

SEMESTER I

S.No.	CATEGORY	SUB. CODE	SUBJECT	TOTAL L CONT	L	T	P	C
THEORY								
1.	MC	P18MCMA101	Algebra-I	5	3	1	0	4
2.	MC	P18MCMA102	Real Analysis I	5	3	1	0	4
3.	MC	P18MCMA103	Ordinary Differential Equations	5	3	1	0	4
4.	MC	P18MCMA104	Graph Theory	5	3	1	0	4
5	ME	P18MEMA012	Major Elective 1 Discrete Mathematics	4	3	1	0	4

SEMESTER II

S.No.	CATEGORY	SUB. CODE	SUBJECT	TOTAL L CONT	L	T	P	C
THEORY								
1.	MC	P18MCMA201	Algebra – II	5	3	1	0	4
2.	MC	P18MCMA202	Real Analysis – II	4	3	1	0	4
3.	MC	P18MCMA203	Partial Differential Equations	5	3	1	0	4
4.	MC	P18MCMA204	Probability Theory	4	3	1	0	4
5	ME	P18MEMA021	Major Elective 2 Numerical Methods	4	3	1	0	4
6	PR	P18PRMA2S1	Technical Seminar	0	0	0	2	1
7	PR	P18PRMA2V1	Internship Programme	0	0	0	0	1

SEMESTER III

S.No.	CATEGORY	SUB. CODE	SUBJECT	TOTAL L CONT	L	T	P	C
THEORY								
1.	MC	P18MCMA301	Complex Analysis – I	5	3	1	0	4
2.	MC	P18MCMA302	Operations Research	4	3	1	0	4
3.	MC	P18MCMA303	Mechanics	5	3	1	0	4
4.	MC	P18MCMA304	Tensor Analysis And Relativity	4	3	1	0	4
5	ME	P18MEMA031	Major Elective III Stochastic Processes	4	3	1	0	4
6	EEC	P18ACEN004	Audit Course- Value Education	2	2	0	0	0

SEMESTER IV

S.No.	CATEGORY	SUB. CODE	SUBJECT	TOTAL L CONT	L	T	P	C
THEORY								
1.	MC	P18MCMA401	Complex Analysis- II	5	3	1	0	4
2.	MC	P18MCMA402	Differential Geometry	4	3	1	0	4
3.	MC	P18MCMA403	Functional Analysis	5	3	1	0	4
4.	MC	P18MCMA404	Number Theory And Cryptography	4	3	1	0	4
5	EEC		Open Elective	2	2	0	0	2(3)
6		P18PRMA4T1	Term Paper	1	0	0	0	1
7	HS	P18MCO001	Stress Management by yoga	0	0	0	0	0
8	PR	P18PRMA4P1	Project	9	0	0		9

MAJOR ELECTIVES: I

Sub Code	Sub Name	No. of periods per week			C
		L	T	P	
P18MEMA011	Formal Language And Automata theory	3	1	0	4
P18MEMA012	Discrete Mathematics	3	1	0	4
P18MEMA013	Mathematical Economics	3	1	0	4

MAJOR ELECTIVES: II

Sub Code	Sub Name	No. of periods per week			C
		L	T	P	
P18MEMA021	Numerical Methods	3	1	0	4
P18MEMA022	Mathematical programming	3	1	0	4
P18MEMA023	Fuzzy Sets and Application	3	1	0	4

MAJOR ELECTIVES: III

Sub Code	Sub Name	No. of periods per week			C
		L	T	P	
P18MEMA031	Stochastic Processes	3	1	0	4
P18MEMA032	Data Structures And Algorithms	3	1	0	4
P18MEMA033	Algebraic theory of Numbers	3	1	0	4

LIST OF OPEN ELECTIVE

S.No.	Sub.Code	Subject	Total No.Hours	L	T	P	C
1.	P18OEBA001	Advertising and Sales Management	2	2	0	0	2
2.	P18OEBA002	BPO Management	2	2	0	0	2
3.	P18OEBA003	Call Centre Management – Voice & Non Voice	2	2	0	0	2
4.	P18OEBA004	Customer Relationship Management	2	2	0	0	2
5.	P18OEBA005	Entrepreneurship Development	2	2	0	0	2
6.	P18OEBA006	Advanced Human Resource Management	2	2	0	0	2
7.	P18OEBA007	Logistics & Supply Chain Management	2	2	0	0	2
8.	P18OEBA008	Office Management	2	2	0	0	2
9.	P18OEVC001	Photography & Videography	2	2	0	0	2
10.	P18OEEN001	Soft Skills	2	2	0	0	2
11.	P18OEEN002	Mass Media and Communication	2	2	0	0	2
12.	P18OESC001	Computer Applications	2	2	0	0	2
13.	P18OESC002	Multimedia	2	2	0	0	2
14.	P18OESC003	Advanced Excel	2	2	0	0	2
15.	P18OESC004	Web Designing	2	2	0	0	2
16.	P18OESC005	Photoshop	2	2	0	0	2
17.	P18OESC006	Flash	2	2	0	0	2
18.	P18OESC007	Computer Hardware and Networking	2	2	0	0	2
19.	P18OESC008	Computer Programming	2	2	0	0	2
20.	P18OESC009	Office Automation Tools	2	2	0	0	2
21.	P18OEMI001	Clinical Microbiology	2	2	0	0	2
22.	P18OEMI002	Herbal Medicine	2	2	0	0	2
23.	P18OEPH001	Electrical Technician	2	2	0	0	2

LIST OF AUDIT COURSE

1	P18ACEN001	English for Research Paper Writing	2	2	0	0	0
2	P18ACCE002	Disaster Management	2	2	0	0	0
3	P18ACEN003	Sanskrit for Technical Knowledge	2	2	0	0	0
4	P18ACBA004	Value Education	2	2	0	0	0
5	P18ACW005	Constitution of India	2	2	0	0	0
6	P18ACBA006	Pedagogy Studies	2	2	0	0	0
7	P18ACBA007	Personality Development through Life Enlightenment Skills	2	2	0	0	0

		ALGEBRA-I					L	T	P	C
P18MCMA101	Total Contact Hours – 60	3	1	0	4					
	Prerequisite course – Mathematics Studied in Under Graduate.									
	Course Coordinator Name & Department:- Mr. V. Nandakumar /Mathematics									
COURSE OBJECTIVES:-										
Learners will be familiar with basic and algorithm analysis. Learners will able to apply the problem solving techniques using theorem.										
COURSE OUTCOMES (COs)										
CO1	Gain knowledge in Group Theory									
CO2	Understand the concept of algorithmic design of Ring Theory									
CO3	Apply suitable data structure for developing a modulus									
CO4	Analyze the algorithm for its complexity and fields									
CO5	Evaluate data structures and algorithms on which file structures and transformations									
CO6	Create an real time application from algorithms.									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	3	3	3	3	1	1	3		
	CO2	3	3	1	2	2	2	3		
	CO3	3	3	3	3	1	3	1		
	CO4	3	2	2	3	3	2	3		
	CO5	2	1	2	1	3	1	3		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship(PR)
					✓					
4	Approval	Academic Council Meeting								

UNIT I

12

GROUP THEORY:

A counting principle – Normal Subgroups and Quotient groups – Homomorphism – Cayley’s theorem – Permutation groups – Another counting principle – Sylow’s theorems.

UNIT II

12

RING THEORY :

Homomorphism of rings – Ideals and quotient rings – More ideals and quotient rings – Polynomial rings – Polynomials over the rational field – polynomials over commutative rings.

**UNIT III
MODULUS:**

12

Inner Product Spaces – Orthogonal complement – Orthogonal Basis – Left Module over a Ring – Sub module – Quotient Module – Cyclic Module – Structure theorem for finitely generated Modules over Euclidean Rings.

**UNIT IV
FIELDS :**

12

Extension fields – Roots of Polynomials – More about roots – The elements of Galois theory – Finite fields.

**UNIT V
TRANSFORMATIONS:**

12

Triangular form – Hermitian, Unitary and Normal Transformations

TEXT BOOK(S)

[1] I.N. Herstein, Topics in Algebra, Second Edn, Wiley Eastern Limited.

UNIT – I -Chapter II : Sec 2.5, 2.6, 2.7, 2.10, 2.11, 2.12

UNIT – II -Chapter III : Sec 3.3, 3.4, 3.5, 3.9, 3.10, 3.11

UNIT – III - Chapter IV : Sec 4.1, 4.2, 4.3, 4.4, 4.5

UNIT – IV -Chapter V : Sec 5.1, 5.3, 5.5, 5.6 and Chapter VII: Sec 7.1

UNIT – V -Chapter VI : Sec 6.4, 6.5 and 6.10

REFERENCE BOOK(S)

[1] Surjeet Singh, Qazi Zameeruddin, Modern Algebra, Vikas Publishing House Pvt Ltd.5

[2] John, B. Fraleigh, A First Course in Abstract Algebra, Addison-Wesley Publishing company.

[3] Vijay, K. Khanna, and S.K. Bhambri, A Course in Abstract Algebra, Vikas Publishing House Pvt Limited, 1993.

CourseCoordinator

HOD

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P18MCMA102		REAL ANALYSIS I						L	T	P	C
		Total Contact Hours – 60						3	1	0	4
Prerequisite course – Mathematics Studied in Under Graduate. Studies											
Course Coordinator Name & Department:- Mrs.L.Radhika /Mathematics											
COURSE OBJECTIVES:- Learners will be familiar with basic and algorithm analysis. Learners will able to know how to prove theorem.											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in Basic Topology										
CO2	Understand the concept of continuity										
CO3	Apply suitable data for developing a real time application in Riemann – Stieltjes Integral.										
CO4	Analyze the algorithm for its Sequences and series of functions										
CO5	Evaluate algorithms on which functions of several variables										
CO6	Create an real time application from algorithms.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	2	3	3	1	3	3	3			
	CO2	3	3	1	2	2	2	2			
	CO3	2	2	3	1	3	3	3			
	CO4	3	1	2	3	2	2	2			
	CO5	2	2	3	3	1	3	3			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)	
					✓						
4	Approval	Academic Council Meeting									

UNIT I**Basic Topology:**

Finite, Countable and Uncountable Sets – Metric spaces – Compact sets – Perfect sets – Connected sets.

Numerical Sequences and Series: Sequences – Convergence – Subsequences -Cauchy Sequences – Upper and Lower Limits - Some Special Sequences – Tests of convergence – Power series – Absolute convergence – Addition and multiplication of series – Rearrangements.

UNIT II

Continuity:

Limits of functions – Continuous functions – continuity and Compactness – Continuity and connectedness – Discontinuities – Monotonic functions – Infinite limits and limits at infinity. Differentiation: Derivative of a real function – Meanvalue Theorems - Intermediate value theorem for derivatives – L'Hospital Rule – Taylor's Theorem – Differentiation of vector valued functions.

UNIT III

Riemann – Stieltjes Integral:

Definition and Existence – Properties – Integration and Differentiation – Integration of vector valued functions.

UNIT IV

Sequences and series of functions:

Uniform Convergence and Continuity – Uniform Convergence and Differentiation – Equicontinuous families of functions – The Stone – Weierstrass Theorem.

UNIT V

Functions of several variables:

Linear Transformations - Differentiation – The Contraction Principle – The Inverse Function Theorem - The Implicit Function Theorem.

TEXT BOOK(S)

[1] Walter Rudin, Principles of Mathematical Analysis Third Edition, Mcgraw Hill, 1976.

UNIT – I - Chapters 2 and 3

UNIT – II - Chapters 4 and 5

UNIT – III - Chapter 6

UNIT – IV - Chapter 7

UNIT – V - Chapter 9 Sections 9.1 to 9.29

REFERENCE(S)

[1] Tom P. Apostol, Mathematical Analysis, Narosa Publishing House, New Delhi, 1985.

[2] A.J. White, Real Analysis : An Introduction, Addison Wesley Publishing Co., Inc. 1968.

[3] Serge Lang, Analysis I & II, Addison-Wesley Publishing Company, Inc. 1969

Course Coordinator

HOD

P18MCMA103	ORDINARY DIFFERENTIAL EQUATIONS							L	T	P	C
	Total Contact Hours – 60							3	1	0	4
	Prerequisite course – Mathematics Studied in Under Graduate										
	Course Coordinator Name & Department:- Ms.S.Kavitha /Mathematics										
COURSE OBJECTIVES:-											
Learners will be familiar with basic and differential equations.To equip students with adequate knowledge of Mathematics to formulate problems and solve them analytically or numerically											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in fundamental linear equations with constant coefficients										
CO2	Understand the concept of algorithmic linear equations with constant coefficients										
CO3	Apply suitable linear equation with variable coefficients										
CO4	Analyze the algorithm for linear equation with regular singular points										
CO5	Evaluate existence and uniqueness of solutions to first order equations:										
CO6	Create an real time application from algorithms.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	1	1		2	1			
	CO2	3	3	2	2	2	1	2			
	CO3	3	1	3	3	3	3	3			
	CO4	3	2	1	1	1	2	1			
	CO5	3	2	2	3	3	3	3			
	CO6	3	3	3	2	3	3	2			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship(PR)	
					✓						
4	Approval	Academic Council Meeting									

UNIT-I :

12

Linear equations with constant coefficients -1

Second order homogeneous equations-Initial value problems-Linear dependence and independence-Wronskian and a formula for Wronskian-Non-homogeneous equation of order two.

Chapter 2: Sections 1 to 6

UNIT-II :**12****Linear equations with constant coefficients-2**

Homogeneous and non-homogeneous equation of order n –Initial value problems- Annihilator method to solve non-homogeneous equation- Algebra of constant coefficient operators.

Chapter 2 : Sections 7 to 12.

UNIT-III :**12****Linear equation with variable coefficients:**

Initial value problems -Existence and uniqueness theorems – Solutions to solve a non-homogeneous equation – Wronskian and linear dependence – reduction of the order of a homogeneous equation – homogeneous equation with analytic coefficients-The Legendre equation.

Chapter : 3 Sections 1 to 8 (Omit section 9)

UNIT-IV :**12****Linear equation with regular singular points:**

Euler equation – Second order equations with regular singular points –Exceptional cases – Bessel Function.Chapter 4 : Sections 1 to 4 and 6 to 8 (Omit sections 5 and 9)

UNIT-V :**Existence and uniqueness of solutions to first order equations****12**

Equation with variable separated – Exact equation – method of successive approximations – the Lipschitz condition – convergence of the successive approximations and the existence theorem.

Chapter 5 : Sections 1 to 6 (Omit Sections 7 to 9)

Recommended Text

E.A.Coddington, A introduction to ordinary differential equations (3rd Printing) Prentice-Hall of India Ltd.,New Delhi, 1987.

Reference Books

- 1.Williams E. Boyce and Richard C. Di Prima, Elementary differential equations and boundary value problems,John Wiley and sons, New York, 1967.
2. George F Simmons, Differential equations with applications and historical notes, Tata McGraw Hill, New Delhi, 1974.
3. N.N. Lebedev, Special functions and their applications, Prentice Hall of India, New Delhi, 1965.
4. W.T.Reid. Ordinary Differential Equations, John Wiley and Sons, New York, 1971
5. M.D.Raisinghania,Advanced Differential Equations, S.Chand& Company Ltd. New Delhi 2001
6. B.Rai, D.P.Choudhury and H.I. Freedman, A Course in Ordinary Differential Equations, Narosa Publishing House, New Delhi, 2002.

P18MCMA104	GRAPH THEORY							L	T	P	C
	Total Contact Hours – 60							3	1	0	4
	Prerequisite course – Mathematics Studied in Under Graduate										
	Course Coordinator Name & Department:- Dr.P.Sumathi/Mathematics										
COURSE OBJECTIVES:- Learners will be familiar with basic and algorithm analysis. Learners will able to apply the problem solving techniques using theorem.											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in graphs, subgraphs and trees										
CO2	Understand the concept of algorithmic design and connectivity, Euler tours and Hamilton cycles										
CO3	Apply for developing a real time application in matchings, edge colourings										
CO4	Analyze the algorithm for independent sets and cliques, vertex colourings										
CO5	Evaluate data structures for planar graphs										
CO6	Create an real time application from algorithms.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	1	1	3	3	3	3	1			
	CO2	3	3	2	2	2	2	3			
	CO3	2	2	3	1	3	3	2			
	CO4	3	3	2	1	1	3	3			
	CO5	3	2	2	1	1	1	1			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship(PR)	
					✓						
4	Approval	Academic Council Meeting									

UNIT-I :

12

Graphs, subgraphs and Trees

Graphs and simple graphs – Graph Isomorphism – The Incidence and Adjacency Matrices – Subgraphs – Vertex Degrees – Paths and Connection – Cycles – Trees – Cut Edges ana Bonds – Cut Vertices.

Chapter 1 (Section 1.1 – 1.7)

Chapter 2 (Section 2.1 – 2.3)

UNIT-II : 12

Connectivity, Euler tours and Hamilton Cycles :

Connectivity – Blocks – Euler tours – Hamilton Cycles.

Chapter 3 (Section 3.1 – 3.2)

Chapter 4 (Section 4.1 – 4.2)

UNIT-III : 12

Matchings, Edge Colourings :

Matchings – Matchings and Coverings in Bipartite Graphs – Edge Chromatic Number – Vizing’s Theorem.

Chapter 5 (Section 5.1 – 5.2)

Chapter 6 (Section 6.1 – 6.2)

UNIT-IV : 12

Independent sets and Cliques, Vertex Colourings :

Independent sets – Ramsey’s Theorem – Chromatic Number – Brooks’ Theorem – Chromatic Polynomials.

Chapter 7 (Section 7.1 – 7.2)

Chapter 8 (Section 8.1 – 8.2, 8.4)

UNIT-V: 12

Planar graphs :

Plane and planar Graphs – Dual graphs – Euler’s Formula – The Five- Colour Theorem and the Four- Colour Conjecture.

Chapter 9 (Section 9.1 – 9.3, 9.6)

Recommended Text

J.A.Bondy and U.S.R. Murthy ,Graph Theory and Applications , Macmillan, London, 1976.

Reference Books

1. J.Clark and D.A.Holton ,A First look at Graph Theory, Allied Publishers, New Delhi , 1995.
2. R. Gould. Graph Theory, Benjamin/Cummings, Menlo Park, 1989.
3. A.Gibbons, Algorithmic Graph Theory, Cambridge University Press, Cambridge, 1989.
4. R.J.Wilson and J.J.Watkins, Graphs : An Introductory Approach, John Wiley and Sons, New York, 1989.
5. R.J. Wilson, Introduction to Graph Theory, Pearson Education, 4th Edition, 2004, Indian Print.
6. S.A.Choudum, A First Course in Graph Theory, MacMillan India Ltd. 1987

P18MEMA011	FORMAL LANGUAGES AND AUTOMATA THEORY							L	T	P	C
	Total Contact Hours – 60							3	1	0	4
	Prerequisite course – Mathematics Studied in Under Graduate										
	Course Coordinator Name & Department:- Mrs.P.S.Sharmila /Mathematics										
COURSE OBJECTIVES:-											
Learners will be familiar with basic and algorithm analysis. Learners will able to apply the problem solving techniques using theorem.											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in finite automata.										
CO2	Understand the concept of properties of regular sets.										
CO3	Apply for developing a real time application in context-free grammars										
CO4	Analyze the pushdown Automata										
CO5	Understand the properties of context-free languages										
CO6	Understand the computer language.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	1	1	1	1	3			
	CO2	3	3	1	2	2	2	3			
	CO3	3	2	3	1	3	3	3			
	CO4	3	2	2	1	1	2	3			
	CO5	2	2	2	1	1	1	3			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship(PR)	
						✓					
4	Approval	Academic Council Meeting									

UNIT-I

FINITE AUTOMATA

12

Finite Automata, regular expressions and regular grammars Finite state systems – Basic definitions – Nondeterministic finite automata – Finite automata with ϵ moves – Regular expressions – Regular grammars.

Chapter 2. Sections 2.1 to 2.5

Chapter 9 Section 9.1

UNIT-II
REGULAR SETS

12

Properties of regular sets. The Pumping lemma for regular sets – Closure properties of regular sets – Decision algorithms for regular sets – The Myhill-Nerode Theorem and minimization of finite automata.
Chapter 3 : Sections 3.1 to 3.4

UNIT-III
CONTEXT-FREE GRAMMARS

12

Motivation and introduction – Context-free grammars – Derivation trees- Simplification of context-free grammars – Chomsky normal form – Greibach normal form.
Chapter 4 : Section 4.1 to 4.6

UNIT-IV

12

PUSHDOWN AUTOMATA INFORMAL DESCRIPTION

Definitions-Pushdown automata and context-free languages – Normal forms for deterministic pushdown automata.
Chapter 5 : Sections 5.1 to 5.3

UNIT-V
PROPERTIES OF CONTEXT-FREE LANGUAGES

12

The pumping lemma for CFL's – Closure properties for CFL's – Decision algorithms for CFL's.
Chapter 6 : Sections 6.1 to 6.3

TEXT BOOK

1. John E. Hopcraft and Jeffrey D. Ullman, Introduction to Automata Theory, Languages and Computation, Narosa Publishing House, New Delhi, 1987.

