

Program: Bachelor's Degree		Year: Third	Semester: VI
Class: UG			
Subject: Mathematics			
Course Code: MJ-12		Course Title: Dynamics & Statics	
Course Learning Outcomes: This course will enable the students to:			
<ul style="list-style-type: none"> a) apply the condition for equilibrium in problems. b) solve problems related to common catenary. c) solve problems related to gravitation % Newton's laws of motion. d) solve problems related to projectile. 			
Credit: 4 (Theory)		Compulsory	
Full Marks: 75		Time: 3 Hours	
Unit	Content		Hours
I	Conditions for equilibrium of forces in three dimensions. Wrench pitch, Null Lines.		15 h
II	Common Catenary, Stable equilibrium, energy test of stability (problems involving one variable only).		15 h
III	Motion of a particle under a central force, Differential equation of a central orbit in both polar and pedal co-ordinates. Newton's law of gravitation, planetary orbits, Kepler's laws of motion.		15 h
IV	Motion of projectile under gravity in a non-resisting medium. Motion of the mass centre and motion relative to the mass centre D'Alembert's principle. Two-dimensional motion of a rigid body rotating about a fixed axis, compound pendulum.		15 h
Sessional Internal Assessment (SIA) Full Marks . 25 Marks A Internal written Examination . 20 Marks (1 Hr.) B Over All Performance including Regularity . 05 Marks			
Books Recommended: 1. Dynamics Part I & II A. S. Ramsay 2. Dynamics by P.P. Gupta, Sanjay Gupta 3. Statics by Loney 4. Statics by A. R. Vasistha			

Program: Bachelor's Degree		Year: Third	Semester: VI
Class: UG			
Subject: Mathematics			
Course Code: MJ-13		Course Title: LPP & Statistics	
Course Learning Outcomes: This course will enable the students to:			
a) solve problems related to linear programming problems.			
b) solve problems related to transportation & assignment problems.			
c) study the nature of curve, fit a suitable curve for bivariate data.			
d) study correlation and do regression analysis.			
Credit: 4 (Theory)		Compulsory	
Full Marks: 75		Time: 3 Hours	
Unit	Content		Hours
I	Convex sets in R^2 and their properties, L.P.P., problem formulation, Graphical Method. Simplex method including Big M-method, Duality: Dual Simplex method.		15 h
II	Transportation and Assignment. Deterministic replacement models, sequencing problems on two machines and n jobs.		15 h
III	Measures of Skewness and Kurtosis. Curve fitting and method of least square.		15 h
IV	Correlation and regression & their expectations and variance.		15 h
Sessional Internal Assessment (SIA) Full Marks . 25 Marks			
A Internal written Examination . 20 Marks (1 Hr.)			
B Over All Performance including Regularity . 05 Marks			
Books Recommended:			
1. Linear Programming Problem: R.K. Gupta			
2. Linear Programming Problem: Lalji Prasad			
3. Operations Research: S. D. Sharma			
4. Mathematical Statistics: Kapur & Saxena			

Program: Bachelor's Degree Class: UG		Year: Third	Semester: VI
Subject: Mathematics			
Course Code: MJ-14		Course Title: Analysis II & Ring	
Course Learning Outcomes: This course will enable the students to:			
<ul style="list-style-type: none"> a) test the convergence of improper integral. b) solve multiple integrals using theorems like Green's theorem, Stokes theorem. c) understand the concept of ring and Ideals. d) explain the concept of field & homeomorphism. 			
Credit: 4 (Theory)		Compulsory	
Full Marks: 75		Time: 3 Hours	
Unit	Content		Hours
I	Convergence of improper integrals, Comparison Tests, Absolute convergence, Able's and Dirichlet's Tests. Frullani's Integrals, Def. Duplication formula, inter-relation.		15 h
II	Multiple Integrals via Dirichlet's Theorem Liouville's extension. Change of order of integration and change of variables. Vector Integration: Line Integral, Surface Integral, Green's theorem in R^2 , Stoke's theorem, Gauss divergence theorem.		15 h
III	Rings, Preliminary Results, Special Kinds, subrings and Ideals. Quotient rings.		15 h
IV	Fields and Homomorphism. Field for quotient and embedding theorem, polynomial rings, Euclidian ring & Unique factorization in it.		15 h
Sessional Internal Assessment (SIA) Full Marks . 25 Marks A Internal written Examination . 20 Marks (1 Hr.) B Over All Performance including Regularity . 05 Marks			
Books Recommended: 1. Mathematical Analysis: Shanti Narayan 2. Mathematical Analysis: Mallick Arora 3. Integral Calculus: Williamson 4. Vector Calculus: Shanti Narayan 5. Modern Algebra: A. R. Vasistha 6. Modern Algebra: Goyal & Gupta			

Program: Bachelor's Degree		Year: Third	Semester: VI
Class: UG			
Subject: Mathematics			
Course Code: MJ-15		Course Title: Numerical Analysis & Programming in C	
Course Learning Outcomes: This course will enable the students to: <ul style="list-style-type: none"> a) find roots of equation and interpolate by numerical methods. b) differentiate % integrate by numerical methods. c) know about the logics and algorithms needed for computer programming. 			
Credit: 4 (Theory)		Compulsory	
Full Marks: 75		Time: 3 Hours	
Unit	Content		Hours
I	Solution of Equations: Bisection, regula-falsi, Newton's method, Root of Polynomials. Interpolation: Lagrange and Hermite Interpolation, divided differences Schemes, Interpolation Formula using Differences.		15 h
II	Numerical Differentiation: Numerical formulas. Numerical Integration Quadrature Formula Simpsons and Trapezoidal Rule.		15 h
III	Programmer's model of a computer. Algorithms. Flow Charts. Data Types. Arithmetic and input/output instructions. Decision control structures. Decisions statements.		15 h
IV	Logical and Conditional operators. Loop. Case control structures. Functions, Recursions, Preprocessors. Arrays, Puppeting of string. Structures. Pointers. File formatting.		15 h
Sessional Internal Assessment (SIA) Full Marks . 25 Marks A Internal written Examination . 20 Marks (1 Hr.) B Over All Performance including Regularity . 05 Marks			
Books Recommended: 1. Programming in ANCI in C.E. Balaguru Swamy. 2. Numerical Analysis: J.B. Scarborough 3. Introduction to Numerical Analysis: A. Gupta & S.C. Bose			