ANNEXURE - 11

MATHEMATICS WITH COMPUTER APPLICATIONS (SF)

VISION:

> *To generate and disseminate mathematical knowledge through humanism and tolerance for reason, for adventure of ideas and for the search of truth in mathematics.*

MISSION:

- *To make students achieve, academic excellence through classroom teaching, practicals, projects and educational tours.*
- *To encourage students with different learning abilities by providing the needed support.*
- *To enable access to education processes through computer based technology by providing hands-on-training.*

Programme Educational Objectives (PEO)

PEO1	Natural navigators and nimble witted in diagnosing problems, in enlisting steps to rectify them and in providing the most effective solutions in the best possible way
PEO2	Moralistic while demonstrating their academic caliber, in recognizing and acknowledging value systems, in making decisions, accepting responsibilities and while concerned about society and public issues and needs
PEO3	Self-reliant in learning and in real life job situations through which they support their peers and become stable and reliable students, workers and citizens
PEO4	Steadfast in shielding and nurturing environment and stimulate its sustainable growth for a bright future
PEO5	Versatile and vibrant communicators in person and through other media. Vigilant/vital in prolonging the long winding richness and tradition of their mother tongue
PEO6	Neoteric global citizens of our nation, who would take the nation's pride around the world by adapting and adopting the scientific and technological developments
PEO7	Civilized and confident graduates, who believe in lifelong learning with the socio-cultural changes in the generations to come

PROGRAM OUTCOMES (PO)

The objectives of this programme is to equip / prepare the students

PO1	Students will be well equipped with knowledge of mathematical facts and logical skills which will rack up with a thorough knowledge of the Mathematics and the Computer papers.
PO2	Develop the knowledge, skills and attitude necessary to pursue higher studies in Mathematics
PO3	Students will acquire the reasoning ability and problem solving skill get through various competitive examinations.
PO4	Adapt the students with better learning ability in the ever changing software industry
PO5	Nurture the students with skills required to become an entrepreneur.

PROGRAM SPECIFIC OUTCOME (PSO)

On the successful completion of B.Sc. Mathematics with Computer Applications, the students will be able to

PSO 1	Understand the fundamental and the advanced concepts in Mathematics and Computer.
PSO 2	Exhibit a computational ability and numerical skills in the various areas.
PSO 3	Develop basic Mathematical and Computer Algorithm and analyze problems.
PSO 4	Build technical, professional, practical and communicative skills to face the industrial with clarity
PSO 5	Develop practical skills to provide solutions for computer oriented problems.

PO - PEO MAPPING

	PEO1	PEO2	PEO3	PEO4	PEO5	PEO6	PEO7
PO1	3	2	3	3	2	2	3
PO2	3	2	2	3	2	2	3
PO3	2	3	3	2	3	3	3
PO4	3	3	2	3	3	3	2
PO5	2	2	2	1	3	2	2

3- Strong   2- Medium   1- Low

B.Sc MATHEMATICS WITH CA

SEM	Part – I	Part – II	Part – III				Part – IV			Part – V (6th Hr)	ACC (6th Hr)			SLC
I Sem.	I Lang (6)	II Lang (6)	Core (5)	Core (5)	Allied Maths CA (4)	Allied Maths CA Lab (2)	SBE (2)	–	Total (30)	NSS / NCC / PED/Rover and Rangers/Library Science and Information (3)	Com.Eng (2)	Comp.Lit (1)	–	–
II Sem.	I Lang (6)	II Lang (6)	Core (4)	Core (5)	Allied Maths CA (4)	Allied Maths CA Lab (2)	SBE (2)	EVS (1)	Total (30)	NSS / NCC / PED/Rover and Rangers/Library Science and Information (3)	Com.Eng (2)	Comp.Lit (1)	–	Number theory
III Sem.	I Lang (6)	II Lang (6)	Core (6)	Core Lab (2)	Allied Maths CA (4)	Allied Maths CA Lab (2)	NME (2)	SBE (2)	Total (30)	NSS / NCC / PED/Rover and Rangers/Library Science and Information (3)	Com.Eng (2)	Comp.Lit (1)	–	History of Mathematics
IV Sem.	I Lang (6)	II Lang (6)	Core (6)	Core Lab (2)	Allied Maths CA (4)	Allied Maths CA Lab (2)	NME (2)	SBE (2)	Total (30)	NSS / NCC / PED/Rover and Rangers/Library Science and Information (3)	Com.Eng (2)	Comp.Lit (1)	–	Discrete Mathematics
V Sem.	Core (6)	Core (6)	Core (4)	Core (4)	Core Lab (2)	Elec. (5)	SBE (2)	WS (1)	Total (30)	–	Com.Eng (2)	Comp.Lit (1)	Skill Development–Career Guidance (3)	Latex
VI Sem.	Core (6)	Core (4)	Core (4)	Core Lab (2)	Elec.II (5)	Elec.III (5)	SBE (2)	VBE (2)	Total (30)	–	Com.Eng (2)	Comp.Lit (1)	Skill Development–Career Guidance (3)	—
								TOTAL	180 Hrs					

I Language	–	Tamil
II Language	–	English
SBE	–	Skill Based Elective
SLC	–	Self Learning Course
EVS	–	Environmental Studies
WS	–	Women Studies
VBE	-	Value Based Education

B.Sc MATHEMATICS WITH CA: CHOICE BASED CREDIT SYSTEM WITH OBE PATTERN FOR THOSE WHO HAVE JOINED FROM THE ACADEMIC YEAR 2021-22 ONWARDS

Part	Course	Subject	Sub Code	Hrs.	6th Hr.	Cr.	Adl. Cr.	Exam (Hrs)	Marks Int.	Marks Ext.
SEMESTER - I										
I	Lang. – I	Tamil – I	210103101	6		3		3	25	75
II	Lang. – II	English – I	211003101	6		3		3	25	75
III	Core	Calculus	213103101	5		5		3	25	75
	Core	Analytical Geometry of 3D and vector calculus	213103102	5		5		3	25	75
	Al.Mat CA	PC software	213103121	4		4		3	25	75
	Al. Mat CA Lab	MS Office Lab	213103122	2		1		3	40	60
IV	SBE - I	Basic Algebra	214403131	2		2		3	25	75
V	Extension activities	NSS / NCC / PED/Rover and Rangers/Library Science and Information	-		3			–	–	–
Additional Credit Courses		Communicative English–I	-		2			–	–	–
		Computer Literacy	-		1			–	–	–
SEMESTER – II										
I	Lang. – I	Tamil – II	210103201	6		3		3	25	75
II	Lang. – II	English – II	211003201	6		3		3	25	75
III	Core	Sequences and Series & Trigonometry	213103201	4		4		3	25	75
	Core	Differential Equation and Laplace Transformation	213103202	5		4		3	25	75
	Al.Mat CA	Programming in C	213103221	4		4		3	25	75
	Al. Mat CA Lab	C Lab	213103222	2		1		3	40	60
IV	SBE - II	Theory of Equations	214403231	2		2		3	25	75
	EVS	Environmental Studies	214103201	1		1		2	–	100
V	Extension activities	NSS / NCC / PED/Rover and Rangers/Library Science and Information	-		3			–	–	–
Additional Credit Courses		Communicative English–I			2		1	3	25	75
		Computer Literacy	-		1			–	–	–
		SLC - Number Theory	218003231				3	3	–	100
SEMESTER – III										
I	Lang. – I	Tamil – III		6		3		3	25	75
II	Lang. – II	English – III		6		3		3	25	75
III	Core	Modern Algebra		6		5		3	25	75
	Core Lab	Application of Differential Equations Lab		2		1		3	40	60
	Al.	Object Orient Programming with C++		4		4		3	25	75
	Al. Lab	C++ Lab		2		1		3	40	60
IV	NME - I	Basic Maths – I		2		2		2	25	75
	SBE –III	Quantitative Aptitude - I		2		2		3	25	75
V	Extension activities	NSS / NCC / PED/Rover and Rangers/Library Science and Information	-		3			–	–	–
Additional Credit Courses		Communicative English–II	-		2			–	–	–
		Computer Literacy	-		1			–	–	–
		SLC -History of Mathematics					3	3	–	100

