UNIVERSITY OF CALICUT
(Abstract)

MSc programme in Mathematics under Credit Semester System (PG)-Scheme and Syllabus -approved –implemented with effect from 2010 admn onwards- Orders issued

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GENERAL & ACADEMIC BRANCH-IV 'J' SECTION

No. GA IV/J2/ 4477/10   Dated, Calicut University PO, 02.08.2010

Read:1. U.O.No. GAIV/J1/1373/08 dated, 23.07.2010.
     2. Item no.2 of the minutes of the meeting of the Board of Studies in Mathematics (PG) held on 22.06.2010
     3. Orders of the Vice-Chancellor in file of even no.dtd 02.08.2010

O R D E R

As per University Order read as first, Credit Semester System was implemented to PG programmes in affiliated Arts and Science Colleges and Self Financing Centres of the University with effect from 2010 admission onwards.

The Board of Studies in Mathematics (PG),vide paper read as second, discussed the implementation of Credit Semester System at PG level in the affiliated colleges and the Board decided to implement the same and approved the syllabus of the first Semester of the Programme and resolved that the programme will have a total of 80 credits.

The Vice Chancellor approved the minutes subject to ratification by the Academic Council,vide paper read as 3 above.

Sanction has therefore been accorded for implementing the Syllabus of Ist Semester of MSc programme in Mathematics under CSS for affiliated Colleges with effect from 2010 admission.

Orders are issued accordingly. Scheme and Syllabus appended.

Sd/-
ASSISTANT REGISTRAR (G & A-IV)
For REGISTRAR

To
    The Principals of affiliated Colleges offering MSc programme in Mathematics
Copy to:
    PS to VC/PA to Registrar/Chairman,B/S in Mathematics/CE/EX/DRIII/ DR-PG/EGI/Enquiry/System Administrator(with a request to upload in the University website)/Information Centres/GAI`F``G`Sections GAII/III

Forwarded/By Order

Sd/
SECTION OFFICER

UNIVERSITY OF CALICUT
(Abstract)

MSc programme in Mathematics under Credit Semester System (PG)-Scheme and Syllabus-II semester-approved –implemented with effect from 2010 admission onwards-Orders issued

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<u>GENERAL & ACADEMIC BRANCH-IV 'J' SECTION</u>

No. GA IV/J2/ 4477/10   Calicut University PO, Dated: 19.01.2011.

Read:1. U.O.No. GAIV/J1/1373/08 dated, 23.07.2010.
  2. No. GA IV/J2/ 4477/10 dated, 02.08.2010
  3. Item no.2 of the minutes of the meeting of the Board of
   Studies in   Mathematics (PG) held on 29.12.2010
  4. Orders of the Vice-Chancellor on 18.01.2011 in file of even
  no.

<u>O R D E R</u>

  As per University Order read as first, Credit Semester System was implemented to all PG programmes in affiliated Arts and Science Colleges and Self Financing Centres of the University with effect from 2010 admission onwards.

  The Scheme and Syllabus of the first Semester of M.Sc programme in Mathematics under CSS PG was implemented vide paper read as second above.

  The Board of Studies in Mathematics (PG), vide paper read as third above finalized the syllabus of M.Sc. Mathematics Programme under CSS PG for the II semester.

  The Vice-Chancellor exercising the powers of the Academic Council approved the minutes subject to ratification by the Academic Council, vide paper read as 4 above.

  Sanction has therefore been accorded for implementing the Syllabus of II Semester of M.Sc programme in Mathematics under CSS PG 2010 for affiliated Colleges with effect from 2010 admission.

  Orders are issued accordingly. Scheme and Syllabus appended.

