Manual", Second Edition, Springer, 2010. Robert Sedgewick, Kevin Wayne, "Algorithms", Fourth Edition, Pearson Education, 2011. Donald E. Knuth, "Art of Computer Programming, Volume I - Fundamental Algorithms", Third Edition, Addison Wesley, 1997 E-REFERENCES https://nptel.org https://www.coursera.org 														
2. <u>https://www.coursera.org</u> Mapping of CO with PO's														
	IO IO	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSOI	PSO2
CO 1	2	1	2	0	0	0	0	0	0	0	0	0	1	1
CO 2	2	3	2	1	0	0	0	0	0	0	0	0	1	1
CO 3	2	3	2	1	0	0	0	0	0	0	0	0	1	1
CO 4	2	3	2	1	0	0	0	0	1	0	0	0	1	1
CO 5	2	2	2	0	0	0	0	0	1	0	0	0	1	1
Fotal	10	12	10	3	0	0	0	0	2	0	0	0	5	5
Scaled Value	2	3	2	1	0	0	0	0	1	0	0	0	1	1
	1		0		1-5		6-1	0	11-1	5				
Note:		otal	0				-	-		-				

COURSE CO	DE	XUM009	L	Т	Р	С					
COURSE NA	ME	ECONOMICS FOR ENGINEERS	3	0	0	3					
PREREQUIS	ITES		L	Т	Р	Н					
C:P:A		2.64:0.24:0.12	3	0	0	3					
COURSE OU	TCOMES		DOM	AIN	LEV	/EL					
CO1	Explain th	ne concepts of economics in engineering and	Cogni	tive	Und	erstand					
	identify el	ement of cost to prepare cost sheet	_								
CO2	Calculate	and Explain the Break-even point and	Cogni	tive	Und	erstand					
	marginal c	osting									
CO3	Summariz	ze and Use value engineering procedure for	Cogni	tive	Und	erstand					
	cost analys	sis									
CO4	Estimate 1	replacement problem	Cogni	tive	Und	erstand					
CO5	Compute,	Explain and make Use of different methods	Cogni	tive	Und	erstand					
	of deprecia	ation									
UNIT I INTRODUCTION TO ECONOMICS 08											

Flow in an economy, Law of supply and demand, Concept of Engineering Economics – Engineering efficiency, Economic efficiency, Scope of engineering economics- types of costing, element of costs, preparation of cost sheet and estimation, Marginal cost, Marginal Revenue, Sunk cost, Opportunity cost

UNIT IIBREAK-EVEN ANALYSIS&SOCIAL COST BENEFIT ANALYSIS 12

Margin of Safety, Profit, Cost & Quantity analysis-Product Mix decisions and CVP analysis, Profit/Volume Ratio (P/V Ratio), Application of Marginal costing, Limitations

Social Cost Benefit Analysis: compare different project alternatives, Calculate direct, indirect and external effects; Monetizing effects; Result of a social cost benefit analysis.

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08

UNIT III VALUE ENGINEERING & COST ACCOUNTING:

Value engineering – Function, aims, Value engineering procedure - Make or buy decision Business operating costs, Business overhead costs, Equipment operating costs

UNIT IV REPLACEMENT ANALYSIS

Replacement analysis –Types of replacement problem, determination of economic life of an asset, Replacement of an asset with a new asset.

UNIT V DEPRECIATION

Depreciation- Introduction, Straight line method of depreciation, declining balance method of depreciation-Sum of the year's digits method of depreciation, sinking fund method of depreciation, Annuity method of depreciation, service output method of depreciation.

	LECTURE	TUTORIAL	TOTAL
HOURS	45	0	45

TEXT BOOKS

1. Sp Gupta, Ajay Sharma & Satish Ahuja, "Cost Accounting", V K Global Publications, Faridabad, Haryana, 2012

2. S.P.Jain&Narang, "Cost accounting – Principles and Practice", Kalyani Publishers, Calcutta, 2012

3. PanneerSelvam, R, "Engineering Economics", Prentice Hall of India Ltd, New Delhi, 2001.

4. William G.Sullivan, James A.Bontadelli& Elin M.Wicks, "Engineering Economy",

Prentice Hall International, New York, 2001.

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- 1. Luke M Froeb / Brian T Mccann, "Managerial Economics A problem solving approach" Thomson learning 2007
- 2. Truett&Truett, "Managerial economics- Analysis, problems & cases "Wiley India 8th edition 2004.
- 3. Chan S.Park, "Contemporary Engineering Economics", Prentice Hall of India, 2002.
- 4. Donald.G. Newman, Jerome.P.Lavelle, "Engineering Economics and analysis" Engg. Press, Texas, 2002

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	1	1	3	2	3	2	1	1	3	1	1
1	0	3	0	0	2	1	0	3	1	0	1
2	3	1	1	2	3	1	1	1	2	3	1
1	3	2	3	3	1	3	3	1	1	0	2
1	1	1	3	1	2	2	1	2	3	3	1
6	8	8	10	8	11	9	6	8	9	7	6
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Mapping of COs with GAs

Note:	Total	0	1-5	6-10	11-15		
	Scaled value	0	1	2	3		
	Relation	No	Low	Medium	High		

Sem	ester	•		: IV : XUM003														
Cou	rse (Code		: IV : XUM003 : DISASTER MANAGEMENT . NU														
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CO	l U ty	Jnder ypes	stan	d tl	ne c	oncep	ots of disa	sters, the	eir signi	ficance a	and	Co	gniti	ve		Unde	erstan	d
CO	2 U d	Jnder isaste	stan er pr	d tl eve	ne re entic	elatio on an	nship bet d risk red	ween vul uction	lnerabili	ty, disas	ters,	Co	gniti	ve		Unde	erstan	d
CO3	8 A R	Able t Risk F	o un Redu	idei ictio	stai	nding DRR	of prelim)	inary ap	proache	s of Dis	aster	Co	gniti	ve		Unde	erstan	d
CO4	1 E	Devel	op a	awareness of institutional processes in the country Cognitive Application														
CO	5 E si th	Develo urrou ney li	relop rudimentary ability to respond to their oundings with potential disaster response in areas where v live, with due sensitivity Application															
CO	URSI	E CO	NT	EN	Т							•						
UNI	ΤI		IN	ΓR	OD	UCT	ION TO	DISAST	TERS									6
			Imp	or	tanc	e &S	ignificand	ce, Type	s of Disa	asters, C	limate	e Ch	ange,	DM	cycle	e		
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			Ris Da	k, mag	Vuli ge A	nerab Assess	ility, Typ sment, Ris	es of Ri sk mode	sk, Risk ling.	dentifi	ication	n, Ei	mergi	ing R	isks,	Risk	Asse	essment,
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		Hazard and Vulnerability profile of India, Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management, Institutional arrangements (Mitigation, Response and Preparedness), Disaster Management Act and Policy – Other related policies,																

	pla	ans, prog	grammes	and legis	slation							
UNIT V	D	SASTE	R MAN	AGEME	NT: AI	PPLICA	TIONS	AND C	CASE ST	TUDIES		7
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3. C N	Gupta An New Dell	nil K, Sı hi, 2011	reeja S. I	Nair. Env	vironme	ntal Kno	wledge	for Disa	aster Ris	sk Manag	gement, N	IDM,
4. K D	KapurAn Delhi, 20	u Vulne 10	rable Inc	lia: A Ge	eographi	cal Stuc	ly of Di	sasters,	IIAS an	d Sage P	ublishers	New
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1. S V	iddharth ⁄ista Inte	na Gauta ernationa	am and I al Pub Ho	K Leelak ouse, 201	risha R 2	ao, "Dis	saster N	lanagem	ent Pro	grammes	and Poli	cies",
2. A	Arun Kui	mar, "Gl	obal Dis	aster Ma	nagemer	nt", SBS	Publish	ers, 200	8			
3. P P	ardeepS PHI, 200	ahni, Al 0	kaDham	eja and U	Jma meo	dury, "D	visaster 1	nitigatio	on: Expe	riences a	nd reflect	ions",
4. C	Govt. of I	India: D	isaster M	anageme	ent Act,	Govern	ment of	India, N	ew Dell	ni, 2005		
5. 0	Governm	ent of Ir	ndia, Nati	onal Dis	aster Ma	anageme	nt Polic	y, 2009				
E-REFE	RENCE	S										
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	PO1	PO2	PO3	PO4	PO5	P06	P07	P08	PO9	PO10	PO11	PO
CO 1	1	0	0	1	0	2	2	1	1	0	0	1
CO 2	1	1	2	2	0	1	1	0	1	1	1	1
CO 3	1	1	2	1	3	1	1	0	1	0	1	1
CO 4	1	1	2	2	0	1	1	2	2	2	1	1
CO 5	1	1	0	1	0	1	0	1	1	1	1	1

CO 5

Total

Scaled

Value

Sem	este	r		•	Г	V													
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CO	2	Use the MATLAB GUI effectivelyCognitiveUnderstandPsychomotorGuided ResponDesign simple algorithms to solve problemsCognitiveApply														onse			
CO.	3 I	Use the MATLAB GUI effectivelyCognitiveUnderstandDesign simple algorithms to solve problemsCognitiveApplyDesign simple algorithms to solve problemsCognitiveApplyPsychomotorGuided ResponseAffectiveRespondWrite simple programs in MATLAB to solve scientific and mathematical problemsCognitivePsychomotorGuided ResponseCognitive<														onse			
CO	4 V r	Write simple programs in MATLAB to solve scientific and mathematical problemsAffectiveRespondWrite simple programs in MATLAB to solve scientific and mathematical problemsCognitive Psychomotor AffectiveApplyPsychomotor AffectiveRespond														onse			
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UNI	TI	(CON	ND.	ITI	ONAI	L STATE	MENT	S AND	LOOPI	NG								9
	 Relational and Logical Operators - If-else statements - Switch-case statements - For loop - While loop - Special commands(Break and continue) - Import data from large database - Export data to own file or database Practical 1. Write a program to perform operations like addition, multiplication, scaling, shifting, and folding on signals and sequences and computation of energy and average power. 2. Find the roots of the equations 6x5 -41x4 +97x3 -97x2 +41x-6 3. Find the values of x,y,z of the equations x+y+z=3,x+2y+3z=4,x+4y+9z=6 																		

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	4. Fo	or f(x) x) and	=8x8 - plot fo	7x7 +: or 0 20	12x6 -:	5 x5 +	8 x4 +	+13 x3	3 -12x+	9 com	pute f(2),root	ts of	
UNIT III	MATLA	B PRC	GRA	MMIN	GI									9
	Vector – I file – Inpu Practical 1. So 2. D D 3. So	Matrix at comm olution etermi ifferen olution	- Arra mands of Lin nation ce Equ of Dif	y Addr – Outp ear equ of Eige lations. ference	essing ut com lations en valu e Equa	- Built mands for Us les and tions u	-in fur s – Stru nderde Eigen sing E	actions acture termin vector uler M	- Math of funct red and rs of a S lethod.	ematic tion file over de Square	al Ope e – Inl etermin matrix	rations ine fun ned cas . Solut	s - Script ctions ses. ion of	
UNIT IV	2D & 3D	PLO	TTING	r J										9
	In-built fu Interpolat PRACTIC 1. Det bounds fr	inction ion - B CAL termination the	s for participation of given	lotting tting in f polyn data.	- Mult terface omial	iple plo - Mes fit, ana	otting v h plot llyzing	with sp - Surfa residu	pecial g ace plot nals, exp	raphics	s - Cur	ve fittin	ng – Dr	
	2. Determ	inatior	of pol	lvnomi	al usin	g meth	od of]	Least S	Square (Curve l	Fitting	_		
UNIT V	2. Determination of polynomial using method of Least Square Curve Fitting. UNIT V GRAPHICAL USER INTERFACE Creating menu window for providing input - Creating graphical user interface table													
	Creating Modifying Practical 1. G	menu g table <mark>RAPH</mark>	windov conter	w for at - Cre 2D PL(provid ating a DTS	ing inj databa	put - (ase	Creatir	ng grap	hical ι	iser in	terface	e table -	
	Practical 1. GRAPHICS - 2D PLOTS L T P Total 45 0 0 45													
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REFEREN	CE BOOK	S						-1						
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2. <u>http</u>	<u>s://in.mathv</u>	works.	com/he	elp/mat	<u>lab/</u>									
Mapping of	f CO with]	PO's			1	1			l					
	P01	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	6 Od	PO 10	PO 11	PO 12	PSO1	PSO2
CO 1	0	0	0	1	3	0	0	0	0	0	0	1	0	0
CO 2	2	2	0	1	3	0	0	0	0	0	0	1	0	0
CO 3	0	2	1	2	2	0	0	0	0	0	0	1	0	0
CO 4	0	0	0	2	2	0	0	0	0	0	0	0	0	0
Total	2	4	1	6	12	0	0	0	0	0	0	3	0	0
Scaled Valu	ie 1	1	1	2	3	0	0	0	0	0	0	1	0	0

Note:	Total	0	1-5	6-10	11-15		
	Scaled value	0	1	2	3		
	Relation	No	Low	Medium	High		

COURSE CODE	XCS408	L	Т	Р	С
COURSE NAME	OPERATING SYSTEMS LABORATORY	0	0	1	1
PREREQUISITES	PROGRAMMING FOR PROBLEM SOLVING,	L	Т	Р	Η
	DATA STRUCTURES AND ALGORITHMS				
C:P:A	0.8:0.2:0	0	0	2	2

COURSE OBJECTIVES

•

- To make aware of different types of Operating System and their services. To learn different process scheduling algorithms and synchronization techniques to achieve better • performance of a computer system.
- To know memory management concepts. •
- To learn implementation of file system. •

COURS	SE OUTCOMES	DOMAIN	LEVEL
CO1	Experiment with UNIX Commands	Cognitive	Apply
CO2	Solvevarious CPU scheduling algorithms.	Cognitive	Apply
CO3	Demonstrate the process synchronization and deadlocks.	Cognitive	Understand
CO4	Demonstrate the memory management strategies.	Cognitive	Understand
		Psychomotor	Guided Response
CO5	Demonstrate File Organization and File Allocation	Cognitive	Understand
	Strategies.	Psychomotor	Guided Response

S.No	List of Experin	nents		(COs
1	Basics of UNIX commands			(CO1
2	Write programs using the following system calls or getpid, exit, wait, close, opendir, readdir.	of UNIX operating	g system fork, exec,	(CO1
3	Write C programs to simulate UNIX commands li	ke cp, ls, grep.		(CO1
4	Implement the various CPU scheduling algorithms and Round robin scheduling.	s like FCFS, SJF	scheduling, Priority	(CO2
5	Implement Producer – Consumer Problem.			(CO3
6	Implementation of Banker's Algorithm.			(CO3
7	Implementation of the Memory Allocation Method	ds.		(CO4
8	Implementation of the Page Replacement Algorith	ıms.		(CO4
9	File Organization Techniques.			(CO5
10	File Allocation Strategies.			(CO5
	HOUDS	TUTORIAL	PRACTICAL	TOT	AL
	HOURS	0	30	3	0

Mapping of	CO	with]	PO's				-						_		
		P01	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	6 O	PO 10	PO 11	PO 12	PSO1	PSO2
CO 1		3	2	1	1	0	0	0	0	1	0	0	0	3	2
CO 2		3	2	1	1	1	0	0	0	1	0	0	0	3	2
CO 3		2	1	0	0	1	0	0	0	1	0	0	0	3	2
CO 4		2	1	0	0	1	0	0	0	1	0	0	0	3	2
CO 5		2	1	0	0	1	0	0	0	1	0	0	0	3	2
Total		12	7	2	2	4	0	0	0	5	0	0	0	15	10
Scaled Valu	ie	3	2	1	1	1	0	0	0	1	0	0	0	3	2
Note:		To	otal	0		1-5		6-1	0	11-1	5				
	Sca	led va	lue	0		1		2		3					
		Relat	ion	No		Lov	v	Medi	um	Hig	h				

COU	RSE (CODE	C	XCS409									
COURSE NAME				DESIGN AND ANALYSIS OF ALGORITHMS									
				LABORATORY									
PREREQUISITES				PROBLEM SOLVING USING C,									
				DATA STRUCTURES									
L	Т	Р	С		C P A								Н
0	0	1	1		0.5	0.5	0			0	0	2	2

COURSE OBJECTIVES

The course should enable the students to:

- Learn how to analyze a problem and design the solution for the problem.
- Design and implement efficient algorithms for a specified application.
- Strengthen the ability to identify and apply the suitable algorithm for the given real world problem.

COURS	SE OUTCOMES: After the completion of the course, the	DOMAIN	LEVEL	
students	will be able to			
CO1	Analyze the time complexities of recursive and non-recursive	Cognitive	Analyze	
	algorithms.	Psychomotor	Guided	
			Response	
CO2	Solve the problems using divide and conquer approach.	Cognitive	Apply	
		Psychomotor	Guided	
			Response	
CO3	Solve the problems using dynamic programming approach.	Cognitive	Apply	
		Psychomotor	Guided	
			Response	
CO4	Solve the problems using backtracking method.	Cognitive	Apply	
		Psychomotor	Guided	
			Response	
CO5	Solve a problem using approximation algorithm.	Cognitive	Apply	
		Psychomotor	Guided	

Response

S.No.	List of Exercises										
1	i.	Implementation of the complexity of non-recursive algorithm for finding a factorial of a number.									
	ii.	Implementation of the complexity of non-recursive algorithm for bubble sorting technique.									
	iii.	Implementation of the complexity of finding a factorial value using recursive algorithm									
	iv.	Implementation of Towers of Hanoi puzzle using recursive algorithm and display its complexities.									
2	i.	Implementation of Prim's algorithm for finding a minimum spanning tree using									
		divide and conquer approach.									
	ii.	Implementation of Kruskal's algorithm for finding the Minimum Spanning Tree									
		of a given undirected graph.									
	iii.	Implementation of Dijkstra's algorithm for finding the shortest paths to other									
		vertices from a given vertex in a weighted connected graph.									
3	i.	Implementation of Warshall's algorithm to compute the transitive closure of a C									
		given directed graph.									
	ii.	Implementation of Floyd's algorithm to find all-pairs shortest paths for the given									
		directed weighted graph.	1								
	iii.	Implementation of 0/1 Knapsack problem	using dynamic pr	ogramming approac	h.						
4	i.	Implementation of N Queen's problem using backtracking approach.									
	ii.	i. Implementation of the Hamiltonian Cycle problem using backtracking approach.									
	iii.	Implementation of the sum subset problem using backtracking approach.									
	iv.	Implementation of job assignment problem using branch and bound approach.									
5	i.	i. Implementing travelling salesman problem for finding the minimum tour cost.									
		HOURG	TUTORIAL	PRACTICAL	TC	TAL					
		HOURS	0	30		30					

Mapping of CO with PO's																
			PO1	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS01	PSO2
CC)1		2	1	2	1	0	0	0	0	0	0	0	0	1	1
CC) 2		2	3	2	2	0	0	0	0	0	0	0	0	1	1
CO 3			2	3	2	0	0	0	0	0	0	0	0	0	1	1
CO 4			2	3	2	2	0	0	0	0	1	0	0	0	1	1
CO 5			2	2	2	2	0	0	0	0	1	0	1	0	1	1
То	tal		10	12	10	7	0	0	0	0	2	0	1	0	5	5
Scaled Value			2	3	2	2	0	0	0	0	1	0	1	0	1	1
	Note:		Total		0			1-5		6-10		11-15				
		Sc	Scaled value			0		1		2		3				
			Rela	1	No		Low		Mediu	ım	Hig	gh				
SEMESTER - V

SEM	IESTE	R		:	V									
COU	IRSE (CODI	E	:	XCS501									
COU	URSE N	NAM	E	:	FORMAL LA	ANGUA	GE AN	DAU.	ГОМАТА	THOERY				
PRE	REQU	JISIT	E	:	DATA STRU	CTURE	ES AND	ALG	ORITHM	5				T
	L	Т	Р	С		С	Р	Α			L	Т	Р	Η
	3	0	0	3		3	0	0	-		3	0	0	3
Cour	se Outo	come:	After	the c	ompletion of the	e course,	studen	s will t	be able to	Doma C or P	in or A		Level	
COU	URSE (OUTO	COME	S										
C	01	Und auto	lerstand mata a	l the	e fundamental eir capabilities	of the	basic	kinds	of finite	Cognitive	e	Un	derstar	nd
C	02	Cate	egorize	regu	lar and context-	free lang	guages			Cognitive	e	Un	derstar	nd
C	03	Inte	rpret tra	ansfo	orm regular expr	ressions	to gram	mars		Cognitive	e	Un	derstar	nd
C	04	Con	struct o	of Tu	ring Machines					Cognitive	e	Un	derstar	nd
C	05	Iden com	ntify th plexity	ne k	ey results in	algorith	mic an	d com	putational	Cognitive	9	Un	derstar	nd
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based UNI Gran Lang Elim	F II mar I uages ination	GR ntrodu – An of U	g Lemr AMMA uction- nbiguity (seless	ARS V Tyj y- Ro symt	pes of Gramma elationship betw pols - Unit proc	ar - Co veen der luctions	ntext F rivation - Null	ree Gr and d produc	ammars a erivation t tions – Gr	nd Langua rees – Sin eiback Nor	ges– plific mal f	Deriv ation	ations of CF - Chor	9 and 5G – nsky
UNI		PUSE		N A										9
Push Equi Lem	down A valence na.	Auton e of l	nata- D Pushdo	efini wn a	tions – Moves - tutomata and C	– Instant CFL - p	aneous umping	descrij lemma	ptions –De a for CFL	terministic – problen	pushc 1s bas	lown a sed of	automa n pum	ata – ping
UNI	r iv 1	URI	NG M	ACH										9
Turir Mach Mach	ng Mac nine as nine co	chines Acc nstruc	- Intro eptors ctions –	ducti – Ti Moo	on – Formal de uring Machine difications of Tu	efinition as Tran Iring Ma	of Tur sducers chines.	ing ma Comp	ichines –In outable Lai	stantaneou 1guages an	s desc d fun	ctions	ons- Tu s – Tu	iring iring
UNI	г	COM	PUTA'	ΓΙΟ	NAL COMPLE	EXITY								9
Unde Recu comp	esirabil rsively plexity	ity- 1 enur of TN	Basic o nerable As –cor	lefin lang nplez	itions- Decidat guages – Introdu kity classes – int	ole and action to troductio	undeci Compon to NF	dable utation P-Hardr	problems al Complex ness and N	- Propertie kity: Defini P-Complete	es of tions- ness.	Rect Time	ursive and S	and pace
								LECT	URE	TUTORI	AL	,	ТОТА	L
								4	5	0			45	

TEXT BOOKS

- 1. <u>Peter Linz</u>An Introduction to **Formal** Languages and Automata 6th edition, Jones & Bartlett, 2016
- 2. Hopcroft J.E., Motwani R. and Ullman J.D, "Introduction to Automata Theory, Languages and Computations", Third Edition, Pearson Education, 2008.ISBN-13: 978-8131720479

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- 1. John.C.Martin, "Introduction to Languages and the Theory of Computation" McGraw-Hill Education, 01-May-2010.
- 2. Michael Sipser, "Introduction to the Theory of Computation" Cengage Learning, 2012.

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- 1. Theory of Computation by Prof.Somenath Biswas, Computer Science and Engineering, IIT Kanpur
- Swayam Theory of Computation: https://onlinecourses.nptel.ac.in/noc19_cs79/preview#:~:text=PRE%2DREQUISITES%3A%20It%20is %20recommended,in%20Data%20Structures%20and%20Algorithms.&text=Category%20%3A,Comp uter%20Science%20and%20Engineering

Mapping of COs with POs:

							РО						PS	50
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	2	2	3	0	0	0	1	1	1	0	0	1	1
CO2	2	3	2	3	0	0	0	0	0	0	0	2	1	1
CO3	2	2	3	1	1	2	1	2	2	0	0	0	1	1
CO4	3	2	2	2	0	0	0	0	0	1	0	1	1	1
CO5	1	1	3	3	1	2	1	1	1	0	0	2	1	1
Total	10	10	12	12	2	4	2	4	4	2	0	5	5	5
Scale Value	2	2	3	3	1	1	1	1	1	1	0	1	1	1

Note:	Total	0	1-5	6-10	11-15		
	Scaled value	0	1	2	3		
	Relation	No	Low	Medium	High		

SEM	FS	FFR		•	v												
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		orn th	no fun	dame	ntolo	of data m	odals ar	nd to rep	racant a	databasa	ovetom		ng Fr	tity I	Palati	onch	in
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• 1	Го u	nders	stand	the fu	ından	nental con	cepts of	transact	ion pro	cessing, co	oncurre	ency	cont	rol teo	chniq	ues	
ar	nd r	ecove	ery pr	ocedı	ires												
Course				ftan	41	1-4i	of the				D		•		Ta		
able to	o c	Juico	me: F	Anter	the c	ompieuoi	i or the	course,	student	s will be		oma	111		Le	vei	
CO1	F	Relate	e and	Арр	lv th	e design	principl	es for le	ogical d	design of	~			Ap	plv		
001	d	ataba	ises, i	nclud	ing I	Entity Rel	ationship	p model.		8	Cogr	11t1V6	e	r.	r <i>J</i>		
CO2	E	Build	queri	ies w	ith th	e basics	of Struc	tured Q	uery La	anguange	Cogr	nitivo	е	Ap	ply		
CO2	and relational algebra.Image: Second structures and access constructionImage: Second structures and access construction3Explain the basic database storage structures and access constructionUnderstand																
003	te	techniques: file organizations, indexing methods including B-															
	tı	tree, B+ tree and hashing.															
CO4	F	Expla	in 1	the	basic	issues	of	transacti	ion p	rocessing	Cogr	nitive	e	Un	derst	and	
005	c	oncu	rrency	/ cont	rol a	nd recover	ry proce	dure.			Corr			1 -			
COS		Devel	op a r	eal da	atabas	se applica	tion with	n the adv	anced o	concepts.	Cogi	IILIV	5	Ap	ргу		
COU.	RS	E CO	NTE													<u> </u>	
UNII			N I K ntrodu	UDU action	$\frac{CIR}{10}$	JN File and D	atabase	systems	- Datab	ase system	n struc	ture	– D	ata M	odel	-	9
		T	ypes	of Da	ata m	odels – E	R model	– Relat	ional M	lodel – Ke	ys – F	Relat	ional	Alge	bra a	nd	
		C	Calcul	us.							•			Ū.			
UNII	[] II	F	RELA	TIO	NAL	MODEL			TT 1 .	* 7*	T .			1.0	•.		9
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		L	Databa	ases -	- De	compositi	on - De	esirable	Propert	ties of De	compo	ositi	on -	Boyc	e-Co	dd	
		N	Jorma	l For	m.	•			Î		Î						
UNIT	[] II	[]	DATA	STO)RA(GE AND	QUERY	r PROC	ESSIN	G							9
)vervi	iew o	f Phy	sical Stor	age Med	dia – Ma	agnetic	Disks – R	AID –	Ter	tiary	stora	ge – 1	File	
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UNIT	ſ IV	7 1	RAN	ISAC	TIO	N MANA	GEME	NT									9
		Г	ransa	ction	Pro	cessing -	– Introc	luction-	Need	for Con	curren	cy	contr	ol- I	Desira	able	
		p	roper	ties c	of Tra	insaction-	Schedu	le and F	Recover	ability- Se	erializa	abilit	y and	l Sch	edule	es –	
		h	oncu	irenc	y Co irrenc	ntrol – T ev control	- Recov	LOCKS-	1 WO P	mases loci s – Immed	king- I iate Ui	Deac	HOCK e- De	- 1111 ferrea	ie sta 1 Uno	unp late	
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1. Abraha Edition	am S n, Tat	ilbersc a Mc C	hatz, H Graw H	Hen [ill,	ry F. H 2021.	Kort	h and	1 S. S	Sudharsl	nan, "I	Databas	se Sys	tem C	Concep	ots", Se	venth
REFEREN	ICE	BOOK	S													
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E-REFERENCES																
<u>https://onlinecourses.nptel.ac.in/noc22_cs91/preview</u> <u>2. http://spoken-tutorial.org</u> <u>3. http://vlab.co.in/</u> Mapping of CO with PO's																
mapping	100	PO1	P02	2 O 0	PO4)	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
CO 1		3	2]	1 1		1	0	0	0	0	0	0	0	3	2
CO 2		3	2	1	1 1		1	0	0	0	0	0	0	0	3	2
CO 3		2	1	(0 0		1	0	0	0	0	0	0	0	3	2
CO 4		2	1	(0 0		1	0	0	0	0	0	0	0	3	2
CO 5		3	2	1	1 1		1	0	0	0	0	0	0	0	3	2
Total		13	8		3 3		5	0	0	0	0	0	0	0	15	10
Scaled Val	ue	3	2		1 1		1	0	0	0	0	0	0	0	3	2
	-				1	-										
Note:	То	tal			0		1-5		6-1	0	11-1	5				
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eours		impart know	x1e	edge	on th	e basic pr	inciples	of softy	vare dev	elonm	ent li	fe cy	vcle				
•	To	familiarize	wi	ith the	e im	portance of	f the soft	tware de	esign co	ncepts		ic cy	cic.				
•	То	develop coi	re	ct and	d sof	tware qual	lity assu	rance pr	oducts.	1							
•	To	understand	th	e con	cept	software p	project n	nanagen	nent.								
•	To	understand	th	e vari	ious	software d	evelopn	nent and	testing	tools.							
Course	e Outo	come: After	r tł	he co	mple	tion of the	course,	student	s will b	e able t	to		Doi C or	main P or	A	Lev	vel
CO1	Des dev	cribe the elopment p	sc roc	oftwa cess 1	re d node	evelopmer els.	nt activi	ties an	d vario	us sof	ftwar	e C	Cogni	tive		Unders	tand
CO2	Ap	ply the know	wl	edge	of de	esign conc	epts to v	arious a	pplicati	ons.		C	Cogni	tive		Apply	
CO3	Ap	oly various	so	oftwa	e tes	ting techn	iques to	an appl	ication.			0	Cogni	tive		Apply	
CO4	Det	ermine the	e p	orojec	t cos	t by vario	us estima	ation tec	hnique	s		0	Cogni	tive		Apply	
CO5	CO5 Describe the advanced software engineering concepts and the Cognitive Understand													tand			
development tools COURSE CONTENTS																	
COUR	RSE (S														
UNII	1	SOF IW.		<u>KEP</u> n H	KO(lardy	LESS ANI	J KEQU	A Ge	ENIS peric vi	aw of	Droc	000	SDI		Droc	acc lifa	9
		cycle m	od	lels	(Wat	er Fall.	Increme	ntal, E	Evolutio	nary,	Spec	css - vializ	ed.	LC - Agile	e) –	Agile	
		developm	ner	nt - S	Syste	em Engine	ering. H	Require	nents H	Enginee	ering	- R	lequin	remer	it ga	thering	
		technique	es	- Rec	Juire	ments Eng	gineering	g tasks	- Proce	ss - Re	equir	emer	nt An	alysi	s - E	Eliciting	
		Requirem	ner	nts - I	30110	ing the an	alysis M	lodel.									
UNIT	II	DESIGN		CONC	CEP	FS AND H	PRINCI	PLES									9
		Design E	lng	ginee	ring	– Design	Process	and D	esign C	oncept	ts and	d Mo	odel-	Archi	tectu	ıral	-
		design -	SC	oftwa	re ar	chitecture	– data	design	– arch	itectur	al de	sign	tr	ansfo	rm a	and	
		transactio	n n	map	oing-	• Modeling	g the Co	mponer	nt Level	Desig	gn - U vrfaca	Jser	inter	tace a	analy	/\$1\$ and	
		deployme	ent	t leve	ıpınış 1.	g and Con		esign e	ements	or me	mace	, coi	npon			anu	
UNIT	III	TESTIN	G														9
		Testing S	tra	ategie	es - A	A strategic	approac	h to sof	tware te	esting -	- Stra	tegic	e Issu	es - 7	lest s	strategy	
		for Conv	en	tiona	l sof	tware, Ob	ject orie	nted so	ftware -	- SQA	- Va	alida	tion '	Testi	ng -	System	
		Basis Par	nd th	debu	iggin ng -	ig - Testii	ig funda	testing	5 - Blac	CASE -	e testi	ing - form	- wh	ite B	OX té	- Object	
		oriented t	tes	ting.	ng -	control s	ucture	usung	- 1050	case -		IOIIII	ance	testh	ng -	Object	
UNIT	IV	SOFTW	AI	RE P	ROJ	ECT MA	NAGEN	IENT									9
		Project N	laı	nager	nent	life cycle	– Need o	of appli	cation n	nainten	ance	- M	anag	emen	t spe	ctrum -	+
		Testing 1	Ra	tiona	le M	lanagemer	nt – Co	nfigura	tion Ma	anagen	nent	– Pı	roject	Ma	nage	ment –	
		project p	orc	ocess	pro	duct mea	sures an	nd met	rics –	Estim	ation	of	soft	ware	pro	jects –	
		Decompo)S1	tion 1	echr	iques and	empiric	al estin	nation r	nodels	- Ri	sk ai	nalysi	is and	1 mi	tigation	
UNIT	V	ADVAN	CI			CS IN SO	FTWA	RE EN	INFF	RING							9
	•	Formal N	€∎ ∕[e	thods	$\frac{1}{3} - 1$	Basic Con	cepts -	Mather	natical	prelim	inarie	es-A	pplvi	ng M	[athe	matical	
		notations	fo	or for	rmal	specificat	tion – F	ormal s	pecifica	ation la	angua	ages-	-Clea	n roc	om se	oftware	
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TEX	T BO	OKS	5												
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REFI	ERE	NCE	BOOK	S											
3.	 Pankajalote An Integrated Approach to Software Engineering, 5 Edition 2011. C.RavindranathPandian, "Software Metrics – A guide to planning, analysis and application", AuerbachPublication, Newyork 2011. Ali Behforooz, Frederick J Hudson, "Software Engineering Fundamentals", 2nd Edition, Oxford University Press, Noida, 2009. 														
		P01	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	9 O	PO 10	PO 11	PO 12	PS01	PSO2
CO 1		1	2	1	0	2	1	0	0	0	0	0	2	2	1
CO 2	2	2	3	3	2	2	1	3	0	0	0	0	1	2	2
CO 3	;	3	3	3	1	1	3	0	1	2	0	3	3	2	2
CO 4	ŀ	3	3	3	1	1	3	0	1	2	0	3	3	2	2
CO 5	;	1	3	0	0	3	0	1	0	0	1	0	1	2	1
Total	I	10	14	10	4	9	8	4	2	4	1	6	10	10	8
Scale Value	ed e	2	3	2	1	2	2	1	1	1	1	2	2	2	2
N	lote:		Total		(0	1-:	5	6-10)	11-15				
		Sc	aled va	lue	(0	1		2		3				

