SYLLABUS
For B.Sc. Honour Mathematics-III

Choice Based Credit System (CBCS)

MATA GUJRI COLLEGE
FATEHGARH SAHIB

DEPARTMENT OF MATHEMATICS
UNDERGRADUATE PROGRAMME

(Courses effective from Academic Year 2018-19)

CHOICE BASED CREDIT SYSTEM (CBCS):

The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/minor or skill based courses. The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system. Therefore, it is necessary to introduce uniform grading system in the entire higher education in India. This will benefit the students to move across institutions within India to begin with and across countries. The uniform grading system will also enable potential employers in assessing the performance of the candidates. In order to bring uniformity in evaluation system and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations, the UGC has formulated the guidelines to be followed.

Outline of Choice Based Credit System:

1. Core Course: A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.

2. Elective Course: Generally a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course.

2.1 Discipline Specific Elective (DSE) Course: Elective courses may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective. The University/Institute may also offer discipline related Elective courses of interdisciplinary nature (to be offered by main discipline/subject of study).

3. Ability Enhancement Courses (AEC)/Competency Improvement Courses/Skill Development Courses/Foundation Course: The Ability Enhancement (AE) Courses may be of two kinds: AE Compulsory Course (AECC) and AE Elective Course (AEEC). "AECC" courses are the courses based upon the content that leads to Knowledge enhancement. They ((i) Environmental Science, (ii) English/MIL Communication) are mandatory for all disciplines. AEEC courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc.

3.1 AE Compulsory Course (AECC): Environmental Science, English Communication/MIL Communication.

3.2 AE Elective Course (AEEC): These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based instruction.

Details of courses under B.Sc. (Honors)

Course	*Credits	
	Theory+ Practical	Theory + Tutorial
I. Core Courses (14 Papers)	14X4= 56	14X5=70
Core Course Practical / Tutorial* (14 Papers)	14X2=28	14X1=14
II. Elective Courses (8 Papers)		
A.1. Discipline Specific Elective **(4 Papers)**	4X4=16	4X5=20
A.2. Discipline Specific Elective Practical/ Tutorial* **(4 Papers)**	4 X 2=8	4X1=4
B.1. Generic Elective/ Interdisciplinary **(4 Papers)**	4X4=16	4X5=20
B.2. Generic Elective Practical/ Tutorial* **(4 Papers)**	4 X 2=8	4X1=4

- **Optional Dissertation or project work in place of one Discipline Specific Elective Paper (6 credits) in 6th Semester**

III. Ability Enhancement Courses

1. **Ability Enhancement Compulsory Courses (AECC)**

(2 Papers of 2 credit each) Environmental Science English/MIL Communication	2 X 2=4	2 X 2=4
2. **Skill Enhancement Courses (SEC)** (Minimum 2) **(2 Papers of 2 credit each)**	2 X 2=4	2 X 2=4
	_____	_____
Total credits	**140**	**140**

Institute should evolve a system/policy about ECA/ General Interest/Hobby/Sports/NCC/NSS/related courses on its own.
*** Wherever there is a practical there will be no tutorial and vice-versa**

B. SC. HONOUR MATHEMATICS- III

CORE COURSE

SEMESTER-V

BHMCC-501: LINEAR ALGEBRA

[5 Lectures, 1Tutorial per week] Max.Marks: 100
Time: 3hrs. [Final-75 + Internal Assessment-25]
Minimum pass marks 40%

INSTRUCTION FOR THE PAPER SETTER

The question paper will consists of three sections A, B & C. Each of section A, B will have four questions from the respective syllabus. Each will consist of twelve marks. Section C will have one compulsory question having nine parts of short-answer type covering the entire syllabus uniformly. Each will consist of three marks.

INSTRUCTION FOR THE CANDIDATES

Candidates are required to attempt five questions in all selecting two questions from each section A & B. Section C is compulsory.