Part	Course	Subject	Sub Code	Hrs.	6thHr.	Cr.	Adl. Cr.	Exam (Hrs)	Marks Int.	Marks Ext.
SEMESTER - IV										
I	Lang. – I	Tamil – IV		6		3		3	25	75
II	Lang. – II	English – IV		6		3		3	25	75
III	Core	Linear Algebra		6		5		3	25	75
	Core Lab	Combinatorial Mathematics Lab		2		1		3	40	60
	Allied	Java programming		4		4		3	25	75
	Al. Lab	Java lab		2		1		3	40	60
IV	NME- II	Basic Maths – II		2		2		2	25	75
	SBE –IV	Quantitative Aptitude - II		2		2		3	25	75
V	Extension activities	NSS / NCC / PED/Rover and Rangers/Library Science and Information				3	1	3	25 *40	75 *60
Additional Credit Courses		Communicative English–II	-			2		1	3	25	75
		Computer Literacy	-			1		–	–	–
		SLC - Discrete Mathematics					4	3	–	100
SEMESTER - V										
III	Core	Real Analysis		6		5		3	25	75
	Core	Operations Research		6		4		3	25	75
	Core	Visual Programming		4		4		3	25	75
	Core	Mechanics		4		2		3	25	75
	Core Lab	Visual Programming Lab		2		2		3	40	60
	Elective	Elective– I		5		5		3	25	75
IV	SBE - V	Astronomy		2		2		3	25	75
	WS	Women Studies		1		1		2	–	100
Additional Credit Courses		Communicative English–III	-		2			–	–	–
		Computer Literacy	-		1			–	–	–
		Skill Development – Career Guidance	-		3			–	–	–
		SLC - Latex					4	3	–	100
SEMESTER - VI										
III	Core	Complex Analysis		6		5		3	25	75
	Core	.Net Programming		4		4		3	25	75
	Core	Numerical Analysis		4		2		3	25	75
	Core Lab	.Net Lab		2		2		3	40	60
	Elective	Elective– II		5		5		3	25	75
	Elective	Elective– III: Project *Report;@Viva		5		5		–	40 [24:16]	60 [36:24]
IV	SBE - VI	Graph Theory		2		2		3	25	75
	VBE	Value Based Education		2		2		2	–	100
Additional Credit Courses		Communicative English–III			2		1	3	25	75
		Computer Literacy			1		1	3	–	100
		Skill Development – Career Guidance			3		2	3	–	100
		Total		**180**	**36**	**140**	**20**			

*Elective I, II: Each elective paper has two choices, select any one.

    I.1. Mathematical Statistics - I

    I.2. Functional Analysis

    II.1. Mathematical Statistics – II

    II.2. Stochastic Processes

ALLIED – MATHEMATICS FOR BCA

Sem	Title of the Paper	SUB CODE	Hrs.	Cr.	Exam (Hrs)	Marks Allotted	
						Int.	Ext.
I	Mathematics for Computer Applications	213103123	4	3	3	25	75
II	Optimization Techniques	213103223	4	3	3	25	75

ALLIED – MATHEMATICS FOR INFORMATION TECHNOLOGY

Sem	Title of the Paper	SUB CODE	Hrs.	Cr.	Exam (Hrs)	Marks Allotted	
						Int.	Ext.
III	Discrete Mathematics	-	4	4	3	25	75
IV	Resource management Techniques	-	4	4	3	25	75

Core Subject	**CALCULUS**	Code: 213103101
	SEMESTER I	**5 Hrs/Week**
		Credits 5

PREAMBLE
➢ *To provide a basic knowledge of fundamental concepts in Calculus.*
➢ *To motivate the learners on Calculus there by to lay foundation for future studies.*

COURSE OUTCOMES (CO)

On Successful completion of the course, the student will be able to

	Course Outcomes	**Knowledge Level(According to Bloom's Taxonomy)**
CO1	Understand the basic concepts of differentiation, envelopes, curvature.	Up to K3
CO2	Estimate the Maxima and minima of two variables and error solving skill.	Up to K3
CO3	Find the reduction formulae for various functions.	Up to K3
CO4	Simplify the problems in area and volume of the surfaces.	Up to K3
CO5	Evaluate problems in Beta and Gama Functions.	Up to K3

K1- Knowledge   K2 – Understand   K3-Apply

UNIT – I: **[15 Hrs]**

Curvature of curves – Radius of curvature – Centre of curvature – Evolute – Envelope.

UNIT – II: **[15 Hrs]**

Maxima and Minima of functions of two variables – Errors and approximations - Jacobians.

UNIT – III: **[15 Hrs]**

Integral – Reduction formulae for $\sin^n x$, $\cos^n x$, $\tan^n x$, $\cot^n x$, $\mathrm{cosec}^n x$, $\sec^n x$ and $\sin^m x \cos^n x$ – and problems.

UNIT – IV: **[15 Hrs]**

Evaluation of Double integrals - change the order of integration – Evaluation of Triple integrals – change of Variables.

UNIT – V: **[15 Hrs]**

Beta and Gamma functions and their properties.

TEXT BOOK:
01. Manickavasagam Pillai T.K., and Narayan S., Calculus, Vol. I and II, S.V. Publications, Chennai, 2006.
REFERENCE BOOK:
01. S. Arumugam and Thangapandi Isaac A., Calculus, New Gamma Publishing House, Palayam Kottai, 2006.

PEDAGOGY : Black Board; Chalk; LCD Projector

WEB RESOURCES:
01.https://www.khanacademy.org/math/calculus-1
02.http://www-math.mit.edu/~djk/calculus_beginners/

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
Unit – I [15 Hrs]				
1.1	Curvature of curves	3	Chalk & Talk	Black Board
1.2	Radius of curvature	3	Chalk & Talk	Black Board
1.3	Centre of curvature	3	Chalk & Talk	Black Board
1.4	Evolute	3	Chalk & Talk	Black Board
1.5	Envelope	3	Chalk & Talk	Black Board
UNIT – II [15 Hrs]				
2.1	Maxima and Minima of functions of two variables	7	Chalk & Talk	Black Board
2.2	Errors and approximations	5	Chalk & Talk	Black Board
2.3	Jacobians	3	Chalk & Talk	Black Board
UNIT – III [15 Hrs]				
3.1	Reduction formulae for $\sin^n x$	1	Chalk & Talk	Black Board
3.2	Reduction formulae for $\cos^n x$	1	Chalk & Talk	Black Board
3.3	Reduction formulae for $\tan^n x$	1	Chalk & Talk	Black Board
3.4	Reduction formulae for $\cot^n x$	1	Chalk & Talk	Black Board
3.5	Reduction formulae for $\operatorname{cosec}^n x$	1	Chalk & Talk	Black Board
3.6	Reduction formulae for $\sec^n x$	1	Chalk & Talk	Black Board
3.7	Reduction formulae for $\sin^m x \cos^n x$	2	Chalk & Talk	Black Board
3.8	Problems	7	Chalk & Talk	Black Board
UNIT – IV [15 Hrs]				
4.1	Evaluation of Double integrals	3	Chalk & Talk	Black Board
4.2	change the order of integration	5	Chalk & Talk	Black Board
4.3	Evaluation of Triple integrals	3	Chalk & Talk	Black Board
4.4	Change of Variables	4	Chalk & Talk	Black Board
UNIT – V [15 Hrs]				
5.1	Beta and Gamma functions Definitions	2	Chalk & Talk	Black Board
5.2	Beta and Gamma functions Properties	8	Chalk & Talk	Black Board
5.3	Problems	5	Chalk & Talk	Black Board

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	1	3	3	2	3
CO2	3	3	3	3	2
CO3	3	3	2	2	2
CO4	2	3	3	3	2
CO5	2	3	2	2	2

3- Strong   2- Medium   1- Low

COURSE DESIGNER : **Mrs. P.DEEPA**

****

Core Subject ANALYTICAL GEOMETRY OF 3D AND VECTOR CALCULUS
                              SEMESTER I   Code: 213103102
                                                              5 Hrs/Week
                                                                Credits 5

PREAMBLE
  ➢ *To introduce basic concepts of Analytical Geometry and Vector.*
  ➢ *To lay foundation for future studies in Geometry and Vectors.*

COURSE OUTCOMES (CO)
On Successful completion of the course, the student will be able to

	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO1	Explain the basic concepts of Lines and Planes.	Up to K3
CO2	Describe about the properties of Spheres and Circles.	Up to K3
CO3	Solve problems in Cylinder and Circular Cone.	Up to K3
CO4	Evaluate the Vector Differentiation and Grad, Div, Curl and directional derivatives.	Up to K3
CO5	Examine Vector Integration and Green's, Gauss's and Stokes theorem for vector valued functions.	Up to K3

K1- Knowledge   K2 – Understand   K3-Apply

UNIT – I: **[15 Hrs]**

Plane equations – Bisecting planes – Image of a point on a plane – Image of a line in a plane – Coplanar lines – Point of intersection of two lines.