Medium

High

Relation

No

Low

COURSE CODE : ACS304					
COURSE NAME : COMPUTER NETWORKS					
PREREQUISITE : PROGRAMMING FOR PROBLEM SOLVIN STRUCTURES	IG AND	DAT	'A		
L T P C C P A	L	Т	Р	Η	
3 1 0 4 3 0 0	3	1	0	4	
Course Objectives					
• To make students understand the basic structure and various principles	s compu	ter ne	twork	ting.	
• To familiarize with the concepts of error detection and correction tech	niques.				
• To study the functions of switching and routing.					
• To study the functions of multiplexing and demultiplexing in transpor	t layer.				
• To understand the various principles, protocols and design aspects of a	compute	r netv	vorkir	ng.	
Course Outcome: After the completion of the course, students will be able to	Do	main		Lev	vel
CO1 Understand the networks components and the various network	Cogni	tive	τ	Jnderst	and
CO2 Describe and Recognize the network error detection and correction	Cogni	tive	τ	Inderst	and
methods.	C o Bill			5110015	
CO3 Identify and interpret the network switching and addressing	Cogni	tive	1	Apply	
methods and apply the various routing simulations.	Comi	tivo	T	Indore	tand
oriented protocol.	Cogin	live		Juders	tanu
CO5 Describe the Application layer functions and network security.	Cogni	tive	ι	Unders	tand
COURSE CONTENT	1		I		
UNIT I DATA COMMUNICATIONS					9
Network Components- Direction of Data flow-networks- Comp	ponents	and C	Catego	ories –	
types of connections- Topologies- Protocols and Standard	s - IS	O/OS	I mo	odel –	
Infansmission Media – Coaxial Cable – Fiber Optics – Line Codin UNIT II DATA LINK LAVED	ng – Mo	dems			9
Error – Detection and Correction – Parity – LRC - CRC – Ham	ming co	de – I	low C	Control	
and Error control – stop and wait – go back –N ARQ – selecti	ve repea	t AR	Q - S	Sliding	
window – HDLC – LAN – Ethernet IEEE 802.3 - IEEE 802.5	- IEEE	802.1	1 – F	DDI –	
SONET - Bridges. UNIT III NETWORK LAVED					0
Internetworks – Packet switching and Datagram approach –	IP addre	ssing	meth	nods –	9
subnetting – Routing – Distance Vector Routing – Link State Ro	uting - 1	Route	rs_		
					9
UNIT IV TRANSPORT LAYER	- Socke	ets –	User		
UNIT IV TRANSPORT LAYER Duties of Transport Layer – Multiplexing – De multiplexing		•	etion		
UNIT IV TRANSPORT LAYER Duties of Transport Layer – Multiplexing – De multiplexing Datagram Protocol(UDP) – Transmission Control Protocol (T Control – Quality of Service (QOS) – Integrated	CP) – C	Conge	stion		1
UNIT IV TRANSPORT LAYER Duties of Transport Layer – Multiplexing – De multiplexing Datagram Protocol(UDP) – Transmission Control Protocol (T Control – Quality of Service (QOS) – Integrated Services. UNIT V APPLICATION LAYER	CP) – C	Conge	suon		9
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- 2. Andrew S. Tanenbaum, David J. Wetherall, "Computer Networks", 5th Edition, 2013
- 3. W. Stallings, "**Data and Computer Communication**", 10th edition, Pearson Education, 2017.
- 4. Larry L. Peterson and Peter S.Davie, "Computer Networks", Morgan Kauffman Publishers 5th Edition 2011.

E REFERENCES

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2. NPTEL videos Computer Networks by Prof. Sujoy Ghosh Department of Computer Science & Engineering Indian Institute of Technology, Kharagpur.

Mapp	ing of CC) with PO	D's												
		P01	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	9 O 4	PO 10	PO 11	PO 12	PSO1	PSO2
CO 1		2	1	1	1	0	0	0	0	1	0	1	1	3	2
CO 2		3	2	2	1	0	0	0	0	1	0	1	0	3	2
CO 3		3	2	3	1	0	0	0	0	1	0	1	0	3	2
CO 4		2	1	2	1	0	0	0	0	0	0	1	0	3	2
CO 5		2	1	1	1	2	0	0	0	0	0	1	1	3	2
Total		12	7	9	5	2	0	0	0	3	0	5	2	15	10
Scaled	l Value	3	2	2	1	1	0	0	0	1	0	1	1	3	2
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Note:	Total	0	1-5	6-10	11-15		
	Scaled value	0	1	2	3		
	Relation	No	Low	Medium	High		

COURSE CODE	XCS507	L	Т	Р	С
COURSE NAME	DATABASE MANAGEMENT SYSTEMS LABORATORY	0	0	1	1
		L	Т	Р	Η
C:P:A	0.7:0.3:0	0	0	2	2

COURSE OBJECTIVES

To facilitate students in database design using Entity Relationship data model. To learn the basics of SQL and construct queries using SQL. •

- •
- To develop solutions using database concepts for real time applications. •

COURS	SE OUTCOMES	DOMAIN	LEVEL
CO1	Apply the design principles for logical design of databases,	Cognitive	Apply
	including ER model and normalization approach.	Psychomotor	Guided
			Response
CO2	Construct queries with the basics of SQL.	Cognitive	Apply
		Psychomotor	Guided
			Response
CO3	Construct database applications using high level language	Cognitive	Apply
	extensions with cursors and triggers		Guided
			Response
CO4	Demonstrate the programs PL/SQL using stored procedures and	Cognitive	Understand
	functions.		Guided
			Response
CO5	Work successfully in a team to design and develop the database	Cognitive	Apply
	applications.	Psychomotor	Guided
			Response

S.No	List of Experin	ients			COs
1	Database design using E-R model and Normalizati	on			CO1
2	Data Definition Language (DDL) commands in RI	OBMS			CO2
3	Data Manipulation Language (DML) and Data Con	ntrol Language (I	DCL)		CO2
4	Views				CO2
5	High level language extensions with cursors and T	riggers			CO3
6	Procedures and Functions				CO4
7	Design and implementation of payroll processing s	system			CO5
8	Design and implementation of Banking system				CO5
9	Design and implementation of Library Information	n System			CO5
10	Design and implementation of Student Information	n System			CO5
	HOUDS	TUTORIAL	PRACTICAL	TC	DTAL
	HOURS	0	30		30

Mapping of CO	Mapping of CO with PO's														
	P01	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	6 Od	PO 10	PO 11	PO 12	PSO1	PSO2	
CO 1	3	2	1	1	1	0	0	0	1	0	0	0	3	2	
CO 2	3	2	1	1	1	0	0	0	1	0	0	0	3	2	
CO 3	3	2	1	1	1	0	0	0	1	0	0	0	3	1	

CO 4		2	1	0	0	1	0	0	0	1	0	0	0	3	1
CO 5		3	2	1	1	1	0	0	0	1	0	0	0	3	3
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COURSE CODE	XCS508	L	Т	Р	С
COURSE NAME	SOFTWARE ENGINEERING LABORATORY	0	0	1	1
PREREQUISITES	PROGRAMMING FOR PROBLEM SOLVING	L	Т	Р	Н
C:P:A	0.5:0.5:0	0	0	2	2

LEARNING OBJECTIVES

- Ability to translate end-user requirements into system and software requirements.
- Create traceability matrix and design SRS document
- Ability to generate a high-level design of the system from the software requirements.
- Ability to translate and implement of high level design into software product.
- Students to get experience and/or awareness of testing problems and will be able to develop a simple testing report.

COURS	SE OUTCOMES	DOMAIN	LEVEL
The stud	lents are able to		
CO1	Exercise the preparation of Software Requirements	Cognitive	Apply
	Specification with reference to standard IEEE format.	Psychomotor	Guided
			Response
CO2	Draw the UML static and behaviour diagrams.	Cognitive	Apply
		Psychomotor	Guided
			Response
CO3	Derive the test cases for white box and black box testing	Cognitive	Apply
	techniques.	Psychomotor	Guided
			Response
CO4	Estimate the project cost using estimation techniques.	Cognitive	Apply
		Psychomotor	Guided
			Response
CO5	Demonstrate the forward and reverse engineering tasks.	Cognitive	Apply
		Psychomotor	Guided
			Response

S.No.	List of Exercises	COs
1	For any given case/ problem statement do the following;	CO1
	i. Prepare a SRS document in line with the IEEE recommended standards.	

	ii. Develop Software Requirements Specification (SRS) for a given problem in IEEE template.	
2	 i. Draw the use case diagram and specify the role of each of the actors. ii. Draw Class Diagram with the identified class along with its relationships. iii. Draw the sequence diagram. iv. Draw the collaboration diagram. 	CO2
	 v. Draw the contaboration diagram. vi. Draw the state chart diagram. vii. Draw the component and deployment diagrams. 	
3	 i. Prototype model –Develop the prototype of the product. ii. Develop test cases for various white box and black box testing techniques. iii. Develop test cases for unit testing and integration testing. 	CO3
4	i. Estimate the Project cost using COCOMO model.ii. Prepare Project Management Document for any one of the project.	CO4
5	 i. Perform forward engineering for any one module of a project (Model to code conversion). ii. Perform reverse engineering for any one module of a project (Code to Model conversion). 	CO5
	HOURS TUTORIAL PRACTICAL TOT	TAL 30

Mapping of	CO	with PC)'s												
		P01	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	9 O 4	PO 10	PO 11	PO 12	PSO1	PSO2
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CO 2		2	2	3	0	2	0	0	0	2	2	1	2	1	1
CO 3		2	2	3	0	2	0	0	0	1	1	2	2	1	1
CO 4		2	2	0	0	0	0	0	0	1	0	1	0	1	1
CO 5		2	2	0	0	0	0	0	0	1	0	0	0	1	1
Total		10	10	7	0	5	0	0	0	7	5	5	5	5	6
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COURS	SE OUTCOMES	\$		Dom	ain		Leve	l
CO1	Relate classroo	m theory with workplace practice	Cog	nitive	e	U	Jndersta	nd
CO2	Comply with practices.	Factory discipline, management, and business	Psy	chom	otor	C F	Guided Response	e
CO3	Demonstrates	teamwork and time management.	Psy	chom	otor	C F	Guided Response	e
CO4	Describe and d obtained during	isplay hands-on experience on practical skills the programme.	Psy	chom	otor	P	Perceptio	n
CO5	Summarize the documents and	e tasks and activities done by technical oral presentations	Psychomotor				Guided Response	e

CO Vs PO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	2	0	0	0	0	0	0	0	0	0	0	0
CO2	0	0	0	0	0	0	1	3	0	0	1	0
CO3	0	0	0	0	0	0	0	0	3	1	3	1
CO4	0	1	2	1	3	0	0	0	0	0	0	3
CO5	0	0	0	3	0	0	0	0	0	3	0	1
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CO3	CO3 Illustrate the intermediate language. Cognitive Understand													and						
CO4	CO4Describe the code generation to generate target code.CognitiveUnderstand													Understand						
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CC) 4		2	2	2	2	2	1	0	0	1	1	0	1	2	2
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		F	indi	ngA	ssocia	ation	7.11.1	die D	&findi	ngsim	Ilarity	7				-	
			cecoi	inme	endati	onsystem:	ollabor	ativeRec		uation	l-	otic					
			Juille	d P o	comp	endation A	auon-K	nowiedg	cDased	Necoll	mend	allo	-11				
InvolucecommendationApproaches. UNIT IV MINING DATA STREAMS										0							
Introduction to Streams Concepts – Stream data model and architecture - Stream																	
		Ċ	Com	outir	g, Sa	mpling data	in a str	eam – F	iltering	stream	ns - C	oun	ting	listing	rt elen	nents in	
		a	stre	am	- Esti	mating mo	ments –	Countin	ng onen	ess in	a win	dow	v – D	ecavi	ng wi	ndow –	
		F	Real	time	Ana	lytics Platf	orm(RT	AP) app	olication	s - ca	ase stu	ıdie	s - r	eal ti	ne se	ntiment	
		a	naly	sis,	stock	market pred	lictions.										
UNI	ΓV	I	FRA	ME	WOR	KS AND V	ISUAL	IZATI	ON								9
		N	ЛарF	Redu	ce –	Hadoop, H	live, Ma	apR – 5	Sharding	– No	oSQL	Da	tabas	es - S	S3 - 1	Hadoop	
		Ι	Distri	bute	d file	e systems -	- Visual	izations	- Visua	ul data	a anal	ysis	tech	nique	s, inte	eraction	
		t	echn	ique	s; Sys	stems and a	pplicatio	ons:			<u> </u>	. 1		-			
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TEXT B		3										v	•			
1. <u>S</u>	ubhas 12657	hini Ch 951X	ellap (SBN	pan Seen	na Ac 8126	<u>. 579518</u>	'Big I 2019	Data and	l Anal	ytics",	Wile	y publ	icatior	,ISB	N 10:	
2. Ľ	avid	Loshin	, "Bi	ig Data	Ana	lytics:	From	Strateg	gic P	lanning	g to	Enterp	orise I	ntegr	ation	with
Т	'ools,7	echniq	ues, l	NoSQL, a	and C	Graph", I	Morga	ın Kauf	mann/	Elsevi	er Puł	olisher	s, 201	3.		
3. A	nand	Rajarar	nan a	nd Jeffre	ey Da	avid Ull	man,	"Mining	g of N	lassive	e Data	asets",	Camb	ridge	Univ	ersity
Р	ress, 2	2012.														
REFERI	ENCE	BOOK	S													
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V	<i>'</i> isuali	zing an	d Pre	senting I	Data"	, Wiley	publis	shers, 20	015.		2			U,	5	U,
2. E	art B	aesens,	"An	alytics i	n a	Big Da	ta W	orld: T	he Es	sential	l Guio	de to	Data	Scier	ice ar	nd its
А З Г	Applications", Wiley Publishers, 2015. Diatmar, Januach, and Markus, Zankar, "Pagammandar, Systems: An Introduction", Cambridge															
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4. K	Cim H	Pries	and I	Robert D	unni	gan, "Bi	ig Dat	ta Anal	ytics:	A Pra	ctical	Guide	for M	lanag	gers "	CRC
Р	ress, 2	2015.				_			_							
5. Jimmy Lin and Chris Dyer, "Data-Intensive Text Processing with MapReduce", Synthesis Lectures																
e-REFERENCES																
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I N	. nttps Jandar	://onlin Sudars	ecoui	ses.npte	Lac.11	n/noc15	_mgU: lagem	5/previe	ew NP dies T	TEL, I IT Ma	Introd dras	uction	to Da	ta An	arytic	s, Dr.
Mapping	g of CO	D with	PO's	i, Dopur		. 01 10 10 1	ugem	ent bru	<i>ares</i> , <i>r</i>	11 1014	urus.					
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				I		-	H	щ	I	H	Р	Ч	Р			
CO 1		2	1	1	1	2	0	0	0	0	0	0	1	3		2
CO 2		3	2	2	2	2	0	0	0	0	0	0	0	3		2
CO 3		3	2	2	2	2	0	0	0	0	0	0	0	3		2
CO 4		2	1	1	1	2	0	0	0	0	0	0	0	3		2
CO 5		12		1	1	2	0	0	0	1	0	0	1	15		2
1 otal Scoled V	ماييم	12	/	/	/ 2	10	0	0	0	1	0	0	2	15		2
Scaleu V	aiue	3	2	Z	L	2	U	U	0		0	0		3		2
Note	:	Т	otal	0		1-5		6-1	0	11-	-15					<u> </u>
	Sc	aled		Ο		1		r			3		1			1
	va	lue		U		1		Z		-	ر		ļ		ļ	<u> </u>
		Relat	ion	No		Lov	V	Medi	um	Hi	gh					

COU	RSE CODE	XGS605		L	Т	Р	SS	С				
COU	RSE NAME	PROFESSIONAL SKILLS		1	0	0	3					
PR	E-REOUISITES	•		L	T	P	SS	H				
	C: P: A	2.6:0.4:0		1	0	4	4 0					
COU	RSE OUTCOMES	5:	D	omai	in	Leve	el					
CO1	Ability to unders	stand communications	Cogn	itive		Rem	ember					
CO2	Apply the known	n skills for career	Cogn	itive		App	ly					
CO3	Identifyinner str	ength	Cogn	itive		Rem	ember					
CO4	Construct the at	titude as a professional	Cogn	itive		Crea	ıte					
CO5	Practicing Etique	ettes	Psych	nome	otor	Guio	led Re	sponse				
UNI	Г I – Communicati	on						<u>9</u>				
1.1 -	Brainstorming											
1.2 -	LSRW											
UNI	Г II – Career Skills	5						9				
2.1 -	Resume & CV prep	baring Skills										
2.2 -	Interview Skills	C										
2.3 -	Exploring Career C	pportunities										
UNI	Г III – Team Skills	* *						9				
3.1 -	Listening as a Tean	n Skill										
3.2 -	Team Building at w	vork place										
UNI	TIV _ Professional	Skille						0				
41 -	Attitude and Goal S	Setting						,				
42 -	Verbal and Non Ve	rbal Communications										
UNI	ΓV – Professional	Etimettes						9				
Socia	1 Etiquettes							/				
Cultu	ral Ethics at work p	lace										
Sugg	ested Readings:											
(i)	Er. A. K. Jain, Dr.	Pravin S. R. Bhatia, Dr. A. M. Sheikh Prot	fessional Co	mmu	inicat	ion Sk	ills S.	Chand				
. /	Publications, 2015	,										
(ii)	Alan Pannett. Key	Skills for Professionals: How to Succeed i	n Profession	al Se	ervice	s, Kog	gan Pag	ge; 1st				

edition, 2013

Mappin	g of CC)s with	GAs:								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	0	0	0	1	0	0	1	1	3	0
CO2	0	0	0	0	1	0	0	1	1	3	0
CO3	2	0	0	0	1	0	0	1	1	3	0
CO4	3	0	0	0	1	0	0	1	3	3	1
CO5	3	0	0	0	1	0	0	1	1	3	1
Total	10	0	0	0	5	0	0	5	7	15	2
Scale	3	0	0	0	1	0	0	1	2	3	1
1-5=1,6	5 - 10 = 2	, 11-15	= 3								

0-No Relation, 1- Low Relation, 2 – Medium Relation, 3- High Relation

COUR	RSE CODE	XCS606			L	Т	Р	C
COUR	RSE NAME	CYBER SECURITY			3	0	0	3
PRE-F	REQUISITES	-						
С	P A				L	Т	P	Η
3	0 0				3	0	0	3
COUR	SE OUTCOMES			DOMA	IN		LEV	EL
CO1	To identify , learn networks and cybe	, practice, and understand the ba r-attacks.	asic concepts of	Cognitiv	ve	Under	stand	
CO2	To define the cond	cepts of system vulnerability scanr	ning and the	Cognitiv	ve	Under	stand	
CO3	To demonstrate , o	lescribe, and differentiate the ne	twork defense	Cognitiv	ve	Apply	,	
	mechanisms and i quarantine networl	lentify and apply the tools used t c attacks.	o detect and					
CO4	To describe, diffe	rentiate, apply the different tools	for scanning.	Cognitiv	ve	Apply	r	
CO5	To identify and lis	t the types of cybercrimes, cyber	laws and cyber-	Cognitiv	ve	Under	stand	
LINIT		IS.						0
	$\frac{1 - 11 \times 1 \times 0 \times 0}{1 \times 0}$	UN	Changing M-4	of Inf.	net.	n C		7
History	y of Information Sys	stems and its Importance, Basics,	Changing Nature	e of Inform	matio	n Syste	ms, N	leed
IOF DIS	Classification of	n Systems: Kole of Internet and	web Services.		m Sy	stem I	reats	and
attacks	, Classification of	Infeats and assessing Damages	Security in mo	bile and	wire	less Co	mput	ing-
Securi	ty Challenges in	Mobile Devices, authentication	Service Secur	Ity, Secu	irity	Implic	ation	IOr
Drgam	zations, Laptops se	rd IDV6 Europtions of various not	world wide w	eu: Dil	er rev	view o		hee
hub a	us ICF/IF, IF V4, a	ind IF vo. Functions of various net	working compor	ients-rout	ers, u	nuges,	swite	nes,
nuo, ga		I NEDA DILITY SCA NININC						0
Overvi	II - SISIENIS VU	LINERADILITY SCANNING	dontification Do	nnor / Vo	reion	Chaol	Tre	9
Droho	Vulnerability Dro	be Vulnershility Exemples Or	aentification, Da	nloit No	truorl		, Ili	
Sconni	ng Notest Soc	ot understanding Port and Sor	vices tools	Dotoning		$\frac{1}{100}$	VinDe	lov
Netwo	rk Reconnaissance	- Nman THC-Aman and Syst	em tools Netw	ork Sniff	ere an	d Injec	tion t	ools
- Tend	lump and Windump	Wireshark Ettercan Hning Kism	et	OIK SIIII		lu injec	uon t	0015
UNIT	III - NETWORK I	DEFENCE TOOLS						9
Firewa	lls and Packet Filter	s: Firewall Basics, Packet Filter V	s Firewall. How	a Firewa	11 Pro	tects a	Netw	ork.
Packet	Characteristic to Fi	lter. Stateless VsStateful Firewalls	s. Network Addr	ess Transl	lation	(NAT) and	Port
Forwar	rding, the basic of V	/irtual Private Networks, Linux F	Firewall. Windov	vs Firewa	ll. Sn	ort: Int	roduc	tion
Detect	ion System. Cryptoc	bl.			,	0100 1110		
UNIT	IV – TOOLS FOR	SCANNING				1.0	0.07	9
Scanni	ng tor web vulneral	onlities tools: Metasploit tool, Ni	kto, W3af, HTT	P utilities	- Cu	ri, Ope	nSSL	and
Stunne	I, Application Inspe	ection tools – Zed Attack Proxy,	Sqlmap. DVWA	, Webgoa	it, Pa	ssword	Crac	king
and Br	ute-Force Tools – Jo	ohn the Ripper, Lohtcrack, Pwdun	np, THC-Hydra.					
UNIT	V - INTRODUCTI	ON TO CYBER CRIME AND	LAW					9
Cyber	Crimes, Types of	Cybercrime, Hacking, Attack	vectors, Cyber	space an	d Cr	iminal	Beha	vior,
Clarifi	cation of Terms, T	raditional Problems Associated v	with Computer C	Crime, Int	rodu	ction to	o Inci	dent
Respon	nse, Digital Forensio	cs, Computer Language, Network	Language, Real	ms of the	Cybe	er world	l, A E	Brief
History	y of the Internet, Re	ecognizing and Defining Compu	iter Crime, Cor	ntemporar	y Cr	imes, C	Compi	iters
as Tar	gets, Contaminants	and Destruction of Data, Indi	an IT ACT 200	0. Introdu	uctior	to Cy	ber Ci	rime
Investi	gation: Password C	cracking, Key loggers and Spyw	are, Virus and V	Worms, T	rojan	and b	ackdo	oors,
Stegan	ography, DOS and l	DDOS attack, SQL injection, Buff	er Overflow, Att	ack on wi	reless	s Netwo	orks.	
			LECTURE	TUTOF	RIAL	'	ΓΟΤΑ	AL
			45		0		45	;
TEXT	BOOKS							

- 1. Nina Godbole, "Information Systems Security: Security Management, Metrics, Frameworks and Best Practices, w/cd", Wiley Publications, 2018
- 2. Thomas J. Mowbray, "Cybersecurity: Managing Systems, Conducting Testing and Investigating Intrusions", Wiley Publications, 2019
- 3. D.S. Yadav, "Foundations of Information Technology", New Age International publishers, 5th Edition, 2018

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- 2. Nina Godbole, SunitBelapure, "Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wiley publications, 2013, ISBN 10 : 8126521791, ISBN 13 : 9788126521791.
- 3. Corey Schou, Daniel Shoemaker, "Information Assurance for the Enterprise: A Roadmap to Information Security (McGraw-Hill Information Assurance & Security)",
- Tata McGraw Hill, 2013, ISBN-10: 0072255242, ISBN-13: 978-0072255249.
- 4. VivekSood, "Cyber Laws Simplified", McGraw Hill Education (INDIA) Private Limited in 2001, ISBN-10: 0070435065, ISBN-13: 978-0070435063.
- 5. Steven M.Furnell, "Computer Insecurity", Springer Publisher, 2005 Edition.

E – REFERENCES

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- 2. https://www.metasploit.com/
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- 5. http://www.winpcap.org/windump/install/
- 6. http://www.tcpdump.org/
- 7. https://www.wireshark.org/
- 8. https://ettercap.github.io/ettercap/
- 9. https://www.concise-courses.com/hacking-tools/top-ten/
- 10. https://www.cirt.net/Nikto2
- 11. http://sqlmap.org/

Mapping of COs with POs:

		PO											PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	3	3	3	0	2	2	2	0	0	0	3	2
CO2	3	3	3	3	2	1	1	1	2	0	0	0	3	2
CO3	0	3	2	2	0	1	2	2	0	0	0	0	0	0
CO4	2	2	2	2	0	0	0	0	0	0	0	0	0	0
O5	3	2	3	3	3	0	2	2	2	0	0	0	3	2
Total	11	13	13	13	8	2	7	7	6	0	0	0	9	6

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$

0 - No Relation, 1 - Low Relation, 2- Medium Relation, 3- High Relation

SEMESTER : VI COURSE CODE : XCS607 COURSE NAME : COMPILER DESIGN LABORATORY PREREOUISITE : FORMAL LANGUAGE AND AUTOMATA THEORY		
COURSE CODE:XCS607COURSE NAME:COMPILER DESIGN LABORATORYPREREOUISITE:FORMAL LANGUAGE AND AUTOMATA THEORY		
COURSE NAME:COMPILER DESIGN LABORATORYPREREOUISITE:FORMAL LANGUAGE AND AUTOMATA THEORY		
PREREOUISITE · FORMAL LANGUAGE AND AUTOMATA THEORY		
L T P C C P A L T F	P H	
0 0 1 1 0.5 0.25 0.25 0 0 0 2	2 2	
Course Objectives		
• To explore the principles, algorithms and methods to design and construction of compiler		
Course Outcome: After the completion of the course, students will be able to Domain	Leve	el
CO1 Describe the compilers and its construction tools and specification Cognitive U	Jnderstar	nd
of tokens.		
CO2 Describe and apply various parsing techniques for parsing the Cognitive, R	Remembe	er
string. Psychomotor C	Guided	
R	Response	
CO3 Illustrate and construct intermediate language Cognitive R	Remembe	er
Developmentary C	Suided	~1
r sycholiotor		
	kesponse	•
CO4 Describe the code generation and make use of code generator to Cognitive, R	Remembe	er
generate the target code. Psychomotor	Guided	
R	Response	;
CO5 Explain the code optimization and apply the optimization Cognitive, R	Remembe	er
techniques. Psychomotor C	Guided	
R	Response	
List of Experiments	tesponse	·
List of Experiments		
S.No List of Experiments		CO'S
UNIT I INTRODUCTION TO COMPILING		10
1. Regular Expression into NFA		CO1
2. Implementation of Lexical Analyzer Using LexTool.		
3. Generate the token using C		
4. Conversion of Infix to Postfix Expression		
5. Simulate Lexical Analyzer Tools		
UNIT II SYNTAX ANALYSIS		10
6.Syntax Analysis using YACC.		CO2
7. Remove Left Recursion		
8.Check Whether the grammar is LL(1) Grammar or not		
9. Implementation of Shift Reduce Parsing Algorithm.		
NIT III INTERMEDIATE CODE GENERATION		4
10.Implementation of Quadruples		CO3
11. Implementation of Triples.		
UNIT IV CODE GENERATION		3
12.Implementation of Intermediate Code Generation.		<u>CO4</u>
UNIT V CODE OPTIMIZATION AND RUN TIME ENVIRONMENTS	3	3
13. Implementation of Intermediate Code Optimization		CO5
Hours Tutorial Practic	al	Total
0 30		30

Mapping of CO with PO's														
	P01	P02	PO 3	PO 4	PO 5	9 Od	PO 7	PO 8	6 Od	PO 10	PO 11	PO 12	PSO1	PSO2

CC	D 1		1	1	1	2	1	1	0	0	2	1	0	2	2	2
CC	0 2		2	2	1	1	2	1	0	0	1	1	0	1	2	2
CC	03		1	3	2	1	1	1	0	0	1	1	0	1	3	2
CC	O 4		2	2	2	1	2	1	0	0	1	1	0	1	3	2
CC	05		2	3	3	2	2	1	0	0	1	1	0	1	2	2
To	otal		8	11	9	7	8	5	0	0	6	5	0	6	12	10
Sc	aled Valu	ue	2	3	2	2	2	1	0	0	2	1	0	2	3	2
	Note:		To	otal	0			1-5			6-10		11-	15		
		Sca	aled va	lue	0			1			2		3			

Low

Medium

High

XCS608	L	Т	P	С
BIG DATA ANALYTICS LABORATORY	0	0	1	1
	L	Т	Р	Η
	0	0	2	2
	XCS608 BIG DATA ANALYTICS LABORATORY	XCS608LBIG DATA ANALYTICS LABORATORY0L0	XCS608LTBIG DATA ANALYTICS LABORATORY00LT00	XCS608LTPBIG DATA ANALYTICS LABORATORY001LTP002

Course Objectives

Relation

- Learn the implementation of basics of Python and text pre-processing
- Learn the implementation of classification and clustering algorithms
- Learn the implementation of visualization

No

COURS	SE OUTCOMES	DOMAIN	LEVEL
CO1	Demonstrate the basics of python for performing data analysis	Cognitive	Apply
CO2	Demonstrate the use of text preprocessing, regression	Cognitive,	Remember
		Psychomotor	Guided
			Response
CO3	Demonstrate the use of classification algorithms	Cognitive,	Remember
		Psychomotor	Guided
			Response
CO4	Demonstrate the use of clustering algorithms	Cognitive,	Remember
		Psychomotor	Guided
			Response
CO5	Demonstrate the use of visualization	Cognitive,	Remember
		Psychomotor	Guided
			Response