SECTION A

Vector Spaces: Definition and elementary properties. Subspaces, linear span, sum of subspaces, direct sum of subspaces. Linear dependence and independence, basis and dimension. (Ch. 4 of Text Book 1)

Linear Mappings: Definitions, algebra of linear mapping, quotient spaces, vector space of linear mappings, dual space, functional, linear mappings and matrices, change of basis. Rank of linear mapping, rank- nullity theorem. (Ch. 5 up to section 6 of Text Book 1)

SECTION B

Reduction of matrices to canonical forms, Eigen values and Eigen vectors, triangularization of a matrix, Jordan canonical form. (Ch. 6 up to section 7 of Text Book 1)

Bilinear form, functional and bilinear form, symmetric bilinear form, Sylvester's theorem, Quadratic form. (Ch. 7 up to section 4 of Text Book 1)

TEXT BOOKS:

1. P.B. Bhattacharya, S.K. Jain and S.R. Nagpaul: First Course in Linear Algebra, Wiley Eastern Ltd., 1991.

2. V. Krishnamurthy, V. P. Mainra, J. L. Arora: An Introduction to Linear Algebra; East – West Press Pvt. Ltd.,2004.
3. K. Hoffman, R. A. Kunze: Linear Algebra 2nd Ed., Prentice-Hall of India Pvt. Limited, 1971.
4. Gilbert Strang: Linear Algebra and its Applications 5th Ed., Thomson, Wellesley – Cambridge Press and SIAM, 2016.
5. Surjeet Singh: Linear Algebra, Vikas Publication.

SEMESTER-V

CORE COURSE

BHMCC-502:PARTIAL DIFFERENTIAL EQUATIONS& ITS APPLICATIONS

5 Lectures, 1Tutorial per week] Max.Marks: 100

Time: 3hrs. [Final-75 + Internal Assessment-25]

Minimum pass marks 40%

INSTRUCTION FOR THE PAPER SETTER

The question paper will consists of three sections A, B & C. Each of section A, B will have four questions from the respective syllabus. Each will consist of twelve marks. Section C will have one compulsory question having nine parts of short-answer type covering the entire syllabus uniformly. Each will consist of three marks.

INSTRUCTION FOR THE CANDIDATES

Candidates are required to attempt five questions in all; selecting two questions from each section A & B. Section C is compulsory.

SECTION-A

Partial differential equations of the first order: Formation of Partial differential equations, solution of Partial differential equations. Lagrange's Equation, Cauchy's Problem for first order equations, Integral surfaces passing through a given curve, surfaces orthogonal to a given system of surfaces.Nonlinear Partial differential equations of the first order, compatible system of first order equations, Charpit method, Special types of first -order equations: Equations involving only p and q, Equations not involving the independent variables, Separable Equations, Clairaut's equation.

SECTION B

Partial differential equations of the second order and their classification into hyperbolic, ellipticand parabolic equations, their transformation into Canonical forms, Homogeneous and Non-homogeneous Linear partial differential equations of second and higher order with constant coefficients, Homogeneous Linear partial differential equations of second and higher order with variable coefficients,

Fourier series, Fourier Series Expansions of Even and Odd Functions, Convergence of Fourier Series, Fourier Half-Range Series. [Scope as in Chapter-9(9.1-9.4)of Text 2]

One dimension Wave and Heat equation, Two dimensional Laplace equation, solutions of second order linear partial differential equations by Separation of Variables, D' Alembert's solution of Wave equation.

TEXT BOOKS:

1. I. N. Sneddon: Elements of Partial Differential Equations, Dover Publications, Inc. Mineola, New York 2006.
2.R. K. Jain, and S.R.K Iyengar: Advanced Engineering Mathematics, Narosa Publishing House,5th Ed. 2016.
3.M.D. Rai Singhania: Ordinary and Partial Differential Equations, S.Chand&Company,NewDelhi, 2013.
4. Babu Ram: Advanced Engineering Mathematics, Pearson Education India,2012.

DISCIPLINE SPECIFIC COURSE
SEMESTER-V

BHMDSE-503: DISCRETE MATHEMATICS

[5 Lectures, 1Tutorial per week] Max. Marks: 100
Time: 3hrs. [Final-75 + Internal Assessment-25]
Minimum pass marks 40%

INSTRUCTION FOR THE PAPER SETTER

The question paper will consists of three sections A, B & C. Each of section A, B will have four questions from the respective syllabus. Each will consist of twelve marks. Section C will have one compulsory question having nine parts of short-answer type covering the entire syllabus uniformly. Each will consist of three marks.

INSTRUCTION FOR THE CANDIDATES

Candidates are required to attempt five questions in all; selecting two questions from each section A & B. Section C is compulsory.