REFERENCE BOOKS

1. A. Salomaa, *Formal Languages*, Academic Press, New York, 1973.
2. John C. Martin, Introduction to Languages and theory of Computations (2nd Edition) Tata-McGraw Hill Company Ltd., New Delhi, 1997

P18MEMA012	DISCRETE MATHEMATICS							L	T	P	C
	Total Contact Hours – 60							3	1	0	4
	Prerequisite course – Mathematics Studied in Under Graduate.										
	Course Coordinator Name & Department:- Ms.E.Vanishree /Mathematics										
COURSE OBJECTIVES:-											
Learners will be familiar with basic and algorithm analysis. Learners will able to apply the problem solving techniques using theorem.											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge about Lattices										
CO2	Understand the applications of lattices										
CO3	Apply a real time application in finite fields										
CO4	Analyze the problems in polynomials										
CO5	Understanding the concept of coding theory										
CO6	Create an real time application from algorithms.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	1	2	3	2	1	3			
	CO2	2	3	1	2	2	2	3			
	CO3	3	2	3	3	3	2	3			
	CO4	2	3	2	3	3	2	2			
	CO5	2	3	3	3	3	3	2			
	CO6	3	3	3	2	3	3	1			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship(PR)	
						✓					
4	Approval	Academic Council Meeting									

UNIT-I :**12****Lattices:**

Properties of Lattices: Lattice definitions – Modular and distributive lattice; Boolean algebras: Basic properties – Boolean polynomials, Ideals; Minimal forms of Boolean polynomials.
Chapter 1: § 1 A and B § 2A and B. § 3.

UNIT-II :**12**

Applications of Lattices:

Switching Circuits: Basic Definitions - Applications
Chapter 2: § 1 A and B

UNIT-III :

12

Finite Fields

Basic Definitions - Applications Chapter 3: § 2

UNIT-IV :

12

Polynomials :

Irreducible Polynomials over Finite fields – Factorization of Polynomials

Chapter 3: § 3 and §4.

UNIT-V:

12

Coding Theory :

Linear Codes and Cyclic Codes

Chapter 4 § 1 and 2

Recommended Text

Rudolf Lidl and Gunter Pilz, Applied Abstract Algebra, Springer-Verlag, New York, 1984.

Reference Books

1. A.Gill, Applied Algebra for Computer Science, Prentice Hall Inc., New Jersey.
2. J.L.Gersting, Mathematical Structures for Computer Science(3rdEdn.), Computer Science Press, New York.
3. S.Wiitala, Discrete Mathematics- A Unified Approach, McGraw Hill Book Co.

P18MEMA013	MATHEMATICAL ECONOMICS							L	T	P	C
	Total Contact Hours – 60							3	1	0	4
	Prerequisite course – Mathematics Studied in Under Graduate										
	Course Coordinator Name & Department:- Ms.E.Vanishree /Mathematics										
COURSE OBJECTIVES:- Learners will be familiar with basic and algorithm in Economics . Learners will able to apply the problem solving techniques .											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge aboutthe theory of consumer behavior										
CO2	Understand the applications of theory of firm										
CO3	Understand the concept of market equilibrium										
CO4	Analyzethe imperfect competition										
CO5	Gain knowledge aboutwelfare economics										
CO6	Detail in external effects in consumption and production										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	3	2	2	1	3			
	CO2	2	3	1	2	2	3	2			
	CO3	3	3	3	1	3	3	3			
	CO4	2	3	2	3	3	2	1			
	CO5	2	2	2	3	1	2	2			
	CO6	3	1	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)	
						✓					
4	Approval	Academic Council Meeting									

UNIT-I:

THE THEORY OF CONSUMER BEHAVIOUR:

12

Utility function – Indifference Curves – Rate of Commodity Substitution – Existence of Utility Function – Maximization of Utility – Choice of a utility Index – Demand function – Income and Leisure – Substitution and Income Effects – Generalization to n variables – Theory of Revealed Preference – Problem of Choice in Risk.

Chapter 2: 2.1 to 2.10

UNIT-II :**THE THEORY OF FIRM:****12**

Production Function – Productivity Curves – Isoquents – Optimization behaviour – Input Demand Functions – Cost Functions (short-run and long-run) – Homogeneous Production functions and their properties – CES Production Function and their Properties – Joint Products – Generalisation to m variables.

UNIT-III :**MARKET EQUILIBRIUM:****12**

Assumptions of Perfect Competition – Demand Functions – Supply Functions – Commodity Equilibrium – Applications of the Analysis – Factor Market Equilibrium – Existence of Uniqueness of Equilibrium – Stability of Equilibrium – Dynamic Equilibrium with lagged adjustment.

UNIT-IV :**IMPERFECT COMPETITION:****12**

Monopoly and its Applications – Duopoly and Oligopoly – Monopolistic Composition – Monopsony, Duopsony and Oligopsony – Bilateral Monopoly
Chapter 6 : Sections 6.1 to 6.7

UNIT-V:**WELFARE ECONOMICS:****12**

Parato Optimality and the efficiency of Perfect competition – The efficiency of Imperfect competition – External Effects in consumption and Production – Taxes, Subsidies and Compensation – Social Welfare functions – The theory of Second Best.
Chapter 7 : Sections 7.1 to 7.7

TEXT BOOK:

1. J.M.Henderson and R.E.Quandt, Micro Economic Theory- A Mathematical Approach, (2nd Edn) McGraw Hill, New York, 1971.
2. A. Kautsoyiannis, Modern Microeconomics (2ndedn) MacMillan, New York, 1979.

REFERENCE BOOKS

1. William J. Baumol. Economic Theory and Operations Analysis, Prentice Hall of India, New Delhi, 1978
2. A.C.Chiang, Fundamental Methods of Mathematical Economics, McGraw Hill, New York, 1984
3. Michael D. Intriligator, Mathematical Optimization and Economic Theory, Prentice Hall, New York, 1971.

P18MCMA201	ALGEBRA – II							L	T	P	C
	Total Contact Hours – 60							3	1	0	4
	Prerequisite course – Mathematics Studied in Under Graduate										
	Course Coordinator Name & Department:- Mr.V.Nandakumar /Mathematics										
COURSE OBJECTIVES:-											
Learners will understand the concepts and develop working knowledge on extension field , roots of polynomials, Galois Theory, Finite division ring, Solvability by radicals.											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in concepts of Extension field.										
CO2	Understand the usage of roots of the polynomials.										
CO3	Apply the algorithms in Elements of Galois theory										
CO4	Analyze the algorithm and the usage of Finite fields										
CO5	Evaluate numerical solution in Solvability by Radicals										
CO6	Apply the algorithms in Algebraic Structure.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	2	1	3	2	1			
	CO2	3	3	3	2	2	2	3			
	CO3	3	2	3	1	3	3	2			
	CO4	3	2	2	2	3	3	3			
	CO5	2	2	3	1	1	1	2			
	CO6	3	3	3	2	2	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)	
					✓						
4	Approval	Academic Council Meeting									

UNIT I

12

EXTENSION OF FIELD

Extension fields - Transcendence of e.
Chapter 5: Section 5.1 and 5.2

UNIT II

12

ROOTS OF POLYNOMIALS

Roots of Polynomials.- More about roots

Chapter 5: Sections 5.3 and 5.5

UNIT III

12

GALOIS THEORY

Elements of Galois theory.

Chapter 5 : Section 5.6

UNIT IV

12

FINITE DIVISION RINGS

Finite fields - Wedderburn's theorem on finite division rings

Chapter 7: Sections 7.1 and 7.2 (Theorem 7.2.1 only)

UNIT V

12

SOLVABILITY BY RADICALS

Solvability by radicals – Galois groups over the rationals -- A theorem of Frobenius.

Chapter 5: Sections 5.7 and 5.8

Chapter 7: Sections 7.3

TEXT BOOK :

1.N. Herstein. Topics in Algebra (II Edition) Wiley 2002

2.N.Jacobson, Basic Algebra, Vol. I & II Hindustan Publishing Company, New Delhi.

REFERENCE BOOKS :

1. M.Artin, Algebra, Prentice Hall of India, 1991.

2. P.B.Bhattacharya, S.K.Jain, and S.R.Nagpaul, Basic Abstract Algebra (II Edition) Cambridge University Press, 1997. (Indian Edition)

3. I.S.Luther and I.B.S.Passi, Algebra, Vol. I - Groups(1996); Vol. II Rings, (1999) Narosa Publishing House , New Delhi.

4. D.S.Dummit and R.M.Foote, Abstract Algebra, 2nd edition, Wiley, 2002.

		REAL ANALYSIS – II						L	T	P	C
P18MCMA202	Total Contact Hours – 60	3	1	0	4						
	Prerequisite course –Mathematics / Mathematics Studied in Under Graduate.										
	Course Coordinator Name & Department:- Mrs.L.Radhika /Mathematics										
COURSE OBJECTIVES:-											
Learners will be familiar with basic Fourier series and Fourier integrals, multivariable differential calculus, implicit functions and extremum problems.											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in measure on the real line										
CO2	Understand the concept of integration of functions of a real variable										
CO3	Apply suitable formulae for Fourier series and Fourier integrals										
CO4	Analyze the concept of multivariable differential calculus										
CO5	Evaluate problems in implicit functions and extremum problems										
CO6	Create an real time application using a suitable algorithms										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	1	3	2	1	3			
	CO2	2	3	3	2	2	3	2			
	CO3	3	1	3	1	3	3	3			
	CO4	3	2	3	2	2	2	2			
	CO5	3	1	2	3	1	2	3			
	CO6	3	3	3	3	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)	
					✓						
4	Approval	Academic Council Meeting									

UNIT-I

12

MEASURE ON THE REAL LINE

Lebesgue Outer Measure - Measurable sets - Regularity - Measurable Functions - Borel and Lebesgue Measurability

Chapter - 2 Sec 2.1 to 2.5 of de Barra

UNIT-II

INTEGRATION OF FUNCTIONS OF A REAL VARIABLE

12

Integration of Non- negative functions - The General Integral - Riemann and Lebesgue Integrals
Chapter - 3 Sec 3.1,3.2 and 3.4 of de Barra

UNIT-III

FOURIER SERIES AND FOURIER INTEGRALS

12

Introduction - Orthogonal system of functions - The theorem on best approximation - The Fourier series of a function relative to an orthonormal system - Properties of Fourier Coefficients - The Riesz-Fischer Theorem - The convergence and representation problems in for trigonometric series - The Riemann - Lebesgue Lemma - The Dirichlet Integrals - An integral representation for the partial sums of Fourier series - Riemann's localization theorem - Sufficient conditions for convergence of a Fourier series at a particular point - Cesaro-summability of Fourier series- Consequences of Fejes's theorem - The Weierstrass approximation theorem

Chapter 11 : Sections 11.1 to 11.15 of Apostol

UNIT-IV

MULTIVARIABLE DIFFERENTIAL CALCULUS

12

Introduction - The Directional derivative - Directional derivative and continuity - The total derivative - The total derivative expressed in terms of partial derivatives - The matrix of linear function - The Jacobian matrix - The chain rule - Matrix form of chain rule - The mean - value theorem for differentiable functions - A sufficient condition for differentiability - A sufficient condition for equality of mixed partial derivatives - Taylor's theorem for functions of \mathbb{R}^n to \mathbb{R}^1

Chapter 12 : Section 12.1 to 12.14 of Apostol

UNIT-V

IMPLICIT FUNCTIONS AND EXTREMUM PROBLEMS

12

Functions with non-zero Jacobian determinants – The inverse function theorem-The Implicit function theorem-Extrema of real valued functions of severable variables-Extremum problems with side conditions.

Chapter 13 : Sections 13.1 to 13.7 of Apostol

TEXT BOOK

- 1). G. de Barra, Measure Theory and Integration, New Age International, 2003 (for Units I and II)
- 2). Tom M.Apostol :Mathematical Analysis, 2nd Edition, Narosa 1989 (for Units III, IV and V)

REFERENCE BOOKS

- 1.Burkill,J.C.TheLebesgue Integral, Cambridge University Press, 1951.
 - 2.Munroe,M.E.Measure and Integration. Addison-Wesley, Mass.1971.
 - 3.Royden,H.L.Real Analysis, Macmillan Pub. Company, New York, 1988.
 - 4.Rudin, W. Principles of Mathematical Analysis, McGraw Hill Company, New York,1979.
- Malik,S.C. and SavitaArora. Mathematical Analysis, Wiley Eastern Limited. New Delhi, 1991

P18MCMA203	PARTIAL DIFFERENTIAL EQUATIONS							L	T	P	C
	Total Contact Hours – 60							3	1	0	4
	Prerequisite course – Mathematics Studied in Under Graduate.										
	Course Coordinator Name & Department:- Ms.S.Kavitha /Mathematics										
COURSE OBJECTIVES:-											
Learners will be familiar with basic . Learners will able to apply the problem solving techniques. to equip students with adequate knowledge of Mathematics to formulate problems and solve them analytically or numerically											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in Partial Differential Equations of First Order										
CO2	Understand the concept of elliptic differential equations										
CO3	Apply suitable model for parabolic differential equations										
CO4	Analyze the algorithm for hyperbolic differential equations										
CO5	Evaluate algorithms on Green’s Function										
CO6	Create an real time application using a suitable algorithms.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	2	1	3	1	1	3			
	CO2	3	3	1	2	2	2	3			
	CO3	3	2	3	1	3	3	1			
	CO4	3	2	3	2	3	2	3			
	CO5	2	2	2	1	1	1	3			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)		Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)
						✓					
4	Approval	Academic Council Meeting									

UNIT-I :

Partial Differential Equations of First Order:

Formation and solution of PDE- Integral surfaces – Cauchy Problem order eqn- Orthogonal surfaces – First order non-linear – Characteristics – Csmptable system – Charpit method. Fundamentals: Classification and canonical forms of PDE.

Chapter 0: 0.4 to 0.11 (omit .1,0.2.0.3 and 0.11.1) and Chapter 1: 1.1

UNIT-II : **12**

Elliptic Differential Equations:

Derivation of Laplace and Poisson equation – BVP – Separation of Variables – Dirichlet’s Problem and Neumann Problem for a rectangle – Interior and Exterior Dirichlet’s problems for a circle – Interior Neumann problem for a circle – Solution of Laplace equation in Cylindrical and spherical coordinates – Examples. Chapter 2: 2.1, 2.2, 2.5 to 2.13 (omit 2.3 and 2.4)

UNIT-III : **12**

Parabolic Differential Equations:

Formation and solution of Diffusion equation – Dirac-Delta function – Separation of variables method – Solution of Diffusion Equation in Cylindrical and spherical coordinates Examples.

Chapter 3: 3.1 to 3.7 and 3.9 (omit 3.8)

UNIT-IV : **12**

Hyperbolic Differential equations:

Formation and solution of one-dimensional wave equation – canonical reduction – IVP- d’Alembert’s solution – Vibrating string – Forced Vibration – IVP and BVP for two-dimensional wave equation – Periodic solution of one-dimensional wave equation in cylindrical and spherical coordinate systems – vibration of circular membrane – Uniqueness of the solution for the wave equation – Duhamel’s Principle – Examples

Chapter 4: 4.1 to 4.12(omit 4.13)

UNIT-V: **12**

Green’s Function:

Green’s function for Laplace Equation – methods of Images – Eigen function Method – Green’s function for the wave and Diffusion equations. Laplace Transform method: Solution of Diffusion and Wave equation by Laplace Transform. Fourier Transform Method: Finite Fourier sine and cosine transforms – solutions of Diffusion, Wave and Laplace equations by Fourier Transform Method.

Chapter 5: 5.1 to 5.6 Chapter 6: 6.13.1 and 6.13.2 only (omit (6.14) Chapter 7: 7.10 to 7.13 (omit 7.14)

Recommended Text

1. S, SankarRao, Introduction to Partial Differential Equations, 2nd Edition, Prentice Hall of India, New Delhi. 2005

Reference Books

1. R.C.McOwen, Partial Differential Equations, 2ndEdn. Pearson Education, New Delhi, 2005.
2. I.N.Sneddon, Elements of Partial Differential Equations, McGraw Hill, New Delhi, 1983.
3. R. Dennemeyer, Introduction to Partial Differential Equations and Boundary Value Problems, McGraw Hill, New York, 1968.
M.D.Raisinghania, Advanced Differential Equations, S.Chand & Company Ltd., New Delhi, 2001.

		PROBABILITY THEORY						L	T	P	C
P18MCMA204	Total Contact Hours – 60	3	1	0	4						
	Prerequisite course –Mathematics / Mathematics Studied in Undergraduate.										
	Course Coordinator Name & Department:- Mrs.P.S.Sharmila /Mathematics										
COURSE OBJECTIVES:-											
Learners will be familiar with basic random events and random variables, parameters of the distribution , characteristic functions, some probability distributions, limit theorems											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in random events and random variables										
CO2	Understand the concept in parameters of the distribution										
CO3	Apply suitable formulae for developing a real time application										
CO4	Analyze the algorithms in some probability distributions										
CO5	Evaluate the solution of limit theorems										
CO6	Create an real time application using algorithms.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	1	1	1	1	1			
	CO2	2	3	3	2	2	3	3			
	CO3	3	1	3	1	3	3	2			
	CO4	1	2	2	3	1	2	3			
	CO5	2	3	3	2	1	1	3			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)	
					✓						
4	Approval	Academic Council Meeting									

UNIT-I

12

RANDOM EVENTS AND RANDOM VARIABLES

Random events – Probability axioms – Combinatorial formulae – conditional probability – Bayes Theorem – Independent events – Random Variables – Distribution Function – Joint Distribution – Marginal Distribution – Conditional Distribution – Independent random variables – Functions of random variables.

Chapter 1: Sections 1.1 to 1.7

Chapter 2 : Sections 2.1 to 2.9

UNIT-II

PARAMETERS OF THE DISTRIBUTION

12

Expectation- Moments – The Chebyshev Inequality – Absolute moments – Order parameters – Moments of random vectors – Regression of the first and second types.

Chapter 3 : Sections 3.1 to 3.8

UNIT-III

12

CHARACTERISTIC FUNCTIONS :

Properties of characteristic functions – Characteristic functions and moments – semiinvariants – characteristic function of the sum of the independent random variables – Determination of distribution function by the Characteristic function – Characteristic function of multidimensional random vectors – Probability generating functions.

Chapter 4 : Sections 4.1 to 4.7

UNIT-IV

12

SOME PROBABILITY DISTRIBUTIONS

One point , two point , Binomial – Polya – Hypergeometric – Poisson (discrete) distributions – Uniform – normal gamma – Beta – Cauchy and Laplace (continuous) distributions.

Chapter 5 : Section 5.1 to 5.10 (Omit Section 5.11)

UNIT-V

12

LIMIT THEOREMS

Stochastic convergence – Bernaulli law of large numbers – Convergence of sequence of distribution functions – Levy-Cramer Theorems – de Moivre-Laplace Theorem – Poisson, Chebyshev, Khintchine Weak law of large numbers – Lindberg Theorem – LapunovTheroem – Borel-Cantelli Lemma - Kolmogorov Inequality and Kolmogorov Strong Law of large numbers.

Chapter 6 : Sections 6.1 to 6.4, 6.6 to 6.9 , 6.11 and 6.12. (Omit Sections 6.5, 6.10,6.13 to 6.15)

TEXT BOOK

1.M. Fisz, Probability Theory and Mathematical Statistics, John Wiley and Sons, New York, 1963.

REFERENCE BOOKS

R.B. Ash, Real Analysis and Probability, Academic Press, New York, 1972

2. K.L.Chung, A course in Probability, Academic Press, New York, 1974.

4. R.Durrett, Probability : Theory and Examples, (2nd Edition) Duxbury Press, New York, 1996.

5. V.K.RohatgiAn Introduction to Probability Theory and Mathematical Statistics, Wiley Eastern Ltd., New Delhi, 1988(3rd Print).

6. S.I.Resnick, A Probability Path, Birhauser, Berlin,1999.

7. B.R.Bhat ,Modern Probability Theory (3rd Edition), New Age International (P)Ltd, New Delhi, 1999

P18MEMA021	NUMERICAL METHODS							L	T	P	C
	Total Contact Hours – 60							3	1	0	4
	Prerequisite course – Mathematics Studied in Under Graduate										
	Course Coordinator Name & Department:- Ms.E.Vanishree /Mathematics										
COURSE OBJECTIVES:- Learners will be familiar with basic and algorithm analysis. Learners will able to apply the problem solving techniques using theorem.											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in solution algebraic and transcendental equation										
CO2	Understand the concept of method of factorization										
CO3	Apply the concept of linear simultaneous equations										
CO4	Analyze the usage of differential equation										
CO5	Evaluate numerical solution of partial differential equations										
CO6	Understanding iterative methods for the solution										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	2	3	1	3	2			
	CO2	2	3	1	2	2	2	3			
	CO3	3	2	3	1	3	2	1			
	CO4	3	2	2	3	3	2	3			
	CO5	2	2	2	3	1	1	2			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship(PR)	
						✓					
4	Approval	Academic Council Meeting									

UNIT I

ALGEBRAIC AND TRANSCENDENTAL EQUATION

12

Introduction – The Bi – section method – The iteration method – Aitken’s A^2 process – The methods of False position – Newton Raphson’s method – Ramanujans method.