S. No.	List of Experiments	Course
		Outcome
1.	Write a Python program to perform operations on Strings, Lists, Sets and	CO1
	Tuples	
2.	Write a Python script to a) add a key to a dictionary, b) to check if a given key	CO1
	already exists in a dictionary	
3.	Write a program to Implement Text Pre-processing with TF-IDF	CO2

4.	Write a program to Implement Linear and Logistics regression	CO2
5.	Write a program to Implement Decision Tree Classification	CO3
6.	Write a program to Implement Naïve Bayes Classification	CO3
7.	Write a program to Implement Principal Component Analysis	CO4
8.	Write a program to Implement K-Means Clustering	CO4
9.	Introduction to Matplotlib, Seaborn Packages in Python	CO5
10.	Getting and Setting Values in Graphs using Python	CO5

Mapping of CO with PO's

	P01	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS01	PSO2
CO 1	3	2	2	2	3	0	0	0	1	0	1	0	3	2
CO 2	3	2	2	2	3	0	0	0	1	0	1	0	3	2
CO 3	3	2	2	2	3	0	0	0	1	0	1	0	3	2
CO 4	3	2	2	2	3	0	0	0	1	0	1	0	3	2
CO 5	3	2	2	2	3	0	0	0	1	0	1	0	3	2
Total	15	10	10	10	15	0	0	0	5	0	5	0	15	10
Scaled Value	3	2	2	2	3	0	0	0	1	0	1	0	3	2

SEMESTER VII

COURSE CODEXCSE75LTPC												
COUR	SE NA	ME	ADVANCED OPERATING SYSTEM		3	0	0	3				
С	Р	A			L	Т	Р	Η				
3.0	0.0	0.0			3	0	0	3				
Objectiv	ve:					·						
G (Object	ive of A	Advanced Operating systems course are to learn the fu	undamenta	ls of	Oper	rating	1				
Systems	, to gai	n know	ledge on distributed operating system concepts that in	ncludes arc	chitec	ture,	mutua	1				
exclusio	n algor	inns, (teadlock detection algorithms and agreement protoco	IS								
and to g	ain ins	ignt on	to the distributed resource management components	viz. the								
nrotocol		mpiem	entation of distributed shared memory, recovery and	commu								
COURS		TCOM	ES	DOMA	INI		IF	VEI				
	Desci	ibe the	e various synchronization scheduling and memory	Cognitive	11N 2	Ret	nember	Y EL r				
001	mana	gement	issues	coginava		Un	derstan	d,				
CO2	Demo	onstrate	e the mutual exclusion, deadlock detection and	Cognitive	Э	Cre	ate,					
	agree	ment	protocols of	Ū		An	alyze					
Distributed operating system												
CO3 Discuss the various resource management techniques issues and Cognitive Remember,												
various deadlock detection algorithm and resolution for Understand												
CO4	Desci	·ihe and	analyze the various agreement problems and	Cognitive Remem			nembei	r				
004	soluti	ons.	analyze the various agreement problems and	coginary		Un	derstan	d.				
CO5	Unde	rstand	and explain the various Mechanisms for building	Cognitive	3	Rei	nember	r,				
	Distri	buted F	ile Systems, Design issues and install open source	-		Un	derstan	d,				
	kerne	l modif	y existing open source kernels in terms of			An	alyze,					
	functi	onality	or features used.			Ap	ply.	•				
UNIT-I	[]]	UNDA	MENIALS OF OPERAIING SYSTEMS					У				
Overviev	w –	Synchr	onization Mechanisms – Processes and Three	ads - Pr	oces	s S	cheduli	ng –				
Deadloc	KS: I	Jetectio	n, Prevention and Recovery – Models	of Reso	urce	s -	– Me	mory				
		ISTRI	RUTED OPERATING SVSTEMS					0				
01111 -								,				
Issues	in l	Distribu	ted Operating System – Architecture – C	ommunica	tion	Pr	Imitive	s –				
Algorith	S LO	gical Cen	tralized and Distributed Deadlock Detection	Algorith	l IVI			usion ment				
Protocol	S.	CCI	tranzed and Distributed Deadlock Detection	ngonu	1113		ngice	mem				
UNIT-I	II D	ISTRI	BUTED RESOURCE MANAGEMENT					9				
Distribu	ted File	e Syster	ns – Design Issues - Distributed Shared	Memory	—	Algo	orithms	for				
Impleme	enting	Distr	ibuted Shared memory-Issues in Load	Distributir	ıg	-	Sched	uling				
Algorith	ms	– Sy	nchronous and Asynchronous Check Pointing	and R	ecov	ery	-	Fault				
Tolerand	$\frac{ce - T}{T}$	wo-Pha	se Commit Protocol.					~				
UNIT -	V	KEAL '	TIME AND MOBILE OPERATING SYSTEMS					9				
Basic M	odel of	Real	Time Systems - Characteristics- Application	s of Real	Ti	me	Syster	ns –				
Real T	ime 7	ask S	cheduling - Handling Resource Sharing - N	Mobile O	perat	ing	System	ns –				
Micro Monoco	Kernel	Desig	gn - Client Server Resource Access – Process	es and '	Threa	ids	- Me	mory				
		ASE S'	IUDIFS					Q				
	Ľ							7				

Linux System: Design Principles - Kernel Modu	ules - Process	Management	Scheduling -
Memory Management - Input-Output Man	agement - Fi	le System -	Interprocess
Communication. iOS and Android: Architecture an	nd SDK Fran	nework - Med	lia Layer -
Services Layer - Core OS Layer - File System.			
	LECTURE	PRACTICAL	TOTAL
	45	0	45
REFERENCES			
1. Mukesh Singhal and Niranjan G. Shivaratri,	"Advanced Co	ncepts in Opera	ting Systems
– Distributed, Database, and Multiprocessor	r Operating S	vstems". Tata	McGraw-Hill.
	operaning of	J	,

- 2. Abraham Silberschatz; Peter Baer Galvin; Greg Gagne, "Operating System Concepts", Seventh Edition, John Wiley & Sons, 2012
- 3. Daniel P Bovet and Marco Cesati, "Understanding the Linux kernel", 3rd edition, O'Reilly, 2005
- 4. Rajib Mall, "Real-Time Systems: Theory and Practice", Pearson Education India, 2006.
- 5. Neil Smyth, "iPhone iOS 4 Development Essentials Xcode", Fourth Edition, Payload media, 2011.

E REFERENCES

- 1. https://nptel.ac.in/courses/106108101/
- 2. https://www.researchgate.net/publication/2959795_Advanced_Operating_Systems

Mapping of COs with POs:

		PO	PO	РО	PO	PO	PO	PO	P	08	РО	P	01	PO	11 P	O12	PS	01	I	PSO		
		1	2	3	4	5	6	7			9		0							2		
CO) 1	1	0	0	0	0	0	0	(0	0		0	1		0	(0		0		
CO	2	1	3	2	0	0	1	3	(0	0		0	0		1	4	2		0		
CO) 3	1	3	0	0 0 1 0 0 0 1 3											~ .	3		0			
CO)4	1	3	0	0 0 0 0 0 0 0 1 3										3			0				
CO) 5	1	0	0	0 3 1 1 0 0 0 2 3										(0		0				
		5	9	2	0	$\begin{array}{c c c c c c c c c c c c c c c c c c c $													0			
		PO1	PO2	PO3	PO4	PO5	6 PO	6 PC	70	PO	8 P	D 9	PO	10	PO11	PO	12	PS	01	F	PSO2	
<u> </u>	1																					_
Origin value	nal	5	9	2	0	0 3 3 4 0 0 0 5 10												8		0		
Scaled	1																					
to 0.1.2.3	3	1	2	1	0	1	1		1	0		0	()	1	2	2		2		0	
scale																						
	C	OURS	E COI	DE	XUM	704]	Ĺ	Т	Р	С	
	С	OURS	E NAN	ΛE	BIOI	LOGY											3	3	0	0	3	
]	L	Т	Р	С	
	C	:P:A=	3:0:0														3	3	0	0	3	-
							Course]
		Course outcome Domain																				
	C	CO1 To describe how biological observations of 18th Century that lead to major Cognitive discoveries.																				
	С	O2 E	Explain	the cel	l morpl	nology	and th	eir fur	nctic	ons								Co	gnit	ive		

CO3 Ex	plain the cell functioning and the physiological system	Cognitive
CO4 To	classify the Biomolecules and to understand the essential of Amino Acids	Cognitive
	JA/RNA	Affective
CO5 Ar	ply Biological sciences in Engineering Applications.	Cognitive
1		Affective
L	COURSE CONTENT	
UNIT I	Introduction	6
	Fundamental differences between science and engineering by draw	ring a
	comparison between eye and camera, Bird flying and aircraft Why we r	need to
	study biology? - Biological observations of 18th Century that lead to	major
	discoveries Examples from Brownian motion and the origin of thermodyn	namics
	by referring to the original observation of Robert Brown and Julius Mayor.	
UNIT II	Cell Biology	9
	Introduction to the cell biology – Cell size and shape - Chemical compos	sition -
	Classification of cell and its properties; Cell membrane- Nucleus –Mitoche	ondria-
	Endoplasmic Reticulum Lysosome and Peroxisome; Microscopy and its type	S.
UNITIII	Cell Physiology	9
	Cell cycle; Cell signaling, Transport across cell membrane; Introduction to I	Human
	physiology – Circulatory system - Respiratory system - Excretory system	stem –
	Biomologulos	
UNITIV	Molecules of life Monomeric units and polymeric structures. Discuss	9 about
	sugars starch and cellulose Amino acids and proteins Nucleotide	about
	DNA/RNA Two carbon units and linids	.s and
UNIT V	Modern Applications in Biological Sciences	12
	Principles and Application of Biosensor: Basics of Biochips – Bio ferti	lizer –
	Bioinformatics – Bio fuel – Introduction to Bio mechanics - Neural Ne	twork:
	Artificial Intelligence (AI) - Stem Cell; Introduction to Genetics; C	Genetic
	Engineering and its Application, Safety Hazardous Effect.	
Total Hou	rs	45
TEXT BO	OKS	<u></u>
1) Biology	: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; V	vasserman, S.
A.; Millors	Ky, P. V.; Jackson, K. D. Pealson Education Ltu ini Singh and Dr. Tanu Allan "Piology for Engineers" Vaya Education of Indi	a Naw Dalhi
2014	ini singn and Dr. rand Anen, Blology for Engineers, vayd Education of mur	a, New Denn,
REFERE	NCF BOOKS	
1) Outlines	of Biochemistry, Conn. E.E. Stumpf, P.K. Bruening, G. Doi, R.H., John Wiley	and Sons
2) Princip	les of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H.	Freeman and
Company		
3) Molecu	lar Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman a	and company,
Distributed	l by Satish Kumar Jain for CBS Publisher	_ •
4) Microbi	ology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brow	n Publishers
5)Biology	for Engineers (ISBN: 9781121439931), TMH	
	0	
Online Re	ferences:	
1) www.bio	12.com/cn3/kaycrom/totes.pdf	
::)	aincoring viewe adv/hma050/avh calida = 4f	
ii) www.er	ngineering.uiowa.edu/bme050/cvb-solids.pdf	
ii) www.er iii) www.b	ngineering.uiowa.edu/bme050/cvb-solids.pdf iologyjunction.com/mendelian_genetics.html	

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

	PROGRAM OUTCOMES														
	1	2	3	4	5	6	7	8	9	10	11	PSO1	PSO2		
CO1	3	2	1	1	0	1	2	1	0	0	3	2	1		
CO2	2	2	2	1	0	1	2	1	0	0	3	3	1		
CO3	3	2	1	1	0	1	2	1	0	0	3	2	1		
CO4	2	2	1	1	0	1	2	1	0	0	3	1	1		
CO5	3	2	1	2	0	1	2	1	0	0	3	2	1		
CO6	3	2	1	1	0	1	2	1	0	0	3	3	1		
CO7	3	2	1	1	0	2	2	1	0	0	3	2	1		
CO8	3	2	1	1	0	1	2	1	0	0	3	1	1		
CO9	3	2	1	1	0	1	2	2	0	0	3	2	1		
	25	18	10	10	0	10	18	10	0	0	27	18	9		

COURSE CO	ODE	XUM705		L	Т	Р	С		
COURSE NA	AME	DISASTER MANAGEMENT		3	0	0	0		
				L	Т	Р	Н		
				3	0	0	3		
PREREQUI	SITE	NIL							
COURSE O	COURSE OUTCOMES DOMA								
CO1	tive		Applir	ıg					
CO2	On co	mpletion of this course the students will be able to	Cogni	Cognitive		Analyz	zing		
	underst	and planning essentials of disaster							
CO3	Under globall	standing of importance of seismic waves occurring y	Cogni	tive		Analyz	zing		
CO4	Estima	te Disaster and mitigation problems.	Cogni	tive		Applir	ıg		
CO5	Have a	keen knowledge on essentials of risk reduction	Cogni	tive		Applir	ıg		
UNIT I	INTR	ODUCTION					9		
Introduction -	- Disaste	er preparedness - Goals and objectives of ISDR Programmer	ne- Ris	k iden	tifica	tion –	Risk		
sharing – Dis	aster and	d development: Development plans and disaster manager	nent-A	lterna	tive t	o dom	inant		
approach – di	saster –	development linkages - Principle of risk partnership.							
				-			~		

UNIT IIAPPLICATION OF TECHNOLOGY IN DISASTER RISK REDUCTION9Application of various technologies: Data bases – RDBMS – Management Information systems – Decision
support system and other systems – Geographic information systems – Intranets and extranets – video
teleconferencing. Trigger mechanism – Remote sensing-an insight – contribution of remote sensing and GIS
- Case study.

UNIT III AWARENESS OF RISK REDUCTION

Trigger mechanism – constitution of trigger mechanism – risk reduction by education – disaster information network – risk reduction by public awareness

9

9

UNIT IV DEVELOPMENT PLANNING ON DISASTER

Implication of development planning – Financial arrangements – Areas of improvement – Disaster preparedness – Community based disaster management– Emergency response.

UNIT V SEISMICITY

Seismic waves – Earthquakes and faults – measures of an earthquake, magnitude and intensity – ground damage – Tsunamis and earthquakes.

LECTURE	TUTORIAL	TOTAL
45	=	45

TEXT BOOKS

- 1. Siddhartha Gautam and K Leelakrishna Rao, "Disaster Management Programmes and Policies", Vista International Pub House, 2012.
- 2 Arun Kumar, "Global Disaster Management", SBS Publishers, 2008.

REFERENCES

- 1. Encyclopedia of Disaster Management, Neha Publishers & Distributors, 2008.
- 2. Pardeep Sahni, Madhavimalalgoda and Ariyabandu, "Disaster risk reduction in south Asia", PHI, 2002.
- 3. Amita Sinvhal, "Understanding earthquake disasters" TMH, 2010.
- 4. Pardeep Sahni, Alka Dhameja and Uma Medury, "Disaster mitigation: Experiences and reflections", PHI, 2000.

TABLE 1: CO vs PO Mapping

	P01	P02	P03	P04	PO5	P06	P07	PO8	P09	P010	P011	P012	PS01	PSO2
CO 1	1					1			1					
CO 2	2	1				1		1			1		3	1
CO 3	1				1		1				1			
CO 4	3	1		3			1						1	
CO 5	3	3											1	
Total	10	5		3	1	2	2	1	1		2		5	1
Scaled value	2	1		1	1	1	1	1	1		1		1	1

 $1\text{-}5{\rightarrow}1, 6\text{-}10 \rightarrow 2, 11\text{-}15 \rightarrow 3$

0 - No Relation, 1 - Low Relation, 2 - Medium Relation, 3 - High Relation

9

SUB. CODEXCSM03LTPC														
SUB. NA	ME		R PROGRAMMING			1	0	0	1					
PRERE(QUISI	TES				L	Т	Р	Η					
С	Р	Α				3	0	0	3					
3.0	0.0	0.0			<u> </u>		<u> </u>							
COURSI	E OU	TCOMI ba abla t	S: Upon completion of the	e course, the	Domair	ı	Le	vel						
students s	Dem	onstrate	o how to install and configure RS	Studio	Cognitiv	ve	Un	derstan	ding					
CO1	Dem		low to instant and configure Ke	liuulo	Coginti	ve		uerstan	ung					
CO2	Expla	ain the us	se of data structure and loop fur	nctions.	Cognitiv	ve	Un	derstan	ding					
CO3	Imple probl	ement lis ems.	ts and matrices to provide solu	tions for various	Cognitiv	ve	Un	derstan	ding					
CO4	Study probl	y about 1 ems.	factors and data frames and to	o solve statistical	Cognitiv	ve	Un	derstan	ding					
CO5	Appl	y various	s plot functions to visualize the	results using R.	Cognitiv	ve	Un	derstan	ding					
UNIT I	JNIT I INTRODUCTION 2													
Overview Language Arithmeti Logical o	Overview of R, R data types and objects, reading and writing data, sub setting R Objects, Essentials of the R Language, Installing R, Running R, Packages in R, Calculations, Complex numbers in R, Rounding, Arithmetic, Modulo and integer quotients, Variable names and assignment, Operators, Integers, Factors, Logical operations													
UNIT II	UNIT II CONTROL STRUCTURES, VECTORS, AND FUNCTIONS 3													
Control \$	Struct	ures: If	statement, ifelse statement, i	f- else() function,	switch()	function,	repe	at loop	, while					
loop, for	loop,	break sta	tement, next statement, Vecto	rs:Creating Vecto	ors, Acces	ssing eler	nents	s of a V	Vector,					
Operation	ns on	Vectors,	Vector Arithmetic; Function	s: Formal and Ac	tual argu	iments, I	Vame	ed argu	ments,					
	I LIST	'S AND	MATRICES	on of functions, Re	cursive i	unctions			3					
Lists Cre	eating I	Lists Ge	neral List Operations List Inde	xing Adding and I	Deleting I	ist Elem	ents	Gettin	g the					
Size of a	List. A	ccessing	List Components and Values.	Applying Function	is to Lists	s. Matrice	es - C	Creating	g the					
matrices,	Acces	sing elen	nents of a Matrix, Operations o	n Matrices, Matrix	transpos	e		2	2					
UNIT IV	FAC	FORS A	ND DATA FRAMES		Ĵ.				3					
Data Fran	mes: C	reating d	lata frame, Operations on data	frames, Accessing	data frai	mes, Con	nmor	n Funct	ions					
Used with	h Facto	ors, Crea	ting data frames from various	sources, Factors:	Understa	nding fac	tors,	Modify	ying					
factors, F	actors	in Data f	rames.											
UNIT V	DATA	VISUA	LIZATION IN R						4					
Need for and line p	data v plot, pie	isualizati e chart /	on, Bar plot. Plotting categoric 3D pie chart, Scatter plot, Box	cal data, Stacked b plot.	ar plot, F	Histogram	n plot	t() func	tion					
				LECTURE	TUTC	ORIAL	7	TOT	AL					
TEXT B	OOKS	5		k	1		<u></u>							
 Roger D. Peng," R Programming for Data Science ", 2012. Norman Matloff,"The Art of R Programming- A Tour of Statistical Software Design", 2011. REFERENCE BOOKS 														
Garrett G	Grolem	und, Hac	lley Wickham,"Hands-On Prog	gramming with R	Write Y	'our Owr	n Fur	nctions	and					
Simulatio	ons", 1 ^s	st Edition	, 2014											
E-REFE	RENC	:Е	/											
1. <u>https://</u> 2. http://w	<u>swaya</u>	<u>m.gov.m</u>	/nd1_noc19_ma33/preview m/elementary_statistics											
2. <u>mp://v</u>	<u>v w w .1</u> -	<u>uuoi.coi</u>	iverementary-stansues											

3. https://www.tutorialspoint.com/r/

			PSO											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO 1	3	-	1	-	3	-	-	-	2	1	-	3	3	1
CO 2	3	-	1	-	3	-	-	-	2	1	-	3	3	1
CO 3	3	-	1	-	3	-	-	-	2	1	-	3	3	1
CO 4	3	-	1	-	3	-	-	-	2	1	-	3	3	1
CO 5	3	-	1	-	3	-	-	-	2	1	-	3	3	1
	15	-	5	-	15	-	-	-	10	5	-	15	15	5

	РО											PS	PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
Original	15	-	5	-	15	-	-	-	10	5	-	15	15	5
Scaled to 0,1,2,3 scale	3	-	1	-	3	-	-	-	2	1	-	3	3	1

SEMESTER VIII

COU	RSE C	ODE	XUM801	L	Т	Р	C					
COU	RSE N.	AME	CYBER SECURITY		3	0	0	3				
С	Р	A			L	Т	Р	H				
3	0	0			3	0	0	3				
COU	RSE O	UTCOMES	1	DOMAIN		LEVEL						
CO1	To co	identify, lean acepts of netwo	rn, practice, and understand the basic vorks and cyber-attacks.	Cognitive	Remember, Analyse, Apply.							
CO2	To the	define the co scanning too	Cognitive	Re	emem	ber						
CO3	To dei to	demonstrate Tense mechani detect and qua	Cognitive	Ui Ai Aj	nderst nalyze pply.	and, >,						
CO4	To sca	describe, dif nning.	Cognitive	Ui Ai Aj	and, ¢,							
CO5	To cyl	identify and ber-crime inve	list the types of cybercrimes, cyber laws and estigations.	Cognitive	Re	Remember						
UNIT	I – IN	FRODUCTI	ON					9				
Histor for D attack Secur Organ Protoc hub, g	y of In istribute s, Clas ity Ch ization cols TC gateway	Formation System and Information sification of allenges in s, Laptops se P/IP, IPV4, an and Modulati	tems and its Importance, Basics, Changing Na n Systems: Role of Internet and Web Servic Threats and assessing Damages Security in Mobile Devices, authentication service Se curity Concepts in Internet and World Wid nd IPV6. Functions of various networking con ion Techniques.	ature of Inform es. Information mobile and ecurity, Securate e Web: Brid mponents-rout	mation on Sys Wirele urity l ef rev ers, br	Syste tem T ess Co implic iew o idges,	ems, N Freats comput ation f Inte switc	leed and ing- for ernet ches,				
UNIT	' II - SY	STEMS VU	LNERABILITY SCANNING					9				
Overv Probe Scann Netwo – Tcp	iew of , Vuln ing - ork Rec dump a	vulnerability erability Pro Netcat, Soca onnaissance nd Windump,	scanning, Open Port / Service Identification, be, Vulnerability Examples, OpenVAS, Mat, understanding Port and Services tools – Nmap, THC-Amap and System tools. N Wireshark, Ettercap, Hping Kismet.	, Banner / Ve etasploit. Ne - Datapipe Jetwork Sniffe	ersion tworks e, Fpi ers and	Check s Vul pe, V l Injec	c, Tra Inerab WinRe ction t	affic ility elay, ools				
UNIT	' III - N	ETWORK I	DEFENCE TOOLS					9				
Firew	alls and	Packet Filter	s: Firewall Basics, Packet Filter Vs Firewall, I	Firewalls and Packet Filters: Firewall Basics, Packet Filter Vs Firewall, How a Firewall Protects a Network,								

Packet Characteristic to Filter, Stateless VsStateful Firewalls, Network Address Translation (NAT) and Port Forwarding, the basic of Virtual Private Networks, Linux Firewall, Windows Firewall, Snort: Introduction Detection System, Cryptool.

UNIT IV – TOOLS FOR SCANNING

Scanning for web vulnerabilities tools: Metasploit tool, Nikto, W3af, HTTP utilities - Curl, OpenSSL and Stunnel, Application Inspection tools – Zed Attack Proxy, Sqlmap. DVWA, Webgoat, Password Cracking and Brute-Force Tools – John the Ripper, L0htcrack, Pwdump, THC-Hydra.

UNIT V - INTRODUCTION TO CYBER CRIME AND LAW

9

9

Cyber Crimes, Types of Cybercrime, Hacking, Attack vectors, Cyberspace and Criminal Behavior, Clarification of Terms, Traditional Problems Associated with Computer Crime, Introduction to Incident Response, Digital Forensics, Computer Language, Network Language, Realms of the Cyber world, A Brief History of the Internet, Recognizing and Defining Computer Crime, Contemporary Crimes, Computers as Targets, Contaminants and Destruction of Data, Indian IT ACT 2000.

Introduction to Cyber Crime Investigation: Password Cracking, Key loggers and Spyware, Virus and Worms, Trojan and backdoors, Steganography, DOS and DDOS attack, SQL injection, Buffer Overflow, Attack on wireless Networks.

	LECTURE	TUTORIAL	TOTAL
	45	0	45
TEXT BOOKS			

- 4. Nina Godbole, "Information Systems Security: Security Management, Metrics, Frameworks and Best Practices, w/cd", Wiley Publications, 2008, ISBN 10: 8126516925, ISBN 13 : 9788126516926
- Thomas J. Mowbray, "Cybersecurity: Managing Systems, Conducting Testing and Investigating Intrusions", Wiley Publications, 2013, Kindle Edition, ISBN 10: 812654919X, ISBN 13: 9788126549191
- 6. D.S. Yadav, "Foundations of Information Technology", New Age International publishers, 3rd Edition, 2006, ISBN-10: 8122417620, ISBN-13: 978-8122417623.

REFERENCES

- 6. Mike Shema, "Anti-Hacker Tool Kit", McGraw Hill Education, 4th edition, 2014,
- Nina Godbole, SunitBelapure, "Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wiley publications, 2013, ISBN 10: 8126521791, ISBN 13: 9788126521791.
- Corey Schou, Daniel Shoemaker, "Information Assurance for the Enterprise: A Roadmap to Information Security (McGraw-Hill Information Assurance & Security)", Tata McGraw Hill, 2013, ISBN-10: 0072255242, ISBN-13: 978-0072255249.
- 9. VivekSood, "Cyber Laws Simplified", McGraw Hill Education (INDIA) Private Limited in 2001, ISBN-10: 0070435065, ISBN-13: 978-0070435063.
- 10. Steven M.Furnell, "Computer Insecurity", Springer Publisher, 2005 Edition.

E – REFERENCES

- 12. https://www.cryptool.org/en/
- 13. https://www.metasploit.com/
- 14. http://sectools.org/tool/hydra/
- 15. http://www.hping.org/
- 16. http://www.winpcap.org/windump/install/
- 17. http://www.tcpdump.org/
- 18. https://www.wireshark.org/
- 19. https://ettercap.github.io/ettercap/
- 20. https://www.concise-courses.com/hacking-tools/top-ten/
- 21. https://www.cirt.net/Nikto2
- 22. http://sqlmap.org/

Table 1: Mapping of COs with POs

							PO						PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	3	3	3	0	2	2	2	0	0	0	3	2
CO2	3	3	3	3	2	1	1	1	2	0	0	0	3	2
CO3	0	3	2	2	0	1	2	2	0	0	0	0	0	0
CO4	2	2	2	2	0	0	0	0	0	0	0	0	0	0

CO5	3	2	3	3	3	0	2	2	2	0	0	0	3	2
Total	11	13	13	13	8	2	7	7	6	0	0	0	9	6

							РО						PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
Original	11	13	13	13	8	2	7	7	6	0	0	0	9	6
Scaled to 0,1,2,3 scale	3	3	3	3	2	1	2	2	2	0	0	0	2	2

3. Syllabus for the Courses

B.Tech . Computer Science and Engineering (Artificial Intelligence and Machine Learning) -Full Time

COU	RSE C	ODE	XMA101	L	Т	Р	C					
COU	RSE N	AME	CALCULUS AND LINEAR ALGEBRA	3	1	0	4					
С	Р	Α		L	Т	Р	H					
3	0.5	0.5		3	1	0	4					
PREI	PREREQUISITE: Differentiation and Integration											
Cour	se Outo	comes	Domai	in	Lev	rel						
CO1	App	ly orthog	Cognitiv	ve	Apply							

	canonical forms.		
CO2	Apply power series to tests the convergence of the sequences and series. Half range Fourier sine and cosine series.	Cognitive	Apply
CO3	Find the derivative of composite functions and implicit functions. Euler's theorem and Jacobian	Cognitive	Remember
CO4	Explain the functions of two variables by Taylors expansion, by finding maxima and minima with and without constraints using Lagrangian Method.Directional derivatives, Gradient, Curl and Divergence.	Cognitive	Understand
CO5	Apply Differential and Integral calculus to notions of Curvature and to improper integrals.	Cognitive	Apply

9+3

Linear Transformation - Eigen values and Eigen vectors -Properties of Eigen values and Eigen vectors - Cayley-Hamilton Theorem – Diagonalisation of Matrices – Real Matrices: Symmetric - Skew-Symmetric and Orthogonal Quadratic form – canonical form - Nature of Quadratic form and Transformation of Quadratic form to Canonical form (Orthogonal only). UNIT2 -SEQUENCES AND SERIES 9+3

Sequences: Definition and examples-Series: Types and convergence- Series of positive terms – Tests of convergence: comparison test, Integral test and D'Alembert's ratio test-. Fourier series: Half range sine and cosine series- Parseval's Theorem.

UNIT 3 -MULTIVARIABLE CALCULUS: PARTIAL DIFFERENTIATION

9+3

Limits and continuity –Partial differentiation – Total Derivative – Partial differentiation of Composite Functions: Change of Variables – Differentiation of an Implicit Function - Euler's Theorem-Jacobian.

UNIT 4 - MULTIVARIABLE CALCULUS: MAXIMA AND MINIMA AND VECTOR CALCULUS 9+3

Taylor's theorem for function of Two variables- Maxima, Minima of functions of two variables: with

and without constraints - Lagrange's Method of Undetermined Multipliers - Directional Derivatives -Gradient, Divergence and Curl.

UNIT 5 - DIFFERENTIAL AND INTEGRAL CALCULUS

9+3

Evolutes and involutes; Evaluation of definite and improper integrals; Beta and Gamma functions and their properties; Applications of definite integrals to evaluate surface areas and volumes of revolutions.

	Hours	LECTURE	TUTORIAL	TOTAL
		45	15	60
TEXT BOOKS				

- 1. Ramana B.V., "Higher Engineering Mathematics", Tata McGraw Hill New Delhi, 11th Reprint, 2015. (Unit-1, Unit-3 and Unit-4).
- 2. N.P. Bali and Manish Goyal, "A text book of Engineering Mathematics", Laxmi Publications, Reprint, 2014. (Unit-2).
- 3. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 40th Edition, 2010. (Unit-5).

REFERENCE BOOKS

1. G.B. Thomas and R.L. Finney, "Calculus and Analytic geometry", 9th Edition, Pearson, Reprint, 2002.

 Veerarajan T., "Engineering Mathematics for first year", Tata McGraw-Hill, New Delhi,
 D. Poole, "Linear Algebra: A Modern Introduction", 2nd Edition, Brooks/Cole, 2005. 2008.