SECTION A

Pigeonhole principle, Basic counting principles, permutations and combinations of sets and Multisets, Binomial and multinomial theorems, combinatorial identities, inclusion and exclusion Principle.
Recurrence relations, Generating functions solution of recurrence relations using difference equations and generating functions, Catalan numbers, Difference sequences and Sterling numbers. Partitions as associated to distribution identical objects in identical boxes.

SECTION B

Elements of Graph Theory, Eulerian and Hamiltonian trails and cycles.Bipartitemultigraphs.Trees, Spanning Trees, Algorithms for BFS and DFS trees weighted Graphs, Greedy algorithmand Prim's Algorithm for generating minimum weight spanning graphs, Digraphs, Planer graphs,
Euler formula and Chromatic numbers.
Lattice and algebraic system basic properties of algebraic system, special types of lattices distributed complemented lattices, Boolean algebra, Boolean expression, normal form of Boolean expression, Boolean functions and its applications to logic gate.

TEXT BOOKS:

1. K. H. Rosen: Discrete Mathematics and its applications, 5th Ed., Tata McGraw-Hill.
2. C. L. Liu: Elements of Discrete Mathematics, 3rd Ed., Tata McGraw-Hill.
3. B. Kolman, R. Busby, S. C. Ross, Nadeem-ur-Rehhman: Discrete Mathematical Structures, Pearson Education.

4. Babu Ram: Discrete Mathematics, Pearson, 2011.
5. J. P. Tremblay, R. Manohar: Discrete Mathematical Structures with applications to computer science, Mc Graw Hill Education (Indian edition).

DISCIPLINE SPECIFIC COURSE

SEMESTER-V

BHMDSE-504:LEBESGUE INTEGRATION AND FOURIER SERIES

[5 Lectures, 1Tutorial per week] Max.Marks : 100
Time: 3hrs. [Final-75 + Internal Assessment-25]
Minimum pass marks 40%

INSTRUCTION FOR THE PAPER SETTER

The question paper will consists of three sections A, B & C. Each of section A, B will have four questions from the respective syllabus. Each will consist of twelve marks. Section C will have one compulsory question having nine parts of short-answer type covering the entire syllabus uniformly. Each will consist of three marks.

INSTRUCTION FOR THE CANDIDATES

Candidates are required to attempt five questions in all; selecting two questions from each section A & B. Section C is compulsory.

Section A

Lebesgue outer measure, measurable sets and Lebesgue measure, Construction of a nonmeasurableset, measurable functions, Littlewoodfive principles.
[Scope as in Chapter 2 of the book 'Real Analysis', 3rd Edition, 2000 by H. L. Royden]
Lebesgue integral of a bounded function over a set of finite measure, the integral of a nonnegativefunction, the general Lebesgue Integral.
[Scope as in the relevant sections from Chapter 4 of the book 'Real Analysis', 3rd Edition, 2000 by H. L. Royden]

Section B

Differentiation of monotone functions, functions of bounded variation, differentiation of an integral, absolute continuity.
[Scope as in the relevant sections from Chapter 5 of the book 'Real Analysis', 3rd Edition, 2000 by H. L. Royden]
Orthogonal/Orthonormal system of functions, the theorem of best approximation, the Fourier Series of a function relative to an orthonormal set, Bessel's inequality, the Riemann-Lebesgue lemma, the Dirichlet integrals, Riemann's Localization theorem, sufficient conditions for convergence of a Fourier Series at aparticular point.
[Scope as in §10.22, §11.1-§11.5, §11.7-§11.12 of the book 'Mathematical Analysis' 2nd Edition,
by T. M. Apostol]

Text Books

H. L. Royden: Real Analysis, 3rd Edition, Prentice Hall of India, 2007.

Reference Readings

1. T. M. Apostol: Mathematical Analysis, 2nd Edition, Narosa Publishing House, Reprint 2002.
2. E.C. Titchmarsh : A Theory of Functions, Indian Edition, Published By Oxford University Press, Delhi, 1976.

