B.Sc.Mathematics

2020 – Batch

Scheme & Syllabus

SRI RAMAKRISHNA
COLLEGE OF ARTS AND SCIENCE
(An Autonomous Institution)
Nava India, Avinashi Road, Coimbatore

Scheme of Examination

*(For the students admitted during the academic year **2020 - 2021** and onwards)*

Under
Choice Based Credit System (CBCS)
& Learning Outcomes-Based Curriculum Framework (LOCF)

UNDERGRADUATE PROGRAMMES

Programme: B.Sc. **Branch: Mathematics**

Part	Course Code	Study Components and Course Title	CIA	Comprehensive Exam (Theory)			Total Marks	Credit
				Online	Descriptive	Total		
Semester – I								
I	20TAO1/ 20HA01/ 20FA01/ 20AA01/ 20MA01	AECC-II **Languages – I**	40	10	50	60	100	3
II	20EA01	AECC-I **English – I**	40	10	50	60	100	3
III	20CMAT01	DSC-I **Algebra and Trigonometry**	40	10	50	60	100	4
III	20CMAT02	DSC-II **Calculus**	40	10	50	60	100	4
III	20CMAT03	DSC-III **Numerical Methods**	40	10	50	60	100	3
III	20PHCG01	GE - I **Allied Physics for Maths – I**	40	10	50	60	100	3
III	20PHCG02	GE PRACTICALS I **Allied Physics Lab for Maths - I**	20		30	30	50	2
IV	20EIA01	Environmental Studies #/ Foundation Course on Entrepreneurship & Innovation # / **AECC**	100	-	-	-	100**	1#
IV	20LSA01	Life Skills-I @ / **SEC- I**	-	-	-	100	100**	2 @
							650	**25**
V	20NS01/ 20NC01/ 20SP01/ 20YR01/ 20SI01/	Extension Activities NSS/NCC/SPORTS/YRC/SIS	Assessment will be in the Final Semester					

	20RB01							
Semester –II								
I	20TAO2/ 20HA02/ 20FA02/ 20AA02/ 20MA02	AECC-II **Languages – II**	40	10	50	60	100	3
II	20EA02	AECC-I **English - II**	40	10	50	60	100	3
III	20CMAT04	DSC-IV **Analytical Geometry - 2D&3D**	40	10	50	60	100	4
III	20CMAT05	DSC-V **Differential Equations & Laplace Transforms**	40	10	50	60	100	4
III	20MATE01	DSE-I **Accountancy**	40	10	50	60	100	4
III	20PHCG03	GE-II **Allied Physics for Maths – II**	40	10	50	60	100	3
III	20PHCG04	GE PRACTICALS II **Allied Physics Lab for Maths –II**	20		30	30	50	2
IV	20ESA01	Environmental Studies # / Foundation Course on Entrepreneurship & Innovation #/ **AECC**	100	-	-	-	100**	1#
IV	20LSA02	Life Skills-II @/ **SEC – II**	-	-	-	100	100**	2 @
IV	20MAT201	Internship / Institutional Training / Mini-Project (Summer Course-1 #)	100#	-	-	-	100**	1$
							650	**26**

Semester III								
III	20CMAT06	DSC-VI **Vector Calculus & Fourier Analysis**	40	10	50	60	100	4
III	20MAT301	DSC-VII **Statics**	40	10	50	60	100	4
III	20MAT302	DSC-VIII **Mathematical Statistics – I**	40	10	50	60	100	3
III		**AEE-I**					100	4
III	20MACCG05	GE-III **Programming in Java**	40	10	50	60	100	3
III	20MACCG06	GE PRACTICALS III **Programming in Java - LAB**	20		30	30	50	2
III	20CMATE01	DSE-II **Discrete Mathematics**	40	10	50	60	100	4
IV	20BCT01 /20AT01	Basic Tamil-I / Advanced Tamil-I #	100	-	-	-	100**	1$
IV	20PEA01	PACE-I @ / **SEC-III**	-	-	-	100	100**	1@
IV	20MATV01	VAC-I $	-	-	-	-	-	1$
							650	**25**

Semester IV								
III	20MAT401	DSC-IX **Actuarial Mathematics**	40	10	50	60	100	4
III	20MAT402	DSC-X **Dynamics**	40	10	50	60	100	4
III	20MAT 403	DSC-XI **Graph Theory**	40	10	50	60	100	3
III	20MAT 404	DSC-XII **Mathematical Statistics – II**	40	10	50	60	100	3
III	20CMATE03	DSE - III **Operations Research - I**	40	10	50	60	100	4
III	20MACCG07	GE-IV **Programming in Python**	40	10	50	60	100	3
III	20MACCG08	GE PRACTICALS IV **Programming in Python – Lab**	20		30	30	50	2
IV	20BCT02 /20AT02	Basic Tamil-II / Advanced Tamil-II #	100	-	-	-	100**	1$
IV	20PEA02	PACE-II @ / **SEC-IV**	-	-	-	100	100**	1@
IV	20MATV02	VAC–II $	-	-	-	-	-	1$
IV	20MAT405	Internship / Institutional Training / Mini-Project (Summer Course-2 #)	100#	-	-	-	100**	1$
							650	**24**

Semester V								
III	20MAT501	DSC-XIII **Real Analysis – I**	40	10	50	60	100	4
III	20MAT502	DSC-XIV **Complex Analysis – I**	40	10	50	60	100	4
III	20MAT503	DSC-XV **Abstract Algebra**	40	10	50	60	100	4
III	20MAT504	DSC-XVI **Data Analytics**	40	10	50	60	100	3
III		**AEE-II**					100	4
III	20CMATE06	DSE-IV **Operations Research -II**					100	4
IV	20PEA03	PACE-III @ / **SEC-V**	-	-	-	100	100**	1@
IV	20MATV03	VAC-III $	-	-	-	-	-	1$
							600	**24**

Semester VI								
III	20MAT601	DSC-XVII **Real Analysis – II**	40	10	50	60	100	4
III	20MAT602	DSC-XVIII **Complex Analysis – II**	40	10	50	60	100	4
III	20MAT603	DSC-XIX **Linear Algebra**	40	10	50	60	100	4
III	20MAT604	DSC- XX -Project **Project in Operations Research**	80			20	100	3
IV	20MAT605	DSC –XXI - Self-Study Course **ADVANCED EXCEL**					100**	3$
V	20NS01/ 20NC01/ 20SP01/ 20YR01/ 20SI01/ 20RB01	Extension Activities NSS/NCC/SPORTS/YRC / SIS #	100	-	-	-	100**	1
							400	**16**

$ Extra credit courses in which Basic Tamil and Advanced Tamil are for the candidates who opted other than Tamil Language in Part–I.

 # Continuous Internal Assessment (CIA) only.

@ Comprehensive Examinations only.

**** Not included in Total Marks and CGPA Calculation.**

@@ MOOC Course -Minimum of 30 Hours from recognized MOOC portal like SWAYAM, Coursera, etc. Assessment with Score/Credit and Certificate is mandatory.

Abstract of
Scheme of Examination
(For the students admitted during the academic year 2020 - 2021 and onwards)

Part	Course	Papers	Credit	Total Credits	Marks	Total Marks
Part I	**AECC-II**	2	3	**6**	100	**200**
Part II	**AECC-I**	2	3	**6**	100	**200**
Part III	**DSC**	20 [6/14]	¾	**74**	100	**2000 +600**
	GE	8 [4/4]	2/3	**20**	50/100	
	AEE	2	4	**8**	100	**200**
	DSE	4	4	**16**	100	**400**
Part IV	*Lang. (BCT/AT #)*	*2*	*1*	*2$*	*100*	***200*****
	EVS & EI / **AECC-III #**	2	1	2	100	**200****
	Job Oriented Course / Value Added Course	*3*	*1*	*3$*	-	-
	PACE / **SEC @**	3	1	3	100	**300****
	Life Skills / **SEC @**	2	2	4	100	**200****
	*Self-Study Course / **DSC***	*1*	*3*	*3$*	*100*	***100*****
	Internship/ Institutional Training/ Mini-Project (Summer Courses #)	*2*	*2*	*2$*	*100*	***200*****
Part V	@ Extension	1	1	1	100	**100****
	Total			**140 + (10 Extra Credits)**		**3600 + (1300**)**

Note:

- **Minimum 20 and Maximum 26 Credit/Semester (except for VI Sem)**
- **VI Semester will have 12 To 16 Credit (Core/DSE Papers Only)**

List of Open Elective Papers	
Open Electives	Yoga for Human Excellence Human Health & Hygiene Indian Culture and Heritage Consumer Awareness and Protection Professional Ethics and Human Values Human Rights, Women's Rights & Gender Equality Disaster Management Green Farming Campus to Corporate How to start a Business? Research Methodology and IPR General Studies for Competitive Examinations IIT JAM Examination (for Science only) CUCET Examination
	Courses offered by the Departments to other Programmes
20MATI01	Mathematics for Competitive Examination
20MATI02	R & SPSS Programming

List of Elective Papers / DSE (Can choose any one of the paper as electives)		
	Course Code	Title
Electives / **DSE-I**	**20MATE01**	**Accountancy**
	20CMATE02	Fuzzy Mathematics
	20MATE02	Mathematical Modeling
Electives / **DSE-II**	**20CMATE01**	**Discrete Mathematics**
	20MATE03	Cryptography
	20MATE04	Actuarial Statistics
Electives / **DSE-III**	**20CMATE03**	**Operations Research – I**
	20CMATE04	Astronomy
	20CMATE05	Differential Geometry
Electives / **DSE-IV**	**20CMATE06**	**Operations Research – II**
	20CMATE07	Measure Theory
	20CMATE08	Probability Theory

VIVEK E
Syllabus Coordinator

Dr UMA N
BOS Chairperson

Dr HARI PRASAD D
Academic Council – Member Secretary

SEMESTER - I

SEMESTER I

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20CMAT01	ALGEBRA AND TRIGONOMETRY	DSC	60	-	-	4	A (Theory)

PREAMBLE / COURSE OBJECTIVE

This course aims at facilitating the students to train on summation of series; on solving algebraic equations subject to some conditions and on trigonometrical functions.

DEPARTMENT OFFERING

PG & Research Department of Mathematics

PREREQUISTE

Higher Secondary Level – Theory of Equations and Inverse Trigonometric Functions

EXPECTED SKILL

Domain Knowledge

COURSE OUTCOMES

On successful completion of the course, students will be

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Sum the series using binomial, exponential and logarithmic expansions	Remember
CO2	Acquire knowledge about theory of equations and solve the equations.	Understand
CO3	Solve algebraic equations approximately.	Apply
CO4	Expand trigonometric functions.	Apply
CO5	Separate real and imaginary parts of hyperbolic functions.	Apply

SYLLABUS

UNIT I **11 HOURS**

SERIES AND ITS SUMMATION

Binomial Theorem – Exponential Theorem (Statement only) – Logarithmic Series (Statement only) - their immediate application to summation only.