4. Erwin kreyszig, "Advanced Engineering Mathematics", 9th Edition, John Wiley & Sons, 2006.

Mapping of Cos with POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2	0	0	2	0	0	0	0	1	0	2
CO 2	3	1	0	0	0	0	0	0	0	1	0	1
CO 3	3	1	0	0	0	0	0	0	0	1	0	1
CO 4	3	2	0	0	0	0	0	0	0	1	0	1
CO 5	3	2	0	0	1	0	0	0	0	1	0	2
	15	8	0	0	3	0	0	0	0	5	0	7
Scaled Value	3	2	0	0	1	0	0	0	0	1	0	2

 $1-5 \rightarrow 1$, $6-10 \rightarrow 2$, $11 - 15 \rightarrow 3$

0 - No Relation, 1 - Low Relation, 2- Medium Relation, 3- High Relation

Cours	Course Code : XCS102 L T P												
Cours	e Nar	ne	:	PROGRAMMING FOR PROBLEM SOLVING UPYTHON	USING	3	0	0	3				
Prerec	quisit	e	:	Basic Understanding Skills		L	Т	Р	Н				
С	P	Α		<u> </u>		3	0	0	3				
3	0	0											
Cours	e Obj	jectiv	es						<u> </u>				
• To	ounder	rstand	theb	asicsof algorithmicproblemsolving.									
• To	learnt	tosolv	epro	blemsusingPythonconditionalsandloops.									
• To	TodefinePythonfunctions and usefunction calls to solve problems.												
• To	TousePythondatastructures-lists, tuples, dictionaries to represent complex data.												
• To	Todoinput/output/utpiloginDuthon												
• 10	uomp	Jul/Ou	ipuiv										
Course to	ourse Outcome: After the completion of the course, students will be able Domain Level C or P or A												
CO1	Dev	elop a	lgor	Cognitive	e	Unde	erstand	1					
CO2	Writ	e	Unde	erstand	1								
CO3	Dec	ompo	sea I	Python programintofunctions.	Cognitive	e	Apply						
		1			U			, 					
CO4	Rep: etc	resent	con	pound data using Python lists, tuples, dictionaries	Cognitive	9	Appl	У					
CO5	Read	d and	write	datafrom/tofiles in Pythonprograms.	Cognitive	9	Appl	У					
COUR	RSE (CONT	'EN'	<u>ا</u>									
UNIT	Ι	PRC)GR	AMMING FUNDAMENTALS					9				
Fundar	menta	ls of	Con	puting - Identification of Computational Problems -	Algorithm	ns, bu	ilding	block	s of				
algorit	hms	(stater	nent	s, state, control flow, functions), notation (pseudo c	code, flow	char	t, prog	gramn	ning				
langua	.ge), a	lgorit	hmic	problem solving, simple strategies for developing alg	orithms (i	teratio	on, rec	ursior	ı).				
UNIT	II	DA'I		YPES,EXPRESSIONS,STATEMENTS			11.		9				
Python	iinterj	preter	and	nteractivemode, debugging;valuesandtypes:int,float,b	oolean,stri	ng,an	dlist;	variat	oles,				
expres	sions,			s, tuple assignment, precedence of operators, comments	8;				0				
Condit	tional	CU S'Boo		values and operators conditional (if) alternative (if also)	chainedcou	nditio	nal(if	alif	9				
else).It	teratic	on stat	e wł	hile for break continue pass Fruitfulfunctions returnitation	lues param	neters	locala	ndølo	bals				
cope.fi	unctic	oncom	posi	tion.recursion:Strings:stringslices.immutability.stringf	functionsal	ndmet	hods.s	tringr	nod				
ule;Lis	stsasa	rrays.	I ···	, ,			,	0					
UNIT	IV		STS	,TUPLES,DICTIONARIES					9				
Lists:li	istope	ration	s,lis	slices,listmethods,listloop,mutability,aliasing,cloning	lists,listpa	ramet	ers;	Tup	oles:				
tuple a	ssign	ment,	tupl	e as return value; Dictionaries: operations and method	ls;advance	d list	proces	sing -	· list				
compre	ehens	ion;											
UNIT	V	FI	LES	,MODULES,PACKAGES					9				
Files a	and ex	ceptio	on: t	ext files, reading and writing files, format operator; o	command	line a	rgume	nts,er	rors				
and ex	ceptio	ons, ha	andli	ng exceptions, modules, packages;			1	-1					
					L	Т	Р	To	otal				

										45	5 ()	0	45
TEXTBOOK	S											-	-	
3. AllenI	B.Down	ey,"Th	inkPyt	hon:Ho	owtoTł	ninklik	eaCom	puterS	cientis	t",2 nd E	dition.	O'Rei	llyPub	
lishers	,2016.	<u> </u>	5					1		,		,	5	
4. KarlB	eecher,"	Compi	itation	alThin	king:A	Begin	ner'sG	uidetoF	Problen	nSolvir	ngandp	orogran	nming	",1stE
dition,	BCSLea	arning&	kamp;l	Develo	pment	Limite	ed,201'	7.						
REFERENCI	E BOOF	KS												
4. Paul Editio	Deitel a n,2021.	ind Ha	arvey	Deitel,	"Pytl	hon fo	or Prog	gramm	ers", I	Pearson	Edu	cation,	1st	
5. G Ve	enkatesh	and	Madł	navan	Muku	ınd, "	Comp	utation	al Th	inking:	А	Prime	r for	
Progra	mmersa	ndData	a Scien	tists",	lstEdit	ion,Nc	otionPr	ess,202	21.	-				
6. John	V Gut	ttag, '	'Introd	uction	to	Compu	itation	and	Progra	amming	g Us	ing P	ython:	
WithA	pplicati	on to (Compu	tationa	l Mod	eling a	ind Un	derstar	nding I	Data", [Third 1	Editior	n, MIT	
Press2	021.		0 10	-	A T T	1								
/. EricM	attnes,	Python dIntro	Crash	Jourse	AHan	as- ina" Ju	AE diti	on No	Storah	Draga 7	010			
8 https:/	www.p	unniou vthon (uction	llopiog	grannin	ing ,2i	iacaiti	011,100	Starch	Piess,2	019.			
9 Martir	C Brow	m "Pvt	hon Tł	neCom	nleteR	eferen	ce" 4th	Edition	ı Mc-C	hawHi	11 201	8		
E-REFEREN	CES	, i jt		100011			,	Luitioi	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	<i></i>	11,201			
4. https://wy	vw.india	bix.co	m/c-pr	ogram	ming/0	westio	ns-and	-answe	rs/					
5 https://ww	vw iavat	point c	com/c_{-1}	orograi	nming	-langu	age-fut	orial						
6 https://wy	vw w3sc	point.	in/c-tu	torial/		, iungu	uge tu	loriur						
o. mupou/ m														
Manuina of (0::4h													
Mapping of C		rus												1
)1	52	3	4	2	90	5	8	6	10	11	12	01	07
	PC	PC	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PS	PS
CO 1	3	2	0	0	3	0	0	0	0	0	2	3	2	0
CO 2	3	2	0	0	2	0	0	0	0	0	2	3	2	0
CO 3	2	2	1	2	2	0	0	0	0	0	2	2	2	0
<u>CO 4</u>	2	2	1	2	2	0	0	0	0	0	2	2	2	0

CO 5

Total

Scaled Value
COURSE CODEXAC103LTPC												
COUR	SE COI	DE	XAC103		L	Т	Р	С				
COUR	RSE NAN	ME	APPLIED CHEMISTRY FOR ENGINEERS		3	1	0	4				
PRER	EQUISI	TES	NIL		L	T	<u>P</u>	H				
<u>C</u>	P 1	A			3	1	0	4				
2.5 COUR			ES					L				
Under	SE ODJ	applicat	ES									
COUR			s	DOM	AIN		LEVE	T.				
COUR			origination and an instruction and a lastron	DOM								
CO1	affinit	y the p	ion states and electro negativity. Degaribe the various	Cognitiv	e	Ren	nember					
COI	water o	, Uxiuai wality n	arameters like hardness and alkalinity	Psychom	otor	Perc	eption					
	Explai	n and M	easure microscopic chemistry in terms of atomic	Cognitiv	e	Und	erstand	1				
CO2	molecu	lar orbit	als and intermolecular forces.	Psychom	otor	Set		-				
	Interp	ret bulk	properties and processes using thermodynamic and	Cognitiv	e	App	oly					
CO3	kinetic	consider	rations.	Psychom	otor	Med	hanisn	1				
Affective Receive												
Describe, Illustrate and Discuss the chemical reactions that are used in Cognitive Remember												
CO4 the synthesis of molecules. Cognitive Analyze Psychomotor Psychomotor Psychomotor												
Affective Perception												
	Apply	Maggi	no and Distinguish the ranges of the electromagnetic			Res	lespond					
CO5	spectru	m used	for exciting different molecular energy levels in various	Cognitiv	e	Ann	lv					
spectroscopic techniques												
UNIT	I I	PERIOD	DIC PROPERTIES AND WATER CHEMISTRY					8+3				
Effecti	ve nucle	ar charg	e, penetration of orbitals, variations of s, p, d and f orbita	l energies	of ato	oms ir	the pe	eriodic				
table, e	electroni	c config	urations, atomic and ionic sizes, ionization energies, elec	ctron affin	ity an	d elec	tronega	ativity,				
polariz	ability, c	oxidation	states, coordination numbers and geometries, hard soft aci	ds and bas	es, mo	lecula	r geom	etries.				
Water	Chemis	s try -Wat	er quality parameters-Definition and explanation of hard	ness, deter	rminat	ion of	hardn	ess by				
EDIA	method-		tion to alkalinity.					12.2				
Therm	n (SE OF	FREE ENERGY IN CHEMICAL EQUILIBRIA	, and free	anarai	as Fra	a anar	12+3				
emf. C	ell poter	tials. th	e Nernst equation and applications. Acid base, oxidation	reduction	and s	olubili	ity equ	ilibria.				
Corros	ion-Type	es, facto	rs affecting corrosion rate and Control methods. Use	of free	energy	cons	ideratio	ons in				
metallu	argy thro	ugh Elli	ngham diagrams. Advantages of electroless plating, electro	less platin	g of ni	ckel a	ind cop	per on				
Printed	l Circuit	Board (F	PCB).									
UNIT	III A	ATOMI	C AND MOLECULAR STRUCTURE					10+3				
Schrod	inger eq	uation. I	Particle in a box solution and their applications for conju	gated mol	ecules	and 1	nanopa	rticles.				
Molecu	ular orbit	tals of d	iatomic molecules and plots of the multicenter orbitals. E	quations 1	for atc	mic a	nd mol	lecular				
orbitals	s. Energy	level di	agrams of diatomic molecules. Crystal field theory and the	energy lev	el dia	grams	for trai	isition				
Intern	olecular	r forces :	and notential energy surfaces	ping on ba	inu su	ucture	5.					
Ionic, dipolar and Vander Waals interactions. Equations of state of real gases and critical phenomena. Potential energy												
surface	es of H ₃ ,	H_2F and	HCN and trajectories on these surfaces.	1				25				
UNIT	IV S	SPECTE	ROSCOPIC TECHNIQUES AND APPLICATIONS					7+3				
Princip	les of sp	ectrosco	py and selection rules. Electronic spectroscopy-chromophor	re, auxoch	romes	, types	s of elec	ctronic				
transiti	on and a	pplicatio	n. Fluorescence and its applications in medicine. Vibration	al spectro	scopy-	types	of vibr	ations,				

Transformer	contation and applications. Detational apost		ia malandaa Muala	an maanatia maaanaa							
Instrun	spectroscopy concerns of chamical shift and applications magnetic resonance imaging. Diffraction and scattering										
spectro	STEPEOCHEMISTRY AND OPCA	NIC DEACTION	r nce imaging. Diffract								
Dopros	antations of 3 dimensional structures, structure	lisomers and stor	o opisomars configurat	ions and symmetry and							
chiralit	y enantiomers diastereomers optical activity	absolute configura	tions and conformation	nol analysis Isomerism							
in trans	sitional metal compounds	absolute conliguit		mai analysis. isomerism							
Organ	ic reactions and synthesis of a drug molecule										
Introdu	Introduction to reactions involving substitution, addition, elimination, oxidation, reduction, cyclization reactions and										
ring opening reactions. Synthesis of a commonly used drug molecule- Aspirin and paracetamol.											
0 1	HOURS LECTURE TUTORIAL TOTAL										
		45	15	60							
TEXT	EXTBOOKS										
1.	Puri B.R. Sharma, L.R., Kalia K.K. Principles	of Inorganic Cher	nistry, (23 rd edition), N	ew Delhi, Shoban Lal							
	Nagin Chand & Co., 1993.										
2.	Lee. J.D. Concise Inorganic Chemistry, UK, E	Black well science,	2006.								
3.	Trapp. C, Cady, M. Giunta. C, Atkins's Physic	cal Chemistry, 10 th	Edition, Oxford publi	ishers, 2014.							
4.	Glasstone S., Lewis D., Elements of Physical Chemistry, London, Mac Millan & Co. Ltd, 1983.										
5.	Morrison R.T. and Boyd R.N. Organic Chemistry (6th edition), New York, Allyn										
	& Bacon Ltd., 1976.										
6.	Banwell. C.N, Fundamentals of Molecular Spectroscopy, (3 th Edition), McGraw-Hill Book Company, Europe 1983.										
7.	Bahl B.S. and Arun Bahl, Advanced Organi Delhi, 1977.	c Chemistry, (4 th	edition), S./ Chand	& Company Ltd. New							
8.	P. S. Kalsi, Stereochemistry: Conformation an International Publishers, 2017	nd mechanism, (9 th	Edition), New Age								
	international i donsilers, 2017.										
REFE	RENCES										
1.	Puri B R Sharma L R and Madan S Pathar Edition 2004.	nia, "Principles of	Physical Chemistry"	, Vishalpublishing Co.,							
2.	Kuriocose, J C and Rajaram, J, "Engineering New Delhi, 2000.	Chemistry", Volun	ne I/II, Tata McGraw-	Hill Publishing Co. Ltd.							
E- RE	FERENCES										
1.	http://www.mooc-list.com/course/chemistry-n	ninor-saylororg									
2.	https://www.canvas.net/courses/exploring-che	emistry									
3.	http://freevideolectures.com/Course/2263/Eng	ineering-Chemistr	<u>y-I</u>								
4.	. <u>http://freevideolectures.com/Course/3001/Chemistry-I</u>										
5.	http://freevideolectures.com/Course/3167/Che	emistry-II									
6.	http://ocw.mit.edu/courses/chemistry/										

Mapping of CO with PO

CO Vs PO	CO1	CO2	CO3	CO4	CO5	Total	Scaled to 0,1,2 and 3
PO ₁	3	2	3	3	3	13	3

PO ₂	0	0	0	0	0	0	0
PO ₃	0	0	0	0	0	0	0
PO ₄	0	0	0	0	0	0	0
PO ₅	0	0	0	0	0	0	0
PO ₆	0	0	0	0	0	0	0
PO ₇	2	1	2	3	2	10	2
PO ₈	3	2	3	3	2	13	3
PO ₉	3	2	3	3	3	14	3
PO ₁₀	0	0	0	0	0	0	0
PO ₁₁	0	0	0	0	0	0	0
PO ₁₂	0	0	0	0	0	0	0
PSO ₁	0	0	0	0	0	0	0
PSO ₂	0	0	0	0	0	0	0

 $1-6 \rightarrow 1, 7-12 \rightarrow 2, 13-18 \rightarrow 3$

0-No Relation, 1-Low Relation, 2-Medium Relation, 3-High Relation

SUI	L	Т	Р	С					
SU	B NA	ME	WORKSHOP PRACTICES		1	0	2	3	
С	Р	Α			L	Т	Р	Η	
1	2	0			1	0	4	5	
PRE	REQ	UISI	ГЕ:						
			Course outcomes	Domain		Level			
CO1	S	umma	arize the machining methods and Practice C	Cognitive	Ur	Understanding			
	n	nachin	ing operation. Pr	sychomotor	Gu	Guided response			
CO2	D	efinin	g metal casting process, moulding methods and C	Cognitive	Re	memb	er		
	r	elated	Casting and Smithy applications.	sychomotor	Pe	rceptio	on		
CO3	P	lan ba	sic carpentry and fitting operation and Practice C	lognitive	Applying				
	c	arpent	ry and fitting operations.	Gu	Guided response				
CO4	S	umma	arize metal joining operation and Practice C	Ur	Understanding				
	W	elding	g operation. Pr	Gu	ided r	respon	se		
CO5	Ι	lustra	te the electrical and electronics basics and C	Cognitive	Ur	ndersta	nding	,	
	N	lakes	appropriate connections. Pr	sychomotor	Or	Origination			
COL	mar								
	D D		(IENI TUTE E				00		
EA N/	Р. Э		IIILE			ргі		ON	
1	9	Intro	duction to Machining Process			KEI	$\frac{LA \Pi}{C01}$	UN	
1		Dlain	Turning using Lathe Operation				$\frac{co1}{co1}$		
2		Plain	Turning using Lathe Operation						
3		Intro	duction to CNC				CO1		
4		Dem		CO1					
5		Stud			CO2				
6		Dem	onstration of Molding Process		CO2				
7		Stud	y of Smithy Operation				CO2		

8	Study of Carpentry Tools	CO3
9	Half lap joint – Carpentry	CO3
10	Mortise and Tenon joint – Carpentry	CO3
11	Study of fitting tools	CO3
12	Square fitting	CO3
13	Triangular fitting	CO3
14	Study of Welding Tools	CO4
15	Square butt joint - welding	CO4
16	Tee joint – Welding	CO4
17	Introduction to house wiring	CO5
18	One lamp controlled by one switch	CO5
19	Two lamps controlled by single switch	CO5
20	Staircase wiring	CO5

TEXT BOOKS

1. Workshop Technology I,II,III, by S K Hajra, Choudhary and A K Chaoudhary. Media Promoters and Publishers Pvt. Ltd., Bombay

2. Workshop Technology by Manchanda Vol. I,II,III India Publishing House, Jalandhar.

REFERENCES

- 1. Manual on Workshop Practice by K Venkata Reddy, KL Narayana et al; MacMillan India Ltd.
- 2. Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi
- 3. Workshop Technology by B.S. Raghuwanshi, Dhanpat Rai and Co., New Delhi.
- 4. Workshop Technology by HS Bawa, Tata McGraw Hill Publishers, New Delhi.

E RESOURCES

2. http://nptel.ac.in/courses/112107145/

Mapping of CO's with PO'S:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	2	1			1	1		1	2
CO2	2	1	2	2	1			1	1		1	2
CO3	2	1	2	2	1			1	1		1	2
CO4	2	1	2	2	1			1	1		1	2
CO5	2	1	2	2	1			1	1		1	2
Total	10	5	10	10	5			5	5		5	10
Scaled	2	1	2	2	1			1	1		1	2

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$

0- No relation 1- Low relation 2- Medium relation

3- High relation

COURSE CODE XGS105 L T P S												SS		С				
COUH	RSE NAI	ME				SPE	ECH	COM	MUN	NICA	TION		0	1	2	0		3
Pre	e-requisit	tes											L	Т	P	SS		Η
C	P	A											0	1	4	0		5
2.6	0.4			r													Ļ	
COUL	KSE UU	ICOM	IES:	s: tha t	tuno	s of s	maach	100					omai	<u>n</u>	Pam	Lev	rel	
C01	Apply	the tech	an u		s in 1		io spece	oking				Cogr	itivo		App		4	
CO_2	Identif	wthe co	omn	mon	natt	torns	in ord	anizin	20.00	snaach		Cogr	itivo		Rem	ombo	r	
CO4 Construct the nature and style of speaking Cognitive Cognitive Create																		
CO5 Prostiging the nature and style of speaking Cognitive Create										0.000								
	Pracuo	EC OF	espea									Psyc	nome	tor	Guit	ieu K	esp	
UNIT - I TYPES OF SPEECHES										9								
$1.1 - 1^{\circ}$ 1 2 - 4	our types Analyzing	s of spec	ıdier	nce														
1.2 - Analyzing the audience																		
1.3 - Developing ideas and supporting materials												9						
UNIT - IT PUBLIC SPEAKING 2.1 Introduction to Public Speaking												,						
2.1 - 11	Competen	cies Ne	uon eede	led f	for si	ucces	eeful e	neech	mak	ring								
2.2 - C	neaking	about e	ever	rvda	v lif	fe siti	uation	speccen	так	ing								
		GANIZ	[7 .Δ'		$\frac{1}{2}$	OF S		CH										9
31-D	Developir	ig a spec	eech		t line	e												,
32-0)rganizin	g the sn	need	n ou ech		C												
3.3 - Iı	ntroducti	on - dev	evelo	opm	ient ·	-coi	nclusi	on										
UNIT	- IV PR	ESENT	TAT)N													9
4.1 - T	Tips for p	reparing	ng th	he d	raft s	speed	ch											
4.2 - P	resentati	on techi	nniqu	ques	usin	ng IC	T too	ls										
4.3 - U	Jsing exa	mples f	fron	m di	iffere	ent so	ources	s										
UNIT	- V AC'	TIVITI	TES	S														9
5.1 - Reading activities																		
5.2 - C	Creative p	oresenta	atior	ons														
5.3 - N	Aedia pre	esentatic	ion t	tech	niqu	les												
SUGG	GESTED	READ	DIN	IGS	:													
(i) Michael Swan. Practical English Usage. OUP. 1995																		
(ii) Sa	anjay Kui	mar and	d Pu	ushp	o Lat	ta. C	ommu	inicatio	on Sl	kills. (Oxford	Universi	ity Pr	ess. 2	011			

COURS	E CODE	XUM106		L	Т	Р	С
COURS	E NAME	CONSTITUTION OF INDIA		3	0	0	0
PRERE	QUISITE:	NIL		L	Т	Р	Η
C:P:A		0:0:0		3	0	0	3
COURS	E OUTCOM	ES	Domain	Level			
CO1	Understand t	Cognitive	U	Understanding			
CO2	Understand t	he Powers and Functions	Cognitive	U	Understanding		
CO3	Understand t	he Legislature	Affective	R	Remember		
CO4	Understand t	he Judiciary	Affective	R	Remember		
CO5 Understand the Centre State relations Cognitive							ing
UNIT - I							8

Constitutional History- The Constitutional Rights- Preamble- Fundamental Rights- Fundamental Duties- Directive principles of State Policy.

9

10

9

9

UNIT - II

The Union Executive- The President of India (powers and functions)- Vice-President of India-The Council of Ministers-Prime Minister- Powers and Functions.

UNIT - III

Union Legislature- Structure and Functions of Lok Sabha- Structure and Functions of Rajya Sabha-Legislative Procedure in India- Important Committees of Lok Sabha- Speaker of the Lok Sabha.

UNIT - IV

The Union Judiciary- Powers of the Supreme Court- Original Jurisdiction- Appellate jurisdictions-Advisory Jurisdiction- Judicial review.

$\mathbf{UNIT} - \mathbf{V}$

Centre State relations- Political Parties- Role of governor, powers and functions of Chief Minister-Legislative Assembly- State Judiciary- Powers and Functions of the High Courts.

LECTURE	TUTORIAL	PRACTICAL	TOTAL
45	0	0	45

REFERENCES

1. W.H.Morris Shores- Government and politics of India, NewDelhi, B.1. Publishers, 1974.

2. M.V.Pylee- Constitutional Government in India, Bombay, Asia Publishing House, 1977.

3. R.Thanker- The Government and politics of India, London: Macmillon, 1995.

4. A.C.Kapur- Select Constitutions S, Chand & Co., NewDelhi, 1995

5. V.D.Mahajan- Select Modern Governments, S, Chand & Co, NewDelhi, 1995.

6. B.C.Rout- Democractic Constitution of India.

7. Gopal K.Puri- Constitution of India, India 2005.

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2			1					
CO 2	2			1					
CO 3	2			1					1
CO 4	2			1				1	1
CO 5	2	2		1				1	1
Total	10	2		5				2	3
Scaled to	2	1		1				1	1
0,1,2,3									

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$

0 – No Relation, 1- Low Relation, 2- Medium Relation, 3- High Relation

COUR	SE CO	DE	XCS107	L	Т	Р	С
COUR	SE NA	ME	PROGRAMMING FOR PROBLEM SOLVING	0	0	1	1
			USING PYTHON LABORATORY				
PRER	EQUIS	ITES	Basic Understanding Skills	L	Т	Р	H
С	Р	Α		0	0	2	2
0.75 0 0.25							

LEARNING OBJECTIVES

• Acquire knowledge about to solve basic problems by understanding basic concepts in python like operators, control statements etc.

• To develop modular, reusable and readable Python Programs using the concepts like functions, arrays etc.

• Design and implement programs to store data in structures and files.

COURS	SE OUTCOMES	DOMAIN	LEVEL
CO1	Apply the concepts of variables, data types, operators and	Cognitive	Understand
	expressions.		Apply
CO2	Implement Python programs with conditionals and loops.	Cognitive	Understand
			Apply
CO3	Develop Python programs stepwise by defining functions and	Cognitive	Understand
	calling them.		Apply
CO4	Use Python lists, tuples, dictionaries for representing	Cognitive	Understand
	compound data		Apply
CO5	Read and write data from/to files in Python	Cognitive	Understand
		-	Apply

S.No	List of Experiments	COs
1	Write a program to demonstrate different number data types in python.	CO1
2	Write a program to perform different arithmetic operations on number sin python.	CO1
3	Write a program to create, concatenate and print a string and accessing the sub-string from given string.	CO2
4	Write aprogramtocreate, appendand removelists in python.	CO2
5	Writeaprogramtodemonstrateworkingwithtuples inpython.	CO2
6	Writeaprogramtodemonstrateworkingwithdictionaries inpython.	CO3

7	Write a program to find the largest number among	the three input nu	umbers.		CO3				
8	Write a python program to construct the following	pattern, using a ne	ested		CO3				
	for loop.								
9	Write a python script that prints prime numbers les	s than 20.			CO4				
10 Write a python program to find the factorial of a number using recursion.									
11	Write a program that accepts the lengths of three si	des of a triangle	as input the program	n	CO4				
	output should indicate whether or not the triang	le, is right trian	gle (recall from th	e					
	Pythagorean the oremthatina right triangle, the squ	are of one side e	equals the sum of th	e					
squares of the other two sides).									
12	Write a python program to define amodule to find	Fibon accinumbe	rs and		CO5				
	Import the module to another program.								
13	Write a script named copyfile.py. This script should	d prompt the user	for the names of tw	/ O	CO5				
	text files. the contents of the first file should be inp	ut. And written o	these cond file.						
14	Write a program that inputs a text file. The program	n should print all	the unique words in		CO5				
the file in alphabetical order.									
15 Write a python class to reverse a string word by word.									
		TUTORIAL	PRACTICAL	TC	DTAL				
	HOURS	0	30		30				

Mapping of CO with PO's

	P01	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
CO 1	3	2	0	0	3	0	0	0	0	0	2	3	2	0
CO 2	3	2	0	0	2	0	0	0	0	0	2	3	2	0
CO 3	2	2	1	2	2	0	0	0	0	0	2	2	2	0
CO 4	2	2	1	2	2	0	0	0	0	0	2	2	2	0
CO 5	2	2	1	0	2	0	0	1	0	2	2	2	2	0
Total	12	10	3	4	11	0	0	1	0	2	10	12	10	0
Scaled Value	3	2	1	1	3	0	0	1	0	1	2	3	2	0

0- No relation

1- Low relation 2- Medium relation

3- High relation

COUR	RSE CODE XAC108 L T P										
COURS	RSE NAME APPLIED CHEMISTRYFOR ENGINEERS 0 0 1										
DDDDI	LABORATORY L T P REQUISITES NIL L T P										
PRERE		ES A	NIL					Р 1			
0.25	r 1.5	A 0.25				U	U	I	3		
COURS	SE OUT	COMES			DOMA	IN	L	EVEI	EL		
CO1	Ability study o	to Identif f science	Ty the principles and engineering	of chemistry relevant to the	Cognitive Psychomo	tor	Rem Perc	ember eption			
CO2	Analyze and Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, extent of hardness, chloride content of water, etc.Cognitive Psychomotor AffectiveAnalyze Perceptio Receive										
CO3	3 Analyze the synthetic procedure and rate constants of reactions from concentration of reactants/products as a function of time Apply										
LIST	OF EXP	ERIMEN	TS								
Ex. No	D	•	<u> </u>	Experiments			1		COs		
1.	Determ	ination of	f chloride ion pre	esent in the water sample by Arg	gentometric	method	1. 		COI		
2.	Determination of total, temporary and permanent hardness of water sample by EDTA method.										
3.	Determination of cell constant and conductance of solutions.										
4.	Potenti	ometry -	determination of	redox potentials and emfs.					CO2		
5.	Determ	nination of	f surface tension	and viscosity.					CO3		
6.	Adsorp	otion of ac	etic acid by char	rcoal.					CO3		
7.	Determ	nination of	f the rate constar	nt of a reaction.					CO4		
8.	Estima	tion of irc	on by colorimetri	c method.					CO4		
9.	Synthe	sis of a po	olymer/drug.						CO5		
10.	Saponi	fication/a	cid value of oil.						CO5		
LECU	RE:0	TUT	ORIAL: 0	PRACTICAL: 30	ТОТА	L:30		•			
TEXT	BOOKS										
1.	Laborato	ry Manua	l "Chemistry La	b", Department of Chemistry, Pl	MIST, Than	javur.					
REFER	RENCE B	BOOKS									
1.	Mendhar	n, Denney	y R.C,. Barnes J.	D and Thomas N.J.K., "Vogel's	s Textbook a	of Qu	lantitat	ive Cł	nemical		
	Analysis	", 6th Edi	tion, Pearson Ed	ucation, 2004.							
2.	2. Garland, C. W.; Nibler, J. W.; Shoemaker, D. P. "Experiments in Physical Chemistry", 8th Ed.; McGraw- Hill: New York 2003										
E-RES	F-RESOURCES- MOOC's										
1	http://free	evideolec	tures.com/Course	e/2380/Chemistry-Laboratory-T	echniques						
2	http://ocw.mit.edu/courses/chemistry/5-301-chemistry-laboratory-techniques										
3	http://free	evideoleci	tures com/Course	e/2941/Chemistry-1A-General-C	<u>Chemistry-F</u>	all-201	1				
	<u>p.//110</u>		M	apping of CO with PO	Ziteringti y -1	wii 201	<u>+</u>				

CO Vs PO	CO1	CO2	CO3	Total	Scaled to 0,1,2 and 3
PO ₁	3	2	2	7	2
PO ₂	3	2	2	7	2

PO ₃	3	2	2	7	2
PO ₄	3	2	2	7	2
PO ₅	2	1	1	4	1
PO ₆	3	2	2	7	2
PO ₇	3	2	2	7	2
PO ₈	0	1	0	1	0
PO ₉	1	1	1	3	1
PO ₁₀	1	1	1	3	1
PO ₁₁	1	1	0	2	1
PO ₁₂	0	1	0	1	0
PSO ₁	0	1	0	1	0
PSO ₂	0	1	0	1	0

 $1\text{-}5 \rightarrow 1, 6\text{-}10 \rightarrow 2, 11\text{-}15 \rightarrow 3$

0 - No Relation, 1 - Low Relation, 2 - Medium Relation, 3 - High Relation

SEMESTER II

COUI	RSE COI	L	Т	P	С							
COUI	RSE NAN	1E	Calculus, Ordinary Differential Equations and		3	1	0	4				
C	D	•	Complex Variable		т	Т	р	тт				
	P	A				1	P					
3	0.5	0.5			3	1	0	4				
PRER	REQUISI	ГЕ : М	Iathematics I (Calculus and Linear Algebra)									
On su	ccessful c	omple	tion of this course, the students will be able to:									
Cours	se outcom	Dom	ain		Lev	el						
CO1:	Find dou	ble and	d triple integrals and to find line, surface and volume	Cogn	itive	A	pplvii	ng				
of an i	ntegral by	Appl	ying Greens, Gauss divergence and Stokes theorem.	8			F F - J	-0				
CO2:	Solve firs	t order	differential equations of different types	Cogn	itive	A	pplyiı	ng				
which	are solva	ble for	p, y, x and Clairaut's type.					_				
CO3:	Solve Sec	cond or	der ordinary differential equations with	Cogn	itive	A	pplyiı	ng				
variab	le coeffic	ients u	sing various methods.									
CO4 :	Use CR	equation	ons to verify analytic functions and to find harmonic	Cogn	itive	A	pplyii	ng				
function	ons and h	armon	ic conjugate. Conformal mapping of translation and									
rotatio	on. Mobiu	s transi	formation.									
CO5:	Apply	Cauch	y residue theorem to evaluate contour integrals	Cogn	itive	Α	pplyiı	ng				
Liouvi	illes the	and Co	Taylor's series zeros of analytic functions									
singul	arities La	urent's	s series									
Suigu												
Unit 1	: Multiva	riable	Calculus (Integration)				9-	+3				
Multip	ple Integra	ation: I	Double integrals (Cartesian) - change of order of integ	gration	in do	uble	integr	als -				
Chang	ge of varia	bles (Cartesian to polar) - Triple integrals (Cartesian), Scala	r line i	ntegr	als - v	vector	line				
integra	als - scala	r surfa	ce integrals - vector surface integrals - Theorems of Gr	een, Ga	auss a	nd St	okes.					
Unit 2	2: First or	der or	dinary differential equations				9-	⊦3				
Exact	- linear a	nd Be	rnoulli's equations - Euler's equations - Equations no	ot of fi	rst de	gree:	equa	tions				
solvab	ole for p -	equation	ons solvable for y- equations solvable for x and Clairau	t's typ	е.							
Unit 3: Ordinary differential equations of higher orders							9-	+3				
Second order linear differential equations with variable coefficients- method of var							ramet	ters -				
Cauchy-Euler equation- Power series solutions- Legendre polynomials- Bessel functions of the first kind												
and th	and their properties.											
Unit 4	Unit 4: Complex Variable – Differentiation9+3											
Differ	entiation-	Cauch	y-Riemann equations- analytic functions-harmonic	functio	ns-fir	ding	harm	ionic				
conjugate- elementary analytic functions (exponential, trigonometric, logarithm) and their properti								ties-				
Confo	rmal map	Conformal mappings- Mobius transformations and their properties.										