UNIT II

METHOD OF FACTORIZATION

12

Muller's method – Graffe's roots squaring methods – Lin – Bairstow's method – Gauss elimination method – modification of elimination method to find the inverse of the matrix – method of factorization.

UNIT III

LINEAR SIMULTANEOUS EQUATIONS

12

Solution of tridiagonal system – solution of Centro – symmetric equations – Ill conditioned linear system – method of Ill conditioned matrices. Solutions of linear systems – Iterative methods – The Eigen value problem – House Holder method.

UNIT IV

DIFFERENTIAL EQUATION S

12

Introduction – Solution by Taylor's series - Picard's method of successive approximation – Euler's method – Runge –kutta's method (RK) – Predictor, corrector method – Boundary value problems – finite different method – Shotting method.

UNIT V

PARTIAL DIFFERENTIAL EQUATIONS

12

Introduction – finite difference approximation to derivatives – Laplace equation – Jacobi's method – Gauss Seidal method – Parabolic equations – Iterative methods for the solution of equations – Hyperbolic equations.

TEXT BOOK

- 1.Introductory methods of numerical Analysis by S.S. Sastry
- 2.B.D. Gupta , Numerical Analysis ,Konork Publisher

REFERENCE BOOKS

1. M.K. Jain – Numerical Solution of differential equation by wiley Eastern.
2. M.K.Jain , S.R.K. Iyenkar and R.K.J – Numerical methods for scientific and Engineering computation .New age international publishers

		MATHEMATICAL PROGRAMMING						L	T	P	C
P18MEMA022	Total Contact Hours – 60	3	1	0	4						
	Prerequisite course –Mathematics / Mathematics Studied in Under Graduate.										
	Course Coordinator Name & Department:- Mrs.L.Radhika/Mathematics										
COURSE OBJECTIVES:- Learners will be familiar with methods appropriate for solving problems. Apply methods to specific problems.											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in basic of Cauchy’s Integral Formula										
CO2	Understand the concept of the general form of Cauchy’s Theorem										
CO3	Evaluation of definite integrals and harmonic functions										
CO4	Analyze the concept of harmonic functions and power series expansions										
CO5	Evaluate partial fractions and entire functions										
CO6	Analyze the concepts of canonical products										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	2	3	1	1	3	1	2			
	CO2	2	3	2	2	2	2	3			
	CO3	3	2	3	2	3	3	3			
	CO4	1	2	2	1	1	3	2			
	CO5	2	2	2	3	3	1	3			
	CO6	3	3	3	2	3	3	2			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)	
						√					
4	Approval	Academic Council Meeting									

UNIT-I

INTEGER LINEAR PROGRAMMING

12

Types of Integer Linear Programming Problems – Concept of Cutting Plane – Gomory’s All Integer Cutting Plane Method – Gomory’s mixed Integer Cutting Plane method – Branch and Bound Method. – Zero-One Integer Programming.

DYNAMIC PROGRAMMING

Characteristics of Dynamic Programming Problem – Developing Optimal Decision Policy – Dynamic Programming Under Certainty – DP approach to solve LPP. Chapters: 7 and 21.

UNIT-II

CLASSICAL OPTIMIZATION METHODS

12

Unconstrained Optimization – Constrained Multi-variable Optimization with Equality Constraints -
Constrained Multi-variable Optimization with inequality Constraints

NON-LINEAR PROGRAMMING METHODS:

Examples of NLPP – General NLPP – Graphical solution – Quadratic Programming – Wolfe’s modified
Simplex Methods – Beale’s Method.

Chapters: 22 and 23

UNIT-III

THEORY OF SIMPLEX METHOD

12

Canonical and Standard form of LP – Slack and Surplus Variables – Reduction of any Feasible solution to
a Basic Feasible solution – Alternative Optimal solution – Unbounded solution – Optimality conditions –
Some complications and their resolutions – Degeneracy and its resolution.

Chapter 24

UNIT-IV

REVISED SIMPLEX METHOD

12

Standard forms for Revised simplex Method – Computational procedure for Standard form I –
comparison of simplex method and Revised simplex Method.

BOUNDED VARIABLES LP PROBLEM:

The simplex algorithm Chapters 25 and 27

UNIT-V

PARAMETRIC LINEAR PROGRAMMING

12

Variation in the coefficients c_j , Variations in the Right hand side, b_i .

GOAL PROGRAMMING

Difference between LP and GP approach – Concept of Goal Programming – Goal Programming Model
formulation – Graphical Solution Method of Goal Programming – Modified Simplex method of Goal
Programming.

Chapters 28 and 29.

TEXT BOOK

1. J.K.Sharma, *Operations Research*, Macmillan (India) New Delhi 2001
2. Beightler. C, D.Phillips, B. Wilde, *Foundations of Optimization* (2nd Edition) Prentice Hall Pvt Ltd.,
New York, 1979

REFERENCE BOOKS

1. Hamdy A. Taha, *Operations Research*, (seventh edition)
Prentice - Hall of India Private Limited, New Delhi, 1997.
2. F.S. Hiller & J.Lieberman *Introduction to Operation Research*
(7th Edition) Tata- McGraw Hill Company, New Delhi, 2001.
2. S.S. Rao - *Optimization Theory and Applications*, Wiley Eastern Ltd. New Delhi. 1990

P18MEMA023	FUZZY SETS AND THEIR APPLICATIONS							L	T	P	C
	Total Contact Hours – 60							3	1	0	4
	Prerequisite course –Mathematics / Mathematics Studied in Under Graduate.										
	Course Coordinator Name & Department:- Ms.S.Kavitha /Mathematics										
COURSE OBJECTIVES:- To identify methods appropriate for solving problems. Apply methods to specific problems.											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in basic concepts of fuzzy										
CO2	Understand the concept of fuzzy graphs										
CO3	Analyze the relationship between fuzzy										
CO4	Analyze the concept of fuzzy logic										
CO5	Evaluate composition of fuzzy										
CO6	Analyze the Fundamental Notions										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	2	3	2	3	1	3	3			
	CO2	2	3	1	2	2	2	3			
	CO3	3	2	3	1	3	3	3			
	CO4	3	2	2	3	3	2	3			
	CO5	2	2	2	1	1	1	3			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)		Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship(PR)
							✓				
4	Approval	Academic Council Meeting									

UNIT-I **12**
BASIC CONCEPTS OF FUZZY
Fundamental Notions: Chapter I: Sec. 1 to 8

UNIT-II **12**
GRAPHS IN FUZZY
Fuzzy Graphs: Chapter II: Sec. 10 to 18

UNIT-III **12**
RELATIONSHIP BETWEEN FUZZY

Fuzzy Relations: Chapter II: Sec. 19 to 29

UNIT-IV

12

CONCEPTS OF FUZZY LOGIC

Fuzzy Logic: Chapter III: Sec.31 to 40 (omit Sec. 37, 38, 41)

UNIT-V

12

COMPOSITION OF FUZZY

The Laws of Fuzzy Composition: Chapter IV: Sec.43 to 49

Text Book

A.Kaufman, Introduction to the theory of Fuzzy subsets, Vol.I,
Academic Press, New York, 1975.

Reference Books

1. H.J.Zimmermann, Fuzzy Set Theory and its Applications, Allied Publishers, Chennai, 1996
2. George J.Klir and Bo Yuan, Fuzzy sets and Fuzzy Logic-Theory and Applications, Prentice Hall India, New Delhi, 2001.

P18MCMA301	COMPLEX ANALYSIS – I							L	T	P	C
	Total Contact Hours – 60							3	1	0	4
	Prerequisite course –Mathematics / Mathematics Studied in Under Graduate.										
	Course Coordinator Name & Department:- Ms.S.Kavitha /Mathematics										
COURSE OBJECTIVES:- Learners will be familiar with methods appropriate for solving problems. Apply methods to specific problems.											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in basic of Cauchy’s Integral Formula										
CO2	Understand the concept of the general form of Cauchy’s Theorem										
CO3	Evaluation of definite integrals and harmonic functions										
CO4	Analyze the concept of harmonic functions and power series expansions										
CO5	Evaluate partial fractions and entire functions										
CO6	Analyze the concepts of canonical products										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	1	3	1	3	2			
	CO2	2	3	1	2	2	2	3			
	CO3	3	2	3	1	3	3	3			
	CO4	2	2	3	3	3	2	1			
	CO5	2	2	2	1	1	1	3			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)		Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)
						✓					
4	Approval	Academic Council Meeting									

UNIT I

12

CAUCHY’S INTEGRAL FORMULA:

The Index of a point with respect to a closed curve - The Integral formula - Higher derivatives. Local Properties of Analytical Functions :Removable Singularities-Taylor’s Theorem-Zeros and poles-The local Mapping - The Maximum Principle .

Chapter 4 : Section 2 : 2.1 to 2.3, Section 3 : 3.1 to 3.4

UNIT II

12

THE GENERAL FORM OF CAUCHY’S THEOREM:

Chains and cycles- Simple Connectivity -Homology - The General statement of Cauchy's Theorem - Proof of Cauchy's theorem – Locally exact differentials-Multilply connected regions – Residue theorem - The argument principle.
Chapter 4 : Section 4 : 4.1 to 4.7, Section 5: 5.1 and 5.2

UNIT III **12**

EVALUATION OF DEFINITE INTEGRALS AND HARMONIC FUNCTIONS:

Evaluation of definite integrals - Definition of Harmonic functions and basic properties - Mean value property - Poisson formula.

Chapter 4 : Section 5 : 5.3, Section 6 : 6.1 to 6.3

UNIT IV

HARMONIC FUNCTIONS AND POWER SERIES EXPANSIONS: **12**

Schwarz theorem - The reflection principle – Weierstrasstheorem - Taylor Series - Laurent series .

Chapter 4 : Sections 6.4 and 6.5

Chapter 5 : Sections 1.1 to 1.3

UNIT V

PARTIAL FRACTIONS AND ENTIRE FUNCTIONS: **12**

Partial fractions – Infinite products - Canonical products - Gamma Function - Jensen's formula

Chapter 5 : Sections 2.1 to 2.4, Section 3.1

TEXT BOOK:

- 1.Lars V. Ahlfors, Complex Analysis, (3rd edition) McGraw Hill Co., New York, 1979
2. D.Sarason, Notes on complex function Theory, Hindustan Book Agency, 1998

REFERENCE BOOKS :

1. H.A. Priestly, Introduction to Complex Analysis, Clarendon Press,Oxford, 2003.
2. J.B.Conway, Functions of one complex variable, Springer International Edition, 2003
3. T.W Gamelin, Complex Analysis, Springer International Edition, 2004.

		OPERATIONS RESEARCH					L	T	P	C
P18MCMA302	Total Contact Hours – 60	3	1	0	4					
	Prerequisite course –Mathematics/ Mathematics Studied in Higher Secondary Studies									
	Course Coordinator Name & Department:- Mrs. L.Radhika /Mathematics									
COURSE OBJECTIVES:- To learn the methods of appropriate for solving problems. Apply methods to specific problems..										
COURSE OUTCOMES (COs)										
CO1	Gain the basic knowledge in decision theory									
CO2	Understand the concept of network models									
CO3	Todeterministic inventory control models									
CO4	Understanding basic knowledge and solving ability in Queueing theory									
CO5	Evaluate data in replacement and maintenance models									
CO6	Evaluate probabilistic inventory control models									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	3	2	1	1	1	1	1		
	CO2	3	3	1	2	2	3	3		
	CO3	2	2	3	3	3	3	3		
	CO4	3	2	3	3	2	2	2		
	CO5	1	2	2	3	1	1	3		
	CO6	3	3	3	2	3	3	3		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)
					✓					
4	Approval	Academic Council Meeting								

UNIT-I

DECISION THEORY

12

Steps in Decision theory Approach – Types of Decision-Making Environments – Decision Making Under Uncertainty – Decision Making under Risk – Posterior Probabilities and Bayesian Analysis – Decision Tree Analysis – Decision Making with Utilities.

Chapter 10 : Sec. 10.1 to 10.8

UNIT-II

NETWORK MODELS

12

Scope of Network Applications – Network Definition – Minimal spanning tree Algorithm – Shortest Route problem – Maximum flow model – Minimum cost capacitated flow problem - Network representation – Linear Programming formulation – Capacitated Network simplex Algorithm.

Chapter 6 : Sections 6.1 to 6.6

H.A.Taha : Operations Research

UNIT-III

DETERMINISTIC INVENTORY CONTROL MODELS

12

Meaning of Inventory Control – Functional Classification – Advantage of Carrying Inventory – Features of Inventory System – Inventory Model building - Deterministic Inventory Models with no shortage – Deterministic Inventory with Shortages

PROBABILISTIC INVENTORY CONTROL MODELS:

Single Period Probabilistic Models without Setup cost – Single Period Probabilities Model with Setup cost.

Chapter 13: Sec. 13.1 to 13.8

Chapter 14: Sec. 14.1 to 14.3

UNIT-IV

QUEUEING THEORY

12

Essential Features of Queueing System – Operating Characteristic of Queueing System – Probabilistic Distribution in Queueing Systems – Classification of Queueing Models – Solution of Queueing Models – Probability Distribution of Arrivals and Departures – Erlangian Service times Distribution with k-Phases.

Chapter 15 : Sec. 15.1 to 15.8

UNIT-V

REPLACEMENT AND MAINTENANCE MODELS

12

Failure Mechanism of items – Replacement of Items that deteriorate with Time – Replacement of items that fail completely – other Replacement Problems.

Chapter 16: Sec. 16.1 to 16.5

TEXT BOOKS

1. For Unit 2 : H.A. Taha, Operations Research, 6th edition, Prentice Hall of India
2. For all other Units: J.K.Sharma, Operations Research ,MacMillan India, New Delhi, 2001.

REFERENCE BOOKS

1. F.S. Hiller and J.Lieberman -,Introduction to Operations Research (7th Edition), Tata McGraw Hill Publishing Company, New Delhi, 2001.
2. Beightler. C, D.Phillips, B. Wilde ,Foundations of Optimization (2nd Edition) Prentice Hall Pvt Ltd., New York, 1979
3. Bazaraa, M.S; J.J.Jarvis, H.D.Sharall ,Linear Programming and Network flow, John Wiley and sons, New York 1990.
4. Gross, D and C.M.Harris, Fundamentals of Queueing Theory, (3rd Edition), Wiley and Sons, New York, 1998.

		MECHANICS						L	T	P	C
P18MCMA303	Total Contact Hours – 60	3	1	0	4						
	Prerequisite course –Mathematics / Mathematics Studied in Under Graduate										
	Course Coordinator Name & Department:- Mrs. L. Radhika /Mathematics										
COURSE OBJECTIVES:-											
To equip students with adequate knowledge of Mathematics to formulate problems and solve them analytically or numerically Learners will be familiar with basic and identify methods appropriate for solving problems. Apply methods to specific problems.											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in fundamental mechanical systems										
CO2	Evaluate the problems in Lagrange's equations										
CO3	Apply the concepts in Hamilton's equations										
CO4	Analyze the algorithm for its complexity and performance										
CO5	Evaluate Hamilton-Jacobi theory										
CO6	Create an real time application using a suitable analysis.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	1	2	1	1	3			
	CO2	3	3	1	2	2	2	3			
	CO3	3	2	3	1	3	3	2			
	CO4	3	2	3	2	2	2	3			
	CO5	2	2	2	1	1	1	1			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship(PR)	
						✓					
4	Approval	Academic Council Meeting									

UNIT-I

MECHANICAL SYSTEMS

12

The Mechanical system- Generalised coordinates – Constraints - Virtual work - Energy and Momentum Chapter 1 : Sections 1.1 to 1.5

UNIT-II

LAGRANGE'S EQUATIONS

12

Derivation of Lagrange's equations- Examples- Integrals of motion. Chapter 2 : Sections 2.1 to 2.3 (Omit Section 2.4)

UNIT-III

HAMILTON'S EQUATIONS

12

Hamilton's Principle - Hamilton's Equation - Other variational principles. Chapter 4 : Sections 4.1 to 4.3 (Omit section 4.4)

UNIT – IV

HAMILTON-JACOBI THEORY

12

Hamilton Principle function – Hamilton-Jacobi Equation - Separability Chapter 5 : Sections 5.1 to 5.3

UNIT-V

CANONICAL TRANSFORMATION

12

Differential forms and generating functions – Special Transformations– Lagrange and Poisson brackets. Chapter 6 : Sections 6.1, 6.2 and 6.3 (omit sections 6.4, 6.5 and 6.6)

TEXT BOOK

- 1.D. Greenwood, Classical Dynamics, Prentice Hall of India, New Delhi, 1985.
- 2.J.L.Synge and B.A.Griffth, Principles of Mechanics (3rd Edition) McGraw Hill Book Co., New York, 1970.

Reference Books

1. H. Goldstein, Classical Mechanics, (2nd Edition) Narosa Publishing House, New Delhi.
2. N.C.Rane and P.S.C.Joag, Classical Mechanics, Tata McGraw Hill, 1991.

		TENSOR ANALYSIS AND RELATIVITY					L	T	P	C
P18MCMA304	Total Contact Hours – 60	3	1	0	4					
	Prerequisite course –Mathematics / Mathematics Studied in Under Graduate.									
	Course Coordinator Name & Department:- Ms.S.Kavitha/Mathematics									
COURSE OBJECTIVES:-										
Learners will be familiar with basic and algorithm analysis. Learners will understand the applications & able to apply the problem solving techniques using calculus.										
COURSE OUTCOMES (COs)										
CO1	Gain knowledge in Tensor Algebra									
CO2	Understand the concept of algorithmic design in Tensor Calculus									
CO3	Apply problem solving algorithms in Intrinsic Differentiation									
CO4	Analyze the algorithm for Special Theory of Relativity									
CO5	Analyze the algorithms in Relativistic Dynamics									
CO6	Understanding the concepts of Relativistic Kinematics									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	3	3	1	1	1	1	3		
	CO2	3	3	1	2	2	2	3		
	CO3	3	2	3	1	3	3	3		
	CO4	3	2	2	1	1	2	3		
	CO5	2	2	2	1	1	1	3		
	CO6	3	3	3	2	3	3	3		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship(PR)
						✓				
4	Approval	Academic Council Meeting								

UNIT-I

Tensor Algebra

12

Systems of Different orders – Summation Convention – Kronecker Symbols - Transformation of coordinates in S_n - Invariants – Covariant and Contravariant vectors - Tensors of Second Order – Mixed Tensors – Zero Tensor – Tensor Field – Algebra of Tensors – Equality of Tensors – Symmetric and Skew-symmetric tensors - Outer multiplication, Contraction and Inner Multiplication – Quotient Law of Tensors – Reciprocal Tensor – Relative Tensor – Cross Product of Vectors.

Chapter I : I.1 – I.3,I.7 and I.8 and Chapter II : II.1 – II.19

UNIT-II

Tensor Calculus

12

Riemannian Space – Christoffel Symbols and their properties.

Chapter III: III.1 and III.2

UNIT-III

Tensor Calculus(contd)

12

Covariant Differentiation of Tensors – Riemann–Christoffel Curvature Tensor – Intrinsic Differentiation

Chapter III:III.3 – III.5

UNIT-IV

Special Theory of Relativity

12

Galilean Transformations – Maxwell’s equations – The ether Theory – The Principle of Relativity.

Relativistic Kinematics

Lorentz Transformation equations – Events and simultaneity – Example – Einstein Train – Time dilation –

Longitudinal Contraction - Invariant Interval - Proper time and Proper distance - World line - Example

– twin paradox – addition of velocities – Relativistic Doppler effect.

Chapter 7 : Sections 7.1 and 7.2

UNIT-V

Relativistic Dynamics

12

Momentum – Energy – Momentum – energy four vector – Force - Conservation of Energy – Mass and energy – Example – inelastic collision – Principle of equivalence – Lagrangian and Hamiltonian formulations.

Accelerated Systems

Rocket with constant acceleration – example – Rocket with constant thrust.

Chapter 7 : Sections 7.3 and 7.4

TEXT BOOK

1.U.C. De, Absos Ali Shaikh and JoydeepSengupta, Tensor Calculus, Narosa Publishing House, New Delhi, 2004.For Units IV and V

2.D.Greenwood, Classical Dynamics, Prentice Hall of India, New Delhi, 1985.