UNIT – II: **[15 Hrs]**

The sphere – Equation of a sphere – Equation of a tangent plane – Equation of a circle – Centre and radius of a circle – Great circle – Intersection of two spheres – Orthogonal spheres.

UNIT – III: **[15 Hrs]**

The Cylinder – Right circular cylinder – The enveloping cylinder – The cone – Right circular cone – Intersection of a cone and a plane through the vertex.

UNIT – IV: **[15 Hrs]**

Vector differentiation – Gradient - Divergence – Curl – Solenoidal – Irrotational – Directional derivatives of a vector – Connected problems.

UNIT – V: **[15 Hrs]**

Vector integration – Line integrals – Surface integral – Volume integral – Verification of Green's Theorem, Stokes theorem and Gauss divergence theorem.

TEXT BOOKS:
  01. S. Arumugam and Thangapandi Isaac A., Analytical Geometry of 3D and Vector Calculus, New Gamma Publishing House, Palayam Kottai, 2006.
  02. Mathew K.C., and Others, Co-ordinate geometry of Two and three dimensions, 1988.

REFERENCE BOOK:
01. Manickavasagam Pillai T.K., and Narayanan S., Analytical Geometry, Vol.2, S.V. Publications, Chennai, 2006.

PEDAGOGY :Black Board; Chalk; LCD Projector
WEB RESOURCES:
01. http://www.mhtlab.uwaterloo.ca/courses/me201/lecturenotes/me201_web_2017_ch11.pdf
02. http://www.bhojvirtualuniversity.com/slm/bsc1_maths3.pdf

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
Unit – I [15 Hrs]				
1.1	Plane equations	3	Chalk & Talk	Black Board
1.2	Bisecting planes	3	Chalk & Talk	Black Board
1.3	Image of a point on a plane	2	Chalk & Talk	Black Board
1.4	Image of a line in a plane	2	Chalk & Talk	Black Board
1.5	Coplanar lines	2	Chalk & Talk	Black Board
1.6	Point of intersection of two lines	3	Chalk & Talk	Black Board
Unit – II [15 Hrs]				
2.1	Equation of a sphere	2	Chalk & Talk	Black Board
2.2	Equation of a tangent plane	2	Chalk & Talk	Black Board
2.3	Equation of a circle	2	Chalk & Talk	Black Board
2.4	Centre and radius of a circle	2	Chalk & Talk	Black Board
2.5	Great circle	2	Chalk & Talk	Black Board
2.6	Intersection of two spheres	2	Chalk & Talk	Black Board
2.7	Orthogonal spheres	3	Chalk & Talk	Black Board
Unit – III [15 Hrs]				
3.1	The Cylinder	1	Chalk & Talk	Black Board
3.2	Right circular cylinder	3	Chalk & Talk	Black Board
3.3	The enveloping cylinder	4	Chalk & Talk	Black Board
3.4	The cone	1	Chalk & Talk	Black Board
3.5	Right circular cone	3	Chalk & Talk	Black Board
3.6	Intersection of a cone and a plane through the vertex	3	Chalk & Talk	Black Board
Unit – IV [15 Hrs]				
4.1	Vector differentiation	1	Chalk & Talk	Black Board
4.2	Gradient	2	Chalk & Talk	Black Board
4.3	Divergence	2	Chalk & Talk	Black Board
4.4	Curl	2	Chalk & Talk	Black Board
4.5	Solenoidal	2	Chalk & Talk	Black Board
4.6	Irrotational	2	Chalk & Talk	Black Board
4.7	Directional derivatives of a vector	2	Chalk & Talk	Black Board
4.8	Connected problems	2	Chalk & Talk	Black Board
Unit – V [15 Hrs]				
5.1	Vector integration	1	Chalk & Talk	Black Board
5.2	Line integrals	3	Chalk & Talk	Black Board
5.3	Surface integral	3	Chalk & Talk	Black Board
5.4	Volume integral	2	Chalk & Talk	Black Board

5.5	Verification of Green's Theorem	2	Chalk & Talk	Black Board
5.6	Stokes theorem	2	Chalk & Talk	Black Board
5.7	Gauss divergence theorem	2	Chalk & Talk	Black Board

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	2	3
CO2	2	2	3	3	2
CO3	3	3	2	2	2
CO4	2	2	3	3	2
CO5	2	3	2	2	2

3- Strong   2- Medium   1- Low

COURSE DESIGNER *:* **Mrs. P.KAYATHRI**

****

Allied Maths CA   **PC SOFTWARE**   Code: 213103121
                              SEMESTER I   **4 Hrs/Week**
                                                          Credits 4

PREAMBLE
   ➢ *To introduce the fundamental concepts of PC Software.*
   ➢ *To lay foundation for future studies in software.*

COURSE OUTCOMES (CO)

On Successful completion of the course, the student will be able to

	Course Outcome	**Knowledge Level (According to Bloom's Taxonomy)**
CO1	Expound the basic knowledge about Personal Computer.	Up to K3
CO2	Improve the capability on DOS and Windows Operating Systems properties.	Up to K3
CO3	Encourage the mail merge and sorting process using MS Word.	Up to K3
CO4	Analyzing data Handling capabilities using MS Excel.	Up to K3
CO5	Creating a Powerful slide presentation.	Up to K3

K1- Knowledge   K2 – Understand   K3-Apply

UNIT – I: **[10 Hrs]**

Characteristics of Computer – History and Generations of Computer — Classification and Application of Computers – Architecture and Organization – Personal Computers – Input and Output devices – Hardware, Software and Operating Systems – Computer Languages – NETWORK concepts.

UNIT – II: **[14 Hrs]**

DOS: Loading DOS – File – Directory – Copying – Deleting – Renaming – Internal and External Commands – Date and Time - Format and Unformat – Xcopy, Type, PATH – Hidden and Unhidden Files – Windows.

WINDOWS: Introduction – Starting Windows – Moving and Resizing – Menu System – File Manager – Opening Multiple Windows – Commands – Copying, Moving, Deleting and Renaming Files – Searching Files – Running a Program.

UNIT – III: **[12 Hrs]**

MS Word: Creating a document – Editing – Formatting – Find and Replace – Spell and Grammar Check – Page Setup – Auto Correction – Bullet and Numbering – Table Creation and Mail Merge.

UNIT – IV: **[12 Hrs]**

MS EXCEL: Work Sheet – Entering Number and Formula – Moving, Copying, Inserting and Deleting Rows and Columns – Chart Creating - Naming Range – Functions – Math Functions – Statistical Function – Auto Sum.

UNIT – V: **[12 Hrs]**

Power Point - Introduction – Creating a Presentation – Power Point Views – Running a Slide Show – Printing a Presentation.

TEXT BOOK:

01. Taxali R.K., PC Software for Windows Made Simple, Tata McGraw–Hill, New Delhi, 2001.

REFERENCES BOOK:

01. Gini Courter and Annette Marquis, MS Office 2000, BPB Publications, New Delhi, 2002.
02. Taxali R.K., PC Software for Windows 98, Tata McGraw Hill, New Delhi, 2001.