DISCIPLINE SPECIFIC COURSE
SEMESTER-V

BHMDSE-505: NUMBER THEORY-I

[5 Lectures, 1Tutorial per week] Max. Marks: 100
Time: 3hrs. [Final-75 + Internal Assessment-25]
Minimum pass marks 40%

INSTRUCTION FOR THE PAPER SETTER

The question paper will consists of three sections A, B & C. Each of section A, B will have four questions from the respective syllabus. Each will consist of twelve marks. Section C will have one compulsory question having nine parts of short-answer type covering the entire syllabus uniformly. Each will consist of three marks.

INSTRUCTION FOR THE CANDIDATES

Candidates are required to attempt five questions in all; selecting two questions from each section A & B. Section C is compulsory.

SECTION A

Divisibility, Greatest common divisor, Fundamental theorem of arithmetic, Congruence, residue classes and reduced residue classes, Euler-Fermat's Theorem. Wilson's Theorem, linear congruences, Chinese Remainder Theorem, polynomial congruences, Arithmetical functions, $\varphi(n)$, $\tau(n)$, $\mu(n)$, $\sigma(n)$ etc. Mobius Inversion Formula.

SECTION-B

Primitive roots, indices, quadratic residues, Legendre's symbol, Euler's Criterion. Gauss's Lemma, Quadratic reciprocity Law, Jacobi symbol. The Diophantine Equations $2x + 2y = 2z$, $4x + 4y = 4z$. (Scope as in Elementary Number Theory by D.M. Burton, Chapters 1-11). Farey Sequences (Scope as in Chapter 6 (Sections 6.1and 6.2) of Elementary Number Theory by Niven & Zuckerman)

TEXT BOOKS:

1. G. H. Hardy and E. M. Wright: An Introduction to Theory of Numbers, Oxford University Press, 6th Edition, 2008.
2. I. Niven, H. S. Zuckerman and H. L. Montgomery: An Introduction to the Theory of Numbers, John Wiley and Sons, (Asia) 5th Edition, 2004.
3. H. Davenport: The Higher Arithmetic, Cambridge, Univ. Press, 7th Edition, 1999.
4. David M. Burton: Elementary Number Theory, Tata McGraw Hill, 6th Edition, 2007.

B. SC. HONOUR MATHEMATICS- III

SEMESTER-VI

CORE COURSE

BHMCC-601:CALCULUS OF SEVERAL VARIABLES AND IMPROPER INTEGRALS

[5 Lectures, 1Tutorial per week] Max. Marks: 100
Time: 3hrs. [Final-75 + Internal Assessment-25]
Minimum pass marks 40%

INSTRUCTION FOR THE PAPER SETTER

The question paper will consists of three sections A, B & C. Each of section A, B will have four questions from the respective syllabus. Each will consist of twelve marks. Section C will have one compulsory question having nine parts of short-answer type covering the entire syllabus uniformly. Each will consist of three marks.

INSTRUCTION FOR THE CANDIDATES

Candidates are required to attempt five questions in all; selecting two questions from each section A & B. Section C is compulsory.

SECTION A

Limit and continuity of functions between Euclidean spaces, Partial derivatives, directionalderivatives and the Jacobian matrix, Derivatives and their elementary properties. Chain rule and its matrix form. Mean value theorem for differentiable functions, sufficient condition fordifferentiability and sufficient condition for the equality of mixed partial derivatives.

Higher order derivatives, Taylor's Theorem for function of n-variables.Inverse function theorem.Implicit function theorem.Maxima and Minima at interior points.Criteria for local maxima and local minima.The method of Lagrange multipliers.

[Scope as in the book 'Mathematical Analysis' by T. M. Apostol, Chapter 12(except 12.6) and Chapter 13]

SECTION B

The measure of a bounded interval in $\mathbf{R_n}$, the Riemann integral of a bounded function defined on a compact interval in $\mathbf{R_n}$, Sets of measure zero and Lebesgue's criterion for existence of a multiple Riemann Integral, Evaluation of a multiple integral by iterated integration.

[Scope as in the book 'Mathematical Analysis' by T. M. Apostol, Chapter 14 (up to 14.5)]

Improper integrals, Cauchy's criterion, absolute convergence, tests for convergence and uniformconvergence.Elementary notions of functions defined by integrals, continuity, differentiationunder the integral sign.Beta and Gamma functions.