REFERENCE BOOKS

1. J.L.Synge and A.Schild, Tensor Calculus, Toronto, 1949.
2. A.S.Eddington. The Mathematical Theory of Relativity, Cambridge University Press, 1930.
3. P.G.Bergman, An Introduction to Theory of Relativity, Newyor, 1942.
4. C.E.Weatherburn, Riemannian Geometry and the Tensor Calculus, Cambridge, 19

P18MEMA031		STOCHASTIC PROCESSES						L	T	P	C
		Total Contact Hours – 60						3	1	0	4
		Prerequisite course –Mathematics / Mathematics Studied in Under Graduate									
		Course Coordinator Name & Department:- Ms.S.Kavitha/ Mathematics									
COURSE OBJECTIVES:-											
Learners will be familiar with basic definitions. Learners will understand the basic theorems and its applications .											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in Markov chains										
CO2	Understand the concept of limit theorems of markov chains										
CO3	Understand the concept of continuous time Markov chains										
CO4	Analyze the algorithm for renewal processes.										
CO5	Evaluate the problems in Brownian motion										
CO6	Create an real time application using Birth and Death Process.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	2	2	3	3	3			
	CO2	3	3	1	2	2	1	3			
	CO3	3	2	3	3	3	3	2			
	CO4	3	2	2	3	2	2	2			
	CO5	2	2	2	3	2	1	2			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)	
						✓					
4	Approval	Academic Council Meeting									

UNIT-I

MARKOV CHAINS

Classification of General Stochastic Processes – Markov Chain – Examples – Transition Probability Matrix – Classifications of States – Recurrence – Examples of recurrent Markov Chains.

Chapter 1 : Section 3 only

Chapter 2 : Sections 1 to 6 (Omit section 7)

UNIT-II

LIMIT THEOREMS OF MARKOV CHAINS

12

Discrete renewal equation and its proof – Absorption probabilities – criteria for recurrence – Queueing models – Random walk.

Chapter 3 : Sections 1 to 7

UNIT-III

CONTINUOUS TIME MARKOV CHAINS

12

Poisson Process – Pure Birth Process – Birth and Death Process – Birth and Death process with absorbing states – Finite State Continuous time Markov Chains.

Chapter 1 : Section 2 (Poisson Process)

Chapter 4 : Sections 1,2 and 4 to 7 (Omit sections 3 and 8)

UNIT-IV

RENEWAL PROCESSES:

12

Definition and related concepts – Some special Renewal processes – Renewal equation and Elementary Renewal Theorem and its applications.

Chapter 5 : Sections 1 to 6.

UNIT-V

BROWNIAN MOTION

12

Definition – Joint probabilities for Brownian Motion – Continuity of paths and the maximum variables – Variations and extensions – Computing some functionals of Brownian Motion by Martingale methods.

Chapter 1 : Section 2 (Brownian Motion)

Chapter 6 : Sections 1 to 5 and 7A only (Omit Sections 6, and 7B,C)

TEXT BOOK

1.S.Karlin and H.M.Taylor. A First Course in Stochastic Processes(2nd edition), Academic Press, New York, 1975.

2.H..Taylor and S.Karlin, An Introduction to Stochastic Modeling (3rd Edition), Academic Press, New York, 19982

REFERENCE BOOKS

1. Cinler E., Introduction to Stochastic Processes,Prentice Hall Inc., New Jersey, 1975
2. Cox D.R. &H.D.Miller, Theory of Stochastic Processes (3rdEdn.), Chapman and Hall, London, 1983
3. Kannan D., An Introduction to Stochastic Processes, North Holland, New York 1979
4. Ross S.M., Stochastic Processes, John Wiley and Sons, New ork,1983

P18MEMA032	DATA STRUCTURES AND ALGORITHMS							L	T	P	C
	Total Contact Hours – 60							3	1	0	4
	Prerequisite course –Computer Science / Mathematics Studied in Under Graduate										
	Course Coordinator Name & Department:- Mrs. P .S.Sharmila/ Mathematics										
COURSE OBJECTIVES:-											
Learners will be familiar with basic data structure and algorithm analysis. Learners will understand the applications of data structure & able to apply the problem solving techniques using datastructure.											
COURSE OUTCOMES (COs)											
CO1	Understanding algorithms and elementary data structures										
CO2	Understand the detailed concept of the divide and conquer method										
CO3	Gain knowledge about the Greedy method										
CO4	Analyze the backtracking method.										
CO5	Evaluate the branch-and-bound and np-hard and np-complete problems										
CO6	Create an real time application using data and algorithms.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	1	1	1	1	3			
	CO2	3	3	1	2	2	2	3			
	CO3	3	2	3	1	3	3	3			
	CO4	3	2	2	1	1	2	3			
	CO5	2	2	2	1	1	1	3			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)	
						√					
4	Approval	Academic Council Meeting									

UNIT-I

ALGORITHMS AND ELEMENTARY DATA STRUCTURES

12

Algorithms – Structures programs – Analysis of algorithms – Stacks and Queues – Trees – Heaps and Heapsort – Sets and disjoint set union – Graphs – Hashing.

Chapter 1 : Sections 1.1 to 1.4

Chapter 2 :Sections 2.1 to 2.6

UNIT-II

THE DIVIDE AND CONQUER METHOD**12**

The general method – Binary search – Finding the maximum and minimum – Mergesort – Quicksort – Selection sort – Strassen's matrix multiplication.

Chapter 3 : Sections 3.1 to 3.7

UNIT-III**THE GREEDY METHOD****12**

The General method – Optimal storage on tapes – Knapsack problem – Job Scheduling with deadlines – Optimal merge pattern – Minimum spanning trees – Single source shortest paths.

Chapter 4 : Sections 4.1 to 4.7

UNIT-IV**BACKTRACKING****12**

The general methods – The 8-queens problem - sum of subsets – Graph colouring – Hamiltonian Cycles – Knapsack problem.

Chapter 7 : Section 7.1 to 7.6

UNIT-V :**BRANCH-AND-BOUND AND NP-HARD AND NP-COMPLETE PROBLEMS :****12**

Branch and Bound Method – 0/1 knapsack problem – Traveling salesperson – Efficiency Considerations – Basic concepts of NP-Hard problems – Cook's theorem - NP-Hard graph problems - NP-Hard Scheduling Problems.

Chapter 8 : Sections 8.1 to 8.4

Chapter 11: Sections 11.1 to 11.4 (omit 11.5 and 11.6)

TEXT BOOK

1.E.Horowitz and S.Sahni. Fundamentals of Computer Algorithm, Galgotia Publications New Delhi, 1984

2.A.V.Aho, J.E.Hopcroft, JD Ullman, The Design and Analysis of Computer Algorithms. Addison – Wesley, Reading', MASS. 1974.

REFERENCE BOOKS

1. D.E.Knuth, The Art of Computer Programming, Sorting and Searching. Vol.3. Addison-Wesley, Mass. 1973.

2. A.Nijenhuis and H.S.Wilf, Combinatorial Algorithms, Academic Press. New York 1975.

3. M.Garey and D.Johnson, Computers and Intractability: A Guide to the theory of NP-Completeness. Johnson, Freeman and San Francisco, 1979.

P18MEMA033	ALGEBRAIC THEORY OF NUMBERS							L	T	P	C
	Total Contact Hours – 60							3	1	0	4
	Prerequisite course –Mathematics / Mathematics Studied in Under Graduate										
	Course Coordinator Name & Department:- Ms.S.Kavitha/ Mathematics										
COURSE OBJECTIVES:- Learners will be familiar with basic definitions. Learners will understand the basic theorems and its applications .											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in algebraic background										
CO2	Understand the detailed concept of algebraic numbers										
CO3	Understanding the concepts of quadratic and cyclotomic fields										
CO4	Analyze the algorithm for Euclidean domains										
CO5	Evaluate the problems in ideals										
CO6	Create an real time application using a known theorems.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	2	3	3	1	1	1	3			
	CO2	2	3	1	2	2	3	2			
	CO3	3	1	3	3	3	3	3			
	CO4	2	3	2	2	1	2	2			
	CO5	2	3	2	3	1	1	3			
	CO6	1	3	3	2	3	3	2			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)	
						✓					
4	Approval	Academic Council Meeting									

UNIT-I

ALGEBRAIC BACKGROUND

12

Rings and Fields- Factorization of Polynomials – Field Extensions – Symmetric Polynomials – Modules – Free Abelian Groups.

Chapter 1: Sec. 1.1 to 1.6

UNIT-II :

ALGEBRAIC NUMBERS:

12

Algebraic numbers –Conjugates and Discriminants – Algebraic Integers – Integral Bases – Norms and Traces – Rings of Integers.

Chapters 2: Sec. 2.1 to 2.6

UNIT-III

QUADRATIC AND CYCLOTOMIC FIELDS

12

Quadratic fields and cyclotomic fields

Factorization into Irreducibles:

Trivial factorization – Factorization into irreducibles – Examples of non-unique factorization into irreducibles.

Chapter 3: Sec. 3.1 and 3.2 ; Chapter 4: Sec. 4.1 to 4.4

UNIT-IV

EUCLIDEAN DOMAINS

12

Prime Factorization – Euclidean Domains – Euclidean Quadratic fields - Consequences of unique factorization – The Ramanujan –Nagell Theorem.

Chapter 4: Sec. 4.5 to 4.9

UNIT-V

IDEALS:

12

Prime Factorization of Ideals – The norms of an Ideal – Non-unique Factorization in Cyclotomic Fields..

Chapter 5 : Sec. 5.1 to 5.4

TEXT BOOK

1. Stewart and D.Tall. Algebraic Number Theory and Fermat's Last Theorem (3rd Edition) A.K.Peters Ltd., Natick, Mass. 2002.

2.P.Ribenboim, Algebraic Numbers, Wiley, New York, 1972.

P. Samuel, Algebraic Theory of Numbers, Houghton Mifflin Company, Boston, 1970.

REFERENCE BOOKS

1. Z.I.Borevic and I.R.Safarevic, *Number Theory*, Academic Press, New York, 1966.

2. J.W.S.Cassels and A.Frohlich, *Algebraic Number Theory*, Academic Press, New York, 1967

P18MCMA401	COMPLEX ANALYSIS- II							L	T	P	C
	Total Contact Hours – 60							3	1	0	4
	Prerequisite course –Mathematics / Mathematics Studied in Under Graduate										
	Course Coordinator Name & Department:- Mr.V.Nandakumar/ Mathematics										
COURSE OBJECTIVES:-											
Learners will be familiar with basic definitions. Learners will understand the basic theorems and its applications .											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in Riemann zeta function and normal families										
CO2	Understand the detailed concept of Riemann mapping theorem										
CO3	Gain knowledge about elliptic functions										
CO4	Analyze the algorithm for Weierstrass theory										
CO5	Evaluate the problems in analytic continuation										
CO6	Create an real time application using a known theorems.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	2	1	1	1	1	2			
	CO2	3	3	3	2	2	2	2			
	CO3	3	2	3	1	3	3	3			
	CO4	3	2	2	3	1	2	3			
	CO5	2	2	2	1	3	3	1			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)	
					✓						
4	Approval	Academic Council Meeting									

UNIT-I

RIEMANN ZETA FUNCTION AND NORMAL FAMILIES

12

Product development – Extension of $\zeta(s)$ to the whole plane – The zeros of zeta function – Equicontinuity – Normality and compactness – Arzela’s theorem – Families of analytic functions – The Classical Definition

Chapter 5 : Sections 4.1 to 4.4, Sections 5.1 to 5.5

UNIT-II

RIEMANN MAPPING THEOREM

12

Statement and Proof – Boundary Behaviour – Use of the Reflection Principle. Conformal mappings of

polygons :Behaviour at an angle Schwarz-Christoffel formula – Mapping of a rectangle.Harmonic Functions : Functions with mean value property – Harnack's principle.
Chapter 6 : Sections 1.1 to 1.3 (Omit Section 1.4)Sections 2.1 to 2.3 (Omit section 2.4), Section 3.1 and 3.2

UNIT-III

ELLIPTIC FUNCTIONS

12

Simply periodic functions – Doubly periodic functions
Chapter 7 : Sections 1.1 to 1.3, Sections 2.1 to 2.4

UNIT-IV

WEIERSTRASS THEORY

12

The Weierstrass \wp -function – The functions $\zeta(s)$ and $\sigma(s)$ – The differential equation – The modular equation $\lambda(\tau)$ – The Conformal mapping by $\lambda(\tau)$.
Chapter 7 : Sections 3.1 to 3.5

UNIT-V

ANALYTIC CONTINUATION

12

The Weierstrass Theory – Germs and Sheaves – Sections and Riemann surfaces – Analytic continuation along Arcs – Homotopic curves – The Monodromy Theorem – Branch points.
Chapter 8 : Sections 1.1 to 1.7

TEXT BOOK

- 1.Lars V. Ahlfors, Complex Analysis, (3rd Edition) McGraw Hill Book Company, New York, 1979.
- 2.D.Sarason, Notes on Complex function Theory, Hindustan Book Agency, 1998

REFERENCE BOOKS

- 1.H.A. Priestly, Introduction to Complex Analysis, Clarendon Press,Oxford, 2003.
- 2.J.B.Conway, Functions of one complex variable, Springer International Edition, 2003
- 3.T.WGamelin, Complex Analysis, Springer International Edition, 2004

		DIFFERENTIAL GEOMETRY					L	T	P	C
P18MCMA402	Total Contact Hours – 60	3	1	0	4					
	Prerequisite course –Mathematics / Mathematics Studied in Under Graduate									
	Course Coordinator Name & Department:- Mr.V.Nandakumar /Mathematics									
COURSE OBJECTIVES:-										
Learners will be familiar with basic definitions and algorithm analysis. Learners will understand the applications of algorithms & able to apply the problem solving techniques .										
COURSE OUTCOMES (COs)										
CO1	Gain basic knowledge in curves in the plane and in space									
CO2	Understand the concept of surfaces in space									
CO3	Apply suitable formulae for curvature of surfaces									
CO4	Analyze the algorithm for geodesics									
CO5	Understand the concepts and theorem egregium of gauss									
CO6	Create an real time application using differential equations.									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	1	3	1	1	1	1	1		
	CO2	2	3	1	2	2	2	3		
	CO3	3	2	3	1	3	3	3		
	CO4	3	2	2	2	1	2	2		
	CO5	2	2	2	1	3	1	3		
	CO6	3	3	3	2	3	3	3		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)
4	Approval	Academic Council Meeting								

UNIT I

CURVES IN THE PLANE AND IN SPACE

12

Curves, parametrisation, arc length, level curves, curvature, plane and space curves.
Chapters 1 and 2.

UNIT II

SURFACES IN SPACE

12

Surface patches, smooth surfaces, tangents, normals, orientability, examples of surfaces, lengths of curves on surfaces, the first fundamental form, isometries, surface area.
Chapter 4 - 4.1, 4.2, 4.3, 4.4, 4.7 and Chapter 5 - 5.1, 5.2, 5.4

UNIT III

CURVATURE OF SURFACES

12

The second fundamental form, Curvature of curves on a surface, normal, principal, Gaussian and mean curvatures, Gauss map.

Chapter 6 - 6.1, 6.2, 6.3 and Chapter 7 - 7.1, 7.5, 7.6

UNIT IV

GEODESICS

12

Geodesics, geodesic equations, geodesics as shortest paths, geodesic coordinates.

Chapter 8 - 8.1, 8.2, 8.4, 8.5

UNIT V

THEOREMA EGREGIUM OF GAUSS

12

TheoremaEgregium, isometries of surfaces, Codazzi-Mainardi equations, compact surfaces of constant Gaussian curvature.

Chapter 10

TEXT BOOK

1.A. Pressley, Elementary Differential Geometry, Springer-Indian Edition, 2004.

2.M.P. do Carmo, Differential Geometry of Curves and Surfaces, Prentice-Hall, 1976.

REFERENCE BOOKS :

1. J.A. Thorpe, Elementary Topics in Differential Geometry, Springer-Indian edition.

2. E.D. Bloch, A First Course in Geometric Topology and Differential Geometry, Birkhauser, 1997.

P18MCMA403		FUNCTIONAL ANALYSIS							L	T	P	C
		Total Contact Hours – 60							3	1	0	4
		Prerequisite course –Mathematics / Mathematics Studied in Under Graduate										
		Course Coordinator Name & Department:- Dr.P.Sumathi /Mathematics										
COURSE OBJECTIVES:-												
Learners will be familiar with basic algorithm and analysis. Learners will understand the theorems and its applications												
COURSE OUTCOMES (COs)												
CO1	Gain knowledge in Banach spaces											
CO2	Understand the concept of boundedness principle											
CO3	Understand the concepts of duals and transposes											
CO4	Analyze the concepts of product spaces											
CO5	Gain knowledge about the operators and adjoints											
CO6	Understanding theorems in Spectrum and Numerical range											
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low												
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2		
2	CO1	3	3	3	3	2	1	3				
	CO2	3	3	1	2	2	2	3				
	CO3	3	2	3	1	3	3	2				
	CO4	3	2	2	3	3	2	2				
	CO5	2	2	2	1	1	1	2				
	CO6	3	3	3	2	3	3	3				
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)		
					✓							
4	Approval	Academic Council Meeting										

UNIT I

BANACH SPACES

12

Normed spaces, Continuity of linear maps, Hahn-Banach Theorems, Banach Spaces.
Chapters II (omit sections 6.8, 7.11, 7.12, 8.4)

UNIT II

BOUNDEDNESS PRINCIPLE

12

Uniform boundedness principle, Closed Graph and Open Mapping theorems, Bounded Inverse Theorem, Spectrum of a bounded operator.

Chapter III (omit sections 9.4 to 9.7, 11.2, 11.4, 11.5, 12.6, 12.7)

UNIT III

DUALS AND TRANSPOSES

12

Duals and Transposes, Weak and weak *convergence, Reflexivity Chapter IV (omit sections 13.7, 13.8, 14, 15.5 to 15.7, 16.5 to 16.9)

UNIT IV

PRODUCT SPACES

12

Inner Product Spaces, Orthonormal sets, Best approximation, Projection and RieszRepresentaion theorems.

Chapter VI (omit sections 23.2, 23.4, 23.6, 24.7, 24.8)

UNIT V

OPERATORS AND ADJOINTS

12

Bounded operators and adjoints, Normal, unitary and self adjoint Operators, Spectrum and Numerical range, Compact selfadjoint operators

Chapter VII (omit sections 26.4, 26.5 26.6, 27.4 to 27.7, 28.7, 28.8)

TEXT BOOK

1.B.V. Limaye, Functional Analysis, New Age International, 1996.

2.E. Kreyszig, Introductory Functional Analysis with Applications, John wiley& Sons, New York.,1978.