U	nit 5: Complex	x Variable – Integration	9+3
C	contour integrals	s - Cauchy-Goursat theorem (without proof) - Cauchy Integral f	formula (without proof)-
L	iouville's theore	em (without proof)- Taylor's series- zeros of analytic functions-	- singularities- Laurent's
S	eries – Residues	s- Cauchy Residue theorem (without proof)- Evaluation of de	finite integral involving
S	ine and cosine- h	Evaluation of certain improper integrals using the Bromwich co	ntour.
	LECTURE	TUTORIAL	TOTAL
	45	15	60
T	'ext Book:		
1	. B.S. Grewal, "	Higher Engineering Mathematics", Khanna Publishers, 40thth E	dition, 2008.
R	eference Books	S:	
1	.G.B. Thomas an	nd R.L. Finney, "Calculus and Analytic geometry", 9 th Edition,	Pearson,
R	eprint, 2002.		
2	. Erwin kreyszig	g, "Advanced Engineering Mathematics", 9th Edition, John Wile	y &Sons, 2006.
3	.W. E. Boyce an	nd R. C. DiPrima, "Elementary Differential Equations and Boun	dary Value
	Problems", 9 th I	Edn. Wiley India, 2009.	
4	. S. L. Ross, "Di	ifferential Equations", 3 rd Ed., Wiley India, 1984.	
5	. E. A. Coddingt	ton, "An Introduction to Ordinary Differential Equations", Pren	tice Hall India,
	1995.		
6	. E. L. Ince, "Or	dinary Differential Equations", Dover Publications, 1958.	
7	. J. W. Brown an	nd R. V. Churchill, "Complex Variables and Applications", 7th I	Ed., McGraw
	Hill, 2004.		
0	ND Doll and N	Manish Caval "A taxt healt of Engineering Mathematics" Law	

8. N.P. Bali and Manish Goyal, "A text book of Engineering Mathematics", Laxmi Publications, Reprint, 2008.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2	0	0	2	0	0	0	0	1	0	2
CO 2	3	1	0	0	0	0	0	0	0	1	0	1
CO 3	3	1	0	0	0	0	0	0	0	1	0	1
CO 4	3	2	0	0	0	0	0	0	0	1	0	1
CO 5	3	2	0	0	1	0	0	0	0	1	0	2
Total	15	8	0	0	3	0	0	0	0	5	0	7
Scaled Value	3	2	0	0	1	0	0	0	0	1	0	2

Mapping of Cos with POs:

 $1-5 \rightarrow 1, \qquad 6-10 \rightarrow 2, \qquad 11-15 \rightarrow 3$

0-No Relation, 1 - Low Relation, 2- Medium Relation, 3- High Relation

COURSE C	CODE	XBE202		L	Т	P	С
COURSE N	AME	ELECTRICAL AND ELECTRONICS ENG	SINEERING	3	1	0	4
		SYSTEMS			-	-	
PREREQU	ISITES	Physics			T	P	H
C: P: A		3:0:0		3	I	0	4
Course Out		Lor	<u>_</u>]				
Course Out	Comes Dofing and	Delate the fundamentals of electrical	Domain	I	Lev	ei	
COI	U	nuers	stanu				
:							
CO2	Define an	d Explain the operation of DC and AC	Cognitive	I	nders	tand	
02	machines.	a Explain the operation of De and Re	Coginave	U	nuere	land	•
CO3	Recall and	Illustrate various semiconductor devices and	Cognitive	U	nders	tand	
	their appl	ications and displays the input output		5			
,	characterist	ics of basic semiconductor devices.					
CO4	Relate and	Explain the number systems and logic gates.	Cognitive	U	nders	tand	
	Construct t	he different digital circuit.	_				
CO5	Label and	Outline the different types of microprocessors	Cognitive	U	nders	tand	
	and their ap	plications.					
UNIT-I: FU	INDAMEN	TALS OF DC AND AC CIRCUITS, MEASU	REMENTS			9+3	
Transformat	ion - Funda	mentals of AC – Average Value, RMS Value, netation of sinusoidal quantities - Simple Serie	Form Factor - A	C powe	s – Sta er and lel C	ar/De l Pov 'ircu	wer
Operating Pr	rinciples of	Moving coil and Moving Iron Instruments (Am	meter. Voltmeter)	and D	vnan	nome	eter
type meters	(Watt meter	and Energy meter).			<i>J</i>		
UNIT -II: E	LECTRIC	AL MACHINES				9 +	3
Construction	. Principle	of Operation, Basic Equations, Types and Appli	cation of DC Ger	erators	. DC	mot	ors
- Basics of	Single-Phas	se Induction Motor and Three Phase Induction	n Motor- Constru	iction.	Princ	ciple	of
Operation of	f Single-Pha	se Transformer, Three phase transformers, Auto	transformer.	· · · · ·		•	
UNIT-III: S	SEMICON	DUCTOR DEVICES				9+	3
Classificatio	n of Semico	onductors, Construction, Operation and Charact	eristics: PN Junc	tion Di	ode -	- Zei	ner
Diode, PNP,	NPN Trans	sistors, Field Effect Transistors and Silicon Cont	rolled Rectifier -	Applic	ation	s.	
UNIT- IV: J	DIGITAL I	ELECTRONICS				9+	3
Basic of Co	ncepts of N	Jumber Systems, Logic Gates, Boolean Algebr	a, Adders, Subtra	actors,	multi	iplex	er,
demultiplexe	er, encoder,	decoder, Flipflops, Up/Down counters, Shift Re	gisters.				
UNIT- V: N	IICROPR	DCESSORS				9+3	3
Architecture	, 8085, pin	diagram of 8085, ALU timing and control u	nit, registers, dat	a and	addre	ss b	us,
timing and o	control sign	als, Instruction types, classification of instruction	ions, addressing r	nodes,	Inte	rfaci	ing
Basics: Data	transfer con	ncepts – Simple Programming concepts.					
		LECTUR	E <u>TUT</u> OR	IAL	T	DTA	L

TEXT BOOKS

- 1. Metha V.K, Rohit Mehta, 2020. Principles of Electronics, 12th ed, S Chand Publishing.
- 2. Albert Malvino, David J.Bates., 2017. Electronics Principles. 7th ed, Tata McGraw-Hill. New Delhi.
- 3. Rajakamal, 2014. Digital System-Principle & Design. 2nd ed. Pearson education.
- 4. Morris Mano, 2015. Digital Design. Prentice Hall of India.
- 5. Ramesh, S. Gaonkar, 2013, Microprocessor Architecture, Programming and its Applications with the 8085, 6th ed , India: Penram International Publications.

REFERENCE BOOKS

1. Corton, H.,2004 Electrical Technology. CBS Publishers & Distributors.

- 2. Syed, A. Nasar, 1998, Electrical Circuits. Schaum Series.
- 3. Jacob Millman and Christos, C. Halkias, 1967, Electronics Devices, New Delhi: McGraw-Hill.

4. Millman, J. and Halkias, C. C., 1972. Integrated Electronics: Analog and Digital Circuits and Systems, Tokyo: McGraw-Hill, Kogakusha Ltd.

5. Mohammed Rafiquzzaman, 1999. Microprocessors - Theory and Applications: Intel and Motorola. Prentice Hall International.

E-REFERENCES

1. NTPEL, Basic Electrical Technology (Web Course), Prof. N. K. De, Prof. T. K. Bhattacharya and Prof. G.D. Roy, IIT Kharagpur.

2.Prof.L.Umanand, http://freevideolectures.com/Course/2335/Basic-Electrical-Technology#, IISc Bangalore. 3. http://nptel.ac.in/Onlinecourses/Nagendra/, Dr. Nagendra Krishnapura, IIT Madras.

4.Dr.L.Umanand, http://www.nptelvideos.in/2012/11/basic-electrical-technology.html, IISC Bangalore.

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	1	1	1	1	0	0	1	1	1	0
CO 2	3	3	1	1	1	1	0	0	1	1	1	0
CO 3	2	2	2	1	2	2	1	1	1	1	1	0
CO 4	2	2	1	1	1	1	1	1	1	1	1	0
CO 5	2	2	1	1	1	1	1	1	1	1	1	0
Total	12	12	6	5	6	6	3	3	5	5	5	0
Scaled	3	3	2	1	2	2	1	1	1	1	1	0

	CODE	XAP203	L	Т	P)	С
COURSE 1	NAME	APPLIED PHYSICS FOR ENGINEERS	3	1	0)	4
C:P:A		2.8:0.8:0.4	L	Т	P)	Н
PREREQU	JISITE:	Basic Physics in HSC level	3	1	0)	4
COURSE	OUTCOM	ES	[Doma	in		Level
CO1	Identify th	e basics of mechanics. explain the principles of elasticity	Cog	nitive			
	and deter	mine its significance in engineering systems and				Un	derstand
	technologie	cal advances.				0	
CO2	Illustrate	the laws of electrostatics, magneto-statics and	~	• . •		1	
	electromag	netic induction; use and locate basic applications of	Cog	ntive		An	alyze
	electromag	netic induction to technology.					
CO3	Understan	d the fundamental phenomena in optics by measurement	Cog	nitive			
	and descri	be the working principle and application of various lasers	Ū			Ap	oly
	and fibre of	ptics.					
CO4	Analyse en	nergy bands in solids, discuss and use physics principles	Cog	nitive		An	alyze
	of latest tec	hnology using semiconductor devices.	-				•
CO5	Develop	Knowledge on particle duality and solveSchrodinger	Com	itivo		An	alv
	equation fo	r simple potential.	Cogi	nuve		Ар	piy
UNIT - I	MECHAN	ICS OF SOLIDS				9	+3
Mechanics	: Force - 1	Newton's laws of motion - work and energy - impulse an	nd mo	ment	um - t	orque	e - law of
conservatio	n of energy	and momentum - Friction.					
Elasticity:	Stress - St	rain - Hooke's law - Stress strain diagram - Classificatio	n of o	elastic	modu	lus -	Moment,
couple and	torque - T	orsion pendulum - Applications of torsion pendulum - B	endin	g of ł	beams	- Exp	perimental
determinati	on of Youn	g's modulus: Uniform bending and non-uniform bending.					
UNIT -II	ELECTRO	DMAGNETIC THEORY				9	+3
Laws of el	ectrostatics	- Electrostatic field and potential of a dipole; Dielectric	Polari	satio	ı, Diel	ectric	constant,
internal fie	eld - Claus	ius Mossotti Equation - Laws of magnetism - Amper	e's Fa	raday	's law	; Ler	z's law -
Maxwell's	equation -	Plane electromagnetic waves; their transverse nature - exp	oressio	on for	plane,	circ	ularly and
elliptically	polarized	light - quarter and half wave plates - production and de	etectio	n of	plane,	circu	ilarly and
elliptically	polarized li	ght.					
UNIT –III	OPTICS	LASERS AND FIBRE OPTICS				9	+3
<u> </u>					d dispe	rsive	nower of
Ontics: Dis	spersion- O	ntical instrument: Spectrometer - Determination of refracti	ve ind	ex an			
Optics: Dis	spersion- O	ptical instrument: Spectrometer - Determination of refracti f light in thin films: air wedge Diffraction: grating	ve ind	ex an	u uisp	2151VC	r
Optics: Dis a prism- Int	spersion- O terference c	ptical instrument: Spectrometer - Determination of refracti f light in thin films: air wedge - Diffraction: grating.	ve ind	ex an	1		1
Optics: Dis a prism- Int LASER: In	spersion- O terference o ntroduction	ptical instrument: Spectrometer - Determination of refracti f light in thin films: air wedge - Diffraction: grating. - Population inversion -Pumping - Laser action - Nd-YAG	ve ind laser	ex an	$\frac{1}{2}$ laser	– Apj	plications.
Optics: Dis a prism- Int LASER: In Fibre Optic	spersion- O terference on troduction cs: Principl	ptical instrument: Spectrometer - Determination of refracti f light in thin films: air wedge - Diffraction: grating. - Population inversion -Pumping - Laser action - Nd-YAG e and propagation of light in optical fibre - Numerical apert	ve ind laser ure ar	ex an - CO ₂ id acc	$\frac{1}{2}$ laser $\frac{1}{2}$ eptanc	– Apj e ang	plications. le - Types
Optics: Dis a prism- Int LASER: In Fibre Optic of optical fi	spersion- O terference o ntroduction cs: Principl ibre - Fibre	 ptical instrument: Spectrometer - Determination of refraction f light in thin films: air wedge - Diffraction: grating. Population inversion -Pumping - Laser action - Nd-YAG e and propagation of light in optical fibre - Numerical apert optic communication system (Block diagram). 	ve ind laser ure ar	ex an - CO <u>2</u> nd acc	$\frac{1}{2}$ laser $\frac{1}{2}$	– Apj e ang	plications. le - Types
Optics: Dis a prism- Int LASER: In Fibre Optic of optical fi	spersion- O terference c ntroduction cs: Principl ibre - Fibre	ptical instrument: Spectrometer - Determination of refracti f light in thin films: air wedge - Diffraction: grating. - Population inversion -Pumping - Laser action - Nd-YAG e and propagation of light in optical fibre - Numerical apert optic communication system (Block diagram).	ve ind laser ure ar	ex an - CO <u>2</u> id acc	2 laser	– Apj e ang	plications. le - Types
Optics: Dis a prism- Int LASER: In Fibre Opti- of optical fi	spersion- O terference o ntroduction cs: Principl ibre - Fibre SEMICO	ptical instrument: Spectrometer - Determination of refracti f light in thin films: air wedge - Diffraction: grating. - Population inversion -Pumping - Laser action - Nd-YAG e and propagation of light in optical fibre - Numerical apert optic communication system (Block diagram).	ve ind laser ure ar	ex an	2 laser eptanc	– Apj e ang	plications. le - Types
Optics: Dis a prism- Int LASER: In Fibre Opti of optical fi UNIT –IV Semicondu	spersion- O terference o ntroduction cs: Principl ibre - Fibre SEMICO uctors: En	ptical instrument: Spectrometer - Determination of refraction f light in thin films: air wedge - Diffraction: grating. - Population inversion -Pumping - Laser action - Nd-YAG e and propagation of light in optical fibre - Numerical apert optic communication system (Block diagram).	ve ind laser ure ar	ex an - CO nd acc	2 laser eptanc	– Apj e ang 9 insul	plications. le - Types +3 ators and
Optics: Dis a prism- Int LASER: In Fibre Opti of optical fi UNIT –IV Semicondu semicondu	spersion- O terference o ntroduction cs: Principl ibre - Fibre SEMICO actors: En ctors - Cor	 ptical instrument: Spectrometer - Determination of refraction f light in thin films: air wedge - Diffraction: grating. Population inversion -Pumping - Laser action - Nd-YAG e and propagation of light in optical fibre - Numerical apert optic communication system (Block diagram). NDUCTOR PHYSICS ergy bands in solids - Energy band diagram of generation of Fermi level - Intrinsic semiconductors - Concertion of Semiconductors - Concertioner (Semiconductors - Concertion) 	ve ind laser ure ar pod c	ex an - CO id acc onduc holes	2 laser eptanc ctors,	– Apj e ang 9 insul	elications. le - Types +3 ators and Extrinsic
Optics: Dis a prism- Int LASER: In Fibre Opti of optical fi UNIT –IV Semiconduc semiconduc	spersion- O terference o ntroduction cs: Principl ibre - Fibre SEMICO Ictors: En ctors - Cor ctors - P tyr	ptical instrument: Spectrometer - Determination of refraction f light in thin films: air wedge - Diffraction: grating. - Population inversion -Pumping - Laser action - Nd-YAG e and propagation of light in optical fibre - Numerical apert optic communication system (Block diagram). NDUCTOR PHYSICS ergy bands in solids - Energy band diagram of go acept of Fermi level - Intrinsic semiconductors - Concept e and N type semiconductors - Hall effect.	ve ind laser ure ar pod c pt of	ex an - CO d acc onduc holes	2 laser eptanc ctors, - dop	– Apj e ang 9 insul	elications. le - Types +3 ators and Extrinsic
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Optics: Dis a prism- Int LASER: In Fibre Opti of optical fi UNIT –IV Semiconduc semiconduc semiconduc Diodes and Working o	spersion- O terference o ntroduction cs: Principl ibre - Fibre SEMICO actors: En ctors - Cor ctors - P typ d Transisto of full way	 ptical instrument: Spectrometer - Determination of refraction f light in thin films: air wedge - Diffraction: grating. Population inversion -Pumping - Laser action - Nd-YAG e and propagation of light in optical fibre - Numerical apert optic communication system (Block diagram). NDUCTOR PHYSICS ergy bands in solids - Energy band diagram of genergy of Fermi level - Intrinsic semiconductors - Concepte and N type semiconductors - Hall effect. ors: P-N junction diode - Forward bias and reverse bias are rectifier using P N junction diodes - PNP and NP 	ve ind laser ure ar ood co ot of - Rec N tra	ex an - CO d acc onduc holes tificat	2 laser eptanc ctors, - dop ion ac ors - 5	– Apje ang e ang insulating – tion of	+3 ators and Extrinsic
Optics: Dis a prism- Int LASER: In Fibre Opti of optical fi UNIT –IV Semiconduc semiconduc semiconduc biodes and Working o configuratio	spersion- O terference o ntroduction cs: Principl ibre - Fibre SEMICO totors: En ctors - Cor ctors - P typ d Transist of full way	 ptical instrument: Spectrometer - Determination of refraction f light in thin films: air wedge - Diffraction: grating. Population inversion -Pumping - Laser action - Nd-YAG e and propagation of light in optical fibre - Numerical apert optic communication system (Block diagram). NDUCTOR PHYSICS ergy bands in solids - Energy band diagram of go acept of Fermi level - Intrinsic semiconductors - Concepte and N type semiconductors - Hall effect. ors: P-N junction diode - Forward bias and reverse bias re rectifier using P N junction diodes - PNP and NP ntages of common emitter configuration - working of N 	ve ind laser ure ar bod c bt of - Rec N tra PN tr	ex an - CO d acc ond acc onduc holes tificat ansist	2 laser eptanc ctors, - dop ion ac ors - 7	– Apje ang e ang insulating – tion of Chree	+3 ators and Extrinsic of diode - different aplifier in
Optics: Dis a prism- Int LASER: In Fibre Opti of optical fi UNIT –IV Semiconduc semiconduc semiconduc biodes and Working o configuratic common en	spersion- O terference o ntroduction cs: Principl ibre - Fibre SEMICO totors - Cor ctors - Cor ctors - P typ d Transist of full way ons - Adva nitter config	 ptical instrument: Spectrometer - Determination of refraction flight in thin films: air wedge - Diffraction: grating. Population inversion -Pumping - Laser action - Nd-YAG e and propagation of light in optical fibre - Numerical apert optic communication system (Block diagram). NDUCTOR PHYSICS ergy bands in solids - Energy band diagram of genergy bands in solids - Energy band diagram of genergy of Fermi level - Intrinsic semiconductors - Concepte and N type semiconductors - Hall effect. ors: P-N junction diode - Forward bias and reverse bias are rectifier using P N junction diodes - PNP and NP intages of common emitter configuration - working of N guration. 	ve ind laser ure ar pod c ot of - Rec N tra PN tr	ex an - CO d acc onduc holes tificat	2 laser eptanc ctors, - dop ion ac or as a	- Apje ang e ang insulating - tion of fhree	+3 ators and Extrinsic of diode - different aplifier in
Optics: Dis a prism- Int LASER: In Fibre Opti of optical fi UNIT –IV Semiconduc semiconduc semiconduc biodes and Working o configuratio	spersion- O terference o ntroduction cs: Principli ibre - Fibre SEMICO totors - Cor ctors - Cor ctors - P typ d Transist of full way ons - Adva nitter config	 ptical instrument: Spectrometer - Determination of refraction flight in thin films: air wedge - Diffraction: grating. Population inversion -Pumping - Laser action - Nd-YAG e and propagation of light in optical fibre - Numerical apert optic communication system (Block diagram). NDUCTOR PHYSICS ergy bands in solids - Energy band diagram of genergy of Fermi level - Intrinsic semiconductors - Concepte and N type semiconductors - Hall effect. ors: P-N junction diode - Forward bias and reverse bias are rectifier using P N junction diodes - PNP and NP intages of common emitter configuration - working of N guration. 	ve ind laser ure ar ood co ot of - Rec N tra PN tr	ex an - CO d acc onduc holes tificat ansisto	2 laser eptanc ctors, - dop ion ac or as a	- Apj e ang insul ing - tion o Chree	+3 ators and Extrinsic of diode - different aplifier in
Optics: Dis a prism- Int LASER: In Fibre Opti of optical fi UNIT –IV Semiconduc semiconduc semiconduc Diodes and Working o configuratic common en	spersion- O terference o ntroduction cs: Principl ibre - Fibre SEMICO totors: En ctors - Cor ctors - P typ d Transiste of full way ons - Adva nitter config	 ptical instrument: Spectrometer - Determination of refraction f light in thin films: air wedge - Diffraction: grating. Population inversion -Pumping - Laser action - Nd-YAG e and propagation of light in optical fibre - Numerical apert optic communication system (Block diagram). NDUCTOR PHYSICS ergy bands in solids - Energy band diagram of go acept of Fermi level - Intrinsic semiconductors - Concepte and N type semiconductors - Hall effect. ors: P-N junction diode - Forward bias and reverse bias re rectifier using P N junction diodes - PNP and NP intages of common emitter configuration - working of N guration. MPHYSICS 	ve ind laser ure ar ood co ot of - Rec N tra PN tr	ex an - CO d acc ond acc onduc holes tificat ansist	2 laser eptanc etors, - dop ion ac or as a	- Apje ang e ang insulating - tion of Chree an an 9	<pre>plications. le - Types +3 ators and Extrinsic of diode - different aplifier in +3</pre>
Optics: Dis a prism- Int LASER: In Fibre Opti of optical fi UNIT –IV Semiconduc semiconduc	spersion- O terference o ntroduction cs: Principl ibre - Fibre SEMICO totors: En ctors - Cor ctors - P typ d Transist of full wav ons - Adva nitter config QUANTU n to quantu	 ptical instrument: Spectrometer - Determination of refraction f light in thin films: air wedge - Diffraction: grating. Population inversion -Pumping - Laser action - Nd-YAG e and propagation of light in optical fibre - Numerical apert optic communication system (Block diagram). NDUCTOR PHYSICS ergy bands in solids - Energy band diagram of genergy of Fermi level - Intrinsic semiconductors - Concepte and N type semiconductors - Hall effect. ors: P-N junction diode - Forward bias and reverse bias are rectifier using P N junction diodes - PNP and NP intages of common emitter configuration - working of N guration. M PHYSICS 	ve ind laser ure ar ood c ot of - Rec N tra PN tr	ex an - CO d acc onduc holes tificat ansist ansist	2 laser eptanc ctors, - dop ion ac or as a nesis, v	- Apje ang e ang insulating - tion of fhree an an 9 vave	+3 ators and Extrinsic of diode - different plifier in +3 – particle
Optics: Dis a prism- Int LASER: In Fibre Opti of optical fi UNIT –IV Semiconduc semiconduc semiconduc semiconduc Diodes and Working o configuratio common en UNIT –V Introduction duality, und	spersion- O terference o atroduction cs: Principli ibre - Fibre SEMICO actors: En ctors - Cor ctors - P typ d Transisto of full way ons - Adva mitter config QUANTU n to quantu certainty pr	 ptical instrument: Spectrometer - Determination of refraction flight in thin films: air wedge - Diffraction: grating. Population inversion -Pumping - Laser action - Nd-YAG e and propagation of light in optical fibre - Numerical apert optic communication system (Block diagram). NDUCTOR PHYSICS ergy bands in solids - Energy band diagram of genergy of Fermi level - Intrinsic semiconductors - Concepte and N type semiconductors - Hall effect. ors: P-N junction diode - Forward bias and reverse bias are rectifier using P N junction diodes - PNP and NP intages of common emitter configuration - working of N guration. MPHYSICS Im physics, black body radiation, Compton effect, de Broinciple, Schrodinger wave equation (Time dependent and properties) 	ve ind laser ure ar ood co ot of - Rec N tra PN tr oglie I Time	ex an - CO d acc onduc holes tificat ansisto ansisto ansisto ansisto	2 laser eptanc ctors, - dop ion ac or as a nesis, v	– Apje ang e ang g insultion of three and	+3 ators and Extrinsic of diode different polifier in +3 – particle rticle in a

TEXT BOOKS

1. Gaur R. K. and Gupta S. L., "Engineering Physics", Dhanpat Rai Publications, 2009.

2. Avadhanulu M. N. "Engineering Physics" (Volume I and II), S. Chand & Company Ltd., New Delhi, 2010. **REFERENCE BOOKS**

- 1. Palanisamy P. K., "Engineering Physics", Scitech Publications (India) Pvt. Ltd, Chennai.
- 2. Arumugam M., "Engineering Physics" (Volume I and II), Anuradha Publishers, 2010.
- 3. Senthil Kumar G., "Engineering Physics", 2nd Enlarged Revised Edition, VRB Publishers, Chennai, 2011.
- 4. Mani P., "Engineering Physics", Dhanam Publications, Chennai, 2007.

E RESOURCES

NPTEL, Engineering Physics, Prof. M. K. Srivastava, Department of Physics, IIT, Roorkee.

LECTURE	TUTORIAL	PRACTICAL	TOTAL HOURS
45	15	-	60

Mapping of CO's with PO's:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	0	0	0	1	0	0	1
CO2	3	0	1	0	1	0	0	0	0	0	0	1
CO3	3	2	2	2	1	0	0	0	1	0	0	1
CO4	3	2	2	2	1	0	0	0	1	0	0	1
CO5	3	0	2	0	0	0	0	0	0	0	0	1
Total	15	6	9	6	4	0	0	0	3	0	0	5
Scaled value	3	2	2	2	1	0	0	0	1	0	0	1

COUF	RSE CODE	Т	Р	SS	С						
COUF	RSE NAME	TECHNICAL COMMUNICATION		2	0	0	0	2			
PRE-I	REQUISITES			L	Т	Р	SS	Н			
C: P:	A	3:0:0		2	0	0	0	2			
COUF	RSE OUTCOM	ES:	Do	omai	in		Leve	1			
CO1	Ability to und	Co	gniti	ve	R	emem	ber				
CO2	Apply the tecl	Co	gniti	ve		Apply	у				
CO3	Identify comm	Co	gniti	ve	R	emem	ber				
CO4	Construct the	Co	gniti	ve		Creat	e				
UNIT	I – Basic Princ					8					
1.1 – E	Basic Principles	of Technical Writing									
1.2 - S	Styles used in Te	chnical Writing									
1.3 - L	Language and To	one									
UNIT	II – Technique	S						8			
2.1 - S	Special Techniqu	es used in writing									
2.2 - I	Definition & Des	cription of mechanism									
2.3 - I	Description- Clas	ssification-Interpretation									
UNIT	III – Commun	cation						8			
3.1 - N	Modern develop	nent in style of writing									
3.2 - 1	New letter writin	g formats									
UNIT	IV – Report W	riting						6			
4.1 – Types of Report writing											
4.2 – P	Project writing for	ormats									
Sugge	sted Readings:										
(iii)	John Sealy	Writing and Speaking Author; Oxford Universi	ty Pre	ess, N	Jew I	Delhi, 2	2019.				

John Sealy, Writing and Speaking Author; Oxford University Press, New Delh
 Williams K.S, Communicating Business. Engage Learning India Pvt Ltd, 2012.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	0	0	0	2	0	0	1	1	3	0	3
CO2	2	0	0	0	1	0	0	1	2	3	0	3
CO3	2	0	0	0	2	0	0	1	3	3	0	3
CO4	3	0	0	0	2	0	0	1	3	3	0	3
Total	10	0	0	0	7	0	0	4	9	12	2	12
Scale	3	0	0	0	2	0	0	1	2	3	1	3

Mapping of COs with POs:

1-5 = 1, 6-10 = 2, 11-15 = 3

0-No Relation, 1- Low Relation, 2 – Medium Relation, 3- High Relation

COURSE CODE XCS205		L	Т	Р	С									
COURSE NAME BASICS OF ELECTRONIC DEV	ICES AND	3	0	0	3									
			U T	D										
PREREQUISITES PHYSICS AND MATHEMATICS		L	Т	Р	Н									
C P A		3	0	0	3									
3 0 0 LEADNING OD LECTIVES			-	-	-									
• To introduce the operation of different types of semicondu	To introduce the operation of different types of semiconductor devices.													
 To familiarize the integrated circuits technology. 														
To provide knowledge on the characteristics of up to electronic devices														
COURSE OUTCOMES:DomainLevelCO1Define the principles of semiconductor physicsCognitiveRemember														
CO1 Define the principles of semiconductor physics.	CO1Define the principles of semiconductor physics.CognitiveRememberCO2Describe the operation and characteristics of semiconductor diodesCognitiveUnderstar													
CO2 Describe the operation and characteristics of semic	CO2 Describe the operation and characteristics of semiconductor diodes. Cognitive Understa													
CO3Understand the operation and Characteristics of BJT and FETCognitiveUnderstand														
CO4 Discuss the operation and characteristics of power electronic and Cognitive Understand														
CO5 Illustrate the Integrated Circuit fabrication process	es.	Cognitiv	e I	Inders	tand									
CO5Illustrate the Integrated Circuit fabrication processes.CognitiveUnderstandUNIT - I Introduction To Semiconductor Technology9														
Review of Quantum Mechanics. Electrons in periodic Lattic	es. E- k diagrams. F	nergy ba	nds in	intrins	ic and									
extrinsic silicon; Carrier transport: diffusion current, drift c	urrent, mobility and	resistivit	y; she	et resis	stance,									
design of resistors.					1									
UNIT - II Junction Diodes And Applications					9									
Generation and recombination of carriers; Poisson and cont	inuity equation P-N	junction	charac	teristic	s, I-V									
characteristics, and small signal switching models; Avalanch	ie breakdown, Zener	diode, H	alf wa	ve Ree	ctifier,									
UNIT - III Transistors And Applications	•				9									
Bipolar Junction Transistor, I-V characteristics, NPN and	d PNP Transistors	, Ebers-N	Ioll N	Iodel,	MOS									
capacitor, C-V characteristics, Junction Field Trans	sistor, VI Chara	acteristic	es, N	10SFE	ET,I-V									
characteristics, and small signal models of MOS transistor.														
UNIT - IV Special Electronic Devices	· · · · · · · · · · · · · · · · · · ·	1			9									
SCR, DIAC, TRIAC, LED, LDR, LCD, Photodiode, Photo Tr	ansistor and solar cel	1.												
UNIT - V Introduction To Integrated Circuit Technology	• • •	1 . 1. 1		1	9									
Integrated circuit fabrication process: oxidation, diffusion chemical vapor deposition, sputtering, twin-tub CMOS process	1, 10n 1mplantation, ss.	photolit	nograp	ny, et	ching,									
LECTURE	TUTORIAL	PRACTI	CAL	TO	TAL									
$\frac{1}{45}$		0			45									

TEXT BOOKS

1. Robert L. Boylestad and Louis Nashelsky, "Electronics devices and Circuit Theory" 11th Edition, UBS Publishers, New Delhi, 2013.

2. G.Streetman, and S.K.Banerjee, "Solid State ElectronicDevices," 7thedition, Pearson, 2014.

3. D.Neamen, D.Biswas "Semiconductor Physics and Devices," McGraw-Hill Education Jacob

4. Millman and Christos C.Halkias, "Electronic Devices and Circuits" 3rd Edition, Tata McGraw

Hill,New Delhi, 2010.