Sd/-
DEPUTY REGISTRAR (G & A-IV)
For REGISTRAR

To
  The Principals of affiliated Colleges offering MSc programme in
  Mathematics
Copy to:
  PS to VC/PA to Registrar/Chairman,B/S in Mathematics/
  CE/EX/DRIII/DR-PG/EGI/Enquiry/System Administrator
  (with a request to upload in the University website)/
  Information Centres/GAI'F''G'Sections/

GAII/III/SF/FC/DF

Forwarded/By Order

APPENDIX - I

UNIVERSITY OF CALICUT

SYLLABUS FOR THE M.Sc. MATHEMATICS
COURSE UNDER CUCSS – PG – 2010
(Total Credits : 80)

EFFECTIVE FROM 2010 ADMISSIONS

Semester I

Sl. No.	Course Code	Title of the Course	No. of Credits	Core/ Elective
1.	MT1C01	Algebra 1	4	Core
2.	MT1C02	Linear Algebra	4	Core
3.	MT1C03	Real Analysis - I	4	Core
4.	MT1C04	ODE and Calculus of Variations	4	Core
5.	MT1C05	Discrete Mathematics	4	Core

Semester II

Sl. No.	Course Code	Title of the Course	No. of Credits	Core/ Elective
6	MT2C06	Algebra II	4	Core
7	MT2C07	Real Analysis II	4	Core
8	MT2C08	Topology I	4	Core
9	MT2C09	PDE and Integral Equations	4	Core
10	MT2C10	Number Theory	4	Core

Semester III

Sl. No.	Course Code	Title of the Course	No. of Credits	Core/ Elective
11.	MT3C011	Complex Analysis I	4	Core
12.	MT3C012	Functional Analysis I	4	Core
13.	MT3C013	Differential Geometry	4	Core
14.	MT3C014	Linear Programming and its Applications	4	Core
15.		Project		

Question Paper Pattern

For each course there will be an external examination of duration 3 hours. The valuation will be done by Direct Grading System. Each question paper will consists of 14 short answer questions, each of weightage 1, 10 paragraph type questions each of weightage 2 and 4 essay type questions, each of weightage 4. All short answer questions are to be answered while 7 paragraph type questions and 2 essay type questions are to be answered with a total weightage of 36. The questions are to be evenly distributed over the entire syllabus.

<u>DETAILED SYLLABI</u>

<u>SEMESTER I</u>

<u>MT1C01 : ALGEBRA - I</u>

No. of Credits : 4
No.of hours of Lectures/week : 5

TEXT : **FRALEIGH, J.B**. : A FIRST COURSE IN ABSTRACT ALGEBRA.
(Fifth edn.) Narosa (1999.)

UNIT I

Plane Isometries (page 113), Direct products & finitely generated Abelian Groups, Binary Linear Codes, Factor Groups, Factor-Group Computations and Simple Groups, Series of groups.
[§§ 2.2(only Plane Isometries) 2.4, 2.5, 3.3, 3.4, 3.5]

UNIT II

Group action on a set, Applications of G-set to counting, Isomorphism theorems: Proof of the Jordan-Holder Theorem (Omit Butterfly Lemma and proof of the Schreier Theorem), Sylow theorems, Applications of the Sylow theory, Free Groups (Omit Another look at free abelian groups).
[§§ 3.6, 3.7, 4.1, 4.2, 4.3, 4.5]

UNIT III

Group Presentations, Rings of polynomials, Factorization of polynomials over a field, Non commutative examples, Homomorphism and factor rings.
[§§ 4.6, 5.5, 5.6, 5.7, 6.1]