REFERENCE BOOKS

1. W.Rudin Functional Analysis, Tata McGraw-Hill Publishing Company, New Delhi , 1973

2. G.Bachman&L.Narici, Functional Analysis Academic Press, New York , 1966.

3. C. Goffman and G.Pedrick, First course in Functional Analysis, Prentice Hall of India, New Delhi, 1987

4. M.Thamban Nair, Functional Analysis. A First Course, Prentice Hall of India, New Delhi, 2002

P18MCMA404		NUMBER THEORY AND CRYPTOGRAPHY						L	T	P	C
		Total Contact Hours – 60						3	1	0	4
		Prerequisite course –mathematics / Mathematics Studied in Under Graduate.									
		Course Coordinator Name & Department:- Mrs.P.S.Sharmila/Mathematics									
COURSE OBJECTIVES:-											
Learners will identify methods appropriate for solving problems. Apply methods to specific problems. Learners will know about encryption and decryption method.											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in elementary number theory.										
CO2	Understand the concept of algorithmic design in crypto systems										
CO3	Understand the concept of quadratic residues										
CO4	Analyze the algorithm for its complexity and performance										
CO5	Evaluatethe problems in cryptography										
CO6	Analyze the algorithm for elliptic curve crypto systems.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	1	3	1	2	1	1	3			
	CO2	3	3	3	2	2	2	2			
	CO3	3	2	3	2	3	3	3			
	CO4	3	2	2	1	2	2	2			
	CO5	2	2	2	3	1	1	3			
	CO6	3	3	3	2	3	3	1			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship(PR)	
					✓						
4	Approval	Academic Council Meeting									

UNIT-I

ELEMENTARY NUMBER THEORY

12

Time Estimates for doing arithmetic – divisibility and Euclidean algorithm – Congruences – Application to factoring. (Chapter 1)

UNIT-II

CRYPTO SYSTEMS

12

Introduction to Classical Crypto systems – Some simple crypto systems – Enciphering matrices DES (Chapter 3)

UNIT-III

QUADRATIC RESIDUES

12

Finite Fields, Quadratic Residues and Reciprocity (Chapter 2)

UNIT-IV

CRYPTOGRAPHY

12

Public Key Cryptography (Chapter 4)

UNIT-V

ELLIPTIC CURVE CRYPTO SYSTEMS

12

Primality, Factoring, Elliptic curves and Elliptic curve crypto systems (Chapter 5, sections 1,2,3 &5 (omit section 4), Chapter 6, sections 1& 2 only)

TEXT BOOK

1. Neal Koblitz, A Course in Number Theory and Cryptography, Springer-Verlag, New York, 1987
2. N. Koblitz, Algebraic Aspects of Cryptography, Springer 1998

REFERENCE BOOKS

1. Niven and H.S. Zuckermann, *An Introduction to Theory of Numbers* (Edn. 3), Wiley Eastern Ltd., New Delhi, 1976
2. David M. Burton, Elementary Number Theory, Brown Publishers, Iowa, 1989
3. K. Ireland and M. Rosen, A Classical Introduction to Modern Number Theory, Springer Verlag, 1972

P18PRMA4P1	PROJECT (DISSERTATION AND VIVA-VOCE)							L	T	P	C
	Total Contact Hours – 45							0	0	20	10
	Prerequisite course – Mathematics Studied in Higher Secondary studies										
	Course Coordinator Name & Department: -Mr.V.Nandakumar/Mathematics										
COURSE OBJECTIVES:-											
To make the students understand the importance of experimental and theoretical analysis. Students can develop a Scientific approach in solving a problems related to Mathematics.											
COURSE OUTCOMES (COs)											
CO1	List out the concept and objectives, nature, types and methods of project.										
CO2	Choose the process and steps involved in preparation of project work, research gap										
CO3	Practice the research design, and methodology , sampling techniques & sampling design										
CO4	Calculate the statistical tools in the project for data analysis										
CO5	Measure the major findings, suggestions and conclusion										
CO6	Design the model for project report.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	1	1	1	2	3			
	CO2	3	3	1	1	1	2	3			
	CO3	3	2	1	1	1	2	3			
	CO4	3	2	1	1	1	2	3			
	CO5	2	2	1	1	1	2	3			
	CO6	3	3	1	1	1	2	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship(PR)	
										✓	
4	Approval	Academic Council Meeting									

PROJECT (DISSERTATION AND VIVA-VOCE)

10

The project topics are to be finalized to the students at the end of the second semester with a time schedule to carryout various stages of work. During the semester vocation, the data Collection may be commenced. The theme selected by each student for the Dissertation should be related to various problems and issues pertaining to Computer Application. Each candidate should submit three copies of dissertation as per the guidelines to the department concerned.

Marks

Dissertation	150
Viva- Voce Examination	50

Course Coordinator

HOD

P18OEBA001	ADVERTISING AND SALES MANAGEMENT							L	T	P	C
	Total Contact Hours – 30							2	0	0	2
	Prerequisite course –UG Level										
	Course Coordinator Name & Department:- T Manjiniprakash/BBA										
COURSE OBJECTIVES: -											
<ul style="list-style-type: none"> Identify the terms and concepts that are commonly used in promotion and advertising. Demonstrate preparation to comprehend the basic advertising. Give the relationship which underlines these terms and concepts To familiarize the students with the basic fundamentals of accounting. To impart knowledge on final accounts of sole trading concern. To enable the students on the concept of income & expenditure and receipts and payments. 											
COURSE OUTCOMES (COs)											
CO1	Students gain basic knowledge of Advertising its functions, roles and development of advertising.										
CO2	Know about Advertising design and its strategies.										
CO3	Expose on Advertising, media and about its types.										
CO4	To forecast sales and its techniques used in management.										
CO5	Students were enriched about salesmanship, sales planning, budgeting.										
CO6	Develop an advertising plan and present and defend it persuasively.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	1	1	2	2	2	3	3			
	CO2	1	1	2	2	2	2	3			
	CO3	1	1	2	2	2	3	3			
	CO4	1	1	2	2	3s	3	3			
	CO5	1	1	2	3	2	2	3			
	CO6	1	1	2	2	2	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship (PR)	
							✓				
4	Approval	Academic Council Meeting									

Introduction to Advertising- Definition -Roles of Advertising- Functions of Advertising-Steps in Development of Advertisement

Unit – II 6

Advertising Design- Appeals- Structure of an Advertisement - Message Strategies - Cognitive strategy- Executorial Strategies-Creating Advertising- Advertising Effectiveness.

Unit – III 6

Advertising Media - Merit and demerits- Kinds of Advertising - Advertising Media- print media - Broadcasting media- Non-media advertising- online advertising.

Unit - IV 6

Sales Management - Defining - Objectives -Strategies- Sales Executives – Functions -Qualities - Sales Presentation Techniques - Emerging Trends in Sales Management.

Unit - V 6

Selling Concept - Objectives- scope and techniques of Salesmanship- Sales Planning- Importance – process- Sales Budget- Objectives-uses of sales Budget.

Text book

1. Advertising & promotion: George E.Belch, THM
2. Advertising Management, Dr. Varma&Aggarwal, kingBooks

References:

1. Sales promotion and advertising management by M .N.Mishra. Himalaya Publication.
2. Advertising and sales management by SanjeevChauhan (Astha publication)
3. Anderson, Hair, Bush: Professional Sales Management, McGraw Hill, Singapore.

T Manjiniprakash

Course Coordinator

HOD

	BPO MANAGEMENT	L	T	P	C
P18OEBA002	Total Contact Hours – 30	2	0	0	2

		Prerequisite course – UG Level								
		Course Coordinator Name & Department:- .P.Srinivasan/ Business Administration								
COURSE OBJECTIVES: -										
<ul style="list-style-type: none"> To familiarize the students with the basic fundamentals of BPO industry To impart knowledge on BPO industry To enable the students on the concept of various decisions in Business Process Outsourcing 										
COURSE OUTCOMES (COs)										
CO1	Develop a strategic understanding of the concepts of BPO's and its benefits									
CO2	Explaining various models used in functioning of BPO's and Trends.									
CO3	Describe the opportunities and challenges in Human Resources BPO									
CO4	Analyzes about call centers its functions, processes and classifications									
CO5	Developing efficiency in understanding the customers and capabilities in handling calls.									
CO6	To understand the future trends in BPO industry									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
	CO1	3	2	1	2	2	1	2	PSO1	PSO2
	CO2	3	1	2	1	3	2	1		
	CO3	3	2	1	2	2	1	2		
	CO4	2	3	2	1	2	1	3		
	CO5	2	2	1	2	1	3	2		
	CO6	1	2	2	3	1	2	1		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Enngsciences(ES)	Professional	Professional Core (PC)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)
							✓			
4	Approval	Academic Council Meeting								

	CALL CENTER MANAGEMENT-Voice and Non Voice	L	T	P	C
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UNIT-II

6

Healthcare BPO – Structure of the American Healthcare Sector – Activity Profile –Future Trends and Threats – Case Study – Cbay Systems.

UNIT - III

6

Human Resource BPO – Reasons for outsourcing HR – Activities involved in HR BPO – HR Outsourcing Trends – Career in HR BPO – Emerging BPO Domains – Media and Entertainment BPO – Publishing BPO.

UNIT – IV

6

Call Centres – Functions – Processes – classifications – Telemarketing – Tele selling – Preparing for a Job – Approach – Training – Selection Process.

UNIT – V

6

Improving Efficiency – Handling Calls – Team Player – Pleasing the Customers – Converse efficiently – Reducing stress.

TEXT BOOKS:

- 1.BPO Industry in India by S K Awasthi by Jain Book
- 2.Business Process Outsourcing: Its Prospects and Challenges by Barua.

REFERENCE BOOKS

- i) SudhindraMokhasi(2009) ,BPO – Sutra : True stories from India’s BPO and call centres, -Rupa& Co.
- ii) Kulkarni, Sarika.(2005), Business process outsourcing – Delhi, Jaico Publishing House.
- iii) Shikapur, Deepak(2004), BPO Digest. Ameya Inspiring Books.

Mr.P.Srinivasan

CourseCoordinator

HOD

Total Contact Hours –30		2	0	0	2					
Prerequisite course – UG Level										
Course Coordinator Name & Department:-A.Jhony / BBA										
COURSE OBJECTIVES:-										
<ul style="list-style-type: none"> • Develop and motivate a call centre team. • Get the most out of call monitoring technology and prepare effective management reports. • React to and plan for operational bottlenecks. • Give meaningful feedback to call-centre agents and set achievable goals and targets. • Students will learn about the roles and methods of different kinds of call centers. They will apply this by designing their own call center and trying to anticipate customer needs. 										
COURSE OUTCOMES (COs)										
CO1	Gaining a basic knowledge about call centers its functioning and classifications.									
CO2	To know about handling the Issues and problems related to calls in a efficient manner.									
CO3	Gives knowledge of technical communications, speech process and educate conversation of oral skills.									
CO4	Students acquire knowledge towards pre-interview about Interview questions and answering techniques									
CO5	Analyses fully about the medias of communications.									
CO6	Demonstrate awareness of the pragmatics of call center planning and operation									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
	CO1	1	3	3	1	1	1	3		
	CO2	1	3	3	2	2	1	3		
	CO3	1	3	3	2	1	1	3		
	CO4	1	3	2	2	1	1	3		
	CO5	1	3	2	1	1	1	3		
	CO6	1	3	3	2	1	1	3		
	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professiona I Core	Core Elective	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)
							✓			
4	Approval	Academic Council Meeting								

UNIT – I

6

Call centers – Meaning – Functions – Processes - Classifications – Tele selling – Types of call centers.

UNIT – II

6

Improving Efficiency – Handling calls – Team Players – Components and working of call center – Issues and problems.

UNIT – III **6**

Nature of Technical communication: Stages of communication – Nature of Technical Communication - The speech process – Conversation and Oral skills.

UNIT – IV **6**

Job Interview: Pre – Interview preparation techniques – Interview questions – Answering Strategies – Frequently asked Interview questions.

UNIT – V **6**

Communication media – Telephone – Fax – Internet – Email – Video conferencing.

TEXT BOOKS

1. Brad Cleveland - Call Center Management on Fast Forward: Succeeding in the New Era of Customer Relationships (3rd Edition) Third Edition,
2. Mr. Thomas Anthony Laird - Advice from a Call Center Geek: Rethinking Call Center Operations,

REFERENCE BOOKS

1. W. Stallings “Data and Computer Communication” Pearson Education, 5 Edition, 2001.
2. M. AshrajRizvi,” Effective Technical Communication”, Tata McGraw – Hill Education, 2005.
3. R.S.N.Pillai&Bagavathi – Modern commercial correspondence.

A.Jhoney

Course Coordinator

HOD

P18OEBA004	CUSTOMER RELATIONSHIP MANAGEMENT	L	T	P	C
	Total Contact Hours – 30	2	0	0	2
	Prerequisite course – UG Level				
	Course Coordinator Name & Department:- Dr.DArun Kumar /BBA				

COURSE OBJECTIVES: -										
<ul style="list-style-type: none"> To Popularize the students with the basic fundamentals of CRM. To improve knowledge & skills on Customer relationship of Marketing strategy. To develop the students on the concept of Customer service. 										
COURSE OUTCOMES (COs)										
CO1	To popularize with the basic of CRM.									
CO2	Can increase awareness about Customer relationship.									
CO3	Able to be aware of the concept of Customer service.									
CO4	Can respond to the concept of Customer needs.									
CO5	Develop confidence in the practical aspects of Customer Satisfaction									
CO6	Identify the main Customer Expectations.									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	1	1	1	1	1	1	3		
	CO2	1	1	1	2	2	2	3		
	CO3	1	1	3	1	3	1	3		
	CO4	1	1	2	1	1	2	3		
	CO5	1	1	2	1	1	1	3		
	CO6	1	1	3	2	3	3	3		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship(PR)
							✓			
4	Approval	Academic Council Meeting								

UNIT – I

6

CRM – Introduction – Definition – Need for CRM – Customer satisfaction – Customer loyalty – Product Marketing – Direct Marketing-

UNIT – II

6

Customer learning relationship – Key stages of CRM - Force driving CRM – Benefits of CRM – Growth of CRM Market in India – Key principles of CRM.

UNIT - **III**

6

CRM – Program – Ground work for effective use of CRM – Components of CRM – Types of CRM.

UNIT - **IV**

6

CRM Process - Frame work – Governance process- Performance evaluation process.

UNIT – V **6**

Use of Technology in CRM – Call center process – CRM Technology tools – Implementation – Requirements analysis – selection of CRM Package – reasons and failure of CRM.

TEXT BOOK

1. Kristin Anderson & Carol Kerr – Customer Relationship Management – McGrawHill 2002
2. Sheth – Customer Relationship Management – McGraw Hill Edition 1st Edition 2000

REFERENCE BOOK

1. Dr. P .Sheela Rani – Customer Relationship Management – Margham Publication.
2. K. Balasubramaniam – Customer Relationship Management – GIGO Publication, 2005.
3. Dr. Ravi Kalakota E – business – Road map for success, Pearson education Asia, 2000.

Dr.D.ArunKumar

CourseCoordinator

HOD

	ENTREPRENEUR DEVELOPMENT	L	T	P	C
	Total Contact Hours – 30	2	0	0	2

P18OEBA005		Prerequisite course – UG Level								
		Course Coordinator Name & Department:- Dr.DArun Kumar /BBA								
COURSE OBJECTIVES: -										
<ul style="list-style-type: none"> To make publicity on the students with the basic fundamentals of Entrepreneur Development To improve knowledge & skills on Entrepreneurship. To develop the students on the concept of Entrepreneurial skills. 										
COURSE OUTCOMES (COs)										
CO1	To popularize with the basics of Entrepreneur development.									
CO2	Can increase awareness about Entrepreneurship.									
CO3	Able to be aware of the concept of Entrepreneurial skills.									
CO4	Can respond to the concept of Entrepreneurial knowledge.									
CO5	Develop confidence in the practical aspects of Business Opportunity.									
CO6	Identify the main Innovations in Entrepreneurial Development.									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	1	1	1	1	1	1	3		
	CO2	1	1	1	2	2	2	3		
	CO3	1	1	3	1	3	1	3		
	CO4	1	1	2	1	1	2	3		
	CO5	1	1	2	1	1	1	3		
	CO6	1	1	3	2	3	3	3		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship(PR)
							✓			
4	Approval	Academic Council Meeting								

UNIT – I

6

Introduction to Entrepreneurship: Meaning and concept of entrepreneurship - the history of entrepreneurship development - role of entrepreneurship in economic development

UNIT – II

6

The Entrepreneur: Meaning of entrepreneur - the skills required to be an entrepreneur, and role models, mentors and support system.

UNIT

–

III

6

Business Opportunity Identification: Business ideas, methods of generating ideas - legal form of new venture, protection of intellectual property -marketing the new venture.

UNIT – IV

6

Preparing a Business Plan: Meaning - significance of a business plan - components -feasibility study.

UNIT – V

6

Financing the New Venture: Importance - types of ownership securities - venture capital - types of debt securities -determining ideal debt-equity mix - financial institutions and banks.

TEXT BOOK

1. Robert D. Hisrich, Mathew J Manimala, Michael P Peters, Dean A Shepherd, “Entrepreneurship”, 9e,McGraw Hill Education, 2014.
2. Peter F. Drucker, “Innovation and Entrepreneurship”,Harper Collins, 2009.

REFERENCE BOOK

1. John Bessant, Joe Tidd, “Innovation and Entrepreneurship”,2e,Wiley India Private Limited, 2012.
2. Robin Lowe, Sue Marriott,"Enterprise: Entrepreneurship and Innovation: Concepts,Contexts and Commercialization"1e,Routledge, 2012.
3. VeeraBhadrapaHavinal – Management Entrepreneurship – New Age International Publishers.

Dr.D.ArunKumar

CourseCoordinator**HOD**

	ADVANCE HUMAN RESOURCE MANAGEMENT	L	T	P	C
	Total Contact Hours – 30	2	0	0	2

P18OEBA006	Prerequisite course – UG Level									
	Course Coordinator Name & Department:- P.Srinivasan / BBA									
COURSE OBJECTIVES:-										
<ul style="list-style-type: none"> • Today's competitive business environment owes its success to effective management of its human resource. • The quality of the organization's employees, their attitude, behavior and satisfaction with their jobs, and their behavior towards ethics and values and a sense of fair treatment all impact the firm's productivity, level of customer service, reputation, and survival. • The students of human resources management must aware of basic aspects of human resource management to understand the functioning of human resource management in an organizational setting. • Students gained knowledge in the present day human resources development practice by incorporate themselves in the changing environment of HRM. 										
COURSE OUTCOMES (COs)										
CO1	Identify how firms gain a sustainable competitive advantages through people									
CO2	To be aware of the responsibility managers of have concerning human resource management									
CO3	Identify the importance of change management.									
CO4	To implement basics compensation and performance appraisal									
CO5	Importance of labour welfare and grievance handling for employment									
CO6	Understand the importance of Employee participation and Relations.									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	1	3	3	1	2	1	3		
	CO2	1	2	3	2	1	2	3		
	CO3	1	2	3	2	2	3	3		
	CO4	1	3	2	1	1	3	3		
	CO5	1	2	3	2	2	1	3		
	CO6	1	2	2	2	3	2	3		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship(PR)
							✓			
4	Approval	Academic Council Meeting								

UNIT – I

6

Human Resource Function- Human Resource Philosophy – Changing environments of HRM – Strategic human resource management – Role of HR Managers.

UNIT – II**6**

Recruitment & Placement: Sources, Developing and using application forms - IT and online recruitment - Selection process, basic testing concepts - types of test - work samples & simulation - selection techniques – interview - Designing & conducting the effective interview - computer aided interview.

UNIT – III**6**

Training & Development: Employee Orientation- Training process- Need analysis- Training techniques- special purpose training- Performance appraisal: Methods - Problem and solutions - MBO approach - Performance appraisal in practice.

UNIT – IV**6**

Basic Compensation & Pay plans - factors determining pay rate - Current trends in compensation - Computerized job evaluation - financial incentives - benefits - Insurance benefits - retirement benefits – welfare measure

UNIT – V**6**

Trade unions - Discipline administration - grievances handling - Labour Welfare: Importance & Implications of labour legislations - Employee health.

TEXT BOOKS

1. Dr. R.Venkatapathy&AssissiMenacheri, Industrial Relations &Labour Welfare, Adithya Publications, CBE, 2001. 5. Robert L.Gibson and Marianne H.Mitchell, Introduction to Counseling and Guidance, VI edition, PHI, 2005
- 2.
3. L.M. Prasad – Human Resource Management – S. Chand & Sons – 2007.

REFERENCEBOOKS

1. Gary Dessler, "
2. zo& Stephen P.Robbins, Personnel/Human Resource Management, Third edition, PHI/Pearson.
3. VSP Rao, Human Resource Management: Text and cases, First edition, Excel Books, New Delhi - 2000.
4. P.SrinivasanHuman Resource Management", Seventh edition, Prentice-Hall of India P.Ltd., Pearson.

David A. DeCen

D.K.SOWMIYALAKSHMI

Course Coordinator**HOD**

P18OEBA007	LOGISTICS & SUPPLY CHAIN MANAGEMENT	L	T	P	C
	Total Contact Hours – 30	2	0	0	2

Prerequisite course: UG Level

Course Coordinator Name & Department:- T.Manjiniprakash / BBA

COURSE OBJECTIVES:-

- To make the students to understand the usefulness of logistics and supply chain.
- This document lists the course’s major subject areas and the knowledge, comprehension, application, analysis, synthesis and evaluation skills that they are designed to impart.
- Identify the sources of cost in a supply chain.
- Define inventory and types of inventory in a supply chain.
- Define transportation cost and identify the factors that contribute to this cost.
- Calculate inventory cost and transportation cost for a logistics problem.
- Define fixed and variable cost.
- Understand the economies of scale in transportation and inventory cost

• **COURSE OUTCOMES (COs)**

CO1	Identify and Analyze Business Models, Business Strategies and corresponding Competitive Advantage.
CO2	Formulate and implement Warehouse Best Practices and Strategies.
CO3	Plan Warehouse and Logistics operations for optimum utilization of resources
CO4	Apply logistics and purchasing concepts to improve supply chain operations
CO5	Apply quality management tools for process improvement
CO6	Create an ideas about logistics and supply chain management

Mapping of Course Outcomes with Program outcomes (POs)
(1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low

1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
2	CO1	1	1	2	1	1	1	3	1	2
	CO2	1	2	3	3	2	3	3		
	CO3	1	1	3	3	3	3	3		
	CO4	1	1	2	3	1	2	3		
	CO5	1	2	2	1	1	1	3		
	CO6	1	1	3	2	3	3	3		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core	Core Elective	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship(PR)
							✓			
4	Approval	Academic Council Meeting								

UNIT

-I

Logistics management and Supply Chain management - Definition, Evolution, Importance. The concepts of logistics. Logistics relationships - Functional applications - Logistics Organization - Logistics in different industries.