REFERENCES

- 1. C.T.Sah, "Fundamentals of solid state electronics," World Scientific publishing Co.Inc,1991.
- S.M.SzeandK.N.Kwok, "Physics of Semiconductor Devices," 3rdedition, John Wiley &Sons, 2006.
- 3. Y.Tsividisand M.Colin, "Operation and Modeling of the MOSTransistor, "Oxford University .Press, 2011.
- 4. David A. Bell ,"Electronic devices and circuits", Prentice Hall of India, 2004.
- 5. S.Salivahanan, "Electronics devices and circuits". 2nd Edition, Tata McGraw Hill, 2008.

E-REFERENCES

- 6. https://www.digimat.in/nptel/courses/video/108101091/L01.html
- <u>http://nptel.ac.in/courses/117103063/</u> (Prof. Chitralekha Mahanta, NPTEL, Basic Electronics, IIT-Guwahati)
- 8. <u>http://nptel.ac.in/video.php?subjectId=117103063</u> (Prof. Gautam Barua, NPTEL, Basic Electronics, IIT-Guwahati)
- <u>http://nptel.ac.in/courses/117101106/</u> (Prof. A N chandorkar, NPTEL, Analog Electronics, IIT-Bombay)
- 10. https://www.digimat.in/nptel/courses/video/108108112/L01.html

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CO 2	1	2	0	0	0	0	0	0	0	0	0	0	0	0
CO 3	2	1	2	0	0	0	0	0	0	0	0	0	0	0
CO 4	1	1	2	0	0	0	0	0	0	0	0	0	0	0
CO 5	0	0	3	0	1	0	0	0	0	0	0	0	0	0
Total	5	4	7	0	1	0	0	0	0	0	0	0	0	0
Scaled value	3	3	3	0	1	0	0	0	0	0	0	0	0	0

Mapping of COs with POs:

0 - No Relation 1 - Low Relation , 2 – Medium Relation, 3- High Relation

TEXT BOOKS

- 1. Robert L. Boylestad and Louis Nashelsky, "Electronics devices and Circuit Theory" 11th Edition, UBS Publishe s, New Delhi, 2013.
- 2. G.Streetman, and S.K.Banerjee, "Solid State ElectronicDevices," 7thedition, Pearson, 2014.
- 3. D.Neamen, D.Biswas "Semiconductor Physics and Devices," McGraw-Hill Education Jacob
- 4. Millman and Christos C.Halkias, "Electronic Devices and Circuits" 3rd Edition, Tata McGraw Hill,New Dell i, 2010.

REFERENCES

- 1. C.T.Sah, "Fundamentals of solid state electronics," World Scientific publishing Co.Inc, 1991.
- 2. S.M.SzeandK.N.Kwok, "Physics of Semiconductor Devices," 3rdedition, John Wiley &Sons, 2006.
- 3. Y.Tsividisand M.Colin, "Operation and Modeling of the MOS Transistor," Oxford University Press, 2011.
- 4. David A. Bell, "Electronic devices and circuits", Prentice Hall of India, 2004.
- 5. S.Salivahanan, "Electronics devices and circuits". 2nd Edition, Tata McGraw Hill, 2008.

E-REFERENCES

- 1. https://www.digimat.in/nptel/courses/video/108101091/L01.html
- 2. <u>http://nptel.ac.in/courses/117103063/</u> (Prof. Chitralekha Mahanta, NPTEL, Basic Electronics, IIT-Guwahati)
- <u>http://nptel.ac.in/video.php?subjectId=117103063</u> (Prof. Gautam Barua, NPTEL, Basic Electronics, IIT-Guwahati)
- 4. <u>http://nptel.ac.in/courses/117101106/</u> (Prof. A N chandorkar, NPTEL, Analog Electronics, IIT-Bombay)
- 5. https://www.digimat.in/nptel/courses/video/108108112/L01.html

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	0	0	0	0	0	0	0	0	0	0	0
CO 2	1	2	0	0	0	0	0	0	0	0	0	0
CO 3	2	1	2	0	0	0	0	0	0	0	0	0
CO 4	1	1	2	0	0	0	0	0	0	0	0	0
CO 5	0	0	3	0	1	0	0	0	0	0	0	0
Total	5	4	7	0	1	0	0	0	0	0	0	0
Scaled value	3	3	3	0	1	0	0	0	0	0	0	0

Mapping of COs with POs:

0 - No Relation 1 - Low Relation , 2 – Medium Relation, 3- High Relation

Cours	se Code	XEG206							
Cours	se Name	Engineering	Graphics and Design						
	L –T	– P – C	C:P:A		L –T –P –H				
	1-0-	- 2- 3	1.75:1:0.25		1-0-4-5				
Cours	se Outco	me]	Domain/Level				
					C or P or A				
CO1	Apply	the national	and international standards,	Cognitive (A	oply)				
	constru	ictand practice v	various curves	Psychomotor					
				(Guided respo	onse)				
				Affective	to a Dhanamana)				
CO2	Intern	et construct	and practice orthographic	(Responding	nderstand)				
02	nroiecti	ons of points str	aight lines and planes	Psychomotor	(Mechanism)				
	projecti	ons or points, su	argin miles and planes.	Affective (Responding to a Phenomena)					
CO3	Constr	uct Sketch and	Practice projection of solids in	Cognitive (A	nnly)				
	various	positions and tru	e shape of sectioned solids.	Psychomotor	(P-J)				
				(Complex over	ert response)				
				Affective (Re	(sponding to a Phenomena)				
CO4	Interpr	et. Sketch and	Practice the development of	Cognitive (U	nderstand)				
	lateral	surfaces of s	simple and truncated solids,	Psychomotor	(Complex overt response)				
	intersec	tion of solids.	•	Affective (Responding to a Phenomena)					
CO5	Constr	uct sketch a	nd practice isometric and	Cognitive (Ap	oply)				
	perspec	tive views of sim	ple and truncated solids.	Psychomotor					
				(Complex over	ert response)				
				Affective	$(\cdot \cdot \cdot)$				
Ohioo	tivos			Responding	to a Phenomena)				
*	to prep realisti manufa	are the student to c constraints such acturability, and	b design a system, component, or h as economic, environmental, so sustainability	process to meet cial, political, e	desired needs within thical, health and safety,				
**	to prep	are the student to	communicate effectively						
*	to prep engine	are the student to ering practice	o use the techniques, skills, and m	odern engineer	ing tools necessary for				
COUI	RSE CO	NTENT							
UNII	I I IN OB	FRODUCTION SJECTS AND C	, FREE HAND SKETCHING	GOFENGG CURVE	12+6 hrs				
	Imp spe Pic two han Pol elli cor	portance of grap cifications and co torial representat dimensional me ad sketching of the ygons & curves pse, parabola ar astruction – draw	phics in engineering application onventions as per SP 46-2003. tion of engineering objects – repr edia – need for multiple views – o aree dimensional objects. used in engineering practice – n d hyperbola by eccentricity me ing of tangents to the above curve	ns – use of d resentation of t leveloping visu methods of cor thod – cycloic es. Practice on t	rafting instruments – BIS hree dimensional objects in alization skills through free astruction – construction of lal and involute curves – pasic tools of CAD				
UNIT	II PR SU	OJECTION (RFACES	OF POINTS, LINES AND	PLANE	12+6 hrs				
	Ger	neral principles o	f orthographic projection – first a	ngle projection	– layout of views –				

		proje of lin surfa and 1	ections nes and aces and lines	of poin their in d circul	ts, strai nclinatio ar lami	ght line ons to t na incli	es locate he plan ned to l	ed in th es of pr both the	e first c ojectio e planes	quadrant n – trace s of proje	rojections of points, straight lines located in the first quadrant – determination of true lengthsf lines and their inclinations to the planes of projection – traces – projection of polygonalurfaces and circular lamina inclined to both the planes of projection-CAD practice on pointsnd lines ROJECTION OF SOLIDS AND SECTIONS OF SOLIDS 12+6 hrs											
	NIT I	PRO)JECT	ION O	F SOL	IDS A	ND SE	CTION	IS OF S	SOLIDS	5	12+6	hrs									
		Proje one abov perp one	ection of plane of re solid endicul reference	of simp of proje s in sin ar to th ce plane	le solid ection – nple ve ne other e – true	ls like p - chang ertical p r and al	prism, p ge of po position bove so s of sect	byramic osition is by cu blids in ions-C.	l, cylino & auxi itting p incline AD pra	der and o liary pro- lane inc d positio ctice on	cone who bjection lined to on with o solid mo	en the ax methods one refe cutting p dels	tis is inc – sectio rence pl lanes pa	lined to oning of ane and rallel to								
UI IV	NIT 7	DEV SOL	EVELOPMENT OF SURFACES AND INTERSECTION OF 12+6 hrs OLIDS 12+6 hrs lead for development of surfaces development of lateral surfaces of simple and truncated																			
		Need solid solid curv inter	1 for de ls – pri ls with es of ir section	evelopr sms, py square ntersect of axes	nent of yramids and cir ion –pr s and w	surfac , cylind rcular c ism wi rith no c	es – de ders and cutouts th cylin offset-C	evelopn d cones perpend nder, cy CAD pra	nent of - deve dicular linder actice o	lateral s elopment to their & cylind n interse	surfaces t of later axes – i er, cone ction of	of simpl ral surfac ntersection & cylin solids.	le and tr ces of th on of so der with	uncated e above lids and normal								
U	NIT V	ISO	OMETRIC AND PERSPECTIVE PROJECTIONS 12+6 hrs inciples of isometric projection isometric scale isometric projections of simple solids																			
L	= 30 hr	s $T = 0000000000000000000000000000000000$	ection of tice on 0 hrs	of prisn isometi P=60 h	ns, pyra ric view rs Tota	$\frac{1}{\sqrt{1}}$ amids a $\frac{1}{\sqrt{1}}$ and	hrs	nders b	by visua	al ray an	d vanish	ning poin	at metho	ds-CAD								
	1. E	hatt,N	.D, "En	gineeri	ng Drav	wing",	Charota	ar Publi	shing H	House, 46	5 th Editic	on-2003.										
	2. N	lataraja	ın,K.V,	" А Те	extbook	of Eng	ineerin	g Grapl	hics", E	Dhanalak	shmi Pu	blishers,	Chennai	, 2006								
	3. E	Dr. P.K.	Srivid	hva. P.	Pandiv	arai. "F	Enginee	ring Gr	aphics"	. PMU F	Publicatio	ons. Vall	am. 2011	3								
R	EFERI	ENCES	5						upines -	,1110 1	uoneun	ono, • u n										
	5. L	uzadde	er and	Duff, "	Fundar	nentals	of Eng	gineerii	ng Drav	wing" Pi	rentice I	Hall of I	ndia Pvt	Ltd, XI								
	6. V 7. C	enugo Jopalak	der and Duff, "Fundamentals of Engineering Drawing" Prentice Hall of India PvtLtd, XI on - 2001. ugopal,K. and Prabhu Raja, V., "Engineering Graphics", New Age International(P) Ltd., 2008. alakrishnan.K.R., "Engineering Drawing I & II", Subhas Publications, 1998.																			
	8. S	han,M	n,M.B and Rana,B.C.,"Engineering Drawing", Pearson Education,2005.																			
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E-	8. S •REFE 3. <u>h</u> 4. <u>h</u> PO1	hah,M RENC ttp://pe ttp://np PO2	ES riyarne ttel.ac.i PO3	t/Econt n/cours PO4	tent es/1121 PO5	103019/ PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2								
E-	8. S •REFE 3. <u>h</u> 4. <u>h</u> PO1 3	RENC ttp://pe ttp://np PO2	ES rriyarne ttel.ac.i PO3	t/Econt n/cours PO4	<u>tent</u> es/1121 PO5	103019/ PO6	PO7	PO8	PO9	PO10 2	PO11 3	PO12	PSO1	PSO2								
E-	8. S •REFE 3. <u>h</u> 4. <u>h</u> PO1 3 3	RENC ttp://pe ttp://np PO2 3 3	ES and ES riyarne tel.ac.i	t/Econt n/cours PO4 2 1	tent es/1121 PO5 3 3	PO6 2 1	PO7 3 3	PO8 1 1	PO9 1 1	PO10 2 1	PO11 3 2	PO12 3 3	PSO1 3 3	PSO2								

CO4	3	3	3	1	3	1	3	1	1	1	2	3	3	
CO5	3	3	3	1	3	1	3	1	1	1	2	3	3	
Total	15	15	15	6	15	6	15	5	5	6	11	15	15	

COURSE CODE	XBE207	L	Т	Р	С
COURSE NAME	ELECTRICAL AND ELECTRONICS ENGINEERING SYSTEMS LABORATORY	0	0	1	1
PREREQUISITE	Physics	L	Т	Р	Η
C : P : A	0.3 : 0.3 : 0.3	0	0	2	2

COURSE OBJECTIVES:

The course helps to

- e. Learn the basic concepts of electrical and electronics components.
- f. Understand the basic wiring methods and connection.
- g. Study the characteristics of diodes, Zener diodes, NPN transistors.
- h. Verify the working of simple logic gates, adders and subtractors.

Course C	Outcomes:	Domain	Level
CO1	Apply the fundamental electrical concepts and differentiate the various electronic components.	Cognitive	Understand
CO2	Implement and execute the different types of wiring connections.	Cognitive	Apply
CO3	Demonstrate the Fluorescent lamp connection with choke.	Cognitive	Understand
CO4	Characterize and display the basic knowledge on the working of PN junction and Zener diode.	Cognitive	Understand
CO5	Implement and execute the various digital electronic circuits such as Adders and Subtractors.	Cognitive	Apply

List of Experiments:

- 11. Study of Electrical Symbols, Tools and Safety Precautions, Power Supplies.
- 12. Study of Active and Passive elements Resistors, Inductors and Capacitors, Bread Board.
- 13. Testing of DC Voltage and Current in series and parallel resistors which are connected in breadboard by using Voltmeter, Ammeter and Multimeter.
- 14. Fluorescent lamp connection with choke.
- 15. Staircase Wiring
- 16. Forward and Reverse bias characteristics of PN junction diode.
- 17. Forward and Reverse bias characteristics of zener diode.
- 18. Input and Output Characteristics of NPN transistor.
- 19. Construction and verification of simple logic gates.
- 20. Construction and verification of adders and subtractors.

PRACTICAL	TOTAL
30	30

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	1	1	1	1	0	0	1	1	1	0
CO 2	3	3	1	1	1	1	0	0	1	1	1	0
CO 3	2	2	2	1	2	2	1	1	1	1	1	0
CO 4	2	2	1	1	1	1	1	1	1	1	1	0
CO 5	2	2	1	1	1	1	1	1	1	1	1	0
Total	12	12	6	5	6	6	3	3	5	5	5	0
Scaled Value	3	3	2	1	2	2	1	1	1	1	1	0

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$

0 - No Relation, 1 - Low Relation, 2 - Medium Relation, 3 - High Relation

COURSE	CODE	XAP208	L	Т	Р	С	
COURSE	NAME	APPLIED PHYSICS FOR ENGINEERS	0	0	1	1	
		LABORATORY					
C:P:A		0:2:0	L	Т	P	Н	
PREREQ	UISITE:	Basic Physics in HSC level	0	0	2	2	
COURSE	OUTCOM	Dom	ain	Level			
CO1	Determine	the significance of elasticity in engineering systems and	Cognitiv	/e	Understand		
	technologic	al advances.	Psychon	notor	Mechanism		
CO2	use and lo	ocate basic applications of electromagnetic induction to	Cognitiv	/e	Understand		
	technology		Psychon	notor	Mecha	Mechanism	
CO3	Describe the	ne working principle and application of various lasers and	Cognitive Unc			stand	
	fibre optics		Psychon	notor	Mecha	Mechanism	
CO4	use physic	s principles of latest technology using semiconductor	Cognitive Understand				
	devices.		Psychomotor Mechanism				

	LABORATORY
1.	Torsional Pendulum - determination of moment of inertia and rigidity modulus of the given material of the wire.
2.	Uniform Bending - Determination of the Young's Modulus of the material of the beam.
3.	Non-Uniform Bending - Determination of the Young's Modulus of the material of the beam.
4.	Meter Bridge - Determination of specific resistance of the material of the wire.
5.	Spectrometer - Determination of dispersive power of the give prism.

	0 0	30	30								
	LECTURE TUTORIAL	PRACTICAL	TOTAL HOURS								
	6. Umayal Sundari AR., "Applied Physics Laboratory Ma	nual", PMU Press, Th	anjavur, 2012.								
:	5. Arora C.L., "Practical Physics", S. Chand & Company	Ltd., New Delhi, 2013									
4	4. Samir Kumar Ghosh, "A text book of Advanced Practic	cal Physics", New Cen	tral Agency (P) Ltd, 2008.								
REF	REFERENCE BOOKS										
10.	10. PN Junction Diode - Determination of V-I characteristics of the given diode.										
9.	Post office Box - Determination of band gap of a given semiconductor.										
0											
0.	grating.	grating.									
8	Leser Determination of wavelength of given leser source and size of the given micro particle using Leser										
7.	7. Air wedge - Determination of thickness of a given thin w	ire.									
6.	6. Spectrometer - Determination of wavelength of various c	olours in Hg source us	ing grating.								

Mapping of CO's with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	0	0	0	1	0	0	1
CO2	3	0	1	0	1	0	0	0	0	0	0	1
CO3	3	2	2	2	1	0	0	0	1	0	0	1
CO4	3	2	2	2	1	0	0	0	1	0	0	1
Total	12	6	7	6	4	0	0	0	3	0	0	5
Scaled value	3	2	2	2	1	0	0	0	1	0	0	1

4. Syllabus of the Courses

B.Tech . Computer Science and Engineering(Cyber Security) -Full Time

COU	RSE C	ODE	XMA101		L	Т	P	С		
COU	RSE N	AME	CALCULUS AND LINEAR ALGEBRA		3	1	0	4		
С	Р	Α			L	Т	Р	Н		
3	0.5	0.5			3	1	0	4		
PREI	PREREQUISITE: Differentiation and Integration									
Cour	se Outo	comes	D	omai	n	Lev	el			
CO1	App cano	Co	gnitiv	ve	Apply					
CO2	App serie	ly power s s. Half rar	Cognitive		ve	Apply				
CO3	Find Eule	the deriv r's theore	Cognitive		ve	Remember				
CO4	Expl findi Lagr Dire	lain the fund ng maxim angian Me ctional der	Cognitive Understand			stand				
CO5	App and	ly Differe to imprope	Co	gnitiv	ve	Apply				

UNITI –MATRICES	9+3							
Linear Transformation - Eigen values and Eigen vectors -Properties of Eigen values and Eigen vectors								
- Cayley-Hamilton Theorem - Diagonalisation of Matrices - Real Matrices: Symmetric - Skew-								
Symmetric and Orthogonal Quadratic form - canonical form - Nature of Quadratic form and								
Transformation of Quadratic form to Canonical form (Orthogonal only).								
UNIT2 -SEQUENCES AND SERIES								
	-							
Sequences: Definition and examples-Series: Types and convergence- Series of positive to	erms – Tests							
of convergence: comparison test, Integral test and D'Alembert's ratio test Fourier series	: Half range							
sine and cosine series- Parseval's Theorem.								
UNIT 3 -MULTIVARIABLE CALCULUS: PARTIAL DIFFERENTIATION	9+3							

Limits and continuity –Partial differentiation – Total Derivative – Partial differentiation of Composite Functions: Change of Variables – Differentiation of an Implicit Function - Euler's Theorem-Jacobian.

UNIT 4 - MULTIVARIABLE CALCULUS: MAXIMA AND MINIMA AND VECTOR CALCULUS 9+3

Taylor's theorem for function of Two variables- Maxima, Minima of functions of two variables: with

and without constraints - Lagrange's Method of Undetermined Multipliers - Directional Derivatives -Gradient, Divergence and Curl.

UNIT 5 - DIFFERENTIAL AND INTEGRAL CALCULUS

9+3 Evolutes and involutes; Evaluation of definite and improper integrals; Beta and Gamma functions and their properties; Applications of definite integrals to evaluate surface areas and volumes of

revolutions.					
	Hours	LECTURE	TUTORIAL	TOTAL	
		45	15	60	
TEXT BOOKS					

1. Ramana B.V., "Higher Engineering Mathematics", Tata McGraw Hill New Delhi, 11th Reprint, 2015. (Unit-1, Unit-3 and Unit-4).

2. N.P. Bali and Manish Goyal, "A text book of Engineering Mathematics", Laxmi Publications, Reprint, 2014. (Unit-2).

3. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 40th Edition, 2010. (Unit-5).

REFERENCE BOOKS

1. G.B. Thomas and R.L. Finney, "Calculus and Analytic geometry", 9th Edition, Pearson, Reprint, 2002.

2. Veerarajan T., "Engineering Mathematics for first year", Tata McGraw-Hill, New Delhi, 2008.

3. D. Poole, "Linear Algebra: A Modern Introduction", 2nd Edition, Brooks/Cole, 2005.

4. Erwin kreyszig, "Advanced Engineering Mathematics", 9th Edition, John Wiley & Sons, 2006.

Mapping of Cos with POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2	0	0	2	0	0	0	0	1	0	2
CO 2	3	1	0	0	0	0	0	0	0	1	0	1
CO 3	3	1	0	0	0	0	0	0	0	1	0	1
CO 4	3	2	0	0	0	0	0	0	0	1	0	1
CO 5	3	2	0	0	1	0	0	0	0	1	0	2
	15	8	0	0	3	0	0	0	0	5	0	7
Scaled Value	3	2	0	0	1	0	0	0	0	1	0	2

 $1-5 \rightarrow 1$, $6-10 \rightarrow 2$, $11 - 15 \rightarrow 3$

0 - No Relation, 1 - Low Relation, 2- Medium Relation, 3- High Relation

Cours	e Cod	le	:	XCS102		L	Т	Р	С
Cours	e Nar	ne	:	PROGRAMMING FOR PROBLEM SOLVING UPYTHON	USING	3	0	0	3
Prerec	quisit	e	:	Basic Understanding Skills		L	Т	Р	Н
С	P	Α		<u> </u>		3	0	0	3
3	0	0							
Cours	e Obj	jectiv	es						<u> </u>
		<u> </u>							
• To	under	rstand	theb	asicsof algorithmicproblemsolving.					
• To	learnt	tosolv	epro	blemsusingPythonconditionalsandloops.					
• To	defin	ePyth	onfu	nctions and use function calls to solve problems.					
• To	usePy	thond	latas	tructures-lists, tuples, dictionaries to represent complex	data.				
• To	doinr	ut/out	thut	withfilesinPuthon					
• 10	uomp	Jul/Ou	ipuiv						
Course to	e Outo	come:	Afte	er the completion of the course, students will be able	Domai C or P o	in or A]	Level	
CO1	Dev	elop a	lgor	ithmic solutions to simple computational problems	Cognitive	e	Unde	erstand	1
CO2	02 Write simple Python programs using conditionals and looping for Cognitive Understand								
CO3	Solving problems. Cognitive Apply								
		1			U			, 	
CO4	Rep: etc	resent	con	pound data using Python lists, tuples, dictionaries	Cognitive	9	Appl	У	
CO5	Read	d and	write	datafrom/tofiles in Pythonprograms.	Cognitive	9	Appl	У	
COUR	RSE (CONT	'EN'	<u>ا</u>					
UNIT	Ι	PRC)GR	AMMING FUNDAMENTALS					9
Fundar	menta	ls of	Con	puting - Identification of Computational Problems -	Algorithm	ns, bu	ilding	block	s of
algorit	hms	(stater	nent	s, state, control flow, functions), notation (pseudo c	code, flow	char	t, prog	gramn	ning
langua	.ge), a	lgorit	hmic	problem solving, simple strategies for developing alg	orithms (i	teratio	on, rec	ursior	ı).
UNIT	II	DA'I		YPES,EXPRESSIONS,STATEMENTS			11.		9
Python	iinterj	preter	and	nteractivemode, debugging;valuesandtypes:int,float,b	oolean,stri	ng,an	dlist;	variat	oles,
expres	sions,			s, tuple assignment, precedence of operators, comments	8;				0
Condit	tional	CU S'Boo		values and operators conditional (if) alternative (if also)	chainedcou	nditio	nal(if	alif	9
else).It	teratic	on stat	e wł	hile for break continue pass Fruitfulfunctions returnitation	lues param	neters	locala	ndølo	bals
cope.fi	unctic	oncom	posi	tion.recursion:Strings:stringslices.immutability.stringf	functionsal	ndmet	hods.s	tringr	nod
ule;Lis	stsasa	rrays.	I ···	, ,			,	0	
UNIT	IV		STS	,TUPLES,DICTIONARIES					9
Lists:li	istope	ration	s,lis	slices,listmethods,listloop,mutability,aliasing,cloning	lists,listpa	ramet	ers;	Tup	oles:
tuple a	ssign	ment,	tupl	e as return value; Dictionaries: operations and method	ls;advance	d list	proces	sing -	· list
compre	ehens	ion;							
UNIT	V	FI	LES	,MODULES,PACKAGES					9
Files a	and ex	ceptio	on: t	ext files, reading and writing files, format operator; o	command	line a	rgume	nts,er	rors
and ex	ceptio	ons, ha	andli	ng exceptions, modules, packages;			1	-1	
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5. A	llenB.Do	owne	y,"Thi	inkPyt	hon:Ho	owtoTł	ninklik	eaCom	puterS	cientis	t",2 nd E	dition	,O'Re	illyPu	0
lis	shers,20	16.							-						
6. K	arlBeech	her,"(Compt	itation	alThin	king:A	Begin	ner'sGi	uidetoI	Problen	nSolvii	ngand	progra	mmin	g",1stE
di	tion,BC	SLea	.rning&	kamp;l	Develo	pment	Limite	ed,2017	7.						
REFERE	NCE BO	OOK	S												
10. Pa	aul Deit	tel a	nd Ha	arvey	Deitel,	, "Pytl	hon fo	or Prog	gramm	ers", F	Pearsor	n Edu	cation	, 1st	
Ec	dition,20)21.	_												
11. G	Venka	atesh	and	Madl	navan	Muku	ind, '	Comp	utation	al Th	inking	A	Prime	er for	
	ogramm	iersai	ndData	a Scier	itists,		101,NC	otionPro	ess,202	Drogr	mmin	a Ua	ina l	Duthor	
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13. Eı	ricMatth	ies,"P	ython	Crash(Course	,AHan	ds-								
or	nProjectl	Based	dIntroc	luctior	ntoProg	gramm	ing",21	ndEditi	on,No	Starch	Press,2	019.			
14. ht	tps://ww	ww.py	ython.c	org/											
15. M	lartinC.E	Brown	n,"Pyt	hon:Tł	neCom	pleteR	eferen	ce",4th	Editio	n,Mc-C	irawHi	11,201	8.		
E-REFE	RENCE	S													
7. https:	://www.i	indial	bix.co	m/c-pr	ogram	ming/q	luestio	ns-and-	answe	rs/					
8. https:	://www.j	javatp	point.c	com/c-j	program	mming	-langu	age-tut	orial						
9. https:	://www.	w3scl	hools.	in/c-tu	torial/										
Mapping	of CO v	with 1	PO's												
					_	10					0	Η	10		2
		0	03	03	04	02	0 6	07	0 8	0) 1	01	01	õ	SO SO
		Ч	Ч	P	Ā	Ā	Ā	Ā	Ρ	Ā	P(P(P(L	Å
CO 1		3	2	0	0	3	0	0	0	0	0	2	3	2	0
CO 2		3	2	0	0	2	0	0	0	0	0	2	3	2	0
CO 2 3 2 0 0 2 0 0 0 0 2 3 2 0										0	0	2	2	2	0
CO 3	CO 3 2 2 1 2 2 0 0 0 0 2 2 2 0														
CO 3 CO 4		2 2	$\frac{2}{2}$	1	$\frac{2}{2}$	$\frac{2}{2}$	0	0	0	0	0	2	2	2	0
CO 3 CO 4 CO 5		2 2 2	$\frac{2}{2}$	1 1 1	2 2 0	2 2 2	0 0 0	0 0	0	0	0 2	2 2	22	22	0
CO 3 CO 4 CO 5 Total		2 2 2 12	2 2 2 10	$ \begin{array}{c} 1\\ 1\\ 1\\ 3\\ \end{array} $	2 2 0 4	2 2 2 11	0 0 0	0 0 0	0 1 1	0 0 0	0 2 2	2 2 10	2 2 12	2 2 10	0 0 0
CO 3 CO 4 CO 5 Total Scaled Va	lue	2 2 2 12 3	$\begin{array}{c} 2 \\ 2 \\ \hline 2 \\ \hline 10 \\ \hline 2 \\ \end{array}$	$ \begin{array}{c} 1\\ 1\\ 3\\ 1 \end{array} $	2 2 0 4 1	2 2 2 11 3	0 0 0 0	0 0 0 0	0 1 1 1	0 0 0 0	0 2 2 1	2 2 10 2	2 2 12 3	2 2 10 2	0 0 0 0
CO 3 CO 4 CO 5 Total Scaled Va	due	2 2 2 12 3	2 2 10 2	$ \begin{array}{c} 1\\ 1\\ 3\\ 1 \end{array} $	2 2 0 4 1	2 2 2 11 3	0 0 0 0	0 0 0 0	0 1 1 1	0 0 0 0	0 2 2 1	2 2 10 2	2 2 12 3	2 2 10 2	0 0 0 0
CO 3 CO 4 CO 5 Total Scaled Va	alue	2 2 2 12 3	$\begin{array}{c} 2\\ \hline 2\\ \hline 2\\ \hline 10\\ \hline 2 \end{array}$	$ \begin{array}{c} 1\\ 1\\ 3\\ 1 \end{array} $	2 2 0 4 1	2 2 2 11 3	0 0 0 0	0 0 0 0	0 1 1 1	0 0 0	0 2 2 1	2 2 10 2	2 2 12 3	2 2 10 2	0 0 0 0
CO 3 CO 4 CO 5 Total Scaled Va	lue	$\begin{array}{c} 2\\ 2\\ \hline 2\\ \hline 12\\ \hline 3 \end{array}$	2 2 10 2	$ \begin{array}{c} 1\\ 1\\ 3\\ 1 \end{array} $	2 2 0 4 1	2 2 2 11 3	0 0 0 0	0 0 0 0 0	0 1 1 1	0 0 0	0 2 2 1	2 2 10 2	2 2 12 3	2 2 10 2	0 0 0
CO 3 CO 4 CO 5 Total Scaled Va	alue DE	2 2 2 12 3	2 2 10 2	1 1 3 1	2 2 0 4 1	2 2 2 11 3	0 0 0 0 XAC1	0 0 0 0 0 0	0 1 1 1	0 0 0	0 2 2 1	2 2 10 2	2 2 12 3 L	2 2 10 2 T	0 0 0 0 0 P
CO 3 CO 4 CO 5 Total Scaled Va	DE ME	2 2 2 12 3	2 2 10 2	1 1 3 1 APPL	2 2 0 4 1	2 2 2 11 3	0 0 0 0 XAC1 ISTRY	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 1 1 1 ENGI	0 0 0 0	0 2 2 1 8	2 2 10 2	2 2 12 3 L 3	2 2 10 2 T 1	0 0 0 0 P 0
CO 3 CO 4 CO 5 Total Scaled Va URSE COI URSE NAM EREQUISI	alue DE ME TES	2 2 12 3	2 2 10 2 	1 1 3 1 APPL	2 2 0 4 1	2 2 11 3	0 0 0 0 XAC1 ISTRY	0 0 0 0 0 0 0 3 7 FOR	0 1 1 1 1 ENGI	0 0 0 NEER	0 2 1 8	2 2 10 2	2 2 12 3 L L	2 2 10 2 T 1 T	0 0 0 0 P 0 P
CO 3 CO 4 CO 5 Total Scaled Va URSE COI URSE NAM EREQUISI P	DE ME TES A	2 2 12 3	2 2 10 2 L	1 1 3 1 APPL	2 2 0 4 1	2 2 11 3	0 0 0 0 XAC1 ISTRY	0 0 0 0 0 0 3 7 FOR	0 1 1 1 ENGI	0 0 0	0 2 1 8	2 2 10 2	2 2 12 3 L 3 L 3	2 2 10 2 T 1 T 1 1	0 0 0 0 P 0 P 0
CO 3 CO 4 CO 5 Total Scaled Va URSE COI URSE NAM EREQUISI P 5 1	DE ME TES A 0.5	2 2 12 3	2 2 10 2 	1 1 3 1 APPL	2 2 0 4 1	2 2 11 3 CHEM	0 0 0 0 XAC1 ISTRY	0 0 0 0 0 0 0 3 7 FOR	0 1 1 1 5 6 8 8	0 0 0	0 2 1 8	2 2 10 2	2 2 12 3	2 2 10 2 T 1 T 1 1	0 0 0 0 P 0 P 0
CO 3 CO 4 CO 5 Total Scaled Va URSE COI URSE NAM EREQUISI P 5 1 URSE OBJ	DE ME TES A 0.5 ECTIV	2 2 12 3 NI	2 2 10 2 L	1 1 3 1	2 0 4 1	2 2 11 3	0 0 0 0 XAC1 ISTRY	0 0 0 0 0 0 0 0 0 3 7 FOR	0 1 1 1 ENGI	0 0 0	0 2 1	2 2 10 2	2 2 12 3 L 3 L 3	2 2 10 2 T 1 T 1 1	0 0 0 0 P 0 P 0
CO 3 CO 4 CO 5 Total Scaled Va URSE COI URSE NAM EREQUISI P 5 1 URSE OBJ erstand the	DE ME TES A 0.5 ECTIV applicat	2 2 12 3 NI ES ion o	2 2 10 2 	1 1 3 1 APPL	2 2 0 4 1 IED C	2 2 11 3	0 0 0 0 XAC1 ISTRY	0 0 0 0 0 0 0 3 7 FOR	0 1 1 1 5 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	0 0 0 0	0 2 1 S	2 2 10 2	2 2 12 3	2 2 10 2 7 T 1 T 1	0 0 0 0 P 0 P 0
CO 3 CO 4 CO 5 Total Scaled Va URSE COI URSE NAM EREQUISI P 5 1 URSE OBJ erstand the URSE OUT	DE ME TES A 0.5 ECTIV applicat	2 2 12 3 NI ES ion o	2 2 10 2 L	1 1 3 1 APPL	2 2 0 4 1 IED C	2 2 11 3	0 0 0 0 XAC1 ISTRY	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 1 1 5 6 7 7 7	0 0 0	0 2 1 S	2 2 10 2	2 2 12 3	2 2 10 2 T 1 T 1	0 0 0 0 P 0 P 0 LEVE
CO 3 CO 4 CO 5 Total Scaled Va URSE COI URSE NAN CREQUISI P 1 URSE OBJ erstand the URSE OUT	DE ME TES A 0.5 IECTIV applicat	2 2 12 3 NI ES ion o ES	2 2 10 2 L	1 1 3 1 APPL	2 2 0 4 1 IED C	2 2 11 3 THEM	0 0 0 0 XAC1 ISTRY	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 1 1 ENGI	0 0 0 NEER	0 2 1 S S	2 2 10 2	2 2 12 3	2 2 10 2 T 1 T 1	0 0 0 0 P 0 P 0 LEVE
CO 3 CO 4 CO 5 Total Scaled Va URSE COI URSE NAM EREQUISI P 1 URSE OBJ erstand the URSE OUT Identif	DE ME TES A 0.5 ECTIV applicat FCOME	2 2 12 3 NI ES ion o ES period	2 2 10 2 L	1 1 3 1 APPL	2 2 0 4 1 IED C in engines such	2 2 11 3 The meeting the as integration	0 0 0 0 XAC1 ISTRY	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 1 1 ENG	0 0 0 NEER	0 2 1 S S	2 2 10 2	2 2 12 3	2 2 10 2 T 1 T 1 Rem	0 0 0 0 0 P 0 P 0 0 LEVF