REFERENCES

1. I.N. Herstein   :   Topics in Algebra
                                            Wiley Eastern (Reprint)
2. N.H. McCoy and R.Thomas   :   Algebra.
                                            Allyn & Bacon Inc. (1977).
3. J. Rotman   :   The theory of groups
                                            Allyn & Bacon Inc. (1973)
4. Hall,Marshall   :   The theory of groups.
                                            Chelsea Pub. Co. NY. (1976)
5. Clark, Allan   :   Elements of Abstract Algebra
                                            Dover Publications (1984)
6. L.W. Shapiro   :   Introduction to Abstract Algebra
                                            McGraw Hill Book Co. NY (1975)
7. N. Jacobson   :   Basic Algebra , Vol. I.
                                            Hindustan Publishing Corporation (India),
                                            Delhi 110 007 Reprint (1991)
8. T.W. Hungerford   :   Algebra
                                            Springer Verlag GTM 73 (1987) 4th
                                            Printing.
9.D.M. Burton   :   A First Course in Rings and Ideals
                                            Addison Wesley 1970

10. Mac Lane & Brikhoff   :   Algebra
                                              Macmillian

11. Joseph A. Gallian   :   Contemporary Abstract Algebra (4th Edition)
                                              Narosa 1999

MT1C02 : LINEAR ALGEBRA

No. of Credits : 4

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No. of hours of Lectures/week : 5

TEXTS : 1. **HOFFMAN, K., and KUNZE, R**.,   LINEAR ALGEBRA, (2nd Edn.) , Printice-Hall of India, 1991.

UNIT I

Vector Spaces & Linear Transformations

[Chapter 2 Sections   2.1 – 2.4; Chapter 3 Sections 3.1 to 3.3 from the text]

UNIT II

Linear Transformations (continued) and Elementary Canonical Forms
[Chapter 3 Sections 3.4 – 3.7;Chapter 6 Sections 6.1 to 6.4 from the text]

UNIT III

 Elementary Canonical Forms (continued), Inner Product Spaces
 [Chapter 6. Sections 6.6 & 6.7; Chapter 8 Sections 8.1 & 8.2 from the text]

REFERENCES

1. P.R. Halmos   : Finite Dimensional Vector spaces
                                              Narosa Pub House, New Delhi (1980)
2. S. Lang   : Linear Algebra
                                              Addison Wesley Pub.Co.Reading, Mass (1972)
3. I.N. Herstein   : Topics in Algebra
                                              Wiley Eastern Ltd Reprint (1991)
4. N.H. McCoy and R. Thomas   : Algebra
                                              Allyn Bacon Inc NY (1977)
5. S. Mac Lane and G. Bikhrkhoff: Algebra
                                               Macmillan Pub Co NY (1967)
6. R.R. Stoll and E.T.Wong   : Linear Algebra
                                               Academic Press International Edn (1968)
7. G.D. Mostow and J.H. Sampson: Linear Algebra
                                                McGraw-Hill Book Co NY (1969
8. T.W. Hungerford   : Algebra
                                                Springer Verlag GTM No 73 (1974)
9. S. Kumaresan   : Linear Algebra-A Geometric Approach
                                                Prentice Hall of India (2000)
10. J. B. Fraleigh& R.H. Beauregard: Linear Algebra
                                                Addison Wesley
11. Henry Helson   : Linear Algebra (Second Edition) Hindustan
                                                Book Agencies, 1994.
12. E.D. Nering   : Linear Algebra and Matrix Theory
                                                Wiley International Edition 1963
13. Sheldon Axler   : Linear Algebra Done Right (Second Edition)
                                                Springer 1997
14. David C. Lay   : Linear Algebra and its Application, Pearson
                                                 Education 2003.

MT1C03 : REAL ANALYSIS - I

No. of Credits : 4

No.of hours of Lectures / week : 5

TEXT: **RUDIN, W**., PRINCIPLES OF MATHEMATICAL ANALYSIS
(3rd Edn.) Mc. Graw-Hill, 1986.

UNIT – I

Basic Topololgy – Finite, Countable and Uncountable sets Metric Spaces, Compact Sets, Perfect Sets, Connected sets.

Continuity - Limits of function, Continuous functions, Continuity and compactness, continuity and connectedness, Discontinuities, Monotonic functions, Infinite limits and Limits at Infinity.
[Chapter   2 & Chapter 4]

UNIT – II

Differentiation – The derivative of a real function, Mean Value theorems, The continuity of Derivatives, L Hospital's Rule, Derivatives of Higher Order, Taylor's Theorem, Differentiation of Vector – valued functions.