PEDAGOGY :   LCD Projector

WEB RESOURCES:
1. https://www.gr8ambitionz.com/2015/08/computer-knowledge-materials-pdf-download.html
2. https://edu.gcfglobal.org/en/subjects/office/

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
Unit – I		[10 Hrs]		
1.1	Characteristics of Computer	1	Chalk & Talk	Black Board
1.2	History and Generations of Computer	1	Chalk & Talk	Black Board
1.3	Classification and Application of Computers	1	Chalk & Talk	Black Board
1.4	Architecture and Organization	1	Chalk & Talk	Black Board
1.5	Personal Computers	1	Chalk & Talk	Black Board
1.6	Input and Output devices	1	Chalk & Talk	Black Board
1.7	Hardware, Software and Operating Systems	2	Chalk & Talk	Black Board
1.8	Computer Languages	1	Chalk & Talk	Black Board
1.9	NETWORK concepts	1	Chalk & Talk	Black Board
Unit – II		[14 Hrs]		
2.1	Loading DOS, File and Directory	1	Chalk & Talk	Black Board

2.2	Copying, Deleting, Renaming	1	Chalk & Talk	Black Board
2.3	Internal and External Commands, Date and Time	1	Chalk & Talk	Black Board
2.4	Format and Unformat, Xcopy, Type, PATH	1	Chalk & Talk	Black Board
2.5	Hidden and Unhidden Files	1	Chalk & Talk	Black Board
2.6	Windows Introduction, Starting Windows	2	Chalk & Talk	Black Board
2.7	Moving and Resizing, Menu System	1	Chalk & Talk	Black Board
2.8	File Manager	1	Chalk & Talk	Black Board
2.9	Opening Multiple Windows	1	Chalk & Talk	Black Board
2.10	Commands	1	Chalk & Talk	Black Board
2.11	Copying, Moving, Deleting and Renaming Files	1	Chalk & Talk	Black Board
2.12	Searching Files	1	Chalk & Talk	Black Board
2.13	Running a Program	1	Chalk & Talk	Black Board
	Unit – III	[12 Hrs]		
3.1	Creating a document	2	Chalk & Talk	LCD Projector
3.2	Editing	1	Chalk & Talk	Black Board
3.3	Formatting	1	Chalk & Talk	Black Board
3.4	Find and Replace	1	Chalk & Talk	LCD Projector
3.5	Spell and Grammar Check	1	Chalk & Talk	Black Board
3.6	Page Setup	1	Chalk & Talk	Black Board
3.7	Auto Correction	1	Chalk & Talk	Black Board
3.8	Bullet and Numbering	1	Chalk & Talk	LCD Projector
3.9	Table Creation	1	Chalk & Talk	LCD Projector
3.10	Mail Merge	2	Chalk & Talk	Black Board
	Unit – IV	[12 Hrs]		
4.1	Work Sheet	2	Chalk & Talk	Black Board
4.2	Entering Number and Formula	2	Chalk & Talk	Black Board
4.3	Moving, Copying, Inserting and Deleting Rows and Columns	2	Chalk & Talk	Black Board
4.4	Chart Creating	2	Chalk & Talk	LCD Projector
4.5	Naming Range	1	Chalk & Talk	LCD Projector
4.6	Math Functions	1	Chalk & Talk	LCD Projector
4.7	Statistical Function	1	Chalk & Talk	Black Board
4.8	Auto Sum	1	Chalk & Talk	Black Board
	Unit – V	[12 Hrs]		
5.1	Power Point-Introduction	2	Chalk & Talk	Black Board
5.2	Creating a Presentation	2	Chalk & Talk	Black Board
5.3	Power Point Views	2	Chalk & Talk	LCD Projector
5.4	Running a Slide Show	3	Chalk & Talk	LCD Projector
5.5	Printing a Presentation.	3	Chalk & Talk	LCD Projector

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	3
CO2	2	2	3	3	3
CO3	3	3	2	2	2
CO4	3	3	3	2	2
CO5	2	2	3	3	2

3- Strong   2- Medium   1- Low

COURSE DESIGNER: MR. S.SEENIRAJAN
****

Allied Maths CA Lab   **MS OFFICE LAB**   Code:213103122
                                  SEMESTER I   **2 Hrs/Week**
                                                                Credit 1

PREAMBLE:
  ➢ *To give the basic theory on Common MS Office*
  ➢ *To lay foundation for future studies in MS Office*

MS WORD:
  01. Bold, Italics, Underline and Different Font Style
  02. Creating Tables in Word
  03. Mail merge

MS–EXCEL:
  01. Mathematical Function
  02. String Function
  03. Logical Function
  04. Date and Time
  05. Chart Creation In Excel
  06. Student Mark Sheet

POWERPOINT:
  01. Power Point with College Details
  02. PowerPoint Presentation Department Details

REFERENCE BOOKS:
  01. Gini Courter and Annette Marquis, MS Office 2000, BPB Publications, New Delhi, 2002.
  02. Taxali R.K., PC Software for Windows 98, Tata McGraw–Hill, New Delhi, 2001.

PEDAGOGY :
  Computer Lab, LCD Projector.

WEB RESOURCES:
  1. https://www.gr8ambitionz.com/2015/08/computer-knowledge-materials-pdf-download.html
  2. https://edu.gcfglobal.org/en/subjects/office/

COURSE DESIGNER: Mr. S.Seenirajan

****

Skill Based Elective   **BASIC ALGEBRA**   Code: 214403131
                                  SEMESTER I   **2 Hrs/Week**
                                                                Credits 2

PREAMBLE
  ➢ *To provide basic knowledge of functions and relations.*
  ➢ *To motivate the learners on algebra there by to lay foundation for future studies.*

COURSE OUTCOMES (CO)

On Successful completion of the course, the student will be able to

No	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO1	Understand the concepts of Relations.	Up to K3
CO2	Analyze Equivalence Classes and Partitions	Up to K3
CO3	Fundamental Knowledge about Partial ordered set and Lattices.	Up to K3
CO4	Brief Knowledge about Concepts of Functions.	Up to K3
CO5	Finding Inverse and Identity functions.	Up to K3

K1- Knowledge   K2 – Understand   K3-Apply

UNIT – I: **[6 Hrs]**

Relations – Equivalence relations – Examples – problems - Theorems.

UNIT – II: **[6 Hrs]**

Equivalence classes – partition – Examples – problems - Theorems.

UNIT – III: **[6 Hrs]**

Partial ordered sets – Representation of finite posets by diagrams – lattices – Definition – examples.

UNIT – IV: **[6 Hrs]**

Functions – examples – Injective, surjective and bijective functions – composite of functions – problems.

UNIT – V: **[6 Hrs]**

Identity and inverse functions – theorems – problems.

TEXT BOOK:

01.Dr. S. Arumugam Isaac A.T., Modern Algebra, New Gamma Publishing House, Palayam Kottai, 2006.

REFERENCE BOOK:

01.M.K. Venkataraman, Dr. N. Sridharan and Dr. N. Chandra Sekaran, Discrete Mathematics, The National Publishing Company, Chennai, 2007.

PEDAGOGY : Black Board; Chalk; LCD Projector

WEB RESOURCES:

01.https://ocw.mit.edu/courses/mathematics/18-703-modern-algebra-spring-2013/

02.https://mathcs.clarku.edu/~djoyce/ma225/

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
Unit – I [6 Hrs]				
1.1	Relations and Examples	2	Chalk & Talk	Black Board
1.2	Equivalence relations	1	Chalk & Talk	Black Board
1.3	Examples	1	Chalk & Talk	Black Board
1.4	Problems	2	Chalk & Talk	Black Board
Unit – II [6 Hrs]				
2.1	Equivalence classes	1	Chalk & Talk	Black Board
2.2	Partition	1	Chalk & Talk	Black Board
2.3	Examples	1	Chalk & Talk	Black Board
2.4	Problems	1	Chalk & Talk	Black Board
2.5	Theorems	2	Chalk & Talk	Black Board
Unit – III [6 Hrs]				
3.1	Partial ordered sets	1	Chalk & Talk	Black Board
3.2	Representation of finite posets by diagrams	1	Chalk & Talk	Black Board
3.3	Lattices	1	Chalk & Talk	Black Board
3.4	Definition	1	Chalk & Talk	Black Board
3.5	Examples	2	Chalk & Talk	Black Board
Unit – IV [6 Hrs]				
4.1	Functions	1	Chalk & Talk	Black Board
4.2	Examples	1	Chalk & Talk	Black Board
4.3	Injective, Surjective, bijective functions	1	Chalk & Talk	Black Board