SR-CAS

UNIT II

THEORY OF EQUATIONS **12 HOURS**

Roots of an Equation – Relations connecting the roots and coefficients – Transformation of Equations – Decreasing and Increasing roots of an equation by n – Reciprocal Equations.

UNIT III **11 HOURS**

Descartes' rule of signs – Rolle's Theorem (statement only) – problems – Multiple roots- Approximate solutions of roots of polynomials by – Horner's method

UNIT IV

EXPANSION IN SERIES **13 HOURS**

Expansion of $Cos^n\theta$, $Sin^n\theta$, in a series of $Cosn\theta$ and Sines of multiples of θ – Expansion of $Cosn\theta$ and $Sinn\theta$ in powers of sines and cosines – Expansion of $Sin\theta$, $Cos\theta$ and $Tan\theta$ in powers of θ.

UNIT V **13 HOURS**

HYPERBOLIC FUNCTIONS

Relation between circular and hyperbolic function – Separation of real and imaginary parts – $\sin(x+iy)$, $\cos(x+iy)$, $\tan(x+iy)$, $\tan^{-1}(x+iy)$ – Problems, Logarithm of Complex quantities – Problems.

TEXT BOOKS

A. T.K. Manicavachagam Pillai, T. Natrajan, K.S. Ganapathy, "Algebra Vol. I", S. Viswanatham Printers & Publishers Private Ltd, 2004, reprint 2012.

B. T. K. Manicavachagam Pillai and T. Narayanan, "Trigonometry", S. Viswanatham Printers & Publishers Private Ltd, 2004 , reprint 2012

REFERENCE BOOKS

A. Walter P. Kandasamy and K. Thilagavathy, "Mathematics for B.Sc. Branch I – Vol. I, II", S. Chand and Company Ltd, New Delhi, 1st edition, 2004, reprint 2015.

B. P.R. Vittal, V. Malini, "Alegbra & Trigonomety", VolII ,Margham Publication, 2003.

C. P.R. Vittal, "Trigonomety", Margham Publication, Third Edition, 2004.

WEB RESOURCES

A. https://www.pdfdrive.com/algebra-trigonometry-problem-solver-d157740108.html

B. https://www.pdfdrive.com/algebra-and-trigonometry-d51613013.html

C. https://www.pdfdrive.com/algebra-and-trigonometry-d33426690.html

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	M	S	M	-	-	-	-	-	-	S	-
CO2	S	M	S	M	-	-	-	-	-	-	S	-
CO3	S	M	S	S	-	-	-	-	-	-	S	-
CO4	S	S	S	S	-	-	-	-	-	-	S	-
CO5	S	S	S	S	-	-	-	-	-	-	S	-

S- Strong; M- Medium; L- Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prof VIVEK E
(Course Coordinator)

Dr JAYASHEELA D
(Academic Council-Member Secretary)

Dr UMA N
(BOS Chairperson)

SEMESTER I

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20CMAT02	CALCULUS	DSC	60	-	-	4	A (THEORY)

PREAMBLE / COURSE OBJECTIVE

To enable the students to gain the knowledge about the evolutes and envelopes, different types of integration, its geometrical applications, double, triple integrals and improper integration

DEPARTMENT OFFERING

PG & Research Department of Mathematics

PREREQUISTE

Higher Secondary Level – Differential Calculus and Integral Calculus

EXPECTED SKILL

Domain Knowledge

COURSE OUTCOMES

On successful completion of the course, students will be

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Explain Radius of Curvature and Euler's Theorem	Understand
CO2	Predict the method to be followed for Integration.	Apply
CO3	Evaluate the problems in double and triple integrals.	Apply
CO4	Determine the Change of order of integration in double and triple integrals.	Analyze
CO5	Distinguish between Beta and Gamma functions	Analyze

SYLLABUS

UNIT I **13 HOURS**

Curvature - Radius of curvature in Cartesian and Polar forms – Evolutes and Envelopes – Pedal equations – Total Differentiation – Eulers theorem on homogeneous

UNIT II **11 HOURS**

Integration of $f'(x)/f(x)$, $f'(x)\sqrt{f(x)}$, $(px+q)/\sqrt{(ax^2+bx+c)}$, $[\sqrt{(x-a)/(b-x)}]$, $[\sqrt{(x-a)(b-x)}$, $1/[\sqrt{(x-a)(b-x)}]$, $1/(a\cos x+b\sin x+c)$, $1/(a\cos^2 x+b\sin^2 x+c)$, Integration by parts – Bernoulli's Formula.

UNIT III **12 HOURS**

Reduction formulae – problems – evaluation of double and triple integrals – applications to calculations of areas and volumes – areas in polar coordinates.

UNIT IV **11 HOURS**

Change of order of integration in double integral – Jacobians – change of variables in double and triple integrals

UNIT V **13 HOURS**

Beta and Gamma integrals – their properties, relation between them – evaluation of multiple integrals using Beta and Gamma Functions – Improper Integrals.

TEXT BOOK

1. S Narayanan and T K M. Pillai, 'Calculus Vol. I and vol II", Viswanathan Publishers, Reprint 2012.

REFERENCE BOOKS

1. P Kandasamy and K Thilagavathy, "Mathematics for B.Sc.Branch I – Vol I", S Chand and Company Ltd, New Delhi, 1st edition 2004, Reprint 2014.
2. S Arumugamand Isaac, "Calculus, Vol.I", New Gamma Publishing House, 1st edition 1999.
3. G Balaji, "Engineering Mathematics" Balaji Publishers, 5th edition,2013.

WEB RESOURCES

A. https://www.thefreedictionary.com/radii+of+curvature

B. https://www.khanacademy.org/math/integral-calculus

C. https://math.stackexchange.com/questions/649034/finding-volumes-when-to-use-double-integrals-and-triple-integrals

D. http://mathonline.wikidot.com/the-gamma-and-beta-functions

MAPPING WITH PROGRAM OUTCOMES

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	S	S	M	-	-	-	-	-	M	-	-
CO2	M	M	M	S	-	-	-	-	-	S	-	-
CO3	S	S	M	S	-	-	-	-	-	S	-	-
CO4	M	M	S	S	-	-	-	-	-	M	-	-
CO5	S	M	S	M	-	-	-	-	-	S	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prof VASANTH KUMAR BONIFACE	Dr JAYASHEELA D	Dr UMA N
(Course Coordinator)	(Academic Council-Member Secretary)	(BOS Chairperson)

SEMESTER I

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20CMAT03	NUMERICAL METHODS	DSC	45	-	-	3	A (Theory)

PREAMBLE / COURSE OBJECTIVE

To provide the necessary basic concepts of numerical methods and give procedure to solving numerically different kinds of problem

DEPARTMENT OFFERING

PG & Research Department of Mathematics

PREREQUISITE

Higher Secondary Level - Calculus and Algebra

EXPECTED SKILL

Domain Knowledge

COURSE OUTCOMES

On successful completion of the course, students will be

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Explain the numerical techniques for solving algebraic and transcendental equations	Understand
CO2	Solve a system of linear equations using direct and iterative methods.	Apply
CO3	Determine the derivatives of the given function numerically by Newton's method.	Apply
CO4	Find the Integrals using quadrature formulae	Apply
CO5	Analyze numerical solution of ordinary differential equations	Analyze

SYLLABUS

UNIT I :The solution of numerical algebraic and transcendental Equations **9 HOURS**

Bisection method – Iteration Method – Convergence condition – Regula Falsi Method – Newton – Raphson method – Horner's Method.

UNIT II: Solution of simultaneous linear algebraic equations **10 HOURS**

Method of Triangularization – Crout's method – Gauss Jacobi method – Gauss Seidel method

UNIT III: Numerical differentiations **9 HOURS**

Newton's forward and backward formulae to compute the derivatives – Derivative using Stirling's formulae – to find maxima and minima of the function given the tabular values – Bessel's formula.

UNIT IV: Numerical Integration **7 HOURS**

Newton's – Cote's formula – Trapezoidal rule – Romberg's Method - Simpson's 1/3rd and 3/8th rules – Weddle's rule - Gaussian quadrature– two points and three point formulae.

UNIT V: Numerical Solution of ODE **10 HOURS**

Taylor series method – Picard's method - Euler's method – improved and modified Euler method – Runge Kutta method (fourth order Runge Kutta method only).

TEXT BOOK

A. Kandasamy.P, Thilagavathi. K and Gunavathi. K "Numerical methods" – S. Chand and Company Ltd, New Delhi – Revised Edition 2007. (Chapters:3,4,9,10 & 11).

REFERENCE BOOKS

A. Venkataraman M. K.,"Numerical Methods in Science and Engineering" National Publishing company V Edition 1999.

B. Sankara Rao K., "Numerical Methods for Scientists and Engineers" Second Edition Prentice Hall India 2004.

WEB RESOURCES

A. https://www.math.ust.hk/~machas/numerical-methods.pdf

B. https://lecturenotes.in/notes/7810-notes-for-numerical-methods-nm-by-ranu-singh?reading=true

C. https://lecturenotes.in/subject/24/numerical-methods-nm

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	L	L	L	-	-	-	-	-	L	L	-
CO2	S	M	M	L	-	-	-	-	-	L	L	-
CO3	S	L	M	L	-	-	-	-	-	L	L	-
CO4	S	M	M	L	-	-	-	-	-	L	L	-
CO5	S	M	M	L	-	-	-	-	-	L	L	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prof INFANT GABRIEL G	Dr JAYASHEELA D	Dr UMA N
(Course Coordinator)	(Academic Council -Member Secretary)	(BOS Chairperson)

SEMESTER I

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20PHCG01	ALLIED PHYSICS FOR MATHS – I	GE-I	45	-	-	3	A

PREAMBLE / COURSE OBJECTIVE

This course aims at facilitating the students to understand the fundamentals of Physics

DEPARTMENT OFFERING

BSc Physics

PREREQUISTE

Higher Secondary Level Physics

EXPECTED SKILL

Domain Knowledge

COURSE OUTCOMES

On successful completion of the course, students will be able to

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Acquire knowledge on the transmission of heat by conduction in different medium	Remember
CO2	Explain the motion of charged particles in electric and magnetic fields.	Understand
CO3	Describe the concept of simple and compound pendulum.	Understand
CO4	Discuss the earth's atmosphere, electromagnetic radiation and astronomical measurement instruments	Understand

SYLLABUS

UNIT I HEAT AND THERMODYNAMICS: TRANSMISSION OF HEAT **9 HOURS**

Introduction – Coefficient of Thermal Conductivity – Rectilinear flow of heat along a bar – Periodic flow of heat – Thermal conductivity Measurements – Propagation of heat waves in the Earth's crust –Searle's Method – Lee's Method for Metals – Forbe's Method to find K – Spherical shell method – Cylindrical flow of heat –Practical application of Conduction.