The Riemann – Stieltjes Integral, - Definition and Existence of the integral, properties of the integral, Integration and Differentiation.

[Chapters   5 & Chapter 6 up to and including 6.22]

UNIT – III

The Riemann – Stieltjes Integral (Continued) - Integration of Vector vector-valued Functions, Rectifiable curves.

Sequences and Series of Functions - Discussion of Main problem, Uniform convergence, Uniform convergence and continuity, Uniform convergence and Integration, Uniform convergence and Differentiation. Equicontinuous Families of Functions, The Stone – Weierstrass Theorem.

[Chapters   6 (from 6.23 to 6.27) & Chapter 7 (upto and including 7.27 only)]

 REFERENCES

1. a) R.G. Bartle   : Element of Real Analysis
  Wiley International Edn
  (Second Edn) (1976)

  b) R.G. Bartle and   : Introduction to Real Analysis
  D.R. Sherbert   John Wiley Bros (1982)
2. L.M. Graves   : The theory of functions of a real variable
  Tata McGraw-Hill Book Co (1978)
3. M.H. Protter & C.B. Moray   : A first course in Real Analysis
  Springer Verlag UTM (1977)
4. S.C. Saxena and SM Shah   : Introduction to Real Variable Theory
  Intext Educational Publishers
  San Francisco (1972)
5. I.K.Rana   : An Introduction to Measure and Integration,
  Narosa Publishing House, Delhi, 1997..
6. Hewitt and Stromberg K   : Real and Abstract Analysis
  Springer Verlag GTM 25 (1975) Reprint
7. S.R. Ghorpade & B.V. Limaye : A course in Calculus and Real Analysis, Springer
  2006
8.Terence Tao   : Analysis I &II
  : Hindustan Book agency

MT1C04 : ODE AND CALCULUS OF VARIATIONS

No. of Credits : 4
No.of hours of Lectures / week : 5

TEXT: **SIMMONS, G.F.**,: DIFFERENTIAL EQUATIONS WITH
APPLICATIONS AND HISTORICAL NOTES,
TMH Edition, New Delhi, 1974.

UNIT I

Power Series Solutions and Special functions; Some Special Functions of Mathematical Physics.
[Chapter 5: Sections 26, 27, 28, 29, 30, 31 ; Chapter 6: Sections 32, 33]

UNIT II

Some special functions of Mathematical Physics (continued)
Systems of First Order Equations; Non linear Equations
Chapter 6 : Sections 34, 35 : Chapter 7 :Sections 37, 38,   Chapter 8 : Sections 40, 41, 42, 43, 44]

UNIT III

Oscillation Theory of Boundary Value Problems,   The Existence and Uniqueness of Solutions,   The Calculus of Variations.
[Chapter 4 : Sections 22, 23 & Appendix A. (Omit Section 24) ; Chapter 11 : Sections 55, 56,57: Chapter 9 : Sections 47, 48, 49]

REFERENCES

1. G. Birkhoff & G.C. Rota   : Ordinary Differential Equations
Edn. Wiley & Sons 3rd Edn (1978)

2. E.A. Coddington   : An Introduction to Ordinary Differential
                                          Equtions Printice Hall of India, New Delhi
                                          (1974)

3. P. Hartman   : Ordinary Differential Equations
                                          John Wiley & Sons (1964)

4. L.S. Pontriyagin   : A course in ordinary Differential Equations
                                          Hindustan Pub. Corporation,Delhi (1967)

5. Courant R and Hilbert D   : Methods of Mathematical Physics , vol I
                                          Wiley Eastern Reprint (1975)

6. W.E. Boyce & R.C. Deprima : Elementary Differential Equations
                                          and boundary value problems
                                          John Wiley & Sons NY 2nd Edn (1969)

