ACHARYA NAGARJUNA UNIVERSITY

NAAC 'A' GRADE

REGISTRAR

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Website::http:/www.anu.ac.in

No.ANU/Acad./U.G/CBCS/III B.SC/Mathematics/ SEM-VI/Syllabus/2017 Date:21.10.2017.

PROCEEDINGS OF THE VICE-CHANCELLOR

Sub:- ANU – Academic –UG courses –CBCS – III –B.Sc.–Mathematics VI Semester Syllabus - Approval - Orders – Issued.

Ref:- 1. Minutes of the meeting of the Board of Studies (UG) in Mathematics held on 25-09-2017.
2. Vice-Chancellor's orders dated 12-10-2017.

O R D E R:-

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The Vice-Chancellor, after having considered the minutes 1st cited, has approved the III B.Sc. Mathematics VI semester syllabus (Theory & Practical) under CBCS pattern for the academic year 2017-18 prepared by the Board of Studies (UG) in Mathematics. The titles of the Papers are mentioned below:

Semester –VI (Any one from Two Electives)

1. Paper: VII- (Elective) (A):: Laplace Trans forms

OR

Paper: VII- (Elective) (B):: Numerical Analysis

Cluster Electives A or B

2. Paper: VIII-(Cluster Elective)-A-1: Integral Trans forms

Paper: VIII-(Cluster Elective)- A -2: Advanced Nutrition Analyses

Paper: VIII-A-3: Project work

OR

Paper: VIII-(Cluster Elective) B-1: Graph theory

Paper: VIII-(