[Scope as in the book 'A Course on Mathematical Analysis' by Shanti Narayan, Twelfth Edition, Chapter 9 and 15]

TEXT BOOKS:

1. T. M. Apostol: Mathematical Analysis, 2nd Edition, NarosaPublishingHouse, Reprint 2002.
2. Shanti Narayan: A course of Mathematical Analysis, 12th Edition, 2000.
3. Malik Arora
4. W. Rudin: Principles of Mathematical Analysis, 3rd Edition, 1976.

CORE COURSE

SEMESTER-VI

BHMCC-602:RINGS AND MODULES

[5 Lectures, 1Tutorial per week] Max. Marks: 100
Time: 3hrs. [Final-75 + Internal Assessment-25]
Minimum pass marks 40%

INSTRUCTION FOR THE PAPER SETTER

The question paper will consists of three sections A, B & C. Each of section A, B will have four questions from the respective syllabus. Each will consist of twelve marks. Section C will have one compulsory question having nine parts of short-answer type covering the entire syllabus uniformly. Each will consist of three marks.

INSTRUCTION FOR THE CANDIDATES

Candidates are required to attempt five questions in all, selecting two questions from each section A & B. Section C is compulsory.

SECTION- A

Rings, subrings, Sum of Rings, Characteristics of Ring, Product of Rings, Ideals, and algebra of Ideals. Quotient Rings, Homomorphism of Rings, Imbedding of Rings, Maximal Ideal. Euclidean domains, Prime and Irreducible elements, Polynomial Rings, Greatest common divisor, Unique Factorization domains.

SECTION- B

Modules: Definition and examples, submodules, Direct sum of Modules, Quotient modules, Free modules, Comparison with vector spaces, Homomorphism's, Simple Modules, Structure of finitelygenerated modules over a PID.

Modules with Chain Conditions: Artinian Modules, Noetherian Modules.

[Scope as in the book Introduction to Rings and Modules second revised edition by C. Musili Chapter V and Chapter VI (6.1-6.2)]

TEXT BOOKS:

1. C. Musili Introduction to Rings and Modulessecond revised edition, Narosa publication.
2. David S. Dummit and Richard M Foote: Abstract Algebra, John Wiley & Sons, 2004.
3. 1.P.B.Bhattacharya, S.K.Jain and S.R.Nagpaul: Basic Abstract Algebra, 2nd Edition,Cambridge University Press 2002.
4. J.A. Gallian, Contemporary Abstract Algebra, 4^{th} ed., Narosa, 1999.
5. S. Lang, Undergraduate Algebra, 2nd Ed., Springer, 2001.
6. SurjeetSinghandQuaziZameeruddin: Modern Algebra, Vikas Publication, 2006.

DISCIPLINE SPECIFIC COURSE
SEMESTER-VI

BHMDSE-603:NUMBER THEORY-II

[5 Lectures, 1Tutorial per week] Max. Marks: 100
Time: 3hrs. [Final-75 + Internal Assessment-25]
Minimum pass marks 40%

INSTRUCTION FOR THE PAPER SETTER

The question paper will consists of three sections A, B & C. Each of section A, B will have four questions from the respective syllabus. Each will consist of twelve marks. Section C will have one compulsory question having nine parts of short-answer type covering the entire syllabus uniformly. Each will consist of three marks.

INSTRUCTION FOR THE CANDIDATES

Candidates are required to attempt five questions in all; selecting two questions from each section A & B. Section C is compulsory.

SECTION A

Continued fractions, periodic continued fractions, approximations of irrationals by rationals, Pell's equation,
Partitions.Ferrer's graphs, generating functions, Euler's identity, Jacobi's Triple Product formula. Representations of Numbers as sums of two and four squares.

SECTION B

Binary quadratic forms, positive definite binary quadratic forms. Hermite's estimate on the minima of positive definite quadratic forms and its application to representations of numbers assums of five squares.
Minkowski's Theorem in Geometry of Numbers and its applications to Diophantine inequalities. Orders of magnitude and average orders of arithmetical functions.

TEXT BOOKS:

1. T. M. Apostol: Introduction to Analytic Number Theory, Narosa Publishing House, New Delhi, 1990.
2. G. H. Hardy and E. M. Wright: An Introduction to Theory of Numbers, Oxford University Press, 6th Ed, 2008.
3. Niven, H. S. Zuckerman and H. L. Montgomery : An Introduction to the Theory of Numbers, John Wiley and Sons, (Asia) 5th Ed., 2004.
4. H. Davenport: The Higher Arithmetic, Cambridge, Univ. Press, 7th edition, 1999.
5. G. E. Andrews: Number Theory, Dover Books, 1995.
6. David M. Burton: Elementary Number Theory, Tata McGraw- Hill, 6th Edition, 2007.