7. A. Chakrabarti   : Elements of ordinary Differential
                                          Equations and special functions
                                          Wiley Eastern Ltd New Delhi (1990)

8. Ian Sneddon   : Elements of Partial Differential Equations
                                          McGraw-Hill International Edn., (1957)

MT1C05 : DISCRETE MATHEMATICS

No. of Credits 4

Number of hours of Lectures / week: 5

> TEXTS: **DOUGLAS B. WEST**, INTODUCTION TO GRAPH THEORY
> (Second Edition) Pearson Education
> 1) **K.D.JOSHI**, FOUNDATIONS OF DISCRETE MATHEMATICS, New
> Age International (P) Ltd. New Delhi 1989
> 2) **PETER LINZ**, AN INTRODUCTION TO FORMAL LANGUAGES
> AND AUTOMATA. (Second Edition) Narosa Publishing House, New
> Delhi, 1997.

UNIT I

Order Relations, Lattices; Boolean Algebra – Definition and Properties, Boolean
Functions.
[Chapter 3 (section.3 (3.1-3.11), chapter 4 (sections 1& 2) from text 2]

UNIT II

What is a graph? Graphs as Models, Matrices and Isomorphism, Paths, Walks,
Connected Graphs, Bipartite Graphs, Eulerian circuits, Vertex Degrees, Degree sum
formula. Directed Graphs – Definitions and examples. Trees-Basic Properties.
Connectivity. Planar Graphs. Embedding and Eulers formula – Restricted Jordan
Curve Theorem (Statement only), Dual Graphs, Eulers formula. [Chapter 1: section
1.1 (up to and including 1.1.40), 1.2 (Up to and including 1.2.27), 1.3 (Up to and
including 1.3.6), 1.4 (Up to and including 1.4.13)
Chapter 2: section 2.1 (Up to and including 2.1.5, 2.1.9 to 2.1.11)
Chapter 4; section 4.1 (4.1.1, 4.1.2, 4.1.7 to 4.1.11)
Chapter 6: section 6.1 (Up to and including 6.1.13, 6.1.21 to 6.1.24) from text 1]

UNIT III

Automata and Formal Languages: Introduction to the theory of Computation, Finite Automata, Regular Expressions.
[Chapter 1 (sections 1.2 & 1.3); Chapter 2 (sections 2.1, 2.2 & 2.3); Chapter 3 (section 3.1) from Text 3]

REFERENCES:

[1] J.A. Bondy and U.S.R.Murty   : Graph Theory with applications.
                                                        Macmillan
[2] F. Harary   : Graph Theory, Narosa publishers
[3] John Clark and Derek Allan Holton   : A First look at Graph Theory,
                                                        Prentice Hall
[4] K.R. Parthasarathy   : Basic Graph Theory, Tata-Mc Graw Hill
[5] R. Balakrishnan & K. Ranganathan   : A Text Book of Graph Theory,
                                                        Springer Verlag.
[6] C.L. Liu   : Elements of Discrete Mathematics (Second
                                                        Edition) Mc Graw Hill Book Company
                                                        1985.
 [7] K.H. Rosen   : Discrete Mathematics and its Applications
                                                        (5th Edition) MC Graw Hill 2003.

MT2C06 - ALGEBRA - II

TEXTS : **FRALEIGH, J.B**. : A FIRST COURSE IN ABSTRACT ALGEBRA.