UNIT II MECHANICS: MOTION OF CHARGED PARTICLES **9 HOURS**

Introduction –Motion of a charged particle in uniform electric field – Longitudinal acceleration – Transverse acceleration – Charged particle in an alternating electric field – Motion of charged particle in uniform

magnetic field – Cyclotron frequency – Effect of simultaneous electric filed and magnetic fields (Lorentz Force).

UNIT III MECHANICS: OSCILLATORS

9 HOURS

Introduction –Linear harmonic oscillator – Energy of a simple harmonic oscillator – Simple harmonic oscillations of a loaded spring – Simple pendulum – Compound pendulum – Bar pendulum – Helmhotzresonator – Lissajous' figures.

UNIT IV ASTROPHYSICS: STARS AND GALAXIES

9 HOURS

Introduction – The earth's atmosphere and the electromagnetic radiation - Classification of Stars – H-R Diagram – Luminosity of stars – Stellar evolution – White Dwarf's – Chandrasekhar limit – Neutron stars – Black holes – Supernova explosion – Internal temperature of a star – Internal pressure of a star – Galaxies - Classification of galaxies - Milky Way Galaxy: Introduction

UNIT V ASTROPHYSICS: ASTRONOMICAL INSTRUMENTS

9 HOURS

Telescopes – Optical telescopes – Reflecting & Refracting telescope – Radio telescopes – The Hubble space telescope – Astronomical spectrographs – Photographic Photometry – Photoelectric Photometry – Spectrophotometry – Detectors and Image Processing.

TEXT BOOKS

A. Brij Lal, N. Subrahmanyam et al., "Heat Thermodynamics and Statistical Physics", S.Chand Publications, Revised Edition 2015.
B. Brijlal N. Subrahmanyam et al., "Mechanics &Electrodynamics", S .Chand & Company, Revised and Enlarged Edition 2005.
C. BaidyanathBasu et al., "A Introduction to Astrophysics", PHI Learning PVT Ltd., New Delhi, Revised Edition 2011.

REFERENCE BOOKS

A. D. S. Mathur et al, "Mechanics", S. Chand & Company, Revised Edition 2012.
B. ThomosArnyet al., "Explorations: Introductionto Astronomy",McGraw Hill publications, Seventh Edition 2014.

WEB RESOURCES

A. https://mechanicalc.com/reference/strength-of-materials

B. https://cnx.org/resources/66d997434e4bf41be1d090f1159a0310e4cedfcf/14-Reading%20-%20Rezaeich2pt2.pdf

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	P11
CO1	-	-	-	-	-	-	-	-	L	-	-
CO2	-	-	-	-	-	-	-	-	L	-	-
CO3	-	-	-	-	-	-	-	-	L	-	-
CO4	-	-	-	-	-	-	-	-	L	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by

Dr Razad P M

Verified by

Dr Poonguzhali S

Approved by

Member Secretary
Academic Council

SEMESTER I

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20PHCG02	ALLIED PRACTICAL – ALLIED PHYSICS LAB FOR MATHS - 1	GE-II	-	-	24	2	B

COURSE OBJECTIVE

This course aims at facilitating the students with basic experimental experiences in physical operation and the law of motion experimentally.

DEPARTMENT OFFERING

BSc Physics

PREREQUISTE

Higher Secondary Level Physics

EXPECTED SKILL

Domain Knowledge and Skill Development

COURSE OUTCOMES

On successful completion of the course, students will be able to

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Recognize the thermal properties of substance by interpreting the results of experiments	Understand
CO2	Implement the mechanical properties of solids, liquids and fluids in real time applications	Apply
CO3	Identify the gravity and radius of gyration using compound pendulum	Understand

SYLLABUS

All the Experiments

1. Measurements of length/diameter – Vernier caliper, screw gauge and travelling microscope
2. Newton's Law of Cooling
3. Joule's Calorimeter – Specific Heat Capacity of Liquid
4. Thermal Conductivity of Bad Conductor – Lee's Disc
5. Surface tension of a liquid – Drop weight method
6. Viscosity of highly viscous liquid – Stroke's method.
7. Compound Pendulum – Determination of 'g' and 'k'
8. Rigidity modulus of the wire and moment of inertia of the disc – Torsional Pendulum

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	-	-	-	-	-	L	-	-
CO2	-	-	-	-	-	-	-	-	L	-	-
CO3	-	-	-	-	-	-	-	-	L	-	-
CO4	-	-	-	-	-	-	-	-	L	-	-
CO5	-	-	-	-	-	-	-	-	L	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by

Dr Razad P M

Verified by

Dr Poonguzhali S

Approved by

Member Secretary
Academic Council

SEMESTER I

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20EIA01	Entrepreneurship & Innovation	AECC-III	26	-	-	1#	A (Theory)

PREAMBLE / COURSE OBJECTIVE

Students acquire the knowledge and skills needed to manage the development of innovations, to recognize and evaluate potential opportunities to monetize these innovations, to plan specific and detailed methods to exploit these opportunities, and to acquire the resources necessary to implement these plans. Topics include entrepreneurial thinking; innovation management; opportunity spotting and evaluation; industry and market research; business strategy; business models and business plans; financial forecasting and entrepreneurial finance; pitching to resource providers and negotiating deals; and launching new ventures.

DEPARTMENT OFFERING

International Business

PREREQUISTE

Fundamental understanding of Business Skills such as Accounting and Finance, Marketing, and Strategy.

EXPECTED SKILL

Interested to become an Entrepreneur / Innovator / Design thinker

COURSE OUTCOMES

On successful completion of the course, students will be

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Think critically and creatively about the nature of business opportunities, resources, and industries.	Remember
CO2	Delineate the processes by which innovation is fostered, managed, and commercialized.	Understand
CO3	Effectively and efficiently evaluate the potential of new business opportunities.	Apply
CO4	Assess the market potential for a new venture, including customer need, competitors, and industry attractiveness.	Apply
CO5	Develop a business model for a new venture, including revenue, margins, operations, working capital, and investment.	Apply

SYLLABUS

Module No.	Topic	Total Hours
1.	Entrepreneurial Thinking	2
2.	Innovation Management	2
3.	Design Thinking	2
4.	Opportunity Spotting / Opportunity Evaluation	2
5.	Industry and Market Research	2
6.	Innovation Strategy and Business Models	2
7.	Financial Forecasting	2
8.	Business Plans/ Business Model Canvas	3
9.	Entrepreneurial Finance	2
10.	Pitching to Resource Providers / Pitch Deck	3
11.	Negotiating Deals	2
12.	New Venture Creation	2
	Total Hours	26

TEXT BOOKS

A. Arya Kumar "Entrepreneurship – Creating and leading an Entrepreneurial Organization", Pearson, Second Edition (2012).
B. Christopher Golis "Enterprise & Venture Capital", Allen &Unwin Publication, Fourth Edition (2007).
C. EmrahYayici "Design Thinking Methodology", Artbiztech, First Edition (2016).
D. Thomas Lock Wood & Edgar Papke "Innovation by Design", Career Press.com, Second Edition (2017).

REFERENCE BOOKS

A. Andrew J. Dubrin "Leadership – Research Findings, Practice & Skills", Biztantra Publishers, Fourth Edition (2007).
B. Jonathan Wilson "Essentials of Business Research", Sage Publication, First Edition (2010).

WEB RESOURCES

A. https://blog.forgeforward.in/tagged/startup-lessons
B. https://blog.forgeforward.in/tagged/entrepreneurship
C. https://blog.forgeforward.in/tagged/minimum-viable-product
D. https://blog.forgeforward.in/tagged/minimum-viable-product
E. https://blog.forgeforward.in/tagged/innovation
F. https://www.youtube.com/watch?v=8vdEyL7uKXs&list=PLmP9QrmTNPqBEvKbMSXvwlwn7fdnXe6Lw

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	S	-	-	-	S	-
CO2	-	-	-	-	-	-	-	-	-	-	S	-
CO3	-	-	-	-	-	-	-	-	-	-	S	-
CO4	-	-	-	-	-	-	-	-	-	-	S	-
CO5	-	S	-	-	-	-	-	-	-	-	S	-

S- Strong; M- Medium; L- Low

ASSESSMENT PATTERN

To Successfully Complete the course, Students must achieve a passing grade of 40% in the Comprehensive Internal Examination.

Extra Credit Course
*No Comprehensive Examination only Continuous Internal Assessment

Assessment Type	Topic	Marks
Assignment	Strategic Innovation	20
Group Discussion/ Presentation	Design Thinking	10
Objective Type	MCQ (CIA 1)	20
Assignment	Market Research	10
Group Discussion/ Presentation	Pitch Deck / Business Plan (Presentation)	20
Descriptive Type	Model Test (4 Questions * 5 Marks)	20
Total		100 Marks

Prepared by
Dr D Santhanakrishnan

verified by
Dr D Santhanakrishnan

Approved by
Member Secretary
Academic Council

SEMESTER 1

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT
20LSA01	Life Skills-I	SEC	40	-	-	2	Theory

PREAMBLE / COURSE OBJECTIVE

This course aims at enhancingthe students self - confidence to speak in front of an audience, improve their self-awareness and overcome fear and insecurity and also help them realize their potential through various classroom practical activities.