4.4	composite of functions	1	Chalk & Talk	Black Board
4.5	Problems	2	Chalk & Talk	Black Board
Unit – V [6 Hrs]				
5.1	Identity Function	1	Chalk & Talk	Black Board
5.2	inverse functions	1	Chalk & Talk	Black Board
5.3	Theorems	2	Chalk & Talk	Black Board
5.4	Problems	2	Chalk & Talk	Black Board

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3
CO2	3	2	3	3	2
CO3	3	3	3	2	2
CO4	2	2	3	3	2
CO5	2	3	2	2	3

3- Strong   2- Medium   1- Low

COURSE DESIGNER : Mr. S.Seenirajan

****

Core Subject   **SEQUENCES AND SERIES & TRIGNOMETRY**   **Code: 213103201**

SEMESTER II   **4 Hrs/Week**

Credits 4

PREAMBLE

> ➢ *To provide fundamental ideas and properties of sequences and series*
> ➢ *To motivate the learners to solve the trigonometrical problems.*

COURSE OUTCOMES (CO)

On Successful completion of the course, the student will be able to

	Course Outcomes	**Knowledge Level (According to Bloom's Taxonomy)**
CO1	Discuss the nature of convergent, divergent and oscillating sequences.	Up to K3
CO2	Recognize and solve innovative learning of limits of sequence.	Up to K3
CO3	Analyze the behavior of series through various tests.	Up to K3
CO4	Simplify the problems of series involving trigonometric functions of multiple angles.	Up to K3
CO5	Explore trigonometry as a tool in solving problems	Up to K3

K1- Knowledge   K2 – Understand   K3-Apply

UNIT – I: **[12 Hrs]**

Sequences – Bounded, convergent, divergent – oscillating sequences – Algebra of limits - Behaviour of monotonic sequences.

UNIT – II: **[12 Hrs]**

Cauchy's first limit theorem – Cesaro's theorem – Cauchy's second limit theorem – subsequences – Cauchy sequence – upper and lower limits of sequences.

UNIT – III: **[12 Hrs]**

Infinite series – tests of convergence of series of positive terms – comparison test – Kummer's test – Root test.

UNIT – IV: **[12 Hrs]**

Expansion of sinnx, cosnx, tannx, $\cos^n x$, $\sin^n x$ - expansion of $\sin\theta$ and $\cos\theta$ in ascending powers of θ.

UNIT – V: **[12 Hrs]**

Hyperbolic function - Inverse Hyperbolic function - Logarithm of a Complex number.

TEXT BOOKS:
01. S. Arumugam and Thangapandi Isaac A., Sequences and series, New Gamma Publishing House, Palayam Kottai, 2006. (Unit I to Unit III)
02. Manickavasagam Pillai T.K., and Narayanan S., Trigonometry, S.V. Publications, Chennai, 2006. (Unit IV and Unit V)

REFERENCE BOOKS:
01.Natarajan .S.,Sequence & Series, S.V.Publications, Chennai.
02.Vital P.R., Trigonometry, Margham Publication, Chennai.

PEDAGOGY : Black Board; Chalk; LCD Projector

WEB RESOURCES:
1. https://tutorial.math.lamar.edu/classes/calcii/convergenceofseries.aspx
2. https://www.khanacademy.org/math/ap-calculus-bc/bc-series-new/bc-10-1/v/convergent-and-divergent-sequences

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
Unit – I		[12 Hrs]		
1.1	Bounded, convergent, divergent	3	Chalk & Talk	Black Board
1.2	oscillating sequences	3	Chalk & Talk	Black Board
1.3	Algebra of limits	3	Chalk & Talk	Black Board
1.4	Behaviour of monotonic sequences	3	Chalk & Talk	Black Board
Unit – II		[12 Hrs]		
2.1	Cauchy's first limit theorem	1	Chalk & Talk	Black Board
2.2	Cesaro's theorem	1	Chalk & Talk	Black Board
2.3	Cauchy's second limit theorem	2	Chalk & Talk	Black Board
2.4	Subsequences	2	Chalk & Talk	Black Board
2.5	Cauchy sequence	2	Chalk & Talk	Black Board
2.6	Upper limits of sequences.	2	Chalk & Talk	Black Board
2.7	Lower limits of sequences.	2	Chalk & Talk	Black Board
Unit – III		[12 Hrs]		
3.1	tests of convergence of series of positive terms	2	Chalk & Talk	Black Board
3.2	comparison test	3	Chalk & Talk	Black Board
3.3	Kummer's test	3	Chalk & Talk	Black Board
3.4	Root test	4	Chalk & Talk	Black Board
Unit – IV		[12 hrs]		
4.1	sinnx, cosnx, tannx	4	Chalk & Talk	Black Board
4.2	$\cos^n x$, $\sin^n x$	4	Chalk & Talk	Black Board
4.3	$\sin\theta$ and $\cos\theta$ in ascending powers of θ	4	Chalk & Talk	Black Board
Unit – V		[12 Hrs]		
5.1	Hyperbolic function	4	Chalk & Talk	Black Board
5.2	Inverse Hyperbolic function	4	Chalk & Talk	Black Board
5.3	Logarithm of a Complex number	4	Chalk & Talk	Black Board

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3
CO2	2	2	3	3	2
CO3	2	3	3	2	2
CO4	2	2	3	2	2
CO5	2	3	2	2	3

3- Strong   2- Medium   1- Low

COURSE DESIGNER :   Mrs. P.Deepa

****

Core Subject	**DIFFERENTIAL EQUATION AND LAPLACE TRANSFORMATION**

SEMESTER II   **Code: 213103202**

5 Hrs/Week

Credits 4

PREAMBLE
- ➢ *To introduce a Basic Knowledge of Differential Equations and Laplace Transformations*
- ➢ *To motivate the learners on Differential Equations there by to lay foundation for further studies.*

COURSE OUTCOMES (CO)

On Successful completion of the course, the student will be able to

	COURSE OUTCOMES	**Knowledge Level** (According to Bloom's Taxonomy)
CO1	Classify differential equations by order, linearity, and homogeneity.	Up to K3
CO2	Solving homogeneous and non homogeneous equations.	Up to K3
CO3	Examine the different forms of PDE for finding the solutions.	Up to K3
CO4	Use Laplace transforms and their inverses to solve differential equations.	Up to K3
CO5	Expound innovations to solve Differential Equations with constant Coefficients and Exact Differential equations using Laplace transformations.	Up to K3

K1- Knowledge   K2 – Understand   K3-Apply

UNIT – I: **[15 Hrs]**

Linear equation with constant coefficients of second order only: Definitions – the operator D – complementary function of a linear equation with constant coefficients – particular Integral – General method of finding P.I. – Special methods for finding P.I.

UNIT – II: **[15 Hrs]**

Linear non homogeneous equation with variable coefficients (Second order only) – Equation reducible to the linear equation (Second order only).

Linear homogeneous equation with variable coefficients: Change of the independent variable – Variation of parameters (two methods only)

UNIT – III: **[15 Hrs]**

Partial differential equations: Formation of P.D.E. - By elimination of constants – By elimination of an arbitrary function – Lagrange's method of solving the linear equation.

UNIT – IV: **[15 Hrs]**

Laplace transforms: Definition - Properties of L.T. – Some general theorems – solutions of differential equation using L.T - problems.

Inverse LT: Definition – some general theorems – solution of ODE with constant coefficient – solution of system of differential equations – solution fo D.E's with variable coefficients – solution of LT involving integrels.

UNIT – V: **[15 Hrs]**

Solution of differential equations with constant Coefficients using Laplace transformation – solution of D.E.'s with variable coefficient L.T. – Exact Differential equation.

TEXT BOOK:
  01. Manickavasagam Pillay T.K., and Narayanan S., Differential Equations and its applications, S.V. Publications, Chennai, 2006.

REFERENCE BOOK:
  01. S. Arumugam and Thangapandi Isaac A., Differential Equations and applications, New Gamma Publishing House, Palayam Kottai, 2006.