(Fifth Edn.) Narosa (1999)

No. of credits :4
No.of hours of lectures/week : 5

UNIT I

Prime and Maximal Ideals, Introduction to Extension Fields, Algebraic Extensions (Omit Proof of the Existence of an Algebraic Closure), Geometric Constructions.
[§§ 6.2, 8.1, 8.3, 8.4]

UNIT II

Finite Fields, Automorphisms of Fields, The Isomorphism Extension Theorem, Splitting Fields, Separable Extensions.
[§§ 8.5, 9.1, 9.2, 9.3, 9.4, 9.6, 9.7 from Text 1]

UNIT III

Galois Theory, Illustration of Galois Theory, Cyclotomic Extensions, Insolvability of the Quintic.
[§§ 9.6, 9.7, 9.8, 9.9]

REFERENCES

1 . N.H. McCoy and R.Thomas : Algebra, Allyn & Bacon Inc. (1977).

2 J. Rotman : The Theory of Groups Allyn & Bacon Inc. (1973)

3. Hall,Marshall : The Theory of Groups,Chelsea Pub. Co. NY. (1976)

4. Clark, Allan : Elements of Abstract Algebra
Dover Publications (1984)

5. L.W. Shapiro : Introduction to Abstract Algebra

McGraw Hill Book Co. NY (1975)

6. C. Musili : Introduction to Rings and Modules
Narosa Publishing House, New Delhi (1992)

7. N. Jacobson : Basic Algebra , Vol. I.
Hindustan Publishing Corporation (India),
Delhi 110 007 Reprint (1991)

8. P.B. Bhattacharya and : First Course in Rings, Fields and Vector Spaces
S.K. Jain Wiley Eastern Ltd.,New Delhi (1976)

9. T.W. Hungerford : Algebra
Springer Verlag GTM 73 (1987) 4th Printing

10. I.N.Herstein : Topics in Algebra. New York, Blaisdell. 1964

11. F Lorenz : Algebra: Volume I: Fields and Galois Theory,
Univesitext, Springer

12. P. Morandi : Fields and Galois Theory, Graduate Text in
Mathematics, Springer

MT2C07 - REAL ANALYSIS - II

TEXTS: 1 **RUDIN, W**.,   PRINCIPLES OF MATHEMATICAL ANALYSIS
(3rd Edn.) Mc. Graw-Hill, 1986.
2. **ROYDEN,H.L**, REAL ANAYLSIS
(3rd Edn.) Macmillan Publishing company.

No. of credits : 4
No.of hours of lectures / week : 5

UNIT – I

Functions of Several Variables – Linear Transformations, Differentiation, The Contraction Principle, The Inverse Function Theorem, the Implicit Function Theorem, Determinants.
[Chapter 9 – Sections 1-29, 33-38 from Text – 1]

UNIT – II

Set Theory - Algebras of Sets.

Lebesgue Measure – Introduction, Outer Measure, Measurable Sets and Lebesgue Measure. A Non Measurable Set, Measurable Functions, Little Wood's Three Principles.

The Lebesgue Integral - The Riemman Integral, The Lebesgue Integral of a Bounded Function Over a Set of Finite Measure, The Integral of a Non Negative Function, The General Lebesgue Integral, Convergence in Measure.
[Chapter 1 Section –4, Chapter 3 – All Sections & Chapter 4 – Sections 1,2,3 from Text 2]

UNIT – III

The Lebesgue Integral - The General Lebesgue Integral, Convergence in Measure.

Differentiation of Monotone Functions, Functions of Bounded Variations. Differentiation of an Integral. Absolute Continuity.
[Chapter 4 – Sections 4,5 & Chapter 5, Sections 1,2,3, 4 from Text 2]

REFERENCES

1. a) R.G. Bartle   : Elements of Real Analysis
Wiley International Edn
(Second Edn) (1976)
    b) R.G. Bartle and   : Introduction to Real Analysis

      D.R. Sherbert   John Wiley Bros. (1982)