DEPARTMENT OFFERING

TIP Center

PREREQUISITE

Higher Secondary Completion- Listening, Speaking, Reading and Writing skills

EXPECTED SKILL

Communication Skills and Professional Skills

COURSE OUTCOMES

On successful completion of the course, students will be able to-

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Introduce oneself and speak creatively	Remember
CO2	Listen and Read effectively	Understand
CO3	Write formal and informal mails	Apply
CO4	Maintain good postures, gestures and social distancing	Apply
CO5	Present effectively using tools	Apply

SYLLABUS

UNIT I **7 HOURS**

Speaking Skills – Self Introduction, common mispronounced words – stress and intonation, impromptu speaking, two minute topics, storytelling, creative speaking – story completion, small talk, tongue twisters

UNIT II **7 HOURS**

Listening skills and Reading Skills – Listening for gist, listening for main ideas, back to back interviews, TED talks, audio clip gap fill exercises, Reading skills – Reading for gist, reading for detail, reading comprehension, newspaper articles, vocabulary search

UNIT III **8 HOURS**

Writing skills – email writing – formal vs informal emails, structure, useful expressions, situation based email writing practice, Effective use of social media –do's and don'ts, guidelines for effective usage of social media,

UNIT IV **9 HOURS**

Non- verbal communication – gestures, posture, do's and don'ts of non- verbal communication, Social and cultural etiquette- how to behave in public, respect others privacy, social distancing, Trust and collaboration

UNIT V **9 HOURS**

Presentation Skills–identifying the audience, analyzing content, creating content, signposting, tone, language, posture, getting audience attention, practice methods, usage of presentations tools, handling questions, Brainstorming – putting ideas together, making notes, selecting relevant ideas, Listening as a team skills - coordinated listening, note taking, identifying main ideas

TEXT BOOKS

A. Sen Madhucchanda (2010), An Introduction to Critical Thinking, Pearson, Delhi
B. Silvia P. J. (2007), How to Read a Lot, American Psychological Association, Washington DC
C Service provider adapted text books

REFERENCE BOOKS

A. New English File – Clive Oxenden, Christina Latham- Koenig, Paul Seligson 3rd Edition
B. New Headway –Liz and John Soars – 4th Edition
C. Business Result – David Grant, Jane Hudson & Robert McLarty 1st Edition

WEB RESOURCES

A. https://busyteacher.org/

B. https://en.islcollective.com/

C. https://www.skillsyouneed.com/presentation-skills.html

D. https://www.englishclub.com/grammar/

E. https://www.mindtools.com/CommSkll/PublicSpeaking.htm

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	S	S	S	-
CO2	-	-	-	-	-	-	-	-	S	S	S	-
CO3	-	-	-	-	-	-	-	-	S	S	S	-
CO4	-	-	-	-	-	-	-	M	S	S	S	-
CO5	-	-	-	-	-	-	-	-	S	S	S	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

- Total: 100 Marks
- Online exam: 50 Marks
- Oral Evaluation: 50 Marks
- Passing Minimum: 40 %
- External Assessment

Prepared & Verified by
Dr T Nagaprakash

Approved by
Academic Council

SEMESTER - II

SEMESTER II

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20CMAT04	ANALYTICAL GOEMETRY 2D & 3D	DSC	60	-	-	4	A(THEORY)

PREAMBLE / COURSE OBJECTIVE

To train the students in solving problems on analytical geometry of 2D & 3D.

DEPARTMENT OFFERING

P G & Research Department of Mathematics.

PREREQUISTE

Higher Secondary Level – Straight line, Sphere, Cone, Cylinder

EXPECTED SKILL

Domain Knowledge

COURSE OUTCOMES

On successful completion of the course, students will be

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Identify the difference between the 2D & 3D	Understand
CO2	Explain straight line and its applications	Apply
CO3	Describe Geometry of Sphere and its applications	Apply
CO4	Analyze the geometry of Cone and its applications	Apply
CO5	Describe the geometry of Cylinder and its applications	Apply

SYLLABUS

UNIT I **14 HOURS**

Analytical Geometry of 2D – Polar Coordinates equation of a Conic – Directrix – Chord – Tangent – Normal – Simple Problems – only in deriving equation of a Conic

.

UNIT II **12 HOURS**

Straight line – Symmetrical form of the equation of a line – Equation of a Straight line passing through two given points – the condition for the line $(x-x_1)/l=(y-y_1)/m$ to the Parallel Plane $ax+by+cz+d=0$ – Angle between a plane and a line – Coplanar lines – the shortest distance between two given lines – simple problems

UNIT III **12 HOURS**

Sphere – Definition – The equation of a Sphere – Centre and Radius – The length of the tangent from the point to the Sphere – Equation of a Sphere passing through a given Circle – Intersection of the Sphere at a point – Equation of the tangent plane to the Sphere at a point – simple problems.

UNIT IV **12 HOURS**

Cone – Definition – Cone whose vertex is at the origin – Envelope cone of a Sphere – Right Circular Cone – Related Simple problems.

UNIT V **10 HOURS**

Cylinder – Definitions – Equation of a Cylinder – Equation of the Right Circular Cylinder with axis and radius of the guiding circle λ – Enveloping Cylinder – Equation of a Right Circular Cylinder – Simple Problems

TEXT BOOKS

A. Manikavasagam Pillai and T.Natarajan, "Analytical Geometry Part I - 2D", S. Viswanatham Printers & Publishers Private Ltd, 1st edition, 1955, Reprint 2014.

B. Manikavasagam Pillai and T.Natarajan, "Analytical Geometry Part II - 3D", S. Viswanatham Printers & Publishers Private Ltd, 1st edition, 1955, Reprint 2014.

REFERENCE BOOKS

A. P. Durai Pandian & others , "Analytical Geometry 2D" , 1st edition, 1965.

B. P. Durai Pandian & others , "Analytical Geometry 3D" , 1st edition, 1975.

WEB RESOURCES

A. https://www.pdfdrive.com/analytical-geometry-2d-and-3d-e195259324.html

B. https://kupdf.net/queue/analytical-geometry-2d-and-3d-p-r-vittal_58ddb8c6dc0d60560e8970ec_pdf?queue_id=-1&x=1608281534&z=MjQwOTo0MDcyOjZjOWU6MWE5OjhkNjU6NjI1NDpjN2Q5OmM4ZTI=

C. https://www.scribd.com/document/29931462/3D-Analytical-Geometry

MAPPING WITH PROGRAM OUTCOMES

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	L	M	L	-	-	-	-	-	L	L	-
CO2	S	L	M	L	-	-	-	-	-	L	L	-
CO3	S	L	M	L	-	-	-	-	-	L	L	-
CO4	S	L	M	L	-	-	-	-	-	L	L	-
CO5	S	L	M	L	-	-	-	-	-	L	L	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prof MALARVIZHI M
(Course Coordinator)

Dr JAYASHEELA D
(Academic Council -Member Secretary)

Dr UMA N
(BOS Chairperson)

SEMESTER II

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20CMAT05	DIFFERENTIAL EQUATIONS & LAPLACE TRANSFORMS	DSC	60	-	-	4	A (THEORY)

PREAMBLE/COURSE OBJECTIVE

This course aims to solve second-order linear differential equations with constant and variable coefficient. This course helps the students to get the ability of solving first and second-order ordinary differential equations and first order partial differential equations and to get the knowledge about Laplace and inverse Laplace transforms.

DEPARTMENT OFFERING

PG & Research Department of Mathematics

PREREQUISTE

Higher Secondary Level- Basic Mathematics

EXPECTED SKILL

Domain Knowledge

COURSE OUTCOMES

On successful completion of the course, students will be able to

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Solve the first order and first degree linear differential equations	Apply
CO2	Solve the first order and first degree linear differential equations	Apply
CO3	Solve the simultaneous linear differential equations with constant coefficients.	Apply
CO4	Solve the linear partial differential equations by using the Lagrange's method.	Apply
CO5	Analyzing the concepts of Laplace transforms and inverse Laplace transforms to solve ODE with constant coefficients.	Analyze

SYLLABUS

UNIT-I

DIFFERENTIAL EQUATIONS: Differential equations of the first order and the first degree – Bernoulli's equation. Differential equations of the first order, but of the higher degree – Equations solvable for dy/dx – Equations solvable for y – Equations solvable for x- Clairaut's form.
Vol. III: Chapter 1 section 2.1, 2.2, 2.3, 2.4, 2.5, 5.1,5.2,5.3,5.4,5.5,6.1.

UNIT-II

DIFFERENTIAL EQUATIONS (cont.): Linear differential equations with constant coefficients: The operators D and D^{-1} – Particular integral – Special methods of finding particular integral – Linear equations with variable coefficients – Equations reducible to the linear homogenous equation – Variable of parameters.
Vol. III: Chapter 2 section 2,3,4,8,9,10.

UNIT-III

DIFFERENTIAL EQUATIONS (cont.): Simultaneous equations of the first order and first degree – methods for solving dx/P=dy/Q=dz/R – Simultaneous Linear Differential equations with constant coefficients – Total Differential Equations.
Vol. III: Chapter 3 section 2,3,4,5,6,7.

UNIT-IV

PARTIAL DIFFERENTIAL EQUATIONS: Derivation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Different integrals of partial differential equations – standard types of first order equations – Lagrange's equations.
Vol. III: Chapter 4, section 1,2,3,5.1,5.2,5.3,5.4,6.

UNIT-V

LAPLACE TRANSFORMS: Laplace transforms–Definition– Transform of f(t), - exp(at), cos at, sin at and t^n when n is an integer –The inverse transforms - Laplace transforms to solve ordinary differential equations with constant coefficients.
Vol. III: Chapter 5, section 1,2,4,5,6,7,9.

TEXT BOOK

1. Calculus Vol.III by T. K. Manicavachagam pillay, S. Narayanan, S. Viswanathan Printers, 2014.

REFERENCE BOOKS

1. N. P. Bali, Differential Equations, Laxmi Publications(P) Ltd, New Delhi, 2004.
2. Dr. J. K. Goyal and K. P. Gupta, Laplace and Fourier Transforms, Pragati Prakasham Publishers, Meerut, 2000

WEB RESOURCES

A. https://youtu.be/ES741wq3APA

B. http://www.che.ncku.edu.tw/facultyweb/changct/html/teaching/Engineering%20Math/Chapter%202.pdf

C. https://youtu.be/XU5hUrh6-18

MAPPING WITH PROGRAM OUTCOMES

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	S	L	M	-	-	-	-	-	-	-
CO2	S	-	M	-	-	-	-	-	-	-
CO3	S	-	L	-	-	-	-	-	-	-
CO4	S	-	M	-	-	-	-	-	-	-
CO5	S	-	L	-	-	-	-	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prof GOMATHI G
(Course Coordinator)

Dr JAYASHEELA D
(Academic Council -Member Secretary)

Dr UMA N
(BOS Chairperson)

SEMESTER I

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT PATTERN
20CMATE01	ACCOUNTANCY	DSE	55	-	-	4	Accounts

TEXT BOOKS

To enable the Students to learn Principles and Concepts of Accountancy.

DEPARTMENT OFFERING

BCom

PREREQUISTE

NIL

EXPECTED SKILL

Domain Knowledge / Entrepreneurship / **Employability** / Skill Development

COURSE OUTCOMES

On successful completion of the course, students will be able to:

S. NO	COURSE OUTCOME	BLOOMS LEVEL
CO1	Identify the Concepts, conventions of accounting; prepare journal ledger and trial balance.	Analyze
CO2	Prepare the Final Statement of Accounts to assess the Profitability and Financial Position of the business.	Understand
CO3	Prepare Cash Book and Bank Reconciliation Statement.	Analyze
CO4	Ascertain the amount of Deprecation by applying different methods.	Apply
CO5	Compute Income and Expenditure and preparation of Balance sheet in case of Non-Profit Organization.	Apply

SYLLABUS

UNIT- I INTRODUCTION TO ACCOUNTING **11 Hours**

Introduction to Accounting- Meaning, Scope, Need for Accounting– Objectives of Accounting -Accounting Concepts and Conventions - Journal, Ledger, Trial balance.