CO2	Explain and Measure microscopic chemistry in to	erms of atomic,		Cognitive	Understand
001	molecular orbitals and intermolecular forces.			Psychomotor	Set
	Interpret bulk properties and processes using	g thermodynam	ic and	Cognitive	Apply
CO3	kinetic considerations.			Psychomotor	Mechanism
				Affective	Receive
	Describe, Illustrate and Discuss the chemical re	actions that are	used in	Cognitive	Remember
CO4	the synthesis of molecules.			Psychomotor	Analyze
001				Affective	Perception
				7 meetive	Respond
	Apply, Measure and Distinguish the ranges of	of the electrom	agnetic	Cognitive	Remember
CO5	spectrum used for exciting different molecular en	nergy levels in	various	Psychomotor	Apply
	spectroscopic techniques			rsychomotor	Mechanism
UNIT I	I PERIODIC PROPERTIES AND WATE	R CHEMISTR	Y		8+3
Effectiv	ve nuclear charge, penetration of orbitals, variation	ns of s, p, d and	l f orbital	energies of ato	ms in the periodic
table, e	electronic configurations, atomic and ionic sizes,	ionization energ	gies, elect	ron affinity and	l electronegativity,
polariza	ability, oxidation states, coordination numbers and	geometries, hard	l soft acid	s and bases, mo	lecular geometries.
Water	Chemistry-Water quality parameters-Definition a	and explanation	of hardn	ess, determinati	on of hardness by
EDTA	method-Introduction to alkalinity.				
UNIT I	II USE OF FREE ENERGY IN CHEMICA	L EQUILIBRI	A		12+3
Thermo	odynamic functions: energy, entropy and free energ	y. Estimations o	of entropy	and free energie	es. Free energy and
emf. Co	ell potentials, the Nernst equation and application	s. Acid base, or	xidation 1	reduction and so	olubility equilibria.
Corrosi	on-Types, factors affecting corrosion rate and	Control method	ds. Use	of free energy	considerations in
metallu	rgy through Ellingham diagrams. Advantages of el	ectroless plating	g, electrol	ess plating of ni	ckel and copper on
Printed	Circuit Board (PCB).				
UNIT I	III ATOMIC AND MOLECULAR STRUCT	TURE			10+3
Schrodi	inger equation. Particle in a box solution and the	ir applications f	or conjug	ated molecules	and nanoparticles.
Molecu	lar orbitals of diatomic molecules and plots of th	e multicenter of	rbitals. Ec	quations for atom	mic and molecular
orbitals	. Energy level diagrams of diatomic molecules. Cry	stal field theory	and the e	energy level diag	grams for transition
metal ic	ons and their magnetic properties. Band structure of	solids and the r	ole of dop	oing on band stru	ictures.
Interm	olecular forces and potential energy surfaces				
Ionic, d	lipolar and Vander Waals interactions. Equations of	f state of real gas	ses and cr	itical phenomen	a. Potential energy
surface	s of H ₃ , H ₂ F and HCN and trajectories on these surf	faces.			
UNIT I	IV SPECTROSCOPIC TECHNIQUES ANI) APPLICATIO	ONS		7+3
Princip	les of spectroscopy and selection rules. Electronic s	pectroscopy-chr	omophor	e, auxochromes,	types of electronic
transitio	on and application. Fluorescence and its application	ns in medicine. V	Vibrationa	al spectroscopy-	types of vibrations,
Instrum	nentation, and applications. Rotational spectrosco	opy of diatomi	c molecu	iles. Nuclear m	agnetic resonance
spectro	scopy-concept of chemical shift and applications-m	agnetic resonand	ce imagin	g. Diffraction a	nd scattering.
UNIT	V STEREOCHEMISTRY AND ORGANIC	CREACTIONS			8+3
Represe	entations of 3 dimensional structures, structural iso	omers and stere	oisomers,	configurations	and symmetry and
chiralit	y, enantiomers, diastereomers, optical activity, abso	olute configurati	ons and c	conformational a	nalysis. Isomerism
in trans	itional metal compounds				
Organi	ic reactions and synthesis of a drug molecule				
Introdu	ction to reactions involving substitution, addition,	elimination, ox	idation, r	eduction, cycliza	ation reactions and
ring op	ening reactions. Synthesis of a commonly used drug	g molecule- Asp	irin and p	aracetamol.	
	HOURS	ECTURE	TUTO	RIAL	TOTAL
		45	15	;	60
TEXTI	BOOKS	l		•	

1.	Puri B.R. Sharma, L.R., Kalia K.K. Principles of Inorganic Chemistry, (23 rd edition), New Delhi, Shoban Lal
	Nagin Chand & Co., 1993.
2.	Lee. J.D. Concise Inorganic Chemistry, UK, Black well science, 2006.
3.	Trapp. C, Cady, M. Giunta. C, Atkins's Physical Chemistry, 10 th Edition, Oxford publishers, 2014.
4.	Glasstone S., Lewis D., Elements of Physical Chemistry, London, Mac Millan & Co. Ltd, 1983.
5.	Morrison R.T. and Boyd R.N. Organic Chemistry (6th edition), New York, Allyn
	& Bacon Ltd., 1976.
6.	Banwell. C.N, Fundamentals of Molecular Spectroscopy, (3th Edition), McGraw-Hill Book Company, Europe
	1983.
7.	Bahl B.S. and Arun Bahl, Advanced Organic Chemistry, (4th edition), S./ Chand & Company Ltd. New
	Delhi, 1977.
8.	P. S. Kalsi, Stereochemistry: Conformation and mechanism, (9 th Edition), New Age
	International Publishers, 2017.
REFE	RENCES
1.	Puri B R Sharma L R and Madan S Pathania, "Principles of Physical Chemistry", Vishalpublishing Co.,
	Edition 2004.
2.	Kuriocose, J C and Rajaram, J, "Engineering Chemistry", Volume I/II, Tata McGraw-Hill Publishing Co. Ltd.
	New Delhi, 2000.
E- REI	FERENCES
1.	http://www.mooc-list.com/course/chemistry-minor-saylororg
2.	https://www.canvas.net/courses/exploring-chemistry
3.	http://freevideolectures.com/Course/2263/Engineering-Chemistry-I
4.	http://freevideolectures.com/Course/3001/Chemistry-I
5.	http://freevideolectures.com/Course/3167/Chemistry-II
6.	http://ocw.mit.edu/courses/chemistry/

Mapping of CO with PO

CO Vs PO	CO1	CO2	CO3	CO4	CO5	Total	Scaled to 0,1,2 and 3
PO ₁	3	2	3	3	3	13	3
PO ₂	0	0	0	0	0	0	0
PO ₃	0	0	0	0	0	0	0
PO ₄	0	0	0	0	0	0	0
PO ₅	0	0	0	0	0	0	0
PO ₆	0	0	0	0	0	0	0
PO ₇	2	1	2	3	2	10	2
PO ₈	3	2	3	3	2	13	3
PO ₉	3	2	3	3	3	14	3
PO ₁₀	0	0	0	0	0	0	0
PO ₁₁	0	0	0	0	0	0	0
PO ₁₂	0	0	0	0	0	0	0

PSO ₁	0	0	0	0	0	0	0
PSO ₂	0	0	0	0	0	0	0

 $1 - 6 \rightarrow 1, 7 - 12 \rightarrow 2, 13 - 18 \rightarrow 3$

0 – No Relation, 1 – Low Relation, 2 – Medium Relation, 3 – High Relation

SUB	CO	DE	XWP104		L	Т	С	
SUB	NA	ME	WORKSHOP PRACTICES		1	0	2	3
С	Р	Α			L	Т	Р	Η
1	2	0			1	0	4	5
PREF	REQ	UISI	re:			-		
CO1	G		Course outcomes	Domain	T.	L	evel	
	n n	nachini	ing operation.	Psychomotor	: G	uided r	respon	se
CO2	D	efinin	g metal casting process, moulding methods and	Cognitive	Re	ememb	er	
	r	elated	Casting and Smithy applications.	Psychomotor	· Pe	rceptio	on	
CO3	P	lan ba	sic carpentry and fitting operation and Practice	Cognitive	A	oplying	g	
004	C	arpenti	ry and fitting operations.	Psychomotor		11ded r	respon	se
CO4	3	umma	rize metal joining operation and Practice	Cognitive		idersta	inding	
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			Fsycholiotol				30
C05		llustra Jokog	te the electrical and electronics basics and	Cognitive		ndersta	inding	
	IV	lanes	appropriate connections.	rsychomotol		Igmai		
COU	RSE	CON	TENT				~~	
EXI	2		TITLE			DEI	CO	
	)	Testers	lesties (c. Machinis, Decess			RE		JN
1		Disin	Transis a series Letter Operation					
2		Plain	Turning using Lathe Operation					
3		Intro	duction to CNC					
4		Dem	onstration of Plain Turning using CNC					
5		Study	y of Metal Casting Operation				CO2	
6		Dem	onstration of Molding Process				CO2	
7		Study	y of Smithy Operation				CO2	
8		Study	y of Carpentry Tools				CO3	
9		Half	lap joint – Carpentry				CO3	
10		Mort	ise and Tenon joint – Carpentry				CO3	
11		Study	y of fitting tools				CO3	
12		Squa	re fitting				CO3	
13		Trian	igular fitting				CO3	
14		Study	y of Welding Tools				CO4	
15		Squa	re butt joint - welding				CO4	
16		Tee j	oint – Welding				CO4	
17		Intro	duction to house wiring				CO5	
18		One	lamp controlled by one switch				CO5	
19		Two	lamps controlled by single switch				CO5	
20		Stair	case wiring				CO5	

# **TEXT BOOKS**

- 1. Workshop Technology I,II,III, by S K Hajra, Choudhary and A K Chaoudhary. Media Promoters and Publishers Pvt. Ltd., Bombay
- 2. Workshop Technology by Manchanda Vol. I,II,III India Publishing House, Jalandhar.

## REFERENCES

- 1. Manual on Workshop Practice by K Venkata Reddy, KL Narayana et al; MacMillan India Ltd.
- 2. Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi
- 3. Workshop Technology by B.S. Raghuwanshi, Dhanpat Rai and Co., New Delhi.
- 4. Workshop Technology by HS Bawa, Tata McGraw Hill Publishers, New Delhi.

# **E RESOURCES**

3. http://nptel.ac.in/courses/112107145/

# Mapping of CO's with PO'S:

	<b>PO1</b>	PO2	PO3	<b>PO4</b>	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	PO11	<b>PO12</b>
CO1	2	1	2	2	1			1	1		1	2
CO2	2	1	2	2	1			1	1		1	2
CO3	2	1	2	2	1			1	1		1	2
CO4	2	1	2	2	1			1	1		1	2
CO5	2	1	2	2	1			1	1		1	2
Total	10	5	10	10	5			5	5		5	10
Scaled	2	1	2	2	1			1	1		1	2

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$ 

0- No relation 1- Low relation 2- Medium relation 3- High relation

COUR	RSE CO	DE	XGS105	XGS105 L T						
COUR	SE NA	ME	SPEECH COMMUNICATION	SPEECH COMMUNICATION012					3	
Pre	e-requisi	tes			L	Т	Р	SS	Н	
С	Р	Α			0	1	1	0	5	
2.6	0.4	0			U	I	4	U	5	
COUR	SE OU	TCOM	ES:	Do	Domain Level			1		
CO1	Ability	to reca	ll the types of speeches	Cogni	tive		Rem	Remember		
CO2	Apply	the tech	iniques in public speaking	Cogni	tive		Apply			
CO3	Identify the common patterns in organizing a speech         Cog					Cognitive Rememb				
CO4 <b>Construct</b> the nature and style of speaking				Cogni	tive		Crea	te		
CO5	Practi	speaking skills	Psych	omo	tor	Guid	ed Res	sponse		

UNIT - I TYPES OF SPEECHES	9
1.1 - Four types of speeches	
1.2 - Analyzing the audience	
1.3 - Developing ideas and supporting materials	
UNIT - II PUBLIC SPEAKING	9
2.1 - Introduction to Public Speaking	
2.2 - Competencies Needed for successful speech making	
2.3 - Speaking about everyday life situations	
UNIT - III ORGANIZATION OF SPEECH	9
3.1 - Developing a speech out line	
3.2 - Organizing the speech	
3.3 - Introduction - development – conclusion	
UNIT - IV PRESENTATION	9
4.1 - Tips for preparing the draft speech	
4.2 - Presentation techniques using ICT tools	
4.3 - Using examples from different sources	
UNIT - V ACTIVITIES	9
5.1 - Reading activities	
5.2 - Creative presentations	
5.3 - Media presentation techniques	
SUGGESTED READINGS:	
(i) Michael Swan. Practical English Usage. OUP. 1995	
(ii) Sanjay Kumar and Pushp Lata. Communication Skills. Oxford University Press. 2011	

COURSE CODE XUM106						Р	С
COURS	E NAME	CONSTITUTION OF INDIA		3	0	0	0
PRERE	QUISITE:	NIL		L	Т	Р	Η
C:P:A		0:0:0		3	0	0	3
COURS	E OUTCOM	ES	Domain	L	evel		
CO1	Understand t	he Constitutional History	Cognitive	Understand			ing
CO2	Understand t	he Powers and Functions	Cognitive	U	nders	stand	ing
CO3	Understand t	he Legislature	Affective	Remember			
CO4	Understand t	he Judiciary	Affective	R	emen	nber	
CO5	Understand t	he Centre State relations	Cognitive	U	nders	stand	ing
UNIT - I	[						8

Constitutional History- The Constitutional Rights- Preamble- Fundamental Rights- Fundamental Duties- Directive principles of State Policy.

# UNIT - II

The Union Executive- The President of India (powers and functions)- Vice-President of India-The

9

Council of Ministers-Prime Minister- Powers and Functions.

# UNIT - III

Union Legislature- Structure and Functions of Lok Sabha- Structure and Functions of Rajya Sabha-Legislative Procedure in India- Important Committees of Lok Sabha- Speaker of the Lok Sabha.

10

9

9

# UNIT - IV

The Union Judiciary- Powers of the Supreme Court- Original Jurisdiction- Appellate jurisdictions-Advisory Jurisdiction- Judicial review.

 $\mathbf{UNIT} - \mathbf{V}$ 

Centre State relations- Political Parties- Role of governor, powers and functions of Chief Minister-Legislative Assembly- State Judiciary- Powers and Functions of the High Courts.

LECTURE	TUTORIAL	PRACTICAL	TOTAL
45	0	0	45

# REFERENCES

1. W.H.Morris Shores- Government and politics of India, NewDelhi, B.1. Publishers, 1974.

2. M.V.Pylee- Constitutional Government in India, Bombay, Asia Publishing House, 1977.

3. R.Thanker- The Government and politics of India, London: Macmillon, 1995.

4. A.C.Kapur- Select Constitutions S, Chand& Co., NewDelhi, 1995

- 5. V.D.Mahajan- Select Modern Governments, S, Chand&Co, NewDelhi, 1995.
- 6. B.C.Rout- Democractic Constitution of India.

7. Gopal K.Puri- Constitution of India, India 2005.

## Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9
CO 1	2			1					
CO 2	2			1					
CO 3	2			1					1
CO 4	2			1				1	1
CO 5	2	2		1				1	1
Total	10	2		5				2	3
Scaled to	2	1		1				1	1
0,1,2,3									

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$ 

0 – No Relation, 1- Low Relation, 2- Medium Relation, 3- High Relation

COUR	SE CO	DE	XCS107	L	Т	Р	С
COURSE NAME		ME	PROGRAMMING FOR PROBLEM SOLVING		0	1	1
			USING PYTHON LABORATORY				
PRER	EQUIS	ITES	Basic Understanding Skills	L	Т	Р	H
С	Р	Α		0	0	2	2
0.75	0	0.25					

## **LEARNING OBJECTIVES**

- Acquire knowledge about to solve basic problems by understanding basic concepts in python like operators, control statements etc.
- To develop modular, reusable and readable Python Programs using the concepts like functions, arrays etc.
- Design and implement programs to store data in structures and files.

COURS	SE OUTCOMES	DOMAIN	LEVEL
CO1	Apply the concepts of variables, data types, operators and	Cognitive	Understand
	expressions.		Apply
CO2	ImplementPythonprogramswithconditionalsandloops.	Cognitive	Understand
			Apply
CO3	Develop Python programs stepwise by defining functions and	Cognitive	Understand
	callingthem.		Apply
<b>CO4</b>	Use Python lists, tuples, dictionaries for representing	Cognitive	Understand
	compound data	-	Apply
CO5	Read and write data from/to files in Python	Cognitive	Understand
		-	Apply

S.No	List of Experiments	COs		
1	Writeaprogram todemonstratedifferentnumberdatatypesinpython.	CO1		
2	Writeaprogramtoperformdifferentarithmeticoperationsonnumbersin python.	CO1		
3	Writeaprogramtocreate, concatenateandprintastringand accessing the sub-	CO2		
	stringfromgivenstring.			
4	Writeaprogramtocreate, appendand removelists in python.	CO2		
5	Writeaprogramtodemonstrateworkingwithtuples inpython.	CO2		
6	Writeaprogramtodemonstrateworkingwithdictionaries inpython.	CO3		
7	Write a programtofindthelargest numberamongthethreeinput numbers.	CO3		
8	Write a python program toconstruct the following pattern, using a nested	CO3		
	for loop.			
9	Writeapythonscriptthatprintsprimenumberslessthan20.	CO4		
10	Write a python program tofind the factorial of an umber using recursion.	CO4		
11	Write a program that accepts the lengths of three sides of a triangle as input the program	CO4		
	output should indicate whether or not the triangle, is righttriangle			
	(recallfromthePythagoreantheoremthatinarighttriangle, the square of one sideequals the			
	sumofthe squaresoftheothertwo sides).			
12	Write a python program todefineamoduletofindFibonaccinumbersand	CO5		
	importthemoduletoanother program.			
13	writeascriptnamedcopyfile.py.Thisscriptshouldprompttheuserfor	CO5		
	thenamesoftwotextfiles.thecontentsofthefirstfileshouldbeinput. andwrittentothesecondfile.			
14	Writeaprogramthatinputsatextfile. The programshould printal the	CO5		
	uniquewordsinthefileinalphabeticalorder.			
15	writeapythonclasstoreverseastringwordbyword.	CO5		
HOURS TUTORIAL PRACTICAL TOTAL 0 30 30				
--------------------------------------------------------	-------	----------	-----------	-------
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	UOUDS	TUTORIAL	PRACTICAL	TOTAL
	HOURS	0	30	30

Mapping of CO with PO's

	P01	P02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS01	PSO2
CO 1	3	2	0	0	3	0	0	0	0	0	2	3	2	0
CO 2	3	2	0	0	2	0	0	0	0	0	2	3	2	0
CO 3	2	2	1	2	2	0	0	0	0	0	2	2	2	0
CO 4	2	2	1	2	2	0	0	0	0	0	2	2	2	0
CO 5	2	2	1	0	2	0	0	1	0	2	2	2	2	0
Total	12	10	3	4	11	0	0	1	0	2	10	12	10	0
Scaled Value	3	2	1	1	3	0	0	1	0	1	2	3	2	0

0- No relation

1- Low relation 2- Medium relation

3- High relation

COURS	E CODI	£	XAC108		L	Т	Р	С
COURS	E NAM	E	APPLIED CHEMISTRYFOR ENGINEERS	0	0	1	2	
PRERE	OUISIT	ES	NIL		L	Т	Р	Н
С	P	Α		0	0	1	3	
0.25	1.5	0.25						
COURS	E OUT(	DOMA	L	LEVEL				
C01	Ability study o	to Identif f science	Cognitive Psychomo	tor	Remember Perception			
CO2	Analyz surface potentia	e and Mea tension, v als, extent	Cognitive Psychomo Affective	Analyze Perception Receive				
CO3	Analyz from co	e the synt	Cognitive		Appl	Apply		

Ex. No	Experiments	COs
1.	Determination of chloride ion present in the water sample by Argentometric method.	CO1
2.	Determination of total, temporary and permanent hardness of water sample by EDTA method.	CO1
3.	Determination of cell constant and conductance of solutions.	CO2
4.	Potentiometry - determination of redox potentials and emfs.	CO2
5.	Determination of surface tension and viscosity.	CO3
6.	Adsorption of acetic acid by charcoal.	CO3

7.	Determination of the rate constant of a reaction.	CO4							
8.	Estimation of iron by colorimetric method.	CO4							
9.	Synthesis of a polymer/drug.	CO5							
10.	0. Saponification/acid value of oil.								
LECURE:0 TUTORIAL: 0 PRACTICAL: 30 TOTAL:30									
TEXT	BOOKS								
1. Laboratory Manual "Chemistry Lab", Department of Chemistry, PMIST, Thanjavur.									
REFE	REFERENCE BOOKS								
1.	Mendham, Denney R.C,. Barnes J.D and Thomas N.J.K., "Vogel's Textbook of Quantitative	Chemical							
	Analysis", 6th Edition, Pearson Education, 2004.								
2.	Garland, C. W.; Nibler, J. W.; Shoemaker, D. P. "Experiments in Physical Chemistry", 8th Ed.;	McGraw-							
	Hill: New York, 2003.								
E-RES	OURCES- MOOC's								
1.	http://freevideolectures.com/Course/2380/Chemistry-Laboratory-Techniques								
2.	http://ocw.mit.edu/courses/chemistry/5-301-chemistry-laboratory-techniques								
3.	http://freevideolectures.com/Course/2941/Chemistry-1A-General-Chemistry-Fall-2011								

# Mapping of CO with PO

CO Vs PO	CO1	CO2	CO3	Total	Scaled to 0,1,2 and 3
PO ₁	3	2	2	7	2
PO ₂	3	2	2	7	2
PO ₃	3	2	2	7	2
PO ₄	3	2	2	7	2
PO ₅	2	1	1	4	1
PO ₆	3	2	2	7	2
PO ₇	3	2	2	7	2
PO ₈	0	1	0	1	0
PO ₉	1	1	1	3	1
<b>PO</b> ₁₀	1	1	1	3	1
PO ₁₁	1	1	0	2	1
<b>PO</b> ₁₂	0	1	0	1	0
PSO ₁	0	1	0	1	0
PSO ₂	0	1	0	1	0

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$ 

0 - No Relation, 1 - Low Relation, 2 - Medium Relation, 3 - High Relation

### SEMESTER II

COUI	RSE COI	DE	XMA201		L	Т	P	С		
COUI	RSE NAN	1E	Calculus, Ordinary Differential Equations and		3	1	0	4		
C	D	•	Complex Variable		т	Т	р	тт		
	P	A				1	P			
3	0.5	0.5			3	1	0	4		
PRER	REQUISI	<b>ГЕ : М</b>	Iathematics I (Calculus and Linear Algebra)							
On su	ccessful c	omple	tion of this course, the students will be able to:							
Cours	se outcom	es:		Dom	Domain			el		
CO1:	Find dou	Cogn	itive	A	pplvii	ng				
of an i	ntegral by	Appl	ying Greens, Gauss divergence and Stokes theorem.	8			F F - J	-0		
<b>CO2:</b>	Solve firs	Cogn	itive	A	pplyiı	ng				
which	are solva	ble for	p, y, x and Clairaut's type.					_		
CO3:	Solve Sec	Cogn	itive	A	pplyiı	ng				
variab	le coeffic									
<b>CO4</b> :	Use CR	Cogn	itive	A	pplyii	ng				
function	ons and h	armon	ic conjugate. Conformal mapping of translation and							
rotatio	on. Mobiu	s transi	formation.							
CO5:	Apply	Cauch	y residue theorem to evaluate contour integrals	Cogn	itive	Α	pplyiı	ng		
Liouvi	illes the	and Co	Taylor's series zeros of analytic functions							
singul	arities La	urent's	s series							
Suigu										
Unit 1	: Multiva	riable	Calculus (Integration)				9-	+3		
Multip	ple Integra	ation: I	Double integrals (Cartesian) - change of order of integ	gration	in do	uble	integr	als -		
Chang	ge of varia	bles (	Cartesian to polar) - Triple integrals (Cartesian), Scala	r line i	ntegr	als - v	vector	line		
integra	als - scala	r surfa	ce integrals - vector surface integrals - Theorems of Gr	een, Ga	auss a	nd St	okes.			
Unit 2	2: First or	der or	dinary differential equations				9-	⊦3		
Exact	- linear a	nd Be	rnoulli's equations - Euler's equations - Equations no	ot of fi	rst de	gree:	equa	tions		
solvab	ole for p -	equation	ons solvable for y- equations solvable for x and Clairau	t's typ	е.					
Unit 3: Ordinary differential equations of higher orders								+3		
Second order linear differential equations with variable coefficients- method of variation of parameters										
Cauchy-Euler equation- Power series solutions- Legendre polynomials- Bessel functions of the first kind										
and their properties.										
Unit 4	Unit 4: Complex Variable – Differentiation9+3									
Differ	entiation-	Cauch	y-Riemann equations- analytic functions-harmonic	functio	ns-fir	ding	harm	ionic		
conjug	conjugate- elementary analytic functions (exponential, trigonometric, logarithm) and their properties-									
Confo	rmal map	pings-	Mobius transformations and their properties.							

U	nit 5: Complex	x Variable – Integration	9+3								
C	contour integrals	s - Cauchy-Goursat theorem (without proof) - Cauchy Integral f	formula (without proof)-								
L	iouville's theore	em (without proof)- Taylor's series- zeros of analytic functions-	- singularities- Laurent's								
S	eries – Residues	s- Cauchy Residue theorem (without proof)- Evaluation of de	finite integral involving								
S	ine and cosine- h	Evaluation of certain improper integrals using the Bromwich co	ntour.								
LECTURE TUTORIAL TOTAL											
	45	15	60								
T	'ext Book:										
1	. B.S. Grewal, "	Higher Engineering Mathematics", Khanna Publishers, 40thth E	dition, 2008.								
R	eference Books	S:									
1	.G.B. Thomas an	nd R.L. Finney, "Calculus and Analytic geometry", 9 th Edition,	Pearson,								
R	eprint, 2002.										
2	. Erwin kreyszig	g, "Advanced Engineering Mathematics", 9th Edition, John Wile	y &Sons, 2006.								
3	.W. E. Boyce an	nd R. C. DiPrima, "Elementary Differential Equations and Boun	dary Value								
	Problems", 9 th I	Edn. Wiley India, 2009.									
4	. S. L. Ross, "Di	ifferential Equations", 3 rd Ed., Wiley India, 1984.									
5	. E. A. Coddingt	ton, "An Introduction to Ordinary Differential Equations", Pren	tice Hall India,								
	1995.										
6	6. E. L. Ince, "Ordinary Differential Equations", Dover Publications, 1958.										
7	. J. W. Brown an	nd R. V. Churchill, "Complex Variables and Applications", 7th I	Ed., McGraw								
	Hill, 2004.										
0	ND Doll and N	Manish Caval "A taxt healt of Engineering Mathematics" Law									

8. N.P. Bali and Manish Goyal, "A text book of Engineering Mathematics", Laxmi Publications, Reprint, 2008.

	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
CO 1	3	2	0	0	2	0	0	0	0	1	0	2
CO 2	3	1	0	0	0	0	0	0	0	1	0	1
CO 3	3	1	0	0	0	0	0	0	0	1	0	1
<b>CO 4</b>	3	2	0	0	0	0	0	0	0	1	0	1
CO 5	3	2	0	0	1	0	0	0	0	1	0	2
Total	15	8	0	0	3	0	0	0	0	5	0	7
Scaled Value	3	2	0	0	1	0	0	0	0	1	0	2

# Mapping of Cos with POs:

 $1-5 \rightarrow 1, \qquad 6-10 \rightarrow 2, \qquad 11-15 \rightarrow 3$ 

0-No Relation, 1 - Low Relation, 2- Medium Relation, 3- High Relation

COURSE C	CODE	XBE202		L	Т	P	С						
COURSE N	AME	ELECTRICAL AND ELECTRONICS ENG	SINEERING	3	1	0	4						
		SYSTEMS			-	-							
PREREQU	ISITES	Physics			T	P	H						
C: P: A		3:0:0		3	I	0	4						
Course Out			Domoin		Lor	<u>_</u> ]							
Course Out	Comes Dofing and	<b>Delate</b> the fundamentals of electrical	Domain	I	Lev	ei							
COI	parameters	and build and explain AC DC circuits by	Cognitive	U	nuers	stanu							
:	Using meas	uring devices											
CO2	Define an	d Explain the operation of DC and AC	Cognitive	I	nders	tand							
02	machines.	U	nuere	land	•								
CO3	Recall and	<b>Illustrate</b> various semiconductor devices and	Cognitive	U	nders	tand							
	their appl	ications and displays the input output		5									
,	characterist	ics of basic semiconductor devices.											
CO4	<b>Relate</b> and	Explain the number systems and logic gates.	Cognitive	U	nders	tand							
	Construct t	he different digital circuit.	_										
CO5	Label and	Outline the different types of microprocessors	Cognitive	U	nders	tand							
	and their ap	plications.											
UNIT-I: FUNDAMENTALS OF DC AND AC CIRCUITS, MEASUREMENTS9+3													
Transformat	ion - Funda	mentals of AC – Average Value, RMS Value, ntation of sinusoidal quantities - Simple Serie	Form Factor - A	C powe	s – Sta er and lel C	ar/De l Pov 'ircu	wer						
Operating Pr	rinciples of	Moving coil and Moving Iron Instruments (Am	meter. Voltmeter)	and D	vnan	nome	eter						
type meters	(Watt meter	and Energy meter).			<i>J</i>								
UNIT -II: E	LECTRIC	AL MACHINES				9 +	3						
Construction	. Principle	of Operation, Basic Equations, Types and Appli	cation of DC Ger	erators	. DC	mot	ors						
- Basics of	Single-Phas	se Induction Motor and Three Phase Induction	n Motor- Constru	iction.	Princ	ciple	of						
Operation of	f Single-Pha	se Transformer, Three phase transformers, Auto	transformer.	· · · · ·		•							
UNIT-III: S	SEMICON	DUCTOR DEVICES				9+	3						
Classificatio	n of Semico	onductors, Construction, Operation and Charact	eristics: PN Junc	tion Di	ode -	- Zei	ner						
Diode, PNP,	NPN Trans	sistors, Field Effect Transistors and Silicon Cont	rolled Rectifier -	Applic	ation	s.							
UNIT- IV: J	DIGITAL I	ELECTRONICS				9+	3						
Basic of Co	ncepts of N	Jumber Systems, Logic Gates, Boolean Algebr	a, Adders, Subtra	actors,	multi	iplex	er,						
demultiplexe	er, encoder,	decoder, Flipflops, Up/Down counters, Shift Re	gisters.										
UNIT- V: N	<b>IICROPR</b>	DCESSORS				9+3	3						
Architecture	, 8085, pin	diagram of 8085, ALU timing and control u	nit, registers, dat	a and	addre	ss b	us,						
timing and o	control sign	als, Instruction types, classification of instruction	ions, addressing r	nodes,	Inte	rfaci	ing						
Basics: Data	transfer con	Basics: Data transfer concepts – Simple Programming concepts.											
		LECTUR	E <u>TUT</u> OR	IAL	T	DTA	L						

#### **TEXT BOOKS**

- 1. Metha V.K, Rohit Mehta, 2020. Principles of Electronics, 12th ed, S Chand Publishing.
- 2. Albert Malvino, David J.Bates., 2017. Electronics Principles. 7th ed, Tata McGraw-Hill. New Delhi.
- 3. Rajakamal, 2014. Digital System-Principle & Design. 2nd ed. Pearson education.
- 4. Morris Mano, 2015. Digital Design. Prentice Hall of India.
- 5. Ramesh, S. Gaonkar, 2013, Microprocessor Architecture, Programming and its Applications with the 8085, 6th ed , India: Penram International Publications.