2. L.M. Graves   : The Theory of Functions of a Real Variable
                       Tata McGraw-Hill Book Co (1978)
3. M.H. Protter & C.B. Moray   : A First course in Real Analysis
                       Springer Verlag UTM (1977)
4. S.C. Saxena and SM Shah   : Introduction to Real Variable Theory
                       Intext Educational Publishers
                       San Francisco (1972)
5. I.K.Rana   : An Introduction to Measure and Integration,
                       Narosa Publishing House, Delhi, 1997, 2nd Edn.
6. E.Hewitt and K. Stromberg   : Real and Abstract Analysis
                       Springer Verlag GTM 25 (1975) Reprint
7. P. R. Halmos   : Measure Theory, Graduate Texts in Mathematics,
                        Springer
8. R. G. Bartle   : The Elements of Integration and Lebesgue
                       Measure, Wiley (1995)
9. K.B. Athreya & S. Lahiri   : Measure Theory, TRIM 36, Hindustan Book Agency

MT2C08 - TOPOLOGY – I

    TEXT: **JOSHI, K.D.,** INTRODUCTION TO GENERAL TOPOLOGY
                  (Revised Edition) Wiley Eastern Ltd., New Delhi, 1984

No.of hours of lectures / week : 5

UNIT I

A Quick Revision of Chapter 1,2 and 3. Topological Spaces, Basic Concepts
[Chapter 4 and Chapter 5 Sections 1, Section 2 (excluding 2.11 and 2.12) and Section 3 only]

UNIT II

Making Functions Continuous, Quotient Spaces, Spaces with Special Properties
 [Chapter 5   Section 4 and Chapter 6]

UNIT III

Separation Axioms: Hierarchy of Separation Axioms, Compactness and Separation Axioms, The Urysohn Characterization of Normality
[Chapter 7: Sections 1 to 3 and Section 4(up to and including 4.6)]

REFERENCES

1. J .Dugundji   : Topology
                                   Prentice Hall of India (1975)
2. S.Willard   : General Topology
                                   Addison Wesley Pub Co., Reading Mass (1976)
3. G.F. Simmons   :   Introduction to Topology and Modern Analysis
                                    McGraw-Hill International Student Edn. (1963)
4. M. Gemignani   :   Elementary Topology
                                    Addison Wesley Pub Co Reading Mass (1971)
5. M.G. Murdeshwar   :   General Topology (Second Edition)
                                    Wiley Eastern Ltd (1990)
6. M.A. Armstrong   :   Basic Topology, Springer Verlag
                                     New York 1983
7. J. R. Munkres   :   Topology- a First Course, PHI

8. Fred H. Croom   :   Principles of Topology, Cengage Learning Asia

MT2C09 - PDE AND INTEGRAL EQUATIONS

TEXTS : 1. **AMARNATH, M.,** : PARTIAL DIFFERENTIAL EQUATIONS
                      Narosa , New Delhi (1997)

2. **HILDEBRAND, F.B.**: METHODS OF APPLIED MATHEMATICS
                      (Second Edn.) Prentice-Hall of India, New Delhi, 1972.

No.of hours of lectures / week : 5

UNIT I

First Order PDE .
[Sections 1.1 – 1.11. from the Text 1]
Omit the Proof of Theorem 1.11.1

UNIT   II

Second Order PDE
[Sections 2.1 – 2.5. from the Text 1]

UNIT   III

Integral Equations.
[Sections 3.1 – 3.3, 3.6 – 3.11 from the Text 2]

REFERENCES

1. G. Birkhoff & G.C. Rota   : Ordinary Differential Equations
                                        Edn. Wiley & Sons 3rd Edn (1978)
2. E.A. Coddington   : An Introduction to Ordinary Differential
Equations