UNIT- II FINAL ACCOUNTS **11 Hours**

Final Accounts - Meaning and importance, Preparation of Trading Account, Profit and Loss Account and Balance Sheet with Simple Adjustments.

UNIT- III PREPARATION OF CASH BOOK & BANK RECONCILIATION STATEMENT

11 Hours

Cash Book - Meaning, Preparation of Cash Book – Cause of difference between Cash book and Pass book, Preparation of Bank Reconciliation Statement.

UNIT-IV DEPRECATION **11 Hours**

Concept of Deprecation – Meaning – Characteristics – Causes – Objectives – Methods of deprecation Straight line Method – Diminishing Balance Method -Distinction Between Straight line and Written Down Value Method.

UNIT-V ACCOUNTS OF NON-PROFIT ORGANIZATION **11 Hours**

Meaning and Recognition of Capital & Revenue items – Nature of Receipt and Payment Account: Income and Expenditure Account –Preparation of Final Accounts.

Note: Distribution of Marks between Theory and Problems shall be 30% and 70%

TOTAL PERIODS: 55

TEXT BOOKS

A. T. S Reddy and A. Murthy -"Advanced Accountancy" Margham Publiations - Volume I, 2nd Revised Edition, 2011, reprint 2019.

REFERENCE BOOKS

A. Jain and Narang - "Financial Accounting" - Kalyani Publishers – 1st Edition 2018.

B. R. L. Gupta, Radhaswamy - "Advanced Accountancy" 18th Reprint – 2018, Sultan Chand & Sons.

WEB RESOURCES

1. www.accountancyknowledge.com/final-accounts/
2. https://www.youtube.com/watch?v=aw30S31WCVQ
3. https://www.profitbooks.net/what-is-depreciation/
4. https://www.tutorialspoint.com/financial_accounting/financial_accounting_capital_and_revenue.htm

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	–	L	–	S	–	–	–	L	–	M	–
CO2	–	–	L	–	S	–	–	–	L	–	M	–
CO3	–	–	L	–	S	–	–	–	L	–	M	–
CO4	–	–	L	–	S	–	–	–	L	–	M	–
CO5	–	–	L	–	S	–	–	–	L	–	M	–

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

N. Selvakumar.

Dr Selvakumar N
Course Coordinator

Dr Nirmala Devi V
Chairperson – BOS

Approved by

Dr Jayasheela D
Member Secretary
Academic Council

SEMESTER II

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20PHCG03	ALLIED PHYSICS FOR MATHS - II	GE-III	45	-	-	3	A (Theory)

COURSE OBJECTIVE

This course aims at facilitating the students to understand the fundamentals of Physics

DEPARTMENT OFFERING

BSc Physics

PREREQUISTE

Higher Secondary Level Physics

EXPECTED SKILL

Domain Knowledge

COURSE OUTCOMES

On successful completion of the course, students will be able to

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Understand the principles of elasticity through the study of young modulus and modulus rigidity	Understand
CO2	Classify the properties of light	Understand
CO3	Execute the functions of logic gates in various applications	Apply
CO4	Explain the concept of modern atomic structure and its application	Understand
CO5	Discuss different model of nuclear structure and classify the elementary particles	Understand

SYLLABUS

UNIT I PROPERTIES OF MATTER **9 HOURS**

Elasticity: Introduction – Different moduli of elasticity – Relation between elastic constants – Work done in a strain – Poisson's Ratio – Torsion – Twisting couple on a cylinder – Work done in twisting a wire – Determination of Rigidity modulus (Static torsion method). **Bending of Beams:** Expression for the bending

moment – Cantilever-Measurement ofYoung's Modulus (E) – Non-uniform bending and uniform bending of a beam.

UNIT II OPTICS — 9 HOURS

Light and its properties – Dual Nature of Light – Electromagnetic Spectrum – Visible range – Speed of light – Interference – Superposition principle – Diffraction – Fresnel diffraction – Fraunhoffer diffraction – Polarisation – Types of polarization – Fiber optics.

UNIT III DIGITAL ELECTRONICS — 9 HOURS

Introduction – Analog and Digital signals – Binary number system – Decimal to Binary conversion – Binary to Decimal conversion – Logic gates – AND ,OR,NOT,NAND and NOR gates – NAND and NOR gate as a universal gates – Demorgan's theorem – Laws of Boolean algebra – Simplification of Boolean expressions.

UNIT IV ATOMIC PHYSICS — 9 HOURS

Introduction of atomic model – Sommerfeld's relativistic atom model – Elliptic orbits for hydrogen – Sommerfeld's relativistic theory – The vector atom model – Spatial quantization – Spinning electron – Quantum numbers associated with vector atom model – The Pauli exclusion principle – The periodic classification of elements – Electron configurations with modern symbolic representations – Discovery of Raman Effect – Experimental study of Raman effect – Applications.

UNIT V NUCLEAR PHYSICS — 9 HOURS

Introduction – Models of Nuclear structure – Liquid drop model – Semi-empirical mass formula – Shell model – Collective model – Interaction between energetic particles and matter – Ionization chamber – Proportional counter – G.M counter – Elementary particles – Particles and Anti-particles – The fundamental interactions – Quantum Chromodynamics

TEXT BOOKS

A. R. Murugesan, "Properties of Matter", S .Chand & Company Ltd, New Delhi, Fifth Edition, 2017.
B. N. Subrahmanyam, Brij Lal and M. N. Avadhanalu, "A Text Book of Optics", S .Chand & Company Ltd, Twenty Fifth Edition, 2015.
C. V. K. Mehta andRohit Mehta, "Digital Electronics", S. Chand & Company Ltd, Eighth Edition, 2016
D. R. Murugesan and S. Kiruthiga, "Modern Physics" S .Chand & Company Ltd, Eighteenth Edition, 2016.

REFERENCE BOOKS

A. R. Mugeshan "Modern Physics" S .Chand & Company Ltd, Seventieth Edition, 2016.
B. Dr. B. R. Gupta and VendanaSingahal "Digital Electronics", S. K. Kataria and Sons Millennium Edition, July 2009.
C. A. Beisur, S. Mahajan and S. Choudhury, "Concept of Modern Physics", Tata McGraw Hill Companies, Seventh Edition, 2015.

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1									L		
CO2									L		
CO3									L		

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by	Verified by	Approved by
Dr Razad P M	Dr Poonguzhali S 29/12/20	Academic Council-Secretary

SEMESTER II

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20PHCG04	ALLIED PRACTICAL – ALLIED PHYSICS LAB FOR MATHS - II	GE-IV	-	-	24	2	B (Practical)

COURSE OBJECTIVE

This course aims at facilitating the students to learn the concept of different properties of matter and to demonstrate simple digital experiments.

DEPARTMENT OFFERING

BSc Physics

PREREQUISTE

Higher Secondary Level Physics

EXPECTED SKILL

Domain Knowledge and Skill Development

COURSE OUTCOMES

On successful completion of the course, students will be able to

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Recognize the physical properties of matter by interpreting the results of experiments	Understand
CO2	Examine the optical properties of solid and liquid	Apply
CO3	Identify the logic gates and demonstrate its applications	Understand

SYLLABUS

All the Experiments

1. Young's modulus of the given bar – Uniform bending using Pin & Microscope
2. Young's modulusof the given bar – Non Uniform bending using Pin & Microscope
3. Young's Modulus– Cantilever using scale and telescope
4. Newton's ring – radius of curvature
5. Spectrometer – refractive index of solids
6. Spectrometer – refractive index of liquids
7. Verification of De-Morgan'stheorem
8. Verification of logic gates

WEB RESOURCES

A. https://www.pbslearningmedia.org/subjects/science/physical-science/matter-and-interactions/properties-of-matter/

B. https://www.pbslearningmedia.org/subjects/science/physical-science/matter-and-interactions/properties-of-matter/

C. https://www.britannica.com/science/atomic-physics

MAPPING WITH PROGRAM OUTCOMES

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	P11
CO1	-	-	-	-	-	-	-	-	S	-	-
CO2	-	-	-	-	-	-	-	-	S	-	-
CO3	-	-	-	-	-	-	-	-	S	-	-
CO4	-	-	-	-	-	-	-	-	S	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by

Dr Razad P M

Verified by

29/12/20

Dr Poonguzhali S

Approved by

Academic Council-Secretary

SEMESTER II

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20ESA01	ENVIRONMENTAL STUDIES	AECC - III	26	-	-	1#	Theory

PREAMBLE/ COURSE OBJECTIVE

1. To recognize the major concepts of ecosystem and have in-depth understanding of environmental interactions and alternate energy resources.
2. To realize the effects of various environmental pollutants and measures to control pollution.
3. To identify the environmental social issues and develop problem – solving skills using scientific techniques.
4. To be aware of human population growth among the nations and the significance of human rights.

DEPARTMENT OFFERING

Biotechnology

PREREQUISITE

Higher Secondary Level

EXPECTED SKILL

Skill Development

COURSE OUTCOMES

On successful completion of the course, students will be able to

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Describe the principles of ecology and major concepts in environmental sciences.	Remember
CO2	Interpret the key concepts in Environmental pollution that apply to air, land and water issues on a global scale and population growth.	Understand
CO3	Investigate the polluted environment area and document the risks and formulate a design for the environmental health.	Analyze
CO4	Identify the Socio- Environmental issues and apply the related analysis for the protection of environment.	Apply
CO5	Describe the human rights and welfare and role of information technology in the environment.	Analyze

UNIT I **4 HOURS**

Multidisciplinary nature of environmental studies Definition, scope and importance, Need for public awareness. Introduction to Renewable and Nonrenewable sources – Uses of alternate energy sources.

UNIT II **6 HOURS**

Ecosystems - Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Food chains, food webs and ecological pyramids. Types of ecosystem - Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). Biodiversity – Levels – Patterns – Threats – Biodiversity services.

UNIT III **5 HOURS**

Environmental Pollution – Definition, Cause, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution, Nuclear hazards. Solid waste Management : Causes, effects and control measures of urban and industrial wastes. Disaster management : floods, earthquake, cyclone and landslides.

UNIT IV **6 HOURS**

Social Issues and the Environment Urban problems related to energy, Water conservation, rain water harvesting, watershed management, Environmental Issues in Coimbatore District (Noyyal River, Dye Industries and Agricultural issues). Environmental ethics : Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents. Environment Protection Act, Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation.