PEDAGOGY : Black Board; Chalk; LCD Projector

WEB RESOURCES:
  1. https://www.math.ust.hk/~machas/differential-equations.pdf
  2. https://tutorial.math.lamar.edu/classes/de/de.aspx
  3. https://www.sakshieducation.com/Engg/EnggAcademia/CommonSubjects/Maths-1-LaplaceTransformation.pdf

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [15 Hrs]				
1.1	Definitions, the operator D	3	Chalk & Talk	Black Board
1.2	complementary function of a linear equation with constant coefficients	3	Chalk & Talk	Black Board
1.3	Particular Integral	3	Chalk & Talk	Black Board
1.4	General method of finding P.I.	3	Chalk & Talk	Black Board
1.5	Special methods for finding P.I.	3	Chalk & Talk	Black Board
UNIT – II [15 Hrs]				
2.1	Linear non homogeneous equation with variable coefficients (Second order only)	5	Chalk & Talk	Black Board
2.2	Equation reducible to the linear equation (Second order only)	5	Chalk & Talk	Black Board
2.3	Change of the independent variable	3	Chalk & Talk	Black Board
2.4	Variation of parameters (two methods only)	2	Chalk & Talk	Black Board
UNIT – III [15 Hrs]				
3.1	Formation of P.D.E.	2	Chalk & Talk	Black Board
3.2	By elimination of constants	2	Chalk & Talk	Black Board
3.3	By elimination of an arbitrary function	2	Chalk & Talk	Black Board

3.4	Lagrange's method of solving the linear equation	9	Chalk & Talk	Black Board
UNIT – IV [15 Hrs]				
4.1	Definition - Properties of L.T.	3	Chalk & Talk	Black Board
4.2	Some general theorems	3	Chalk & Talk	Black Board
4.3	Problems	3	Chalk & Talk	Black Board
4.4	Definition – Some general theorems	3	Chalk & Talk	Black Board
4.5	Inverse LT:	3	Chalk & Talk	Black Board
UNIT – V [15 Hrs]				
5.1	Using Laplace transformation	5	Chalk & Talk	Black Board
5.2	solution of D.E.'s with variable coefficient L.T.	5	Chalk & Talk	Black Board
5.3	Exact Differential equation.	5	Chalk & Talk	Black Board

MAPPING OF COs WITH POs

	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1	3	2	2	3	3
CO2	2	2	3	3	2
CO3	3	3	3	2	2
CO4	2	2	3	2	2
CO5	2	3	2	2	3

3- Strong   2- Medium   1- Low

COURSE DESIGNER :   **Mrs. P.KAYATHRI**

****

Allied Maths CA	**PROGRAMMING IN C**	**Code: 213103221**
	SEMESTER II	**4 Hrs/Week**
		Credits 4

PREAMBLE
> * *To introduce the fundamental concepts in C Programming.*
> * *To lay foundation for future studies in C Programming*

COURSE OUTCOMES (CO)

On Successful completion of the course, the student will be able to

	Course Outcomes	**Knowledge Level (According to Bloom's Taxonomy)**
CO1	Explain the basic concepts of C Language.	Up to K3
CO2	Apply decision making, looping and branching statements to create simple programs.	Up to K3
CO3	Identify various dimensional arrays, string handling and user defined functions.	Up to K3
CO4	Analyze the concept of Pointers and Files.	Up to K3
CO5	Choose appropriate C programming structure for real life problems.	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT – I: **[12 Hrs]**

C fundamentals, data input, output and control statements: The C Character – Identifiers and Keywords – Data types – Constants – Variables – Declaration – Expressions – Various types of operators – Single character –

Input and Output – Entering input data – Writing output data – The gets and puts functions – Branching – Looping – Nested control structures – Switch – Break – Continue – GOTO.

UNIT – II: **[12 Hrs]**

Functions: Defining a function – Accessing a function – Function Prototypes – Passing arguments to a function – Recursion – Library function - Macros.

Storage classes – Automatic variables – Global variables – Static variables – Register variables.

UNIT – III: **[12 Hrs]**

Arrays and Pointers: Defining and processing of array – Passing arrays function – Multi dimensional arrays – Arrays and strings – String handling functions.

Pointers – Declaration – Passing pointers to function.

UNIT – IV: **[12 Hrs]**

Structures and Unions: Defining a Structure – Processing a structure – Structures and pointers – Passing structures to functions – Bit fields – Unions – Enumerations.

UNIT – V: **[12 Hrs]**

Data Files: Opening and closing of data files – Creating a data file – Processing a data file – Command line parameter.

TEXT BOOK:
01. Balagurusamy E., Programming in ANSI C, Edi 4E, Tata MaGraw–Hill, New Delhi, 2004.
    Chapters: 2, 3, 4, 5, 7, 8.8, 9, 10.1 to 10.10, 11.1 to 11.5, 11.10, 12.1 to 12.4, 12.7

REFERENCE BOOK:
01. Byron S. Gottifired, Theory and Problems of Programming with C, 2nd Edition, Tata McGraw–Hill, New Delhi, 2002.

PEDAGOGY : LCD Projector

WEB RESOURCES:
    01. http://www.cprogrammingnotes.com/
    02. https://www.tutorialspoint.com/cprogramming/index.htm

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Mod ule No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I		[12 Hrs]		
1.1	C Character	1	Chalk & Talk	Black Board
1.2	Identifiers and Keywords	1	Chalk & Talk	Black Board
1.3	Data types, Constants, Variables	1	Chalk & Talk	Black Board
1.4	Declaration, Expressions	1	Chalk & Talk	Black Board
1.5	Various types of operators	1	Chalk & Talk	Black Board
1.6	Single character, Input and Output, Entering input data,	1	Chalk & Talk	Black Board

		Writing output data			
1.7		The gets and puts functions	2	Chalk & Talk	Black Board
1.8		Branching Statements	2	Chalk & Talk	LCD Projector
1.9		Looping Statements	2	Chalk & Talk	LCD Projector
Unit – II				[12 Hrs]	
2.1		Defining a function, Accessing a function, Function Prototypes	2	Chalk & Talk	Black Board
2.2		Passing arguments to a function	1	Chalk & Talk	Black Board
2.3		Recursion	1	Chalk & Talk	Black Board
2.4		Library function, Macros	2	Chalk & Talk	Black Board
2.5		Storage classes	2	Chalk & Talk	Black Board
2.6		Automatic variables, Global Variables	2	Chalk & Talk	Black Board
2.7		Static variables, Register variables	2	Chalk & Talk	Black Board
Unit – III				[12 Hrs]	
3.1		Defining and processing of array	2	Chalk & Talk	Black Board
3.2		Passing arrays function	1	Chalk & Talk	Black Board
3.3		Multi dimensional arrays	1	Chalk & Talk	Black Board
3.4		Arrays and strings	2	Chalk & Talk	Black Board
3.5		String handling functions	2	Chalk & Talk	Black Board
3.6		Pointers, Declaration	2	Chalk & Talk	Black Board
3.7		Passing pointers to function	2	Chalk & Talk	Black Board
Unit – IV				[12 Hrs]	
4.1		Defining a Structure	2	Chalk & Talk	Black Board
4.2		Processing a structure	2	Chalk & Talk	Black Board
4.3		Structures and pointers	2	Chalk & Talk	Black Board
4.4		Passing structures to functions	3	Chalk & Talk	Black Board
4.5		Bit fields	1	Chalk & Talk	Black Board
4.6		Unions	1	Chalk & Talk	Black Board
4.7		Enumerations	1	Chalk & Talk	Black Board
Unit – V				[12 Hrs]	
5.1		Opening and closing of data files	3	Chalk & Talk	Black Board
5.2		Creating a data file	3	Chalk & Talk	Black Board
5.3		Processing a data file	3	Chalk & Talk	Black Board
5.4		Command line parameter	3	Chalk & Talk	Black Board

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	3
CO2	2	3	3	3	3
CO3	3	3	3	2	2
CO4	3	3	3	2	2
CO5	2	2	2	2	2

3- Strong   2- Medium   1- Low

COURSE DESIGNER :   Mr. S.Seenirajan

****

Allied Maths CA	**C LAB**	Code: 213103222
	SEMESTER II	**2 Hrs/Week**
		Credit 1

PREAMBLE
> ➢ *To give hands on training in C Programming.*
> ➢ *To illustrate the basic operations in C Programming.*

Program List:

01. Write a program to calculate the simple interest
02. Write a program to calculate the salesmen commission

Amount of Sales	Commission
10000	5%
15000	8%
More than 15000	10%

03. Write a program to find the average of n numbers
04. Write a program to find the sum of digits
05. Write a program to check whether the given number is prime or not.
06. Write a program to reverse the given string and check whether it is a palindrome or not
07. Write a program to sort the given n number
08. Write a program to multiply given two matrices
09. Write a program to maintain the employee details using structures
10. Write a program to count the occurrence of the characters in a string
11. Write a program to find the roots of the quadratic equation
12. Write a program to find the nC_r value nP_r using functions.