UNIT

-II

6

Logistics Activities: – objectives, solution. Customer Service, Warehousing and Material Storage, Material Handling, information handling and procurement Transportation and Packaging - Reverse Logistics - Global Logistics

UNIT-III

6

Fundamentals of Supply Chain - Development of SCM - Strategic Supply Chain Management and Key components - Drivers of Supply Chain Performance – key decision areas – External Drivers of Change.

UNIT-IV

6

Supply Chain Drivers and Design Drivers of supply chain performance: Framework for structuring Facilities warehouse – Inventory – Transportation – Information - Sourcing, and Pricing – Revenue management.

UNIT-V

6

Demand and Inventory Aggregate Planning in a Supply Chain: role - strategies Implementation Responding to predictable variability in supply chain – Types of supply chains - creating responsive supply chains lean

TEXT BOOKS

1. Supply Chain Management: Ronald H. Ballou, Samir K. Srivastava, Pearson Education Ltd, Jan 2007.
2. Supply Chain Management: Anil Sinha, McGraw Hill Education, August 2011.

REFERENCE BOOKS

1. Logistics And Supply Chain Management: Martin Christopher, Pearson Education Ltd, 2016.

- Supply Chain Management: Sunil Chopra, Peter Meindl, Dharma Virus Kalra, Pearson Education Ltd, 2016.
- Supply Chain And Logistics Management: V. Anandaraj, S. Kumaran, IshankaSaikira, Airwalk Publication, Jan 2018.

T.Manjiniprakash.
Course Coordinator

HOD

		OFFICE MANAGEMENT						L	T	P	C
P18OEBA008		Total Contact Hours – 30						2	0	0	2
		Prerequisite course – UG Level									
		Course Coordinator Name & Department:- D.K.Sowmiyalakshmi /BBA									
COURSE OBJECTIVES: -											
<ul style="list-style-type: none"> To familiarize the students with the basic fundamentals of accounting. To impart knowledge on final accounts of sole trading concern. To enable the students on the concept of income & expenditure and receipts and payments. 											
COURSE OUTCOMES (COs)											
CO1	To make them understand office management and duties of an office manager										
CO2	To give an idea about proper filing and indexing of office documents										
CO3	To understand the principles of record management and different types of records in business organization.										
CO4	To enable them to aware about safety hazardous and steps to improve office safety.										
CO5	To introduce different measures of office work										
CO6	Create an ideas about office management										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO 2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	1	1	1	1	2	1	3			
	CO2	1	1	1	2	2	2	3			
	CO3	1	1	3	1	3	1	3			
	CO4	1	1	2	1	1	2	3			
	CO5	1	1	2	1	3	1	3			
	CO6	1	1	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship(PR)	
								✓			

4	Approval	Academic Council Meeting
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UNIT -I 6

Introduction: Meaning, functions and importance of office management; office management and organization. Principles of office management and organization. Principal departments of modern office.

UNIT-II 6

Office Manager: qualities of office manager. The authorities and responsibilities of an office manager. Office accommodation: Selection of site. Office layout. Environment and working conditions.

UNIT-III 6

Office equipment's - Reproduction equipment - Typewriter - Duplicators - Photo Copier - Communication Equipment - Intercom - Telephone - Use of Computers in Office Management Office System - Procedure - Routine - And methods - Paper work in office Filling functions.

UNIT-IV 6

Office Communication: Various means of communication- Their use, Correspondence through Internet - Office Correspondence -Central vs. Departmental Correspondence - Handling Mail - Postal Services - Oral written - Internal and external communication - Records Management Types - Forms Controls - Principles - Foremost -Continuous stationery

UNIT-V 6

Office Supervisor - Meaning and characteristics of Supervisor - Status - Place and Role of Supervisor - Effective Supervisor - Qualification - skill of Supervisor.

TEXT BOOKS

1. Modern Office Management: N. D Sharma, And Publishers, Jan 2006.
2. Office Management: Prashansa K. Ghosh, S. Chand & Sons, Jan 2010

REFERENCE BOOKS

1. Office Management: R.S.N Pillai&Bhagavathi, S. Chandler & Come, Dec 2010.
2. Office Management: R. Nangia, G. K Gupta, Crescent Publishing House.
3. Office Management: Dr. R. K Chopra, PriyankaGauri, Himalaya Publishing House, Jan 2017.
4. Of Non-Trading Organization-Receipts And Payment Account- Income And Expenditure Account

P18OEVC001	PHOTOGRAPHY AND VIDEOGRAPHY							L	T	P	C
	Total Contact Hours – 45							2	0	0	2
	Prerequisite – UG Level										
	Course Coordinator Name & Department:- L.Rakesh – Dept of Visual Communication										
COURSE OBJECTIVES											
<ul style="list-style-type: none"> To understand the fundamentals of Photography and Videography To examine the technical factors of indoor and outdoor photography and Videography To enable the students to equip themselves to become a photography and Videography professionals. 											
COURSE OUTCOMES (COs)											
CO1	Can analyze the fundamentals of Photography and Videography										
CO2	Understanding of the camera operations										
CO3	Evaluating the lighting										
CO4	Can be aware of the wrong exposures										
CO5	Can promote various types of photography and Videography										
CO6	Understanding the concept of photo-journalism										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	
2	CO1	3	3	3	3	3	3	3			
	CO2	1	3	2	1	2	2	1			
	CO3	2	1	3	1	2	1	3			
	CO4	2	2	3	1	2	3	1			
	CO5	2	1	1	1	1	1	1			
	CO6	3	3	3	3	3	3	3			
3	Category	Humanities & Social Studies	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective	Open Elective (OE)	Any other		
					✓						
4	Approval	Academic Council Meeting									

Human Eye and Camera. Basics of Camera (aperture, shutter speed, focal length, f-stop, depth of field etc.) Camera operations, Introduction to Television Production, Types of telecasting, Television Crew, an overview of direction.

UNIT-II:

6

Types of Still and video cameras. Types of Lenses. Visual Perception, Art direction, floor management-indoor & outdoor, production management, budget preparation. Locations: In-door, set, on-sights sets, - Outdoor on-sight sets, blue matte. Etc.,

UNIT-III:

6

Understanding lighting-indoor and outdoor, Exposing and Focusing, Types of lighting, Natural and Artificial Lights, Controlling lights, Exposure Meters. Camera techniques & operation, Framing, shots & movements (wide, medium, close ups, shadow, zoom, pan, tilt, aerial etc.),

UNIT-IV:

6

Photography for advertising-Consumer and industrial. Usage of various types of camera lenses (Normal, Tele, Zoom etc.), usages of various filters (day ,night, colour correcting filter, diffusion filter), objectives TV lighting, various types of Lights (baby, Junior, Senior, etc.,)

UNIT- V:

6

Basics of photo-journalism, Photo-features, Photo - essays, Writing captions, Visual story telling. Planning a shoot-studio, location, set props and casting. Colour temperature, lighting for different situations (interviews, indoor, out-door), types of lighting(Back, Front, full, semi, etc.,)

TEXT BOOKS:

- 1.The Art of Photography: A Personal Approach to Artistic Expression, Barnbaum, Bruce, Rocky Nook
- 2.Photography Demystified: Your Guide to Gaining Creative Control, David McKay, Photography Inc.
3. Television Productions: A History of All Series and Pilots, by [Jon Abbott](#), Publisher: McFarland & Company (May 13, 2009)
- 4.Production Management for TV and Film: The Professional's Guide, Methuen Drama (August 1, 2010)

REFERENCE BOOKS:

- 1.The Photographer's Eye,Szarkowski, John, The Museum of Modern Art, New York (Publisher)
- 2.Creative Composition: Digital Photography Tips and Techniques, Davis, Harold, Wiley
- 3.From Concept to Screen: An Overview of Film and Television Production, Robert Benedetti, Pearson; 1 edition (June 11, 2001)
- 4.The Television Handbook, Routledge, Holland, P (1998)

Sub. code :	Subject name : SOFT SKILLS					L	T	P	C	
	Total Contact Hours – 30					2	0	0	2	
P18OEEN001	Prerequisite – UG Level									
Course coordinator name : Mrs.B.CAROLINE– Dept of English										
COURSE OBJECTIVES:- To impart students with the efficient knowledge of important events in through soft skills										
COURSE OUTCOMES (COs)										
CO1	Remember the personal as well as professionals goals of the students									
CO2	Understand the manners during professional meetings									
CO3	Apply the confidence and fluency in speaking English.									
CO4	Analyze the learners to fine-tune their linguistic skill with communication globally									
CO5	Evaluate the excellence in both personal and professional life									
CO6	Create the performance of learners at placement interviews and other recruitment procedures.									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	3	3	3	3	3	3	3		
	CO2	3	3	3	3	3	3	3		
	CO3	2	3	3	2	3	2	3		
	CO4	2	2	2	2	2	2	2		
	CO5	2	2	2	2	2	2	2		
	CO6	2	3	3	2	2	2	2		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship (PR)
								✓		
4	Approval	Academic Council Meeting								

UNIT I- LISTENING / VIEWING

6

Listening and note-taking – Listening to telephonic conversations – Ted talks – Inspiring Speeches – Watching documentaries on personalities, places, socio-cultural events, TV news programmes and discussions to answer different kinds questions, viz., identifying key idea and comprehension questions... so on.

UNIT II- SPEAKING**6**

Elements of presentation skills-Structure of presentation-presentation tools- mock interviews – group discussion – introducing one self and others – welcome address and proposing a vote of thanks- role play – debating.

UNIT III - READING**6**

Different genres of text (literature, media, technical) for comprehension – Reading strategies like note-making – reading graphs, charts and graphic organizer – Sequencing sentences – reading online sources like e-books, e-journals and e-newspapers.

UNIT IV - WRITING**6**

Resume/Report preparation/Letter Writing-Structuring the resume-comprehension- Describing charts and tables – writing for media on current events.

UNIT V- PROJECT**6**

Gender injustice: Dowry-Violence against women -Sexual Harassment -Eve teasing-Female infanticide-Prostitution. **Social problem:** Poverty-unemployment-Child Labour-Terrorism-Drug abuse-Alcoholism-Corruption. **Industrial problem:** Work and Labour organization-Elements-Principles-Staff and Functional Activities. **Industrial Conflict:** Strikes-Disputes-Grievances-Industrial development in India-Steps in Automation process-Industrial policy-Liberation.

Text books

- 1 .Rizvi ashraf ,Effective Technical Communication , Tata amcgraw Hill Education Private Ltd,New Delhi,2011.
2. Townsend Roz , Presentation skills for the upwardly mobile , Emerald Publishers .

Reference

1. T.M.Farhathullah, communication skills for Technical students, Orient Longman Ltd,2002.
2. Andree J Rutherford, Basic communication skills for Technology, Pearson Education,Asia (Singapore) Pte.Ltd, Banglore , 2001.

Course Coordinator**HOD**

Sub. code : P18OEEN002	Sub name: MASS MEDIA AND COMMUNICATION						L	T	P	C
	Total Contact Hours – 30						2	0	0	2
	Prerequisite – UG Level									
	Course coordinator :- Dr.P.AROCKIA NATHAN Dept of English									
COURSE OBJECTIVES : To impart students with the efficient knowledge of important events in through literature										
COURSE OUTCOMES (COs)										
CO1	Remember the art of writing, report and editing									
CO2	Understand the skills of writing									
CO3	Apply the Role & importance in social change									
CO4	Analyze the social structure of Indian society									
CO5	Evaluate the growth & development of communication and media									
CO6	Create the interpreting the meaning from the text									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	3	3	3	3	3	3	3		
	CO2	3	3	3	3	3	3	3		
	CO3	2	3	3	2	3	2	3		
	CO4	2	2	2	2	2	2	2		
	CO5	2	2	2	2	2	2	2		
	CO6	2	3	3	2	2	2	2		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship (PR)
								√		
4	Approval	Academic Council Meeting								

Communication & Media: Definition, meaning and concept.
Different types of communication: verbal and written
Scope and Process of Mass Media & Communication

UNIT II -History of Mass media	6
History of the development of electric media in India: Radio & TV Role of media in society, Impact of media on audience, Media effects, limitations and different form of media.	
UNIT- III- Role & Responsibilities	6
Role and responsibilities of journalist, ethics, careers, Media management, Media laws in India, and freedom of press Qualities and Responsibilities of a reporter	
UNIT IV -Theories & Principles	6
Theories and Principles of Editing Communication and theories of social change, Role of media in social change, Development communication	
UNIT V-Technology & Development	6
Changing trends of mass communication under the process of globalization Technology in the development of media.	

Text Books

1. Vivian, John, Mass Media & communication Boston, Massachusetts : Pearson Allyn and Bacon, c.2008.
2. Stovall, James Glen, Writing for the mass media, New Jersey : Pearson Education, Inc., c.2012

Reference Books:

1. Parthasarathy, Rangaswami, journalism in India, sterling Publisher pvt. Ltd. New Delhi.
2. D.S. Mehta. Mass communication and Journalism in India New Delhi, Allied Publishers, 2011

Course Coordinator

HOD

	COMPUTER APPLICATIONS	L	T	P	C
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P18OESC001	Total Contact Hours – 30						2	0	0	2
	Prerequisite course – UG Level									
	Course Coordinator Name & Department:- Dr. S.Thiru Nirai Senthil / BCA									
COURSE OBJECTIVES:-										
Learners will be familiar with basic of computer application. Learners will understand the applications of computer & able to know about the operating systems.										
COURSE OUTCOMES (COs)										
CO1	Gain knowledge in fundamental computer applications									
CO2	Understand the concept of input device functions									
CO3	Identify the suitable input devices for application									
CO4	Analyze the input and output devices and its processes									
CO5	Evaluate data and storage devices for application									
CO6	Create an real time application using a system software and application software									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	3	3	1	1	1	1	3		
	CO2	3	3	1	2	2	2	3		
	CO3	3	2	3	1	3	3	3		
	CO4	3	2	2	1	1	2	3		
	CO5	2	2	2	1	1	1	3		
	CO6	3	3	3	2	3	3	3		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship (PR)
								✓		
4	Approval	Academic Council Meeting								

UNIT I

6

Brief History of Development of Computers ,Computer System Concept, Computer System Characteristics ,Capabilities and Limitations, Types of Computers-Personal Computer (PCs) - IBM PCs, Types of PCs- Desktop, Laptop, Notebook, Palmtop, etc. Basic Components of a Computer

System - Control Unit, ALU, Input/ Output Unit- Memory, Storage Fundamentals - Primary Vs Secondary memory.

UNIT II

6

Input Devices : Keyboard, Mouse, Joystick, Scanners, Digital Camera, MICR,OCR, OMR, ,Light pen, Touch Screen.

UNIT III

6

Output Devices: Monitors - Characteristics and types of monitor, Size, Resolution, Refresh Rate, Dot Pitch, Video Standard - VGA, SVGA, XGA etc. Printers - Daisy wheel, Dot Matrix, Inkjet, Laser. Plotter, Sound Card and Speakers.

UNIT IV

6

Various Storage Devices - Magnetic Disks, Hard Disk Drives, Floppy, Disks, Optical Disks.

UNIT V

6

Computer Software, Need, Types of Software - System software, Application software System Software - Operating System, Compiler , Assemblers, Interpreter.

TEXT BOOKS:

1. S.K. Basandra, "Computers Today", Galgotia Publications,2010.
2. Alexis Leon & Mathews Leon, "Fundamentals of Information Technology", Vikas Publishing House, New Delhi,2009.

REFERENCE BOOKS:

1. Rajeev Mathur, "Dos Quick Reference", Galgotia Publications.

Course Coordinator

HOD

P18OESC002	MULTIMEDIA							L	T	P	C
	Total Contact Hours – 30							2	0	0	2
	Prerequisite course – UG Level										
	Course Coordinator Name & Department:- Dr. S.Thiru Nirai Senthil / BCA										
COURSE OBJECTIVES:- To Understand the basic multimedia concepts and designing concepts.											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in basic concepts of multimedia										
CO2	Analyze the multimedia application problems.										
CO3	Understand the Video capturing, Sound capturing, editing concepts.										
CO4	Identify the basic multimedia design principles.										
CO5	Evaluate the multimedia system and Design Process.										
CO6	Create a real time application using a multimedia concept.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	1	1	1	1	3			
	CO2	3	3	1	2	2	2	3			
	CO3	3	2	3	1	3	3	3			
	CO4	3	2	2	1	1	2	3			
	CO5	2	2	2	1	1	1	3			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship (PR)	
								√			
4	Approval	Academic Council Meeting									

6

Multimedia Fundamentals: Concept of multimedia, Fundamental criteria for the design of a multimedia presentation, Multimedia Application Goals & Objectives, opportunities in multimedia production.

UNIT II

6

Role of multimedia-development of team members, avoiding problems in planning a multimedia application.

UNIT III

6

Multimedia Building Blocks: Text, Graphics, Video capturing, Sound capturing, editing.

UNIT IV

6

Basic design principle: proximity, visual hierarchy, Symmetry, Asymmetry, Repetition, unity, Contrast, dynamics, Emphasis, Multimedia Authoring tools.

UNIT V

6

Design, Development and evaluation of multimedia a system, Development of user interface design, Design Process.

Text Books

1. John Villamil, Casanova, Louis Molina, "An introduction to multimedia",1998.
2. Mohammad Dastbaz, "Designing Interactive Multimedia Systems",2002.

Reference Books

1. Bohdan O. Szuprowicz, "Multimedia Networking",1995.
2. Stephen McGloughlin, "Multimedia on the web",1997.

P18OESC003	ADVANCED EXCEL						L	T	P	C
	Total Contact Hours – 30						2	0	0	2
	Prerequisite course – UG Level									
	Course Coordinator Name & Department:- S.Anupriya / BCA									
COURSE OBJECTIVES:- To identify the various functions in Excel Sheet										
COURSE OUTCOMES (COs)										
CO1	Understand the advanced Excel formulas.									
CO2	Evaluate IF conditions, AND, OR functions.									
CO3	Analyze the advanced filter options.									
CO4	Execute the multiple windows, splitting windows management.									
CO5	Understand the pivot table methods.									
CO6	Create a real time application by creating, modifying Excel sheet.									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	3	3	1	1	1	1	3		
	CO2	3	3	1	2	2	2	3		
	CO3	3	2	3	1	3	3	3		
	CO4	3	2	2	1	1	2	3		
	CO5	2	2	2	1	1	1	3		
	CO6	3	3	3	2	3	3	3		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship (PR)
								✓		
4	Approval	Academic Council Meeting								

UNIT I **6**
Uses of Advance Excel Formulas -VLOOKUP, HLOOKUP, SUMIF, SUMIFS, SUMPRODUCT, DSUM, COUNTIF, COUNTIFS, IF, IFERROR, ISERROR, ISNA, ISNUMBER, ISNONTEXT, OR, AND, SEARCH, INDEX, MATCH etc

UNIT II **6**
Various Methods and Uses of IF Conditions , Usage of "IF" Conditions? , Creation of Multiple IF Conditions in One Cell , Use the IF Conditions with the Other Advance Functions, How to use nested IF statements in Excel with AND, OR Functions Sorting, Data Forms, Adding Data Using the Data Form, Finding Records Using Criteria

UNIT III **6**
Filtering Data, AutoFilter, Totals and Subtotals, Row, Various Methods of Filter and Advance Filter options , Creating and Updating Subtotals , Various Method of Sorting Data ,Creating, Formatting and Modifying Chart.

UNIT IV **6**
Customizing the Quick Access Tool Bar , Managing Windows ,Multiple Windows , Splitting Windows.

UNIT V **6**
Various Methods and Options of Pivot Table, Using the Pivot Table Wizard, Changing the Pivot Table Layout, Subtotal and Grand total Options, Formatting, and Grouping items

Text Books

1. Jordan Goldmeler, “Advanced Excel Essentials” ,A Press, 2015 edition.

Reference Books

1. John Walkenbach, “Microsoft Excel 2013 Bible”, Wiley Publications,2013.

P18OESC004	WEB DESIGNING							L	T	P	C
	Total Contact Hours – 30							2	0	0	2
	Prerequisite course – UG Level										
	Course Coordinator Name & Department:- V.Ramya/BCA										
COURSE OBJECTIVES:- To Understand the basic web designing concepts.											
COURSE OUTCOMES (COs)											
CO1	Gain knowledge in web basics and server side scripting.										
CO2	Execute the HTML coding.										
CO3	Apply hyper links between webpages										
CO4	Evaluate the Embedded Style Sheets & Linking External Style Sheets.										
CO5	Create the backgrounds and user style sheets.										
CO6	Create a real time application using web designing concept.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	1	1	1	1	3			
	CO2	3	3	1	2	2	2	3			
	CO3	3	2	3	1	3	3	3			
	CO4	3	2	2	1	1	2	3			
	CO5	2	2	2	1	1	1	3			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship (PR)	
								✓			
4	Approval	Academic Council Meeting									

Introduction - The Internet in Industry and Research - Evolution of the Internet and World Wide Web - Web Basics – Client Side Scripting versus Server Side Scripting.