UNIT V **5 HOURS**

Human Population and the Environment - Population growth, variation among nations, Population explosion – Family Welfare Programme, Environment and human health, Human Rights - Women and Child Welfare, Role of Information Technology in Environment and human health.

***Activity – Documentation about Impacts of pollutants in Environment/ Socio – Environmental Issues.**

A. Erach Bharucha. "Textbook for Environmental Studies for Undergraduate Courses", 2nd edition, University Grants Commission, New Delhi and Bharati Vidyapeeth Institute of Environment Education and Research, Pune, University Press, Revised edition.

A. M P Poonia and S C Sharma "Environmental Studies - Concepts, Impacts, Mitigation and Management", 2nd edition, Khanna Book Publishing, 2017.

B. R Rajagopalan "Environmental Studies", 3rd edition, Oxford University Press, 2015.
C. Dr D K Asthana and Dr Meera Asthana, Text Book of Environmental Studies, Revised edition, S Chand and Company, 2010.
D. Shashi Chawla "A Text Book of Environmental Studies", 1st edition, Tata McGraw Hill, 2012.

[redacted]

A. https://ugc.ac.in/oldpdf/modelcurriculum/env.pdf
B. https://play.google.com/books/reader?id=ZHsoDwAAQBAJ&hl=en&pg=GBS.PP1
C. http://www.nacwc.nic.in (Suggested by UGC)
D. http://www.opcw.org (Suggested by UGC)

[redacted]

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1									
CO2									
CO3									
CO4									
CO5									

S- Strong; M-Medium; L-Low

[redacted]

No Comprehensive Examinations. Only Continuous Internal Assessment (CIA).

Verified and Approved by

Course Coordinator
(Dr Jayasheela D)

Academic Council

Principal

SEMESTER 2

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT
20LSA02	Life Skills-II	SEC	40	-	-	2	Theory

PREAMBLE / COURSE OBJECTIVE

This course aims at

- Developing essential skills to influence and motivate others
- Creating and maintaining an effective and motivated team to work for the society
- Nurture a creative and entrepreneurial mindset and Explore desired career opportunities
- Inculcating and practicing human values

DEPARTMENT OFFERING

TIP Center

PREREQUISITE

First Semester - Life Skills- I

EXPECTED SKILL

Leadership Skills/ Professional Skills/ Entrepreneurial Skills

COURSE OUTCOMES

On successful completion of the course, students will be able to-

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Understand the skills, strengths and abilities of different leadership styles	Understand
CO2	Demonstrate the practical skills in conflict management and self management	Apply
CO3	Understand the basics of entrepreneurship and develop business plans	Apply
CO4	Explore sources of career opportunities	Apply
CO5	Become conscious practitioners of human values	Apply

SYLLABUS

UNIT I Leadership Skills **8 Hours**

Understanding leadership and its importance – meaning of leadership, significance of leadership required, characteristics of an ideal leader

Traits and Models of Leadership - leaders born or made, key characteristics of an effective leader, Leadership styles, perspectives of different leaders

Basic Leadership Skills – motivation, team work, negotiation, networking

UNIT II Managerial Skills **8 Hours**

Basic Managerial Skills - planning for effective management, organizing teams, recruiting and retaining talent, delegation of tasks, learning to coordinate, conflict management

Self-Management Skills - understanding self-concept, developing self-awareness, self-examination, self-regulation

UNIT III Entrepreneurial skills **8 Hours**

Basics of Entrepreneurship - meaning of entrepreneurship, classification and types of entrepreneurship, traits and competencies of entrepreneur

Creating Business Plan - problem identification and idea generation, idea validation, pitch making

UNIT IV Career Skills **8 Hours**

Group Discussion- meaning and methods, , procedure, simulation ,common errors

Exploring career opportunities – knowing yourself, personal characteristics, knowledge about the world of work, requirements of jobs including self-employment, sources of career information, preparing for a career based on potentials and availability of opportunities

UNIT V Universal Human Values **8 Hours**

Universal human values - love and compassion, truth, non-violence, righteousness, peace, service, renunciation (sacrifice)

TEXT BOOKS

A. Ashokan, M. S. (2015). Karmayogi: A Bibliography of E. Sreedharan. Penguin, UK.

B. Brown, T. (2012). Change by Design. Harper Business

C. Elkington, J., & Hartigan, P. (2008). The Power of Unreasonable People: How Social Entrepreneurs Create Markets that Change the World. Harvard Business Press.

D. Goleman D. (1995). Emotional Intelligence. Bloomsbury Publishing India Private Limited

E. Kalam A. A. (2003). Ignited Minds: Unleashing the Power within India. Penguin Books India

F. Kelly T., Kelly D. (2014). Creative Confidence: Unleashing the Creative Potential within Us All. William Collins

G. Kurien V., & Salve G. (2012). I Too Had a Dream. Roli Books Private Limited

H. Livermore D. A. (2010). Leading with cultural intelligence: The New Secret to Success. New York: American Management Association

I. McCormack M. H. (1986). What They Don't Teach You at Harvard Business School: Notes From A Street-Smart Executive. RHUS

REFERENCE BOOKS

A. O'Toole J. (2019) The Enlightened Capitalists: Cautionary Tales of Business Pioneers Who Tried to Do Well by Doing Good. HarperCollins
B. Sinek S. (2009). Start with Why: How Great Leaders Inspire Everyone to Take Action. Penguin
C. Sternberg R. J., Sternberg R. J., &Bales P. B. (Eds.). (2004). International Handbook of Intelligence. Cambridge University Press.

WEB RESOURCES

A. Fries, K. (2019). 8 Essential Qualities That Define Great Leadership. Forbes. Retrieved 2019- 02-15 from https://www.forbes.com/sites/kimberlyfries/2018/02/08/8-essentialqualities-that-define-great-leadership/#452ecc963b63.
B. How to Build Your Creative Confidence, Ted Talk by David Kelly - https://www.ted.com/talks/david_kelley_how_to_build_your_creative_confidence
C. India's Hidden Hot Beds of Invention Ted Talk by Anil Gupta - https://www.ted.com/talks/anil_gupta_india_s_hidden_hotbeds_of_invention
D. Knowledge@Wharton Interviews Former Indian President APJ Abdul Kalam - . "A Leader Should Know How to Manage Failure" https://www.youtube.com/ watch?v=laGZaS4sdeU
E. Martin, R. (2007). How Successful Leaders Think. Harvard Business Review, 85(6): 60.
F. NPTEL Course on Leadership - https://nptel.ac.in/courses/122105021/9

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1									
CO2									
CO3									
CO4									
CO5									

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

- Total: 100 Marks
- Online exam: 50 Marks
- Oral Evaluation: 50 Marks
- Passing Minimum: 40 %
- **External Assessment**

Prepared & Verified by
Dr Thamarai selvan M

Dr. S. DEENA, Ph.D.,
DIRECTOR
Catering Science & Hotel Mgt.,
Sri Ramakrishna College of Arts & Science
(Formerly S.N.R. Sons College)
Coimbatore - 641 006

Approved by
Academic Council

SEMESTER - III

SEMESTER III

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT PATTERN
20CMAT06	VECTOR CALCULUS & FOURIER ANALYSIS	DSC	60	-	-	4	A (THEORY) CIA 40; CE-60 TOTAL -100

PREAMBLE / COURSE OBJECTIVE

- To introduce students to the fundamentals of vector differentiation and integration.
- To describe the basic idea of Fourier series of periodicity function and half range sine and cosine series.

DEPARTMENT OFFERING

PG & Research Department of Mathematics

PREREQUISTE

Higher Secondary Level: Differentiations – Integrations and Trigonometric formulas

EXPECTED SKILL

Domain Knowledge

COURSE OUTCOMES

On successful completion of the course, students will be able to

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Analyze the vector differentiation of scalar and vector point function.	Analyze
CO2	Evaluate the vector integrations using Gauss, Green's and Stoke's theorem.	Apply
CO3	Expand the given periodic function as a Fourier series.	Apply
CO4	Determine half range sine & cosine series of the given function.	Apply
CO5	Analyze the properties of Fourier transform.	Analyze

SYLLABUS

UNIT I: VECTOR DIFFERENTIATION AND INTEGRATION — 12 HOURS

Derivative of vector function– Gradient – Directional derivative – Divergence and Curl operators – Solenoidal & Irrotational vectors -Vector Identities – Laplacian operator– Evaluation of line integral – Conservative force field – Scalar potential – Work done by a force -Example problems.

UNIT II: VECTOR INTEGRATION — 13 HOURS

Gauss divergence theorem (statement only) – Verification of Gauss Divergence theorem – Evaluation of surface integral using Gauss divergence theorem - Green's theorem (statement only) – Finding the area bounded by simple closed curve 'c' using Green's theorem – Evaluation of line integral using Green's theorem – Stoke's theorem (statement only) – Evaluation of line integral using Stoke's theorem – Verification of Stoke's theorem-Example problems.

UNIT III: FOURIER SERIES — 11 HOURS

Definition of periodic function - Fourier series – Euler's formula for Fourier coefficients – Dirichlet's conditions – Obtaining Fourier series of periodicity 2π *and* π for a function f(x)-Example problems

UNIT IV:FOURIER SERIES — 12 HOURS

Half range sine and cosine series – Definition of half range sine series - Definition of half range cosine series – Obtaining half range fourier sine and cosine series of periodicity π for a given function f(x) – Definition of RMS value of a function – Parseval's theorem (statement only) – Problems using Parseval's theorem-Example problems.

UNIT V: FOURIER TRANSFORMS — 12 HOURS

Definition of Fourier transform – Properties of Fourier transform- Fourier Cosine transform - Fourier Sine transform - Parseval's Identity - Convolution theorem – Example problems.

TOTAL – 60 HOURS

TEXT BOOKS

A. "Vector Analysis" – P. Duraipandian and LaxmiDuraipandian – Emerald Publishers 1984, Reprint 2003 (Unit I, II & III).

B. "Calculus" Volume III, - S. Narayanan and K. ManicavachagamPillay – Vanathan Printers & Publishers Pvt. Ltd 1999 (Unit IV & V).