TEXT BOOK:
01. Balagurusamy E., Programming in ANSI C, Edi 4E, Tata MaGraw–Hill, New Delhi, 2004.

REFERENCE BOOKS:
01. Byron S.Gottifired, Theory and Problems of Programming with C, 2nd Edition, Tata McGraw–Hill, New Delhi, 2002.

PEDAGOGY : LCD Projector

WEB RESOURCES:
1. http://www.cprogrammingnotes.com/
2. https://www.tutorialspoint.com/cprogramming/index.htm

COURSE DESIGNER :   Mr. S.SEENIRAJAN
****

Skill Based Elective	**THEORY OF EQUATIONS**	Code:214403231
	SEMESTER II	**2 Hrs/Week**
		Credits 2

PREAMBLE
> ➢ *To give an introductory knowledge about Equations.*
> ➢ *To train the students in solving equations.*

COURSE OUTCOMES (CO)

On Successful completion of the course, the student will be able to

	Course Outcomes	**Knowledge Level (According to Bloom's Taxonomy)**
CO1	Recognize the fundamental concepts of theory of equations.	Up to K3
CO2	Finding solutions to the equations by using relation between roots and coefficients.	Up to K3

CO3	Apply computational techniques to find the reciprocal and multiple roots of the equation.	Up to K3
CO4	Perform the transformation of equations.	Up to K3
CO5	Evaluate the roots of the cubic equation.	Up to K3

K1- Knowledge   K2 – Understand   K3-Apply

UNIT – I: [6 Hrs]

Introduction – In an equation with real coefficients imaginary roots occur in pairs –   In an equation with rational coefficients irrational roots occur in pairs.

UNIT – II: [6 Hrs]

Symmetric function of the roots – Roots with sign changed – Roots multiplied by a given number.

UNIT – III: [6 Hrs]

Reciprocal roots – Multiple roots.

UNIT – IV: [6 Hrs]

To increase or decrease the roots – Removal of terms.

UNIT – V: [6 Hrs]

Finding a real root of a cubic equation by Newton's Method.

TEXT BOOK:
01. Manickavasagam Pillai T.K., Natarajan T., and Ganapathy K.S., Algebra, Vol.1, S.Visvanathan (Printers and Publishers) Pvt. Ltd., Chennai, 2008.

REFERENCE BOOK:
01. S. Arumugam and Thangapandi Isaac A., Algebra, New Gamma Publishing House, Palayam Kottai, 2006.

PEDAGOGY : Black Board; Chalk; LCD Projector

WEB RESOURCES:
1. https://sakshieducation.com/Inter/InterPDFStory.aspx?nid=59755&cid=22&sid=174&chid=169&tid=93
2. https://www.jagranjosh.com/articles/theory-of-equations-iit-jee-important-questions-and-preparation-tips-1460030334-1

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
Unit – I		[6 Hrs]		
1.1	Introduction	2	Chalk & Talk	Black Board
1.2	In an equation with real coefficients imaginary roots occur in pairs	2	Chalk & Talk	Black Board
1.3	In an equation with rational coefficients irrational roots occur in pairs.	2	Chalk & Talk	Black Board
Unit – II		[6 Hrs]		
2.1	Symmetric function of the roots	2	Chalk & Talk	Black Board
2.2	Roots with sign changed	2	Chalk & Talk	Black Board
2.3	Roots multiplied by a given number.	2	Chalk & Talk	Black Board
Unit – III		[6 Hrs]		
3.1	Reciprocal roots	3	Chalk & Talk	Black Board

3.2	Multiple roots.	3	Chalk & Talk	Black Board
Unit – IV		[6 Hrs]		
4.1	To increase or decrease the roots	3	Chalk & Talk	Black Board
4.2	Removal of terms.	3	Chalk & Talk	Black Board
Unit – V		[6 Hrs]		
5.1	Finding a real root of a cubic equation by Newton's Method.	6	Chalk & Talk	Black Board

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	3
CO2	2	2	3	3	2
CO3	3	3	3	2	2
CO4	2	2	3	2	2
CO5	2	3	2	2	3

3 -Strong   2 - Medium   1- Low

COURSE DESIGNER :   Mr. S.Seenirajan
****

Self Learning Course	**NUMBER THEORY**	**Code: 218003231**
	SEMESTER II	**Addl. Credits 3**

PREAMBLE

➢ ***To motivate the learners for Self – study.***

UNIT – I:

Theory of Numbers – prime and composite number – The sieve of Eratosthenes – Divisors of a given number – simple problems

UNIT – II:

Euler's function – Integral part of a real number – simple problems.

UNIT – III:

The highest power of a primeρ contained in n! – simple problems – The product of r consecutive integers is divisible by r! – simple problems.

UNIT – IV:

Congruence – Criteria of divisibility of a number – simple problems – Numbers in Arithmetic progression – Fermat's theorem.

UNIT – V:

Generalization of Fermat's theorem – Wilson's theorem – Lagrange's theorem – Simple problems.

TEXT BOOKS:
    01.Dr. Arumaugam and Issac, Theory of Equations and Number theory.
REFERENCE BOOKS:
  01. T.K. Manicavasagam Pilli and Narayanan, Algebra I & II, S.V. Publications - 2008.
COURSE DESIGNER :   Mr. S.Seenirajan
****

Allied Maths   **MATHEMATICS FOR COMPUTER APPLICATIONS**
                       [For BCA Major Students]   **Code:213103123**
                       SEMESTER I   **4 Hrs/Week**
                                                           Credits 4

PREAMBLE:
  ➢ *To enable the students to learn the mathematical foundations of computer applications.*
  ➢ *Understood the mathematical logic grammars and languages and Probability concepts.*

COURSE OUTCOMES (CO)

On Successful completion of the course, the student will be able to

	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO1	Explain the concepts of Relations.	Up to K3
CO2	Finding Inverse and Rank of Matrix and Solutions of Simultaneous linear equations.	Up to K3
CO3	Expound the Basic concepts of logic.	Up to K3
CO4	Explain basic concepts and its properties of algebraic, transcendental equations.	Up to K3
CO5	Apply computational methods to solve Simultaneous equations by various methods.	Up to K3

K1- Knowledge   K2 – Understand   K3-Apply

UNIT – I: **[12 Hrs]**

Relations:

Introduction – Cartesian product of Two sets – Relations – Representation of a Relation - Operations on Relations – Equivalence relation.

UNIT – II: **[12 Hrs]**
Matrix Algebra:

Introduction – Matrix Operations – Inverse of a square matrix – Elementary operations and Rank of a matrix – Simultaneous linear Equations

UNIT – III: **[12 Hrs]**

Logic Introduction – TF statements – connectives – parsing trees – Truth table of a formula – Tautology – Tautology implications and equivalence of formula.

UNIT – IV: **[12 Hrs]**

Algebraic and Transcendental Equations:

Errors in Numerical Computation – Iteration method – Bisection method – Regula falsi method – Newton Raphson method.

UNIT – V: **[12 Hrs]**

Simultaneous Linear Equations - Gauss elimination method – Gauss Jacobi iteration method – Gauss Seidel iteration method – Eigen values and Eigen vectors of a matrix.

TEXT BOOKS:
  01. Dr.M.K. Venkataraman, Dr. N. Sridharan and Chandrasekaran N., Discrete Mathematics, The National Publishing Company, Chennai, 2000.
  02. S. Arumugam, Thanga pandi Issac, Dr.S. Somasundaram Numerical Methods, Scitech publications (India) Pvt Ltd, 2009.