UNIT II

6

Introduction – First HTML example – Headings – Linking - Images, alt Attribute, Void Elements.

UNIT III

6

Using Images as Hyperlinks-Special Characters and Horizontal Rules – Lists – Tables.

UNIT IV

6

Introduction - Inline Styles - Embedded Style Sheets - Linking External Style Sheets

UNIT V

6

Backgrounds - Element Dimensions - Box Model and Text Flow - Drop-Down Menus - User Style Sheets.

Text Books

1. Paul Deitel, Harvey Deitel, Abbey Deitel, “Internet & World Wide Web: How To Program”, 5th Edition, Pearson Publication, 2012.

Reference Books

1. Jennifer Niederst Robbins, “Learning Web Design”, Fourth Edition, O’Reilly Media, 2012.
2. Thomas Michaud, “Foundations of Web Design, Introduction to HTML & CSS”, Pearson Publication, 2014.
3. Bayross, “Web Enable Commercial Application Development Using HTML, DHTML, JavaScript, Perl CGI”, BPB Publications, 2010.
4. T. A Powell, “Complete Reference HTML (Third Edition)”, TMH, 2002.

Course Coordinator

HOD

P18OESC005	PHOTOSHOP						L	T	P	C
	Total Contact Hours – 30						2	0	0	2
	Prerequisite course – UG Level									
	Course Coordinator Name & Department:- V.Brindha/BCA									
COURSE OBJECTIVES:-										
Learners can Apply methods to specific 3D Images and to identify various designs appropriate for Animation.										
COURSE OUTCOMES (COs)										
CO1	Gain knowledge to Create and save Images in fundamental computer applications									
CO2	Understand the title bar, menu bar, option bar, image title bar in photo shop program.									
CO3	Execute Zooming & Panning an Image while Working with Images.									
CO4	Analyze Color manipulations & Working with Toolbox									
CO5	Gain knowledge in Working with layers.									
CO6	Create a real time application using 3D image and Animation.									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	3	3	1	1	1	1	3		
	CO2	3	3	1	2	2	2	3		
	CO3	3	2	3	1	3	3	3		
	CO4	3	2	2	1	1	2	3		
	CO5	2	2	2	1	1	1	3		
	CO6	3	3	3	2	3	3	3		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship (PR)
								✓		
4	Approval	Academic Council Meeting								

UNIT I

6

Introduction to Adobe photoshop, Getting started with photoshop, creating and saving a document in photoshop, page layout and back ground.

UNIT II

6

Photoshop program window-titlebar, menu bar, option bar, image window, image title bar, status bar, ruler, palettes ,tool box, screen modes, saving files, reverting files, closing files.

UNIT III

6

Images: working with images, image size and resolution, image editing, color modes and adjustments, Zooming & Panning an Image, Rulers, Guides & Grids-Cropping & Straightening an Image, image backgrounds, making selections.

UNIT IV

6

Working with tool box: working with pen tool, save and load selection-working with erasers-working with text and brushes-Color manipulations: color modes- Levels – Curves - Seeing Color accurately - Patch tool

UNIT V

6

Layers: Working with layers- layer styles- opacity-adjustment layers.

Text Books

1. Reema Thareja ,”Fundamentals of Computers”,Oxford University Press,2014.

Reference Books

1. Photoshop: Beginner's Guide for Photoshop - Digital Photography, Photo Editing, Color
2. Adobe Creative Team ,”Adobe Photoshop Class Room in a Book”,2014.

Course Coordinator

HOD

P18OESC006	FLASH							L	T	P	C
	Total Contact Hours – 30							2	0	0	2
	Prerequisite course – UG Level										
	Course Coordinator Name & Department:- N.Mathimagal/ BCA										
COURSE OBJECTIVES:- Learners can identify methods appropriate for Basic Animation. Apply methods to design with flash.											
COURSE OUTCOMES (COs)											
CO1	Understand inWorking with flash, drawing with flash using Animation tools and Mixer.										
CO2	Execute working with multiple objects, importing color palettes										
CO3	Analyze Basic animation and working in the timeline,										
CO4	Create Frames, key frames, deleting, copying and reversing frames										
CO5	Evaluate the Shape tweening and shape hinting in motion										
CO6	Apply methods to design with flash										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	1	1	1	1	3			
	CO2	3	3	1	2	2	2	3			
	CO3	3	2	3	1	3	3	3			
	CO4	3	2	2	1	1	2	3			
	CO5	2	2	2	1	1	1	3			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship (PR)	
								√			
4	Approval	Academic Council Meeting									

UNIT I

6

Working with flash, drawing with flash, drawing with the pencil, modifying lines, drawing with the pen, the oval and rectangle tools, free transform tool, envelope modifier, the brush tool, using the mixer.

UNIT II

6

Adding custom colors to color palette, importing color palettes, working with multiple objects, grouping objects.

UNIT III

6

Basic animation and working in the timeline, the timeline, movie properties.

UNIT IV

6

Frames vs. key frames, deleting, copying, and reversing frames, frame-by-frame vector animation, Animation on an image.

UNIT V

6

Shape twining , shape hinting , Shape tweening text , edit multiple frames , animating gradients, basic motion tweening.

Text Books

1.Nick Vandome ,“FLASH 5 in easy steps”, ,Dreamtech press,2001.

Reference Books

1. E A Vander Veer &Chris Graver, “Flash CS3”,Orelly Publications,2009.

Course Coordinator

HOD

P18OESC007	COMPUTER HARDWARE AND NETWORKING						L	T	P	C
	Total Contact Hours – 30						2	0	0	2
	Prerequisite course – UG Level									
	Course Coordinator Name & Department:- V.Ramya/BCA									
COURSE OBJECTIVES:-										
Learners familiar with the basic concepts of Microprocessor, Controller, Server and to demonstrate the traditional imperative design of CPUs, cards, PCs and BIOS.										
COURSE OUTCOMES (COs)										
CO1	Design the structure of Micro Processor and PCs and CPUs									
CO2	Understand the structure of PC architecture and the study of various PCs									
CO3	Understand the Basics of Processor									
CO4	Study the CPU, Chips, Processor and Controllers									
CO5	Working with Internal Components cards and Higher Level Processor									
CO6	Used to develop the Backups, Switches Routers, BIOS, Floppy Disk and zip Driver									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	3	3	1	1	1	1	3		
	CO2	3	3	1	2	2	2	3		
	CO3	3	2	3	1	3	3	3		
	CO4	3	2	2	1	1	2	3		
	CO5	2	2	2	1	1	1	3		
	CO6	3	3	3	2	3	3	3		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship (PR)
								√		
4	Approval	Academic Council Meeting								

UNIT I **6**
Microprocessor System - Introduction of System overview, Introduction to Processors, Memory Interfacing, Interfacing I/O Devices, Interfacing Data Converters, Display Interface, Serial I/O and Data Communication, Higher level Processors.

UNIT II **6**
Introduction to PC Architecture Study of PC-AT/ATX System, Pentium, Core, Core 2 Cord, Core 2 Duo, I3, I5, I7.

UNIT III **6**
Processor Basics of Processor and CPU Block Diagram of Computer and Computer Generation Motherboards, Chipset and Controllers, BIOS and the Boot Process, Computer Memory.

UNIT IV **6**
Internal Components IDE and SATA Devices: Hard Disk Drive and CD/DVDs Drives, SCSI Devices, Floppy Disk, Zip Drive, Backup Drive, Expansion Cards- LAN Card, IDE Card , VGA and SVGA Cards, Sound Card, Interface Cards, I/O cards, Video Cards, USB Card, Fire-Wire Cards, Internal Ports, Cables and Connector Types.

UNIT V **6**
Introduction of Network Cable like UTP, STP, Fiber Optics, Hub, Unmanageable Switch, Manageable Switch, Router, Modem, Wi-Fi, Access Point, PCI Wireless Card, USB Wireless Device, Print Server, USB Network Sharer, Backup Device, Server Hardware etc.

Text Books

1. Ramesh Gaonkar, "Microprocessor Architecture Programming and Application with the 8085", Penram International Publication, October 2013.

Reference Books

1. M.L. Gupta, "Electronics and Radio Engineering", Dhanpat rai & Sons, New Delhi.
2. B. Govinda rajalu, "PC AND CLONES Hardware, Troubleshooting and Maintenance", Tata McGraw-Hill Publication.
3. Stephen J. Bigelow, "PC Troubleshooting and Repair", Dream tech Press, New Delhi.

Course Coordinator

HOD

P18OESC008		COMPUTER PROGRAMMING						L	T	P	C
		Total Contact Hours – 30						2	0	0	2
		Prerequisite course – UG Level									
		Course Coordinator Name & Department:- S.Anupriya/ BCA									
COURSE OBJECTIVES:-											
Learners understand the basic concepts of C programming. Practice the use of conditional and looping statements. Implement arrays, functions and pointers. Gain skills to handle strings and files.											
COURSE OUTCOMES (COs)											
CO1	Understand the concept of data types, loops, functions, array, pointers, string, structures and files.										
CO2	Design flow-chart, algorithm and program logic.										
CO3	Analyze problems, errors and exceptions.										
CO4	Apply programming concepts to compile and debug c programs to find solutions.										
CO5	Gain knowledge to use Function, Pointers, Structures, Unions & preprocessor directives										
CO6	Construct programs that demonstrate effective use of C.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	3	1	1	1	1	3			
	CO2	3	3	1	2	2	2	3			
	CO3	3	2	3	1	3	2	3			
	CO4	3	2	2	1	1	2	3			
	CO5	2	2	2	1	1	1	3			
	CO6	3	3	3	2	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/ Seminar/ Internship (PR)	
								√			
4	Approval	Academic Council Meeting									

UNIT I

6

Generation and Classification of Computers, Basic organization of a Computer, Number System, Binary, Decimal, Conversion, Problems.

UNIT II

6

Algorithm, Pseudo code, Flow Chart, Problem formulation, Problem solving , Introduction to “C” programming, Fundamentals, Structure of C Program , compilation and linking processes, Constants, Variables, Data Types.

UNIT III

6

Expressions using operators in C, Managing input and output operations, Decision making and Branching, Looping Statements.

UNIT IV

6

Arrays, Initialization, Declaration, One Dimensional and Two Dimensional Arrays, String, String Operations, String Arrays.

UNIT V

6

Function, Definition of Function, Declaration of Function, Recursion, pointers, pointer and arrays, Structure data type, Structure definition, Structure declaration, Structure within a structure, Union, Storage classes, Pre-processor directives.

Text Books

1. Anita Goel and Ajay Mittal, “Computer Fundamentals and programming in C”, Dorling Kindersley (India) Pvt Ltd., Pearson Education in South Asia 2011.
2. Pradip Dey, Manas Ghosh, “fundamentals of computing and programming in c”, First edition, Oxford University Press, 2009.
3. Yashavant P. Kanethar, “Let Us C”, BPB Publications, 2011.

Reference Books

1. Byron S Gottfried, “ Programming with C”, Schaum’s Outlines, 2nd Edition, Tata McGraw-Hill 2006.
2. Dromey R.G., “How to Solve it by Computer”, Pearson Education, Fourth Reprint, 2007.
3. Kernighan., B.W and Ritchie, D.M, “ The C Programming Language”, Second Edition, Pearson Education, 2006.

4	Approval	Academic Council Meeting
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UNIT I

6

Text Manipulations- font size, style, color. Alignment- left, right and justify, paragraph alignment, Usage of Numbering, Bullets, Footer and Headers, Usage of Spell check, and Find & Replace, Text Formatting, Picture insertion and alignment.

UNIT II

6

Insertion – Table, chart, clip art, shapes, borders. Creation of documents, saving of documents, using templates, Creation templates, Mail Merge Concepts, Copying Text & Pictures from Excel.

UNIT III

6

Creating of Excel sheet, Cell Editing, Usage of Formulae and Built-in Functions, File Manipulations, Data Sorting, Worksheet Preparation, Drawing Graphs, Usage of Auto Formatting.

UNIT IV

6

Start power point, Create blank presentation, Selecting slide layout , Insert new slide, Editing presentation , Designing and formatting presentation , Change font, font color, size, style of text, Bullet and numbering, Slide design, layout, change background , preparing slide show presentation.

UNIT V

6

Inserting Clip arts and Pictures, Frame movements, Insertion of new slides. Preparation of Organization Charts, Presentation using Wizards, Usage of design templates, working with tables, graphics and animation, working with graphs and organization charts.

Text Books

1. Joyce Cox, Joan Lambert and Curtis Fryc, “Step by Step Microsoft Office Professional 2010”, Microsoft press edition.

Reference Books

1. Ralph T.Reilly, “The Handbook of Office Automation”, Universe Publications,2012.

4	Approval	Academic Council Meeting
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UNIT I

6

General introduction about clinical microbiology, Sterilization and Disinfection., Culture Media preparation, Staining Methods, Collection and Transportation of Specimen - General Principles, Containers, Rejection, Samples - Urine, Faeces, Sputum, Pus, Body fluids, Swab, Blood, Disposal of Laboratory/Hospital Waste.

UNIT II

6

General characters and classification of bacteria, Characteristics - Growth and maintenance of Bacteria, Pathogenicity and diagnosis of bacterial pathogens, antimicrobial compounds against clinical pathogens.

UNIT III

6

Morphology and structure of fungi - Classification of fungi - Nutrition and cultivation of fungus - Cutaneous & Sub cutaneous and Systemic Mycosis - Lab diagnosis of fungal Infections - Opportunistic fungal infections.

UNIT IV

6

General characters of viruses. - Classification of viruses. - Lab diagnosis of viral infections. - Cultivation of viruses. - Bacteriophages - Retro viruses - HIV, Hepatitis virus, Pox virus . - Picorna virus - Polio. - Orthomyxo virus - Influenza. - Arbo virus - Chikungunya, Dengue. - Herpes and Adeno virus.

UNIT V

6

Definition - parasitism, host, vectors etc. Classification of Parasites, Phylum Protozoa- general Pathogenic and non pathogenic protozoa, Phylum Nematelminthes/Round words (Nematoda), Phylum Platyhelminthes - class - Cestoda, class - Trematoda, Lab diagnosis of parasitic infections.

TEXT BOOKS:

1. Monica Chees Brough. Medical laboratory manual for tropical countries, Elsevier Health Sciences, Butter worths, 1987.
2. Bailey and Scott. Diagnostic Microbiology, Eighth edition, The Mosby Company, 1990.

REFERENCE BOOKS:

1. Keith Struthers K. Clinical Microbiology, 2nd Edition, CRC Press, 2017.
2. Jennie Wilson. Clinical Microbiology -An Introduction for Healthcare Professional, 8th Edition, Bailleirre Tindall, 2000.

U18OEMI002	HERBAL MEDICINE							L	T	P	C
	Total Contact Hours – 30							2	0	0	2
	Prerequisite course – Under graduate degree in any discipline										
	Course Coordinator Name & Department:- Dr. J. Senthil & Microbiology										
COURSE OBJECTIVES:- Learners will be familiar with medicinal herbs. Learners will understand the importance of herbal drugs and herbal therapies.											
COURSE OUTCOMES (COs)											
CO1	Recall the herbal medicines used in daily life.										
CO2	Recognize the different methods of herbal extraction and its types.										
CO3	Apply various herbal medicines in curing the diseases.										
CO4	Analyze the role of herbs in drug discovery.										
CO5	Evaluate the importance and toxicity studies of herbal extracts.										
CO6	Create and develop new drugs from wide range of medicinal plants available worldwide.										
Mapping of Course Outcomes with Program Outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	2	2	2	3	2	2			
	CO2	3	3	2	2	3	2	3			
	CO3	3	3	2	2	3	3	3			
	CO4	3	2	1	1	2	1	2			
	CO5	3	3	3	3	3	3	3			
	CO6	3	3	3	3	3	3	3			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship (PR)	
								✓			
4	Approval	Academic Council Meeting									

UNIT I

6

Definition of Herbal drug, Importance of Herbal therapies, Herbs used as nutraceuticals and healing agents. Making and using herbal medicines for common ailments like cold, skin infections and Diarrhea; Analytical Profiles of selected herbs.

UNIT II

6

General methods of extraction, types and principles of extractions - merits and demerits, selection of suitable extraction methods, purification and recovery of solvents

UNIT III

6

Different methods for isolation and estimation of phyto-constituents from medicinal herbs like *Mucuna pruriens*, *Garcinia combogia*, Green tea, *Hypericum species* etc.

UNIT IV

6

Qualitative and Quantitative estimation of standardized extracts by HPTLC, Biological standardization -Pharmacological screening of herbal extracts and Microbiological evaluation of herbal extracts, Toxicity studies of herbal extracts.

UNIT V

6

Herbal drugs acting on brain and nervous system – Rheumatoid arthritis – Psychoactive drugs – Depressants, Stimulants, hallucinogens – sources, effects, basic mechanism of action.

TEXT BOOKS:

1. Indian Herbal Pharmacopoeia, Vol.1 & 2, RRL, 1 DMA, 1998, 2000.
2. Kokate CK, Purohit and Gokhlae. Text book of Pharmacognosy, 4th edition, Nirali Prakashan, 1996.

REFERENCE BOOKS:

1. Toxicology and Clinical Pharmacology of Herbal Products, Melanie Johns Cupp.
2. Choudhary RD. Herbal drug industry, 1st edition, Eastern publisher, New Delhi, 1996.

Course Coordinator

HOD

P18OEPH001	ELECTRICAL TECHNICIAN						L	T	P	C
	Total Contact Hours - 30						2	0	0	2
	Prerequisite – B.Sc Physics									
	Course Coordinator Name & Department:- – Dr. S.Anandhi / Physics									
OBJECTIVES: Students will have an appreciation on the electrical systems and electrical equipment typically used in the Oil and Gas production plant.										
COURSE OUTCOMES (COs)										
CO1	Analyze and solve routine technical problems related to electrical systems by applying mathematics and science principles.									
CO2	Explain how to used electrical tools, operate and maintain specific equipment in the Oil and Gas production plant									
CO3	Explain how to perform corrective and preventive maintenance in electrical tasks.									
CO4	Understand the work on electrical systems safely and efficiently.									
CO5	Understand the electrical system and electrical equipment used in the Oil and Gas production plant.									
CO6	To execute the principle and how to working process of the transformer and classification of transformer									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	3	3	2	2	3	1	3		
	CO2	3	3	3	3	2	3	3		
	CO3	2	2	3	2	1	2	3		
	CO4	2	3	1	1	3	2	3		
	CO5	3	3	3	2	2	1	3		
	CO6	3	3	2	2	3	3	3		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship (PR)
								✓		
4	Approval	Academic Council Meeting								

UNIT-I**6**

Basic Principle Of Petroleum - Overview of Oil and Gas Processing -Wellhead Platform and Equipment

S.No.	Sub.Code	Subject Name	Total No. of Hours	L	T	P	C
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UNIT –II**6**

Introduction to Instrumentation -P & ID Drawing -Introduction to Distributed Control System (DCS)

UNIT –III**6**

Safety in Electrical Maintenance - Batteries and Chargers -Reading Electrical Diagrams -Cables and Conductors - Terminations and Splices - Motor Branch Circuit Protections

UNIT –IV**6**

Three Phase AC Induction Motors - AC Generator Maintenance -Fire & Gas Detection and Safety Systems and SIS -DC Generator -Construction& Principle- Types-Series,- Shunt & Compound Generator- EMF equation, Characteristics - (OCC & LCC). Armature reactions,- commutation Efficiency, Regulation & Applications. DC Motor- Construction& Principle. Types- Series, Shunt & Compound Motors. Characteristics curve-Applications. Necessity of starter- Construction and Working of- starters (3 point& 4 point). Speed control of DC Shunt-motor (armature & Field control. Traction System.- Trouble shooting –Care and maintenance.

UNIT-V**6**

Transformer –Principle -Construction- Classification of Transformers - EMF equation ,rating - Loading, Losses & Efficiency Regulation. Parallel Operation- Cooling methods, Transformer- oil testing. Care and maintenance,- Protective devices. Tap Changer – ON load and OFF- load. Auto transformer, Instrument- Transformer- CT & PT. Welding Transformer.