#### **REFERENCE BOOKS**

1. Corton, H.,2004 Electrical Technology. CBS Publishers & Distributors.

- 2. Syed, A. Nasar, 1998, Electrical Circuits. Schaum Series.
- 3. Jacob Millman and Christos, C. Halkias, 1967, Electronics Devices, New Delhi: McGraw-Hill.

4. Millman, J. and Halkias, C. C., 1972. Integrated Electronics: Analog and Digital Circuits and Systems, Tokyo: McGraw-Hill, Kogakusha Ltd.

5. Mohammed Rafiquzzaman, 1999. Microprocessors - Theory and Applications: Intel and Motorola. Prentice Hall International.

#### **E-REFERENCES**

1. NTPEL, Basic Electrical Technology (Web Course), Prof. N. K. De, Prof. T. K. Bhattacharya and Prof. G.D. Roy, IIT Kharagpur.

2.Prof.L.Umanand, http://freevideolectures.com/Course/2335/Basic-Electrical-Technology#, IISc Bangalore. 3. http://nptel.ac.in/Onlinecourses/Nagendra/, Dr. Nagendra Krishnapura, IIT Madras.

4.Dr.L.Umanand, http://www.nptelvideos.in/2012/11/basic-electrical-technology.html, IISC Bangalore.

#### Mapping of COs with POs

	<b>PO1</b>	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	PO10	PO11	PO12
CO 1	3	3	1	1	1	1	0	0	1	1	1	0
CO 2	3	3	1	1	1	1	0	0	1	1	1	0
CO 3	2	2	2	1	2	2	1	1	1	1	1	0
CO 4	2	2	1	1	1	1	1	1	1	1	1	0
CO 5	2	2	1	1	1	1	1	1	1	1	1	0
Total	12	12	6	5	6	6	3	3	5	5	5	0
Scaled	3	3	2	1	2	2	1	1	1	1	1	0

COURSE CO	DE	XAP203	T.	Т	P	•	С			
COURSE NA	ME	APPLIED PHYSICS FOR ENGINEERS	3	1	- 0	)	4			
C:P:A		2.8:0.8:0.4	L	Ť	P	•	H			
PREREOUIS	SITE:	Basic Physics in HSC level	3	1	0	)	4			
COURSEOI	TCOM			L Doma	in	T	Level			
	ontify the	a basics of machanics, <b>avalain</b> the principles of electicity	Cog	nitivo			Level			
	d deter	<b>mine</b> its significance in engineering systems and	Lindersta							
tec	chnologic	al advances					derstand			
CO2 III	ustrate	the laws of electrostatics, magneto-statics and	~			1				
ele	ectromagi	netic induction; use and locate basic applications of	Cog	nitive		An	alyze			
ele	ectromagi	netic induction to technology.								
CO3 Ur	nderstan	<b>d</b> the fundamental phenomena in optics by measurement	Cog	nitive						
an	d <b>descri</b> ł	<b>be</b> the working principle and application of various lasers				Ap	ply			
an	d fibre op	otics.								
CO4 Ar	nalyse en	ergy bands in solids, discuss and use physics principles	Cog	nitive		An	alyze			
of	latest tec	hnology using semiconductor devices.								
CO5 De	evelop k	knowledge on particle duality and solveSchrodinger	Cog	nitive		An	oply			
eq	uation for	r simple potential.	005			<b>^ •</b> P	r-J			
UNIT - I MI	ECHAN	ICS OF SOLIDS	1			9	+3			
Mechanics: I	Force - N	wewton's laws of motion - work and energy - impulse an	nd mo	oment	um - t	orqu	e - law of			
conservation of	of energy	and momentum - Friction.	c	1	1	1	м.			
Elasticity: St	ress - St	fain - Hooke's law - Stress strain diagram - Classification	n or andin	elastic	c modu	uus ·	· Moment,			
determination	of Voun	orsion pendulum - Applications of torsion pendulum - B g/s modulus: Uniform banding and non-uniform banding	enam	gori	beams	- EX	perimental			
		S modulus. Onnorm bending and non-uniform bending.				Q	113			
Laws of elect	rostatics	- Electrostatic field and potential of a dipole: Dielectric	Polar	isatio	Diel	ectric	$r_{\rm COnstant}$			
internal field	- Clausi	us Mossotti Equation - Laws of magnetism - Amper	e's E	araday	's law	· I e	nz's law -			
Maxwell's equ	uation - 1	Plane electromagnetic wayes: their transverse nature - exi	ressi	on for	plane	, Lei	ularly and			
elliptically po	plarized 1	ight - quarter and half wave plates - production and de	etectio	on of	plane.	circ	ularly and			
elliptically pol	larized li	ght.			<b>r</b> ,					
UNIT –III (	<b>OPTICS</b> ,	LASERS AND FIBRE OPTICS				9	'+3			
<b>Ontics:</b> Dispe	ersion_ O	ntical instrument: Spectrometer - Determination of refracti	ve ind	lev an	d disne	reiva	e nower of			
o priem Interf	formon of	flight in this films, six wedge Diffraction, grating	ve me		u uisp	.15170	power or			
a prisii- interi		Presentation in the second sec	1	00	1	<b>A</b>				
LASER: Intro		- Population inversion -Pumping - Laser action - Nd- YAG	laser	- CO ₂	2 laser	– Ap	plications.			
Fibre Optics:	Principl	e and propagation of light in optical fibre - Numerical apert	ure a	nd acc	eptanc	e ang	gle - Types			
of optical fibro	e - Fibre	optic communication system (Block diagram).								
						<u> </u>				
UNIT –IV S	SEMICO	NDUCTOR PHYSICS				9	'+3			
Semiconduct	ors: Ene	rgy bands in solids - Energy band diagram of go	od c	conduc	ctors,	insul	ators and			
semiconducto	rs - Con	cept of Fermi level - Intrinsic semiconductors - Concep	pt of	holes	- dop	ing -	• Extrinsic			
semiconductor	rs - P typ	e and N type semiconductors - Hall effect.								
Diodes and 7	Fransisto	<b>rs</b> : P-N junction diode - Forward bias and reverse bias	- Rec	tificat	ion ac	tion	of diode -			
Working of	full way	e rectifier using P N junction diodes - PNP and NF	N tr	ansiste	ors -	Three	e different			
configurations	s - Adva	ntages of common emitter configuration - working of N	PN ti	ansist	or as a	an ar	nplifier in			
common emit	ter config	guration.					1			
UNIT –V Q	UANTU	M PHYSICS				9	+3			
Introduction t	o quantu	m physics, black body radiation, Compton effect, de Bro	oglie 1	hypotł	nesis, v	vave	- particle			
duality, uncer	tainty pr	inciple, Schrodinger wave equation (Time dependent and	Time	indep	benden	t), pa	urticle in a			
hox Extension	n to three	dimension - Degeneracy.								

# **TEXT BOOKS**

1. Gaur R. K. and Gupta S. L., "Engineering Physics", Dhanpat Rai Publications, 2009.

2. Avadhanulu M. N. "Engineering Physics" (Volume I and II), S. Chand & Company Ltd., New Delhi, 2010. **REFERENCE BOOKS** 

- 1. Palanisamy P. K., "Engineering Physics", Scitech Publications (India) Pvt. Ltd, Chennai.
- 2. Arumugam M., "Engineering Physics" (Volume I and II), Anuradha Publishers, 2010.

3. Senthil Kumar G., "Engineering Physics", 2nd Enlarged Revised Edition, VRB Publishers, Chennai, 2011.

4. Mani P., "Engineering Physics", Dhanam Publications, Chennai, 2007.

# **E RESOURCES**

NPTEL, Engineering Physics, Prof. M. K. Srivastava, Department of Physics, IIT, Roorkee.

LECTURE	TUTORIAL	PRACTICAL	TOTAL HOURS
45	15	-	60

## Mapping of CO's with PO's:

	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	0	0	0	1	0	0	1
CO2	3	0	1	0	1	0	0	0	0	0	0	1
CO3	3	2	2	2	1	0	0	0	1	0	0	1
CO4	3	2	2	2	1	0	0	0	1	0	0	1
CO5	3	0	2	0	0	0	0	0	0	0	0	1
Total	15	6	9	6	4	0	0	0	3	0	0	5
Scaled value	3	2	2	2	1	0	0	0	1	0	0	1

COUR	RSE CODE	XGS204		L	Т	Р	SS	С				
COUF	RSE NAME	TECHNICAL COMMUNICATION		2	0	0	0	2				
PRE-I	REQUISITES			L	Т	Р	SS	Н				
<b>C: P:</b>	A	3:0:0		2	0	0	0	2				
COUF	RSE OUTCOM	ES:	Do	omai	in		Leve	Level				
CO1	Ability to und	erstand the basic principles	Co	gniti	ve	R	emem	ber				
CO2	Apply the tech	Co	gniti	ve		Apply	у					
CO3	<b>Identify</b> comm	unicative styles	Co	gniti	ve	R	emem	ber				
CO4	Construct the	nature of writing	Co	gniti	ve		Creat	e				
UNIT	I – Basic Princ	iples						8				
1.1 – E	Basic Principles	of Technical Writing										
1.2 - S	Styles used in Te	chnical Writing										
1.3 – L	Language and To	one										
UNIT	II – Technique	S						8				
2.1 - S	special Techniqu	les used in writing										
2.2 - I	Definition & Des	cription of mechanism										
2.3 - I	Description- Clas	ssification-Interpretation										
UNIT	III – Commun	cation						8				
3.1 - N	Aodern develop	nent in style of writing										
3.2 - 1	New letter writin	g formats										
UNIT	IV – Report W	riting						6				
4.1 – Types of Report writing												
4.2 - P	4.2 – Project writing formats											
Sugge	Suggested Readings:											
(v)	John Sealy, W	riting and Speaking Author; Oxford University F	Press,	New	Dell	ni, 201	9.					

(v) John Sealy, Writing and Speaking Author; Oxford University Press, New Delhi, 2
 (vi) Williams K.S, Communicating Business. Engage Learning India Pvt Ltd, 2012.

	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
CO1	3	0	0	0	2	0	0	1	1	3	0	3
CO2	2	0	0	0	1	0	0	1	2	3	0	3
CO3	2	0	0	0	2	0	0	1	3	3	0	3
CO4	3	0	0	0	2	0	0	1	3	3	0	3
Total	10	0	0	0	7	0	0	4	9	12	2	12
Scale	3	0	0	0	2	0	0	1	2	3	1	3

# Mapping of COs with POs:

1-5 = 1, 6-10 = 2, 11-15 = 3

0-No Relation, 1- Low Relation, 2 – Medium Relation, 3- High Relation

COURSE CODE XCS205		L	Т	Р	С								
COURSE NAME BASICS OF ELECTRONIC DEV	ICES AND	3	0	0	3								
			U T	D									
PREREQUISITES PHYSICS AND MATHEMATICS		L	Т	Р	Н								
C P A		3	0	0	3								
3     0     0       LEADNING OD LECTIVES			-	-	-								
• To introduce the operation of different types of semicondu	ctor devices.												
<ul> <li>To familiarize the integrated circuits technology.</li> </ul>													
To provide knowledge on the characteristics of up to electronic devices													
COURSE OUTCOMES:     Domain     Level       COURSE OUTCOMES:     Course     Course     Course													
<b>CO1 Define</b> the principles of semiconductor physics.		Cognitiv	e I	Remen	nber								
CO2Describe the operation and characteristics of semiconductor diodes.CognitiveUn													
CO3Understand the operation and Characteristics of BJT and FETCognitiveUnderstand													
CO4     Discuss the operation and characteristics of power electronic and     Cognitive     Understand													
optoelectronic diodes         CO5         Illustrate the Integrated Circuit fabrication processes         Cognitive         Understand													
UNIT - I Introduction To Semiconductor TechnologyCognitiveUnderstand9													
Review of Quantum Mechanics. Electrons in periodic Lattic	es. E- k diagrams. F	nergy ba	nds in	intrins	ic and								
extrinsic silicon; Carrier transport: diffusion current, drift c	urrent, mobility and	resistivit	y; she	et resis	stance,								
design of resistors.					1								
UNIT - II Junction Diodes And Applications					9								
Generation and recombination of carriers; Poisson and cont	inuity equation P-N	junction	charac	teristic	s, I-V								
characteristics, and small signal switching models; Avalanch	ie breakdown, Zener	diode, H	alf wa	ve Ree	ctifier,								
UNIT - III Transistors And Applications	•				9								
Bipolar Junction Transistor, I-V characteristics, NPN and	d PNP Transistors	, Ebers-N	Ioll N	Iodel,	MOS								
capacitor, C-V characteristics, Junction Field Trans	sistor, VI Chara	acteristic	es, N	10SFE	ET,I-V								
characteristics, and small signal models of MOS transistor.													
UNIT - IV Special Electronic Devices	· · · · · · · · · · · · · · · · · · ·	1			9								
SCR, DIAC, TRIAC, LED, LDR,LCD, Photodiode, Photo Transistor and solar cell.													
UNIT - V Introduction To Integrated Circuit Technology     9													
Integrated circuit fabrication process: oxidation, diffusion, ion implantation, photolithography, etching, chemical vapor deposition, sputtering, twin-tub CMOS process.													
LECTURE	TUTORIAL	PRACTI	CAL	TO	TAL								
$\frac{1}{45}$		0			45								

<b>TEXT BOOKS</b>
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1. Robert L. Boylestad and Louis Nashelsky, "Electronics devices and Circuit Theory" 11th Edition, UBS Publishers, New Delhi, 2013.

2. G.Streetman, and S.K.Banerjee, "Solid State ElectronicDevices," 7thedition, Pearson, 2014.

3. D.Neamen, D.Biswas"Semiconductor Physics and Devices," McGraw-Hill Education Jacob

4. Millman and Christos C.Halkias, "Electronic Devices and Circuits" 3rd Edition, Tata McGraw

Hill,New Delhi, 2010.

#### REFERENCES

- 1. C.T.Sah, "Fundamentals of solid state electronics," World Scientific publishing Co.Inc, 1991.
- S.M.SzeandK.N.Kwok, "Physics of Semiconductor Devices," 3rdedition, John Wiley &Sons, 2006.
- 3. Y.Tsividisand M.Colin, "Operation and Modeling of the MOSTransistor, "Oxford University .Press, 2011.
- 4. David A. Bell ,"Electronic devices and circuits", Prentice Hall of India, 2004.
- 5. S.Salivahanan, "Electronics devices and circuits". 2nd Edition, Tata McGraw Hill, 2008.

#### **E-REFERENCES**

- 11. https://www.digimat.in/nptel/courses/video/108101091/L01.html
- 12.<u>http://nptel.ac.in/courses/117103063/</u> (Prof. Chitralekha Mahanta, NPTEL, Basic Electronics, IIT-Guwahati)
- 13.<u>http://nptel.ac.in/video.php?subjectId=117103063</u> (Prof. Gautam Barua, NPTEL, Basic Electronics, IIT-Guwahati)
- 14. <u>http://nptel.ac.in/courses/117101106/</u> (Prof. A N chandorkar, NPTEL, Analog Electronics, IIT-Bombay)
- 15. https://www.digimat.in/nptel/courses/video/108108112/L01.html

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CO 2	1	2	0	0	0	0	0	0	0	0	0	0	0	0
CO 3	2	1	2	0	0	0	0	0	0	0	0	0	0	0
<b>CO 4</b>	1	1	2	0	0	0	0	0	0	0	0	0	0	0
CO 5	0	0	3	0	1	0	0	0	0	0	0	0	0	0
Total	5	4	7	0	1	0	0	0	0	0	0	0	0	0
Scaled value	3	3	3	0	1	0	0	0	0	0	0	0	0	0

#### Mapping of COs with POs:

0 - No Relation 1 - Low Relation , 2 - Medium Relation, 3- High Relation

#### **TEXT BOOKS**

- 1. Robert L. Boylestad and Louis Nashelsky, "Electronics devices and Circuit Theory" 11th Edition, UBS Publishers, New Delhi, 2013.
- 2. G.Streetman, and S.K.Banerjee, "Solid State ElectronicDevices," 7thedition, Pearson, 2014.
- 3. D.Neamen, D.Biswas"Semiconductor Physics and Devices," McGraw-Hill Education Jacob
- 4. Millman and Christos C.Halkias, "Electronic Devices and Circuits" 3rd Edition, Tata McGraw Hill,New Delhi, 2010.

### REFERENCES

- 1. C.T.Sah, "Fundamentals of solid state electronics," World Scientific publishing Co.Inc, 1991.
- S.M.SzeandK.N.Kwok, "Physics of Semiconductor Devices," 3rdedition, John Wiley &Sons, 2006.
- 3. Y.Tsividisand M.Colin, "Operation and Modeling of the MOS Transistor, "Oxford University .Press, 2011.
- 4. David A. Bell, "Electronic devices and circuits", Prentice Hall of India, 2004.
- 5. S.Salivahanan, "Electronics devices and circuits". 2nd Edition, Tata McGraw Hill, 2008.

#### **E-REFERENCES**

- 6. https://www.digimat.in/nptel/courses/video/108101091/L01.html
- 7. <u>http://nptel.ac.in/courses/117103063/</u> (Prof. Chitralekha Mahanta, NPTEL, Basic Electronics, IIT-Guwahati)
- 8. <u>http://nptel.ac.in/video.php?subjectId=117103063</u> (Prof. Gautam Barua, NPTEL, Basic Electronics, IIT-Guwahati)
- <u>http://nptel.ac.in/courses/117101106/</u> (Prof. A N chandorkar, NPTEL, Analog Electronics, IIT-Bombay)
- 10. https://www.digimat.in/nptel/courses/video/108108112/L01.html

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	0	0	0	0	0	0	0	0	0	0	0
CO 2	1	2	0	0	0	0	0	0	0	0	0	0
CO 3	2	1	2	0	0	0	0	0	0	0	0	0
CO 4	1	1	2	0	0	0	0	0	0	0	0	0
CO 5	0	0	3	0	1	0	0	0	0	0	0	0
Total	5	4	7	0	1	0	0	0	0	0	0	0
Scaled value	3	3	3	0	1	0	0	0	0	0	0	0

#### Mapping of COs with POs:

0 - No Relation 1 - Low Relation , 2 - Medium Relation, 3- High Relation

Cours	se Cod	le	XEG206									
Cours	se Nan	ne	Engineering	Graphics and Design								
	L -	-T -P	Р-С	C:P:A	L	-T -P -H						
	1-	0 - 2	- 3	1.75:1:0.25	1.	-0-4-5						
Cours	se Out	come	9		Dor	nain/Level						
					С	or P or A						
CO1	Appl cons	ly t truct	he national and <b>practice</b> v	and international standards, arious curves	Cognitive (Ap Psychomotor (Guided respondence) Affective (Responding)	pply) onse) to a Phenomena)						
CO2	<b>Inter</b> proje	rpret ection	, construct as of points, stra	Cognitive (Un Psychomotor Affective (Re Phenomena)	nderstand) (Mechanism) sponding to a							
CO3       Construct Sketch and Practice projection of solids in various positions and true shape of sectioned solids.       Cognitive (Apply)         Psychomotor       (Complex overt response)         Affective (Responding to a Phenomena)												
CO4	Intera latera inters	r <b>pret</b> al su sectio	, Sketch and urfaces of s on of solids.	<b>Practice</b> the development of imple and truncated solids,	Cognitive (Understand) Psychomotor (Complex overt response) Affective (Responding to a Phenomena)							
CO5	Cons persp	struc pectiv	t sketch as ve views of sim	<b>nd practice</b> isometric and ple and truncated solids.	Cognitive (Apply) Psychomotor (Complex overt response) Affective (Pasponding to a Phanomona)							
Objec	ctives:				(Itesponong							
*	to pr with and	repare in rea safety	e the student to alistic constrain y, manufactura	b design a system, component, or p nts such as economic, environment bility, and sustainability	process to meet ntal, social, poli	desired needs tical, ethical, health						
*	to pi for e	repare	e the student to e the student to eering practice	o use the techniques, skills, and mo	odern engineer	ing tools necessary						
COU	RSE C	CONT	TENT									
UNIT	LI I	INTF OBJI	RODUCTION ECTS AND C	, FREE HAND SKETCHING CONSTRUCTION OF PLANE (	OF ENGG CURVE	12+6 hrs						
	Importance of graphics in engineering applications – use of drafting instruments – BIS specifications and conventions as per SP 46-2003. Pictorial representation of engineering objects – representation of three dimensional objects in two dimensional media – need for multiple views – developing visualization skills through free hand sketching of three dimensional objects. Polygons & curves used in engineering practice – methods of construction – construction of ellipse, parabola and hyperbola by eccentricity method – cycloidal and involute curves – construction – drawing of tangents to the above curves. Practice on basic tools											

	of CAD	
UNIT II	PROJECTION OF POINTS, LINES AND PLANE SURFACES	12+6 hrs
	General principles of orthographic projection – first angle projection – projections of points, straight lines located in the first quadrant – determ lengths of lines and their inclinations to the planes of projection – trace polygonal surfaces and circular lamina inclined to both the planes of propractice on points and lines	layout of views – nination of true s – projection of ojection-CAD
UNIT III	PROJECTION OF SOLIDS AND SECTIONS OF SOLIDS	12+6 hrs
	Projection of simple solids like prism, pyramid, cylinder and cone inclined to one plane of projection – change of position & auxiliary pro- sectioning of above solids in simple vertical positions by cutting plane reference plane and perpendicular to the other and above solids in incli- cutting planes parallel to one reference plane – true shapes of sections solid models	when the axis is ojection methods – ne inclined to one ined position with s-CAD practice on
UNIT IV	DEVELOPMENT OF SURFACES AND INTERSECTION OF SOLIDS	12+6 hrs
	Need for development of surfaces – development of lateral surface truncated solids – prisms, pyramids, cylinders and cones – devel surfaces of the above solids with square and circular cutouts perpendic intersection of solids and curves of intersection –prism with cyli- cylinder, cone & cylinder with normal intersection of axes and wi practice on intersection of solids.	tes of simple and opment of lateral ular to their axes – inder, cylinder & th no offset-CAD
UNIT V	ISOMETRIC AND PERSPECTIVE PROJECTIONS	12+6 hrs
L = 30 hrs	Principles of isometric projection – isometric scale – isometric pro- solids, truncated prisms, pyramids, cylinders and cones – princip- projections – projection of prisms, pyramids and cylinders by visual point methods-CAD practice on isometric view T = 0 hrs P=60 hrs Total = 90 hrs	jections of simple les of perspective ray and vanishing
TEXT BO	OKS	
4. Bh	hatt, N.D, "Engineering Drawing", Charotar Publishing House, 46 th Edition	on-2003.
5. Na 20	atarajan,K.V, "A Textbook of Engineering Graphics", Dhanalakshmi Pu 06	ıblishers, Chennai,
6. Dr	. P.K. Srividhya, P. Pandiyaraj, "Engineering Graphics", PMU Publicati	ons, Vallam, 2013
REFERE	NCES	
9. Lu	zadder and Duff, "Fundamentals of Engineering Drawing" Prentice Ha	ll of India PvtLtd,
10. Ve 20	Edition - 2001. enugopal,K. and Prabhu Raja, V., "Engineering Graphics", New Age Int 08.	ernational(P) Ltd.,
11. Go 12. Sh	opalakrishnan.K.R,. "Engineering Drawing I & II", Subhas Publications, ah,M.B and Rana,B.C.,"Engineering Drawing", Pearson Education.2005	1998. 5.
E-REFER	ENCES	
5. <u>htt</u>	p://periyarnet/Econtent	

Γ	6.	nttp://np	otel.ac.i	n/cours	es/112	103019	/							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	3	3	2	3	2	3	1	1	2	3	3	3	
CO2	3	3	3	1	3	1	3	1	1	1	2	3	3	
CO3	3	3	3	1	3	1	3	1	1	1	2	3	3	
CO4	3	3	3	1	3	1	3	1	1	1	2	3	3	
CO5	3	3	3	1	3	1	3	1	1	1	2	3	3	
Tota	<b>I</b> 15	15	15	6	15	6	15	5	5	6	11	15	15	

COURSE CODE	XBE207	L	Т	Р	С
COURSE NAME	ELECTRICAL AND ELECTRONICS ENGINEERING SYSTEMS LABORATORY	0	0	1	1
PREREQUISITE	Physics	L	Т	Р	Н
<b>C</b> : <b>P</b> : <b>A</b>	0.3:0.3:0.3	0	0	2	2

# **COURSE OBJECTIVES:**

The course helps to

- i. Learn the basic concepts of electrical and electronics components.
- j. Understand the basic wiring methods and connection.
- k. Study the characteristics of diodes, Zener diodes, NPN transistors.
- 1. Verify the working of simple logic gates, adders and subtractors.

Course C	outcomes:	Domain	Level
CO1	<b>Apply</b> the fundamental electrical concepts and <b>differentiate</b> the various electronic components.	Cognitive	Understand
CO2	<b>Implement</b> and <b>execute</b> the different types of wiring connections.	Cognitive	Apply
CO3	<b>Demonstrate</b> the Fluorescent lamp connection with choke.	Cognitive	Understand
CO4	<b>Characterize</b> and <b>display</b> the basic knowledge on the working of PN junction and Zener diode.	Cognitive	Understand
CO5	<b>Implement</b> and <b>execute</b> the various digital electronic circuits such as Adders and Subtractors.	Cognitive	Apply

#### List of Experiments:

- 21. Study of Electrical Symbols, Tools and Safety Precautions, Power Supplies.
- 22. Study of Active and Passive elements Resistors, Inductors and Capacitors, Bread Board.
- 23. Testing of DC Voltage and Current in series and parallel resistors which are connected in breadboard by using Voltmeter, Ammeter and Multimeter.
- 24. Fluorescent lamp connection with choke.
- 25. Staircase Wiring
- 26. Forward and Reverse bias characteristics of PN junction diode.
- 27. Forward and Reverse bias characteristics of zener diode.
- 28. Input and Output Characteristics of NPN transistor.
- 29. Construction and verification of simple logic gates.
- 30. Construction and verification of adders and subtractors.

PRACTICAL	TOTAL
30	30

#### Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	1	1	1	1	0	0	1	1	1	0
CO 2	3	3	1	1	1	1	0	0	1	1	1	0
CO 3	2	2	2	1	2	2	1	1	1	1	1	0
<b>CO 4</b>	2	2	1	1	1	1	1	1	1	1	1	0
CO 5	2	2	1	1	1	1	1	1	1	1	1	0
Total	12	12	6	5	6	6	3	3	5	5	5	0
Scaled Value	3	3	2	1	2	2	1	1	1	1	1	0

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$ 

0 - No Relation, 1 - Low Relation, 2 - Medium Relation, 3 - High Relation

COURSE	CODE	XAP208					
COURSE	NAME	APPLIED PHYSICS FOR ENGINEERS	0	0	1	1	
		LABORATORY					
C:P:A		0:2:0	L	Т	P	H	
PREREQ	UISITE:	Basic Physics in HSC level	0	0	2	2	
COURSE	OUTCOM	Dom	ain	Level			
CO1	Determine	the significance of elasticity in engineering systems and	Cognitiv	/e	Understand		
	technologic	al advances.	Psychon	notor	Mechanism		
CO2	use and lo	cate basic applications of electromagnetic induction to	Cognitiv	/e	Understand		
	technology		Psychon	notor	Mechanism		
CO3	Describe the	ne working principle and application of various lasers and	s and Cognitive Understa				
	fibre optics	Psychon	notor	Mechanism			
CO4	use physic	s principles of latest technology using semiconductor	Cognitiv	/e	Understand		
	devices.		Psychomotor Mechanism			nism	

			LABORATO	<u>RY</u>						
1.	Torsional P wire.	endulum - determinatior	n of moment of inertia	and rigidity modulus	of the given material of the					
2.	Uniform Bending - Determination of the Young's Modulus of the material of the beam.									
3.	Non-Unifor	m Bending - Determina	tion of the Young's Mo	odulus of the materia	l of the beam.					
4.	Meter Bridge - Determination of specific resistance of the material of the wire.									
5.	Spectrometer - Determination of dispersive power of the give prism.									
6.	Spectrometer - Determination of wavelength of various colours in Hg source using grating.									
7.	Air wedge - Determination of thickness of a given thin wire.									
8.	Laser - Dete grating.	ermination of wavelengt	h of given laser source	and size of the given	n micro particle using Laser					
9.	Post office	Box - Determination of	band gap of a given se	miconductor.						
10.	PN Junction	n Diode - Determination	of V-I characteristics	of the given diode.						
REF	FERENCE B	OOKS								
2	7. Samir Ku 8. Arora C.I 9. Umayal S	mar Ghosh, "A text boo , "Practical Physics", S Sundari AR., "Applied P	k of Advanced Practic . Chand & Company I hysics Laboratory Mar	al Physics", New Cer Ltd., New Delhi, 2012 nual", PMU Press, Th	ntral Agency (P) Ltd, 2008. 3. nanjavur, 2012.					
		LECTURE	TUTORIAL	PRACTICAL	TOTAL HOURS					
		0	0	30	30					

# Mapping of CO's with POs

	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	0	0	0	1	0	0	1
CO2	3	0	1	0	1	0	0	0	0	0	0	1
CO3	3	2	2	2	1	0	0	0	1	0	0	1
<b>CO4</b>	3	2	2	2	1	0	0	0	1	0	0	1
Total	12	6	7	6	4	0	0	0	3	0	0	5
Scaled value	3	2	2	2	1	0	0	0	1	0	0	1