REFERENCE BOOKS:
01. A.Kandasamy P., Thilagavathy K., and Gunavathy K., Numerical Methods, S.Chand and Company Ltd, New Delhi, 1991.
02. B.Trembley and Manohar, Discrete Mathematical Structures with Applications to Computer Science, Mc Graw Hill, New Delhi, 1997.

PEDAGOGY : Black Board; Chalk; LCD Projector

WEB RESOURCES:
1. https://www.javatpoint.com/discrete-mathematics-tutorial
2. https://mathworld.wolfram.com/DiscreteMathematics.html
3. https://nptel.ac.in/courses/111/107/111107105/
4. https://www.sciencedirect.com/topics/engineering/numerical-method

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
Unit – I	[12 Hrs]			
1.1	Introduction	1	Chalk & Talk	Black Board
1.2	Cartesian product of Two sets	2	Chalk & Talk	Black Board
1.3	Relations	2	Chalk & Talk	Black Board
1.4	Representation of a Relation	2	Chalk & Talk	Black Board
1.5	Operations on Relations	2	Chalk & Talk	Black Board
1.6	Equivalence relation	3	Chalk & Talk	Black Board
Unit – II	[12 Hrs]			
2.1	Introduction	1	Chalk & Talk	Black Board
2.2	Matrix Operations	2	Chalk & Talk	Black Board
2.3	Inverse of a square matrix	3	Chalk & Talk	Black Board
2.4	Elementary operations and Rank of a matrix	3	Chalk & Talk	Black Board
2.5	Simultaneous linear Equations	3	Chalk & Talk	Black Board
Unit – III	[12 Hrs]			
3.1	Logic Introduction	1	Chalk & Talk	Black Board
3.2	TF statements	1	Chalk & Talk	Black Board
3.3	Connectives	2	Chalk & Talk	Black Board
3.4	Parsing trees	2	Chalk & Talk	Black Board
3.5	Truth table of a formula	2	Chalk & Talk	Black Board
3.6	Tautology	2	Chalk & Talk	Black Board
3.7	Tautology implications and equivalence of formula.	2	Chalk & Talk	Black Board
Unit – IV	[12 Hrs]			
4.1	Errors in Numerical Computation	2	Chalk & Talk	Black Board
4.2	Iteration method	2	Chalk & Talk	Black Board
4.3	Bisection method	2	Chalk & Talk	Black Board
4.4	Regula falsi method	3	Chalk & Talk	Black Board
4.5	Newton Raphson method	3	Chalk & Talk	Black Board
Unit – V	[12 Hrs]			
5.1	Gauss elimination method	4	Chalk & Talk	Black Board
5.2	Gauss Jacobi iteration method	2	Chalk & Talk	Black Board
5.3	Gauss Seidel iteration method	3	Chalk & Talk	Black Board
5.4	Eigen values and Eigen vectors of a matrix	3	Chalk & Talk	Black Board

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	3
CO2	2	2	3	3	3
CO3	3	3	2	2	2
CO4	3	2	3	2	2
CO5	2	3	3	3	2

3- Strong   2- Medium   1- Low

COURSE DESIGNER : Mr. S.Seenirajan

****

Allied Maths	**OPTIMIZATION TECHNIQUES**	Code: 213103223
	[for BCA Major Students]	**4 Hrs/Week**
	SEMESTER II	**Credits 3**

PREAMBLE
➢ *To introduce a basic knowledge of formation of Linear Programming problems.*
➢ *To motivate the learners to find the solutions.*

COURSE OUTCOMES (CO)

On Successful completion of the course, the student will be able to

	Course Outcomes	**Knowledge Level (According to Bloom's Taxonomy)**
CO1	Construct mathematical formulation for real life problems.	Up to K3
CO2	Apply efficient computational techniques and algorithms that are needed to solve optimization problems.	Up to K3
CO3	Analyze the Critical path for a Network	Up to K3
CO4	Perform quantitative technique to solve Assignment problems.	Up to K3
CO5	Evaluate Transportation problems to make effective decisions.	Up to K3

K1- Knowledge   K2 – Understand   K3-Apply

UNIT I: **[12 Hrs]**
Linear programming problem: Mathematical formulation of theLinear programming problem –Graphical solution method – some Exceptional cases – General linear programming problem - slack & surplus variable – canonical & standard forms of L.P.P.

UNIT – II: **[12 Hrs]**
Simplex method: The computational procedure for simplex method – problems – Artificial Variables - Big – M method.

UNIT – III: **[12 Hrs]**
Network: basic components – Logical sequences – Rules of Network construction – concurrent activities – critical path analysis – probability consideration in PERT – probability of meeting for schedule time – distinction between PERT & CPM.

UNIT – IV: **[12 Hrs]**
Assignment problem – mathematical formulation of the problem – solution methods of Assignment problem – special cases in Assignment

problem –Maximization Assignment problem and unbalanced Assignment problem. The Travelling salesman problem.

UNIT – V: **[12 Hrs]**
    Transportation problem – Introduction – LP formulation of the transportation problem – Existence of solution in T.P. – the Transportation table – loops in Transportation table – solution in T.p –finding an Initial Basic feasible solution – test for optimality – degeneracy in T.P - Transportation Algorithm (Modi method.) – some exceptional cases.

TEXT BOOK:
    01.Kanthi Swarap, Gupta P.K., Manmohan, Operation Research, 13th Edition, Sultan Chand and Sons, New Delhi, 2007.

REFERENCE BOOKS:
    01.Sharma S.D., Operations Research, 2007.
    02.Hamdy A. Taha., Operations Research, 8th Edition, Prentice-Hall of India, Private Limited, New Delhi, 2008

UNIT	CHAPTERS
I	2.1, 2.2, 2.3, 2.4, 3.2, 3.3, 3.4, 3.5.
II	4.1, 4.2, 4.3, 4.4.
III	5.1, 5.2, 5.3, 5.4, 5.7
IV	11.1, 11.2, 11.3, 11.4, 11.7.
V	10.1, 10.2, 10.3, 10.5, 10.6, 10.8, 10.9, 10.10, 10.15

PEDAGOGY : Black Board; Chalk; LCD Projector

WEB RESOURCES:
    1. http://www.notes4free.in/admin/postimages/OR%20NOTES.pdf
    2. https://learnengineering.in/linear-programming-by-robert-j-vanderbei/

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
Unit – I [12 Hrs]				
1.1	Mathematical formulation	3	Chalk & Talk	Black Board
1.2	Graphical Solution	3	Chalk & Talk	Black Board
1.3	Slack and Surplus Variable	3	Chalk & Talk	Black Board
1.4	Canonical form	3	Chalk & Talk	Black Board
Unit – II [12 Hrs]				
2.1	Simplex Method	6	Chalk & Talk	Black Board
2.2	Big – M Method	6	Chalk & Talk	Black Board
Unit – III [12 Hrs]				
3.1	basic components	3	Chalk & Talk	Black Board
3.2	critical path analysis	3	Chalk & Talk	Black Board
3.3	PERT	3	Chalk & Talk	Black Board
3.4	Distinction between PERT & CPM	3	Chalk & Talk	Black Board
Unit – IV [12 Hrs]				
4.1	Mathematical formulation	3	Chalk & Talk	Black Board
4.2	special cases in Assignment problem	3	Chalk & Talk	Black Board
4.3	unbalanced Assignment problem	3	Chalk & Talk	Black Board
4.4	The Travelling salesman problem	3	Chalk & Talk	Black Board
Unit – V [12 Hrs]				
5.1	Mathematical formulation	1	Chalk & Talk	Black Board

5.2	Existence of solution	2	Chalk & Talk	Black Board
5.3	finding an Initial Basic feasible solution	3	Chalk & Talk	Black Board
5.4	Transportation Algorithm (Modi method)	3	Chalk & Talk	Black Board
5.5	Some exceptional cases	3	Chalk & Talk	Black Board

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	3
CO2	2	2	3	3	3
CO3	3	3	2	2	2
CO4	3	2	3	2	2
CO5	2	3	3	3	2

3- Strong   2- Medium   1- Low

COURSE DESIGNER :   Mr.S.Seenirajan

****