TEXT BOOKS

1. Fundamental Electrical circuits by Charles K.Alexandeer and Matthew NO Sadiku(2003)
2. Fundamental of Digital circuits 3rd edition by Kumar A Anandh

1	P18ACEN001	English for Research Paper Writing	2	2	0	0	0
2	P18ACCE002	Disaster Management	2	2	0	0	0
3	P18ACEN003	Sanskrit for Technical Knowledge	2	2	0	0	0
4	P18ACBA004	Value Education	2	2	0	0	0
5	P18ACW005	Constitution of India	2	2	0	0	0
6	P18ACBA006	Pedagogy Studies	2	2	0	0	0
7	P18ACBA007	Personality Development through Life Enlightenment Skills	2	2	0	0	0

P18ACEN001	AUDIT COURSE : ENGLISH FOR RESEARCH PAPER WRITING							L	T	P	C
	Total Contact Hours – 30							2	0	0	0
	Prerequisite course – UG Level										
	Course Coordinator Name & Department:- Mr.V.C.Jain/Department of English										
COURSE OBJECTIVES:-											
Understand the skills needed when writing a Title Ensure the good quality of paper at very first-time submission.											
COURSE OUTCOMES (COs)											
CO1	Recognize to prepare and Plan the word order, breaking of long sentences, structural formation of paragraph and being concise without any ambiguities.										
CO2	Describe how to write abstract and introduction to any topic or project.										
CO3	Relate the skills require for the discussions and conclusions.										
CO4	Express the quality of paper and time management in writing skills.										
CO5	Categorize the useful phrase and how to ensure the paper is as good.										
CO6	Prepare the oral presentation in class using effective delivery strategies.										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	2	2	3	2	2	3			
	CO2	3	2	3	2	1	3	2			
	CO3	3	1	2	3	2	3	3			
	CO4	2	3	3	3	3	2	2			
	CO5	2	2	3	2	2	2	3			
	CO6	1	1	2	3	3	2	1			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective	Any other	Project/Term Paper/Seminar/ Internship (PR)	
								✓			
4	Approval	Academic Council Meeting									

UNIT - 1: PLANNING AND PREPARATION :

6

Planning and Preparation - word order - breaking up long sentences, structuring, paragraphs and sentences, being concise and removing redundancy, avoiding ambiguity and vagueness.

UNIT-2 : ABSTRACT

6

Clarifying who did what - highlighting your findings - hedging and criticizing - paraphrasing and plagiarism - sections of a paper - abstracts - introduction.

UNIT -3 : DISCUSSION AND CONCLUSION

6

Review of the literature - methods - results - discussion - conclusions, the final check - key skills are needed when writing a title - key skills are needed when writing an abstract - key skills are needed when writing an introduction - skills needed when a review of the literature.

UNIT -4 : WRITING SKILLS

6

Skills are needed when writing the methods - skills needed when writing the results - skills are needed when writing the discussion - skills are needed when writing the conclusions.

UNIT -5: QUALITY AND TIME MAINTAINANCE

6

Useful phrases - how to ensure paper is as good as it could possibly be the first -time submission.

TEXT BOOKS :

1. Goldbort R (2006) Writing for Science, Yale University Press (Available on Google Books).
2. Day R(2006), How to Write and Publish a Scientific Paper, Cambridge University Press.

REFERENCE BOOKS :

1. HighmanN, Handbook of Writing for the Mathematical Sciences, SIAM, Highman's Book, 1st, Edition, 1998.
2. Adrian Wallwork, English for Writing Research Papers, Springer New York Dordrecht Heidelberg London, 2nd Edition, 2011.

Course Coordinator

HOD

P18ACCE002	AUDIT COURSE : DISASTER MANAGEMENT						L	T	P	C
	Total Contact Hours – 30						2	0	0	0
	Prerequisite course – UG Level									
	Course Coordinator Name & Department:- Ms.Jhony/ Dept. of Business Administration									
COURSE OBJECTIVES:- Develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.										
COURSE OUTCOMES (COs)										
CO1	Identify the key concepts in disaster risk reduction and humanitarian response.									
CO2	Determine the disaster risk reduction and humanitarian response policy from multiple perspectives.									
CO3	Illustrate the standards of humanitarian response.									
CO4	Criticize the practical relevance in specific types of disasters and conflict situations.									
CO5	Evaluate the strengths and weakness of disaster management approaches.									
CO6	Predict the planning and programming in different countries, particularly their home country or the countries they work .									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	3	1	3	3	2	2	3		
	CO2	2	3	2	2	1	3	2		
	CO3	2	3	3	3	3	3	3		
	CO4	3	1	3	2	3	1	1		
	CO5	2	3	3	2	1	2	2		
	CO6	3	2	3	2	3	1	3		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective	Any other	Project/Term Paper/ Seminar/ Internship (PR)
								✓		
4	Approval	47 th Academic Council Meeting								

UNIT - : INTRODUCTION:

6

Disaster : Definition - Factors and Significance - Difference between Hazard and Disaster - Natural and Manmade Disasters - Difference - Nature - Types and Magnitude.

UNIT - 2 : REPERCUSSIONS OF DISASTERS AND HAZARDS:

6

Economic Damage - Loss Of Human And Animal Life - Destruction Of Ecosystem - Natural Disasters:

Earthquakes - Volcanisms - Cyclones - Tsunamis - Floods - Droughts And Famines - Landslides And Avalanches - Man-made disaster.

UNIT -3 : DISASTER PRONE AREAS IN INDIA: 6

Study Of Seismic Zones - Areas Prone To Floods And Droughts - Landslides And Avalanches - Areas Prone To Cyclonic And Coastal Hazards With Special Reference To Tsunami - Post-Disaster Diseases And Epidemics.

UNIT -4 : DISASTER PREPAREDNESS AND MANAGEMENT 6

Preparedness: Monitoring Of Phenomena Triggering A Disaster Or Hazard - Evaluation Of Risk: Application Of Remote Sensing, Data From Meteorological And Other Agencies - Media Reports: Governmental And Community Preparedness.

UNIT -5 : RISK ASSESSMENT 6

Disaster Risk: Concept And Elements - Disaster Risk Reduction, Global And National Disaster Risk Situation - Techniques Of Risk Assessment - Global Co- Operation In Risk Assessment And Warning, People's Participation In Risk Assessment - Strategies for Survival.

TEXT BOOKS:

1. R. Nishith, Singh AK, "Disaster Management in India: Perspectives, issues and strategies "New Royal book Company.

REFERENCE BOOKS:

1. Sahni, PardeepEt.Al. (Eds.)," Disaster Mitigation Experiences And Reflections", Prentice Hall Of India, New Delhi.
2. Goel S. L. , Disaster Administration And Management Text And Case Studies" ,Deep &Deep Publication Pvt. Ltd., New Delhi.

Course Coordinator

HOD

P18ACEN003	AUDIT COURSE : SANSKRIT FOR TECHNICAL KNOWLEDGE	L	T	P	C
	Total Contact Hours – 30	2	0	0	0
	Prerequisite course – UG Level				
	Course Coordinator Name & Department:- Ms.Subathra / Dept. of English				
COURSE OBJECTIVES:- Learners will get a working knowledge in illustrious Sanskrit, the scientific language in the world.					
COURSE OUTCOMES (COs)					
CO1	Define the learning of Sanskrit to improve brain functioning				
CO2	Review the Learning of Sanskrit to develop the logic in mathematics, science & other subjects enhancing the memory power				
CO3	Practice the engineering scholars equipped with Sanskrit will be able to explore the huge knowledge from ancient literature				
CO4	Identify the uses of basic Sanskrit language				

CO5	Estimate Ancient Sanskrit literature about science & technology can be understood									
CO6	Develop the projects either individual or group on presentations.									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	3	2	3	2	3	2	3		
	CO2	2	3	2	3	2	3	2		
	CO3	3	2	1	2	2	3	2		
	CO4	2	3	2	3	3	2	1		
	CO5	3	2	3	2	2	2	1		
	CO6	2	2	2	3	3	3	2		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective (OE)	Any other	Project/Term Paper/Seminar/ Internship (PR)
								✓		
4	Approval	Academic Council Meeting								

UNIT -1 : INTRODUCTION: 6

Alphabets, Consonants, Nouns Declensions; Nominative, Accusative(singular, dual and plural)

UNIT - 2 : BASIC OF SANSKRIT LIERATURE: 6

Instrumental case, Dative, Ablative, and Indeclinables, verbal conjugation: first person, second person, third person: Present Tense.

UNIT - 3 : FUNDAMENTALS OF SANSKRIT ARCHITECTURE: 6

Genitive, locative and Vocative Absolute, Masculine Gender, Feminine Gender and Neuter Gender.

UNIT -4 : VERBAL CONJUGATION: 6

Verbal Conjugation: Past Tense and Future Tense Declensions ending in Rāmaḥ, Kaviḥ, Bhānuḥ, Mātr , Mālā

UNIT - 5 : TRANSLATION: 6

Translation of simple sentences, Stories & selected Subhashitas

TEXT BOOKS:

1. “Abhyaspustakam” – Dr.Vishwas, Samskrita-Bharti Publication, New Delhi.
2. Sanskrit for Beginners by Dr. M. Narasimhacharyand Dr.S. Ramaratnam, N&R Publications, Chennai & New Delhi.

REFERENCE BOOKS :

1. “Teach Yourself Sanskrit” Prathama Deeksha-VempatiKutumbshastri, Rashtriya Sanskrit Sansthanam, New Delhi Publication.
2. “India’s Glorious Scientific Tradition” Suresh Soni, Ocean books (P) Ltd., New Delhi.

Course Coordinator

HOD

P18ACBA004	AUDIT COURSE : VALUE EDUCATION							L	T	P	C
	Total Contact Hours – 30							2	0	0	0
	Prerequisite course – UG Level										
	Course Coordinator Name & Department:- Mr.Srinivasan/ Dept. of Business Administration										
COURSE OBJECTIVES:-											
Our objectives are to promote a new understanding and framework help learners to achieve positive and purposeful lives for themselves and their communities through engaging with values to guide and inform their behaviour.											
COURSE OUTCOMES (COs)											
CO1	Identify and describe feelings of self-worth that arise through striving for personal success in physical activity and sport										
CO2	Demonstrate the tolerance of other people's abilities during physical activity and sport										
CO3	Generalize the Values,attitudes that they need to develop in their class programmes										
CO4	Choose the essential steps to become good leaders.										
CO5	Select their role and contribution to the nation building.										
CO6	Prepare to understand value of education and self- development										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	2	3	2	3	1	3			
	CO2	1	2	3	2	2	2	2			
	CO3	2	3	2	3	2	3	2			
	CO4	3	2	2	1	3	2	3			

	CO5	2	3	2	3	1	2	1		
	CO6	2	3	3	3	2	3	3		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective	Any other	Project/Term Paper/Seminar/ Internship (PR)
								✓		
4	Approval	47 th Academic Council Meeting								

UNIT-I:

6

Value Education - Definition - relevance to present day - Concept of Human Values - self introspection - Self esteem.

UNIT-II:

6

Family values - Components, structure and responsibilities of family - Neutralization of anger - Adjustability - Threats of family life - Status of women in family and society - Caring for needy and elderly - Time allotment for sharing ideas and concerns.

UNIT-III:

6

Ethical values - Professional ethics - Mass media ethics - Advertising ethics - Influence of ethics on family life - psychology of children and youth - Leadership qualities - Personality development.

UNIT-IV:

6

Social values - Faith, service and secularism - Social sense and commitment - Students and Politics - Social awareness, Consumer awareness, Consumer rights and responsibilities - Redressal mechanisms.

UNIT-V:

6

Effect of international affairs on values of life/ Issue of Globalization - Modern warfare - Terrorism. Environmental issues - mutual respect of different cultures, religions and their beliefs.

TEXT BOOKS:

1. T. Anchukandam and J. Kuttainimathathil (Ed) Grow Free Live Free, Krisitu Jyoti Publications, Bangalore (1995).
2. Mani Jacob (Ed) Resource Book for Value Education, Institute for Value Education, New Delhi 2002.

REFERENCE BOOKS:

1. DBNI, NCERT, SCERT, Dharma Bharti National Institute of Peace and Value Education, Secunderabad, 2002.
2. Daniel and Selvamony - Value Education Today, (Madras Christian College, Tambaram and ALACHE, New Delhi, 1990)
3. S. Ignacimuthu - Values for Life - Better Yourself Books, Mumbai, 1991.

4. M.M.M.Mascaronhas Centre for Research Education Science and Training for Family Life Promotion - Family Life Education, Bangalore, 1993.

Course Coordinator

HOD

P18ACLW005		AUDIT COURSE : CONSTITUTION OF INDIA						L	T	P	C
		Total Contact Hours – 30						2	0	0	0
		Prerequisite course – UG Level									
		Course Coordinator Name & Department:- Mr.Prakash/Dept. of Law									
COURSE OBJECTIVES:-											
To Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.											
COURSE OUTCOMES (COs)											
CO1	Underline to address the growth of Indian opinion regarding modern Indian intellectuals										
CO2	Express the constitutional role and entitlement to civil and economic rights										
CO3	Utilize the emergence of nationhood in the early years of Indian nationalism.										
CO4	Distinguish the role of socialism in India										
CO5	Judge the commencement of the Bolshevik Revolution										
CO6	Predict its impact on the initial drafting of the Indian Constitution										
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	3	2	1	2	2	2	3			
	CO2	2	3	2	3	3	3	2			
	CO3	3	1	3	3	2	3	3			
	CO4	2	3	2	3	3	1	2			
	CO5	3	2	2	3	2	3	3			
	CO6	2	3	3	3	1	2	1			
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective	Any other	Project/Term Paper/ Seminar/ Internship (PR)	
								✓			

4	Approval	Academic Council Meeting
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UNIT -1 : HISTORY OF MAKING OF THE INDIAN CONSTITUTION: 6

History - Drafting Committee, (Composition & Working)

UNIT -2 : PHILOSOPHY OF THE INDIAN CONSTITUTION: 6

Preamble - Salient Features - Directive Principles of State Policy - Fundamental Duties.

UNIT - 3 : CONTOURS OF CONSTITUTIONAL RIGHTS & DUTIES: 6

Fundamental Rights - Right to Equality - Right to Freedom - Right against Exploitation - Right to Freedom of Religion - Cultural and Educational Rights - Right to Constitutional Remedies.

UNIT -4 : ORGANS OF GOVERNANCE: 6

Parliament - Composition - Qualifications and Disqualifications - Powers and Functions - Executive President - Governor - Council of Ministers - Judiciary, Appointment and Transfer of Judges, Qualifications - Powers and Functions.

UNIT - 5 : LOCAL ADMINISTRATION & ELECTION COMMISSION : 6

District's Administration head: Role and Importance - Introduction, Mayor and role of Elected Representative CEO of Municipal Corporation - Pachayati raj: Introduction, PRI: Zila Pachayat - Elected officials and their roles - Introduction of Election Commission - Election Commission: Role and Functioning - Chief Election Commissioner and Election Commissioners - State Election Commission: Role and Functioning - Institute and Bodies for the welfare of SC/ST/OBC and women.

TEXT BOOKS:

1. The Constitution of India, 1950 (Bare Act), Government Publication.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.

REFERENCE BOOKS:

1. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
2. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.

Course Coordinator

HOD

P18ACBA006	AUDIT COURSE : PEDAGOGY STUDIES	L	T	P	C
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Total Contact Hours – 30		2	0	0	0					
Prerequisite course – UG Level										
Course Coordinator Name & Department:- Dr.Arunkumar / Dept. of Business Administration										
COURSE OBJECTIVES:- To inform programme design and policy making undertaken by the DfID, other agencies and researchers.										
COURSE OUTCOMES (COs)										
CO1	List common training so everyone teaches from the same curriculum									
CO2	Describe to learners what is expected of them									
CO3	Illustrate the teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy.									
CO4	Inspect the review existing evidence on the review topic to inform programme design.									
CO5	Assess how the outcomes of a single course align with larger outcomes for an entire program									
CO6	Plan appropriate teaching strategies, materials and assessments									
Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low										
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2
2	CO1	2	3	3	2	2	2	2		
	CO2	1	3	1	1	3	1	2		
	CO3	3	2	3	3	2	2	3		
	CO4	1	1	2	2	3	3	1		
	CO5	3	3	3	2	1	2	1		
	CO6	2	3	2	1	2	2	2		
3	Category	Humanities & Social Studies (HS)	Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective	Any other	Project/Term Paper/Seminar/ Internship (PR)
								√		
4	Approval	Academic Council Meeting								

UNIT - 1 : INTRODUCTION AND METHODOLOGY:

6

Aims and rationale, Policy background, Conceptual framework and terminology - Theories of learning - Curriculum - Teacher education - Conceptual framework, Research questions -Overview of methodology and Searching.

UNIT - 2 : THEMATIC OVERVIEW:

6

Pedagogical practices are being used by teachers in formal and informal classrooms in developing countries - Curriculum, Teacher education.

UNIT - 3 : EVIDENCE ON THE EFFECTIVENESS OF PEDAGOGICAL PRACTICES :-6

Methodology for the in depth stage: quality assessment of included studies - How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy? Theory of change - Strength and nature of the body of evidence for effective pedagogical practices.

UNIT - 4 : PROFESSIONAL DEVELOPMENT:

6

Alignment with classroom practices and follow up support - Peer support - Support from the head teacher and the community - Curriculum and assessment - Barriers to learning: limited resources and large class sizes

UNIT - 5 : Research gaps and future directions:-

6

Research design - Contexts - Pedagogy - Teacher education - Curriculum and assessment - Dissemination and research impact.

TEXT BOOKS:

1. Ackers J, Hardman F (2001) Classroom interaction in Kenyan primary schools, Compare, 31 (2): 245-261.
2. Agrawal M (2004) Curricular reform in schools: The importance of evaluation, Journal o Curriculum Studies, 36 (3): 361-379.
3. Akyeampong K (2003) Teacher training in Ghana - does it count? Multi-site teacher education research project (MUSTER) country report 1. London: DFID.

REFERENCE BOOKS:-

1. Akyeampong K, Lussier K, Pryor J, Westbrook J (2013) Improving teaching and learning of basic maths and reading in Africa: Does teacher preparation count? International Journal Educational Development, 33 (3): 272–282.
2. Alexander RJ (2001) Culture and pedagogy: International comparisons in primary education. Oxford and Boston: Blackwell.
3. Chavan M (2003) Read India: A mass scale, rapid, ‘learning to read’ campaign.

Course Coordinator

HOD

P18ACBA007	AUDIT COURSE : PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS	L	T	P	C
	Total Contact Hours – 30	2	0	0	0
	Prerequisite course – UG Level				
	Course Coordinator Name & Department:- Mr.Srinivasan/Dept.of Business Administration				
COURSE OBJECTIVES:-					
To become a person with stable mind, pleasing personality and determination					
COURSE OUTCOMES (COs)					
CO1	Identify the way to achieve the highest goal happily				
CO2	Review to awaken wisdom for learners				
CO3	Schedule to study of Shrimad-Bhagwad-Geeta will help the student				
CO4	Developing his personality and achieve the highest goal in life				
CO5	Evaluate the person who has studied Geeta will lead the nation and mankind to peace and prosperity				
CO6	Propose to study of Neetishatakam will help in developing versatile personality of students				

Mapping of Course Outcomes with Program outcomes (POs) (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low											
1	COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS O1	PS O2	
2	CO1	1	1	2	3	3	1	2			
	CO2	1	1	3	1	2	2	1			
	CO3	1	1	2	1	2	3	1			
	CO4	1	1	1	1	1	3	1			
	CO5	1	1	3	1	2	2	1			
	CO6	1	1	2	1	3	1	1			
3	Category	Humanities & Social Studies (HS)		Basic Sciences (BS)	Engg Sciences (ES)	Professional Core (PC)	Core Elective (CE)	Non-Major Elective (NE)	Open Elective	Any other	Project/Term Paper/Seminar/ Internship (PR)
									✓		
4	Approval	Academic Council Meeting									

UNIT - 1 : HOLISTIC DEVELOPMENT OF PERSONALITY- I

6

Neetisatakam-Holistic development of personality : Verses- 19,20,21,22 (wisdom) - Verses- 29,31,32 (pride & heroism) - Verses- 26,28,63,65 (virtue) - Verses- 52,53,59 (dont's) - Verses- 71,73,75,78 (do's).

UNIT - 2 : BHAGWADGEETA:

6

Approach to day to day work and duties. ShrimadBhagwadGeeta: Chapter 2-Verses 41, 47,48. Chapter 3-Verses 13, 21, 27, 35.

UNIT - 3: BHAGWAD GEETA:-

6

ShrimadBhagwadGeeta: Chapter 6-Verses 5, 13, 17, 23, 35, Chapter 18-Verses 45, 46, 48.

UNIT - 4: BASIC KNOWLEDGE:

6

Statements of basic knowledge. ShrimadBhagwadGeeta: Chapter2-Verses 56, 62, 68. Chapter 12 - Verses 13,14, 15, 16,17, 18.

UNIT - 5: ROLE MODEL :-

6

Personality of Role model. Shrimad BhagwadGeeta: Chapter2-Verses 17, Chapter 3-Verses 36,37,42, - Chapter 4-Verses 18, 38,39 - Chapter18 – Verses 37,38,63.

TEXT BOOK:

1. P.Gopinath, “Bhartrihari’s Three Satakam (Niti-sringar-vairagya)”, Rashtriya Sanskrit Sansthanam, New Delhi.

REFERENCE BOOK:

1. “Srimad Bhagavad Gita” by Swami SwarupanandaAdvaita Ashram (Publication Department), Kolkata.
2. http://openlearningworld.com/section_personality_development.html

Course Coordinator

HOD