REFERENCE BOOKS

A. "Vector Calculus, Fourier Series and Fourier Transforms " – Dr.P.R. Vittal and V. Malini. Margham Publication 2004.

B. J.N. Sharma, A.R. Vasishtha, Vector Calculus, Krishna Prakashan Media (P) Ltd, 2004.

WEB RESOURCES

A. https://open.umn.edu/opentextbooks/textbooks/vector-calculus

B.https://www.math.bgu.ac.il/~leonid/ode_9171_files/Schoenstadt_Fourier_PDE.pdf

C. https://see.stanford.edu/materials/lsoftaee261/book-fall-07.pdf

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L	S	L	M	-	-	-	-	-	L	M	-
CO2	L	S	M	L	-	-	-	-	-	M	L	-
CO3	M	L	S	M				-	-	L	M	-
CO4	L	M	S	M	-	-	-	-	-	L	M	-
CO5	S	L	M	L	-	-	-	-	-	L	M	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by	Verified by	Approved by
INFANT GABRIEL G (Course Coordinator)	VIVEK E (Syllabus Coordinator)	Dr UMA N (BOS Chairperson)

Dr HARI PRASAD D
(Academic Council - Member Secretary)

SEMESTER III

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT PATTERN
20MAT301	STATICS	DSC	60	-	-	4	A (THEORY) CIA 40; CE-60 TOTAL -100

PREAMBLE / COURSE OBJECTIVE

- To enable the students to gain knowledge about a system of forces acting on a particle and on a body in order to maintain equilibrium.
- To impart knowledge on the concepts of friction, center of gravity and equilibrium of strings

DEPARTMENT OFFERING

PG and Research Department of Mathematics

PREREQUISITE

HSC level Calculus and Algebra

EXPECTED SKILL

Domain Knowledge

COURSE OUTCOMES

On successful completion of the course, students will be able to

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Explain the basic concepts of components and resultant of a system of forces on a particle	Understand
CO2	Determine moment and resultant of a system of coplanar Couples	Apply
CO3	Reduce a system of forces on a body to a single force through analytical representation.	Apply
CO4	Analyze the equilibrium of a particle on a rough inclined plane and determine the center of gravity	Analyze
CO5	Analyze the characteristics of equilibrium of a string	Analyze

SYLLABUS

UNIT I **Forces acting at a point** **13 HOURS**

Resultant and Component - Analytical expressions- Parallelogram of Forces - - Triangle of Forces and its converse-Perpendicular triangle of forces -Polygon of forces-Lamis theorem - (λ- μ) theorem- Resolution and components of forces-Theorem on resolved parts-Resultant of any number of forces (Analytical and graphical methods).

UNIT II Parallel Forces **13 HOURS**

Resultant of two like and unlike parallel forces- condition of equilibrium of three coplanar parallel forces-moment of a force-geometrical representation-Varignon's theorem- generalized theorems-Couples: Definition-Equilibrium of two couples-Equivalence of two couples-Couples in parallel planes- Resultant of coplanar couples-Resultant of a couple and a force.

UNIT III Forces Acting on a Rigid Body **12 HOURS**

Three forces acting on a rigid body: Rigid body subjected to any three forces-Three coplanar forces-Two triangle theorems (statements only)-Coplanar forces: Reduction of any number of coplanar forces- Analytical representation- Conditions for a system of forces to be reduced to a single force.

UNIT IV Friction and Centre of Gravity **12 HOURS**

Introduction- Statical, Dynamical and limiting friction - Coefficient of friction- Angle of friction-Cone of friction-Equilibrium of a particle on a rough inclined plane-Introduction to center of gravity-Determination of center of gravity in simple cases

UNIT V Equilibrium of Strings **10 HOURS**

Definition-Equation of common catenary- Tension at any point.

TOTAL – 60 HOURS

TEXT BOOKS

A. M.K.Venkataraman, *Statics*, Agasthiar Publications, Trichy, 1999.

REFERENCE BOOKS

A. P.Duraipandian and LaxmiDuraipandian, *Mechanics* , S.Chand and Company Ltd, Ram Nagar, New Delhi -55, 1985.
B. Herbert Goldstein, Charles P.Poole, John Safko, *Classical Mechanics*, Pearson, 3rd Edition.
C. Upadhyaya J.C., *Classical Mechanics*, Himalaya Publishing house, 2017.

WEB RESOURCES

https://link.springer.com/chapter/10.1007/978-1-4939-2101-0_4

http://www.iitg.ac.in/kd/Lecture%20Notes/ME101-Lecture12-KD.pdf

http://www.iitg.ac.in/rkbc/me101/Presentation/L16-18.pdf

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	-	M	L	-	-	-	-	-	-	L	-
CO2	S	-	M	L	-	-	-	-	-	-	L	-
CO3	S	-	M	L	-	-	-	-	-	-	L	-
CO4	S	-	M	L	-	-	-	-	-	-	L	-
CO5	S	-	M	L	-	-	-	-	-	-	L	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by

SIVA CHANDRAN Y L
(Course Coordinator)

Verified by

VIVEK B
(Syllabus Coordinator)

Approved by

Dr UMA N
(BOS Chairperson)

Dr HARI PRASAD D
(Academic Council - Member Secretary)

SEMESTER III

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT PATTERN
20MAT302	MATHEMATICAL STATISTICS I	DSC	45	-	-	3	A (THEORY) CIA 40; CE-60 TOTAL -100

PREAMBLE / COURSE OBJECTIVE

This course aims at facilitating the students to understand the concepts of probability, one dimensional, two dimensional random variables, basic probability distributions and the applications of Statistics with R Programming.

DEPARTMENT OFFERING

PG & Research Department of Mathematics

PREREQUISTE

Higher Secondary Level –Basic knowledge in Statistics

EXPECTED SKILL

Skill Development

COURSE OUTCOMES

On successful completion of the course, students will be

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Solve the problems by using distribution functions.	Apply
CO2	Demonstrate the concept of Mathematical expectations.	Understand
CO3	Apply the concept of probability distributions.	Apply
CO4	Analyze data using correlation and regression.	Analyze
CO5	Apply R programming to the concepts learnt.	Apply

SYLLABUS

UNIT I **8 HOURS**

Random variable – Discrete and Continuous – Distribution functions – Marginal and Conditional distributions. (Simple Problems).

UNIT II **9 HOURS**

Mathematical Expectation – Moment Generating Function and Characteristic Function – Properties – Tchebychev's inequality. (Simple Problems).

UNIT III **10 HOURS**

Probability Distributions – Binomial, Poisson & Normal Distributions – Derivations, Properties and Applications. (Simple Problems).

UNIT IV **10 HOURS**

Correlation and Regression – Correlation Co-efficient and Rank correlation – Regression lines and Regression Coefficients – Properties. (Simple Problems).

UNIT V **8 HOURS**

Introduction to R– Basics – Variables – Functions – Data Types – Operators – Vectors and Data Frames– Data Structures in R– Problem solving Using R –Correlation , Regression and Probability distributions.

TOTAL – 45 HOURS

TEXT BOOKS

A. S. C. Gupta & V. K. Kapoor : "Fundamentals of Mathematical Statistics" 1st Edition 1970, Reprint 2016.

REFERENCE BOOKS

A. P. R. Vittal : "Mathematical Statistics" 1st Edition 2002, Reprint 2016.

B. S. P. Gupta : "Statistical Methods" 1st Edition 1969, Reprint 2017.

WEB RESOURCES

A. https://www.stat.pitt.edu/stoffer/tsa3/intro_prob.pdf

B. http://www.mcrhrdi.gov.in/88FC/Week-12/correlation%20regression.pdf

C. https://www.tutorialspoint.com/r/r_tutorial.pdf

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	L	M	L	-	-	-	-	-	L	L	S
CO2	S	L	M	L	-	-	-	-	-	L	L	S
CO3	S	L	M	L	-	-	-	-	-	L	L	S
CO4	S	L	M	L	-	-	-	-	-	L	L	S
CO5	S	L	M	L	-	-	-	-	-	L	L	S

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by

Dr RAMYA K
(Course Coordinator)

Verified by

VIVEK E
(Syllabus Coordinator)

Approved by

Dr UMA N
(BOS Chairperson)

Dr HARI PRASAD D
(Academic Council - Member Secretary)

SEMESTER III

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT PATTERN
20MACCG05	PROGRAMMING IN JAVA	GE - I	45	-	-	3	A (THEORY) CIA 40; CE-60 TOTAL -100

PREAMBLE / COURSE OBJECTIVE

- To gain knowledge about basic Java language syntax and semantics.
- To understand the basic concepts such as Tokens, variables, data types, operators and expressions.
- To understand simple programs using decision making and looping statements.
- To gain knowledge about interfaces, packages, Multithreaded Programming.
- To understand how to implement Applet programs and Exceptions.

DEPARTMENT OFFERING

Mathematics with CA

PREREQUISTE

JAVA Programming fundamental concepts

EXPECTED SKILL

Programming and Problem-Solving Skill

COURSE OUTCOMES

On successful completion of the course, students will be able to

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Define Basic programming concepts in java	Understanding
CO2	Implement basic Oops concepts in java	Analyze
CO3	Apply packages and interfaces in java.	Application
CO4	Demonstrate the concept of Multithreaded Programming	Analyze
CO5	Demonstrate Applet and describe I/O streams in java.	Application

SYLLABUS

UNIT I **9 HOURS**

Fundamentals of Object Oriented Programming: Basic Concepts of Oops - **Java Evolution:** JavaHistory – Java features – Java environment – **Overview of Java Language:** Java Tokens **Constants, Variables and Data Types:** Constants – Variables – Data Types - **Operators and Expressions**

UNIT II **9 HOURS**

Decision making and Branching - Decision making and Looping – Classes, Objects and Methods : Defining a class – Adding variables and method – Creating objects – Accessing class members – Constructors – Method overloading –Inheritance – Method overriding – Visibility control.

UNIT III **9 HOURS**

Interface: Defining interface – Extending interface – Implementing interface – Accessing interface variable - **Packages:** Java API packages – Using system package – Naming conventions – Creating packages – Using a package.

UNIT IV **9 HOURS**

Multithreaded programming: Creating threads – Extending the thread class – Stopping and blocking thread – Life cycle of a thread – Thread methods –Implementing the Runnable interface.

UNIT V **9 HOURS**

Applet Programming: Introduction – Applet code – Applet life cycle – Applet Tag – Web page designing – Running the applet – More about applet tag – Passing parameters to Applets - **Managing I/O Files:** Streams – Stream classes – Byte streams – Character streams – Using stream – I/O classes and file class.