DISCIPLINE SPECIFIC COURSE
SEMESTER-VI

BHMDSE-604:PROBABILITY AND STATISTICS

[5-Lectures, 1-Tutorial per week] Max. Marks: 100
Time: 3hrs. [Final-75 + Internal Assessment-25]
Minimum pass marks 40%

INSTRUCTION FOR THE PAPER SETTER

The question paper will consists of three sections A, B & C. Each of section A, B will have four questions from the respective syllabus. Each will consist of twelve marks. Section C will have one compulsory question having nine parts of short-answer type covering the entire syllabus uniformly. Each will consist of three marks.

INSTRUCTION FOR THE CANDIDATES

Candidates are required to attempt five questions in all; selecting two questions from each section A & B. Section C is compulsory.

SECTION-A

Sample space, probability axioms, real random variables (discrete and continuous), cumulativedistribution function, probability mass/density functions, mathematical expectation, moments,moment generating function, characteristic function, Discrete distributions: Uniform, Binomial,Poisson, Geometric, Negative binomial, Continuous distributions: Uniform, Normal, Exponential.

SECTION-B

Joint cumulative distribution function and its properties, joint probability density functions,marginal and conditional distributions, expectation of function of two random variables,conditional expectations, independent random variables, bivariate normal distribution,correlation coefficient, multiple correlation coefficient, joint moment generating function (jmgf) and calculation of covariance(from jmgf), linear regression for two variables.

TEXT BOOKS:

1. Irwin Miller and Marylees Miller, John E. Freund:Mathematical Statistics with Applications,7th Ed., Pearson Education, Asia, 2006.
2. Sheldon Ross:Introduction to Probability Models, 9th Ed., Academic Press, Indian Reprint, 2007.
3. Alexander M. Mood, Franklin A. Graybill and Duane C. Boes:Introduction to the Theory of Statistics, 3rd Ed., Tata McGraw- Hill, Reprint 2007.
4. S. C. Gupta and V. K. Kapoor: Fundamental of Mathematical Statistics, 11th Edition, S. Chand, 2009.
5. P. L. Meyer: Introductory Probability and Statistical applications, 2nd Edition, Addison Wesley, 1970.

DISCIPLINE SPECIFIC COURSE
SEMESTER-VI

BHMDSE-605:MECHANICS

[5 Lectures, 1Tutorial per week] Max. Marks: 100
Time: 3hrs. [Final-75 + Internal Assessment-25]
Minimum pass marks 40%

INSTRUCTION FOR THE PAPER SETTER

The question paper will consists of three sections A, B & C. Each of section A, B will have four questions from the respective syllabus. Each will consist of twelve marks. Section C will have one compulsory question having nine parts of short-answer type covering the entire syllabus uniformly. Each will consist of three marks.

INSTRUCTION FOR THE CANDIDATES

Candidates are required to attempt five questions in all; selecting two questions from each section A & B. Section C is compulsory.

SECTION-A

Force, Resultant of force, Moment of a force about a point and an axis, couple, Moment of a couple about a line, distributed force system, free body diagram, free body involving interior sections, general equations of equilibrium, two point equivalent loading, problems arising from structures, static indeterminacy.
(Chapter 3, Chapter 4, Chapter 5. Of Text Book 1)

SECTION-B

Laws of Coulomb friction, application to simple and complex surface contact friction problems, transmission of power through belts, screw jack, wedge, first moment of an area and the centroid, other centers, Theorem of Pappus-Guldinus, second moments and the product of area of a plane area, transfer theorems, relation between second moments and products of area, polar moment of area, principal axes.
(Chapter 6 Sections 6.1-6.7, Chapter 7 of Text Book 1)

TEXT BOOKS:

1. S.L. Loney: The Elements of Statics and Dynamics, Cambridge University Press, 1897.
2. F. Chorlton: Text Book of Dynamics, CBS New Delhi 1985.
3. J.L. Merianx: Mechanics Part-IStatics, 2nd Ed., Wiley Tppan.