                                        Printice Hall of India ,New Delhi (1974)
3. P. Hartman   : Ordinary Differential Equations
                                        John Wiley & Sons (1964)
4. L.S. Pontriyagin   : A Course in Ordinary Differential Equations
                                        Hindustan Pub. Corporation, Delhi (1967)
5. F. John   : Partial Differential Equations
                                        Narosa Pub. House New Delhi (1986)
6. Phoolan Prasad &   : Partial Differential Equations
    Renuka Ravindran   Wiley Eastern Ltd New Delhi (1985)
7. R. Courant and D.Hilbert   : Methods of Mathematical Physics , Vol I
                                        Wiley Eastern Reprint (1975)
8. W.E. Boyce & R.C. Deprima   : Elementary Differential Equations
                                        and Boundary Value Problems
                                        John Wiley & Sons, NY, 9th Edition
9. A. Chakrabarti   : Elements of Ordinary Differential
                                        Equations and Special Functions
                                        Wiley Eastern Ltd New Delhi (1990)
10. Ian Sneddon   : Elements of Partial Differential Equations
                                        McGraw-Hill International Edn., (1957)

MT2C10 - NUMBER THEORY

TEXTS :

1. **APOSTOL, T.M.,**: INTRODUCTION TO ANALYTIC NUMBER THEORY , Narosa Publishing House, New Delhi 1990.

2. **KOBLITZ , NEAL**:A COURSE IN NUMBER THEROY AND CRYPTOGRAPHY, Springer–Verlag , New York (1987).

No.of hours of lectures / week : 5

UNIT I

    Arithmetical Functions and Dirichlet Multiplication ; Averages of Arithmetical Functions; Some Elementary Theorems on the Distribution of Prime Numbers.

[Chapter 2 Sections 2.1 to 2.14, 2.18, 2.19 ; Chapter 3 Sections 3.1 to 3.4, 3.9 to 3.12; Chapter 4 Sections 4.1 to 4.10 of Text 1]

UNIT II

Congruences, Quadric Residues and Quadratic Reciprocity Law.
[Chapters 5 (All Sections) and Chapter 9 Sections 9.1 to 9.7 of Text 1]

UNIT III

Cryptography, Public Key.
[Chapter 3 and 4 of Text 2.]

REFERENCES

1. W. W Adams   :   Introduction to Number Theory
                          L. J. Goldstein   Printice Hall Inc.,Engelwoods, (1976)
2. W.J. Le Veque   :   Topics in Number Theory ,Vols. I & II
                          Addison Wesley Pub. Co. Readings Mass (1961).
3. A.Hurwitz & N.Kritiko   :   Lectures on Number Theory
                          Springer Verlag ,Universitext (1986)
4. H. Davenport   :   The Higher Arithmetic
                          Cambridge Univ.Press, Sixth Edn. (1992)
5. Kenneth H. Rosen   :   Elementary Number Theory and its Applications
                          Addison Wesley Pub Co., 3rd Edn. (1993)
6. G.H. Hardy & E. M.Wright: An Introduction to the Theory of Numbers
                          Oxford International Edn (1985)

7. D.P.Parent   :   Exercises in Number Theory
                          Springer Vertlag,(Problem Books in Math) 1984
8. Don Redmond   :   Number Theory
                          Monographs & Texts in Mathematics No: 220
                          Marcel Dekker Inc (1994).
9.. Thomas Koshy   :   Elementary Number Theory with Applications
                          Harcourt / Academic Press 2002
10. Douglas R Stinson   :   Cryptography- Theory and Practice (2nd edn.)
                          Chapman & Hall / CRC (2002)
11. Simon Singh   :   The Code Book
                          The Fourth Estate, London (1999)
12. Song Y.Yan   :   Number Theory for Computing (2nd Edition)
                          Springer – Verlag 2002
13. Oystein Ore   :   Number Theory and its History –

			Mc Graw – Hill Book Company 1948
14.	Paulo Ribenboim	:	The Little Book of Big Primes Springer-Verlag (New York 1991)
15.	Albrecht Beautelspacher	:	Cryptology Mathematical Association of America (Incorporated),1994
16.	G. Everest and T.Ward	:	An Introduction to Number Theory, GTM 232, Springer.
17.	Erickson & Vazzana	:	Introduction to Number Theory, Chapman & Hall, Indian Edition.