TOTAL-45 HOURS

TEXT BOOKS

1. E.Balagurusamy, Programming with JAVA A Primer, Fourth Edition, Mc Graw Hill, 2011

REFERENCE BOOKS

1. Java™: The Complete Reference. Nineth Edition Herbert Schildt., Mc Graw Hill, 2014.

WEB RESOURCES

1. https://www.youtube.com/watch?v=Zh11XoxDglg
2. https://www.javatpoint.com/method-overriding-in-java
3. https://www.javatpoint.com/difference-between-abstract-class-and-interface
4. https://www.tutorialspoint.com/java/java_overview.htm
5. https://www.javatpoint.com/internal-details - java-program
6. https://www.guru99.com/java-tutorial.html

MAPPING WITH PROGRAM OUTCOMES

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	S	-	-	-	-	M	S	S	-	M	-
CO2	S	S	-	M	S	L	-	M	S	-	S	-
CO3	S	S	-	M	S	L	L	M	S	-	S	-
CO4	S	S	-	M	S	L	L	M	S	-	S	-
CO5	S	S	-	M	S	L	-	-	s	-	S	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

- Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared By	Verified By	Approved By
Karunya N (Course Co-Ordinator)	Vivek E (Syllabus Co-Ordinator)	Dr Uma N (BOS Chairperson)

Dr Hari Prasad D
(Academic Council Member Secretary)

SEMESTER III

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT PATTERN
20MACCG06	PROGRAMMING IN JAVA-LAB	GE - I	30	-	-	2	B (PRACTICAL) CIA 20; CE-30 TOTAL - 50

PREAMBLE / COURSE OBJECTIVE

- To learn the main features of the Java language.
- To understand how to debug and test Java programs
- To gain knowledge to implement interface, inheritance and applet concepts using java.
- To understand the importance of java in real life applications
- To apply the syntax of programming language Java for solving the real world problems.

DEPARTMENT OFFERING

Mathematics with CA

PREREQUISTE

JAVA Programming fundamental concepts

EXPECTED SKILL

Programming and Problem Solving Skill

COURSE OUTCOMES

On successful completion of the course, students will be able to

S. NO	COURSE OUTCOME	BLOOMS LEVEL
CO1	Create a programs to apply the fund amental of programming approaches	Application
CO2	Create a programs to demonstrate the concepts of looping and method overloading	Analyze
CO3	Create a programs to demonstrate inheritance and illustrate the concepts of packages	Analyze
CO4	Crete a program to apply the concept of interface to prepare employee payslip and thread for creating a multiplication table.	Application
CO5	Create a program to Illustrate the concept of functions using applets	Application

LIST OF EXPERIMENTS

1. Write a program to find the greatest of three numbers.
2. Write a program using arithmetic, relational and logical operators.
3. Write a program to find the factorial of a number entered by user using while loop.
4. Write a program to perform Method Overloading.
5. Write a program to demonstrate Inheritance.
6. Write a program to create a Java Package.
7. Write a program to prepare pay slip using Interfaces concept
8. Write a program to explain the multithreading with the use of multiplication tables. Three threads must be defined, with each creating one multiplication table
9. Write a program to display all shapes with available built in functions using applets.
10. Write a program to drawing a human face using applet.

WEB RESOURCES

1. https://beginnersbook.com/2017/09/java-program-to-find-factorial-using-for-and-while-loop/
2. https://www.javatpoint.com/method-overloading-in-java
3. https://beginnersbook.com/java-collections-tutorials/
4. https://www.tutorialspoint.com/java/java_overview.htm
5. https://www.programiz.com/java-programming/basic-input-output

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	S	-	-	-	-	M	S	S	-	M	-
CO2	S	S	-	M	S	L	-	M	S	-	S	-
CO3	S	S	-	M	S	L	L	M	S	-	S	-
CO4	S	S	-	M	S	L	L	M	S	-	S	-
CO5	S	S	-	M	S	L	-	-	s	-	S	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

- Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared By	Verified By	Approved By
Karunya N (Course Coordinator)	Vivek E (Syllabus Coordinator)	Dr Uma N (BOS Chairperson)

Dr Hari Prasad D
(Academic Council Member Secretary)

SEMESTER III

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT PATTERN
20CMATE01	DISCRETE MATHEMATICS	DSE - II	55	-	-	4	A (THEORY) CIA 40; CE-60 TOTAL -100

PREAMBLE / COURSE OBJECTIVE

To enable the students to learn and visualize the fundamental ideas about Mathematical logic, Formal languages, Automata, Boolean Algebra and Lattices.

DEPARTMENT OFFERING

PG & Research Department of Mathematics

PREREQUISTE

Higher Secondary Mathematics

EXPECTED SKILL

Domain Knowledge

COURSE OUTCOMES

On successful completion of the course, students will be able to

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Solve Mathematical logic problems.	Apply
CO2	Visualize and apply the fundamental ideas of relations and functions	Analyze
CO3	Describe the different types of formal languages and Automata theory	Analyze
CO4	Summarize the concepts of Lattices.	Apply
CO5	Simplify the Boolean expressions.	Analyze

SYLLABUS

UNIT –I MATHEMATICAL LOGIC **12 HOURS**

Connectives, Well-Formed Formula Tautology, Equivalence of formula, Tautological implications, Duality law, Normal forms, Theory of inference Predicates, Variables &Quatifiers.

UNIT- II RELATIONS AND FUNCTIONS **10 HOURS**

RELATIONS: Properties – Equivalence relation and Partial order relation – Poset – Graphs of relations – Hasse diagram – Matrices of relations – Closure operations on

relations – Partition & Covering of a set – Compatibility relations- Composition of binary relations

FUNCTIONS: Definition & Introduction – Composition of Functions – Inverse function – Binary and n-array operations – Characteristic function of a set - Hashing functions.

UNIT –III LANGUAGES AND AUTOMATA THEORY **12 HOURS**

Language, Grammar – Definition and Types. Deterministic finite state automata, Non- Deterministic finite state automata – Conversation of Non- Deterministic automata to deterministic automata – Procedure and Problems.

UNIT -IV LATTICES **10 HOURS**

Lattices as partially ordered sets: Definitions & Examples – Some properties of lattices – Lattices as algebraic systems – Sub lattices – Direct product & homomorphism.

UNIT -V BOOLEAN ALGEBRA **11 HOURS**

Definition and Examples – Subalgebra, Direct Product and homomorphisms – Boolean polynomials - Karnaugh map (k-map for 5 & 6 variables are not included)

TOTAL: 55 HOURS

TEXT BOOKS

1. .J.K. Sharma, **'Discrete Mathematics',** Macmillan Publishers India Ltd, 3rd edition 2011

REFERENCE BOOKS

1. J.P. Trembly and R.P. Manohar, **'Discrete Mathematical Structures with Application to Computers',** Tata MC Graw Hill Publications 1997
2. Dr.M.K. Venkataraman, Dr.N. Sridharan, N.Chandrasekaran, **'Discrete Mathematics'** National Publishing Company, 1st edition 2000, Reprint 2012.

WEB RESOURCES

A. https://www.cis.upenn.edu/~jean/discmath-root-b.pdf

B. http://home.iitk.ac.in/~arlal/book/mth202.pdf

C. https://www.cs.yale.edu/homes/aspnes/classes/202/notes.pdf

D. https://profs.info.uaic.ro/~fliacob/An1/2016-2017/Resurse_2016-2017/R02/Calvin%20Jongsma_Discrete%20Mathematics-%20Chapter%207%20Posets%20Lattices%20&%20Boolean%20Alge.pdf

MAPPING WITH PROGRAM OUTCOMES

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	M	-	-	-	-	-	-	-	-	-	-
CO2	S	M	M	L	-	-	-	-	-	-	-	-
CO3	S	L	M	-	-	-	-	-	-	-	-	-
CO4	S	M	S	-	-	-	-	-	-	-	-	-
CO5	S	M	S	L	-	-	-	-	-	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by

INFANT GABRIEL G
(Course Coordinator)

Verified by

VIVEK E
(Syllabus Coordinator)

Approved by

Dr UMA N
(BOS Chairperson)

Dr HARI PRASAD D
(Academic Council - Member Secretary)

SEMESTER III

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT
20PEA01	PACE-I	SEC-I	40	-	-	1	Theory CIA- O Marks CE-100 Marks (Online 50+ Oral 50)

PREAMBLE / COURSE OBJECTIVE

This course aims at facilitating the students to communicate effectively in English by enhancing learning , speaking , reading and writing skills

DEPARTMENT OFFERING

TIP Center

PREREQUISITE

First year UG Life Skills Completion

EXPECTED SKILL

English Communication / Employability / Soft Skill Development

COURSE OUTCOMES

On successful completion of the course, students will be able to-

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Set goals and hone soft skills	Remember
CO2	Develop listening and reading skills	Understand
CO3	Use error free sentences in speaking and writing	Understand
CO4	Display business etiquettes	Apply
CO5	Discuss in groups and speak effectively in public	Apply

SYLLABUS

UNIT I Goal Setting **7 HOURS**

Psychometric test, SWOT analysis, Career planning, Goal setting – planning on setting goals, introduction to soft skills – communication, presentation and intra-personal skills, motivation skills.

UNIT II Listening and Reading Skills **8 HOURS**

Techniques of effective listening – listening and comprehension – probing questions- barriers to listening – techniques of effective reading – gathering ideas and information- evaluating these ideas and information - interpret the text

UNIT III Speaking skills and Writing skills **9 HOURS**

Pronunciation –enunciation – vocabulary – fluency – common errors- writing and different modes of writing – avoid ambiguity, vagueness, unwanted generalizations and over simplification of issues- use proper signposting techniques

UNIT IV Non verbal Communication **7 HOURS**

Non- verbal communication – appearance and grooming, Tips to maintain a good impression at work – business etiquette, basic postures, gestures, table manners, body language, Dealing with people, Etiquette – Media, telephone and email etiquette,

UNIT V Public speaking skills **9 HOURS**

Group discussion – open and closed group discussion, group behavior, team work & team building, pubic speaking skills – common etiquette of public speaking, debate, extempore, eliminating fear, Contemporary group play and Role play, organizing speech and effective delivery, open and closing of speech and audience management

TEXT BOOKS

A. Service provider recommended / adapted text books
B. Books recommended by UGC's Jeevan Kaushal curriculum

REFERENCE BOOKS

A. New English File – Clive Oxenden, Christina Latham- Koenig, Paul Seligson 3rd Edition
B. New Headway –Liz and John Soars – 4th Edition
C. Business Result – David Grant, Jane Hudson & Robert McLarty 1st Edition

WEB RESOURCES

A. https://busyteacher.org/

B. https://en.islcollective.com/

C. https://www.skillsyouneed.com/presentation-skills.html

D. https://www.englishclub.com/grammar/

E. https://www.mindtools.com/CommSkll/PublicSpeaking.htm

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1									
CO2									
CO3									
CO4									
CO5									

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

- Total: 100 Marks
- Online exam: 50 Marks
- Oral Evaluation: 50 Marks
- Passing Minimum: 40 %
- External Assessment

Prepared by

Dr Thamarai Selvan M
TIP Coordinator

Approved & Verified by

Dr Deena S
Vice Principal

Dr Hari Prasad D
Member Secretary
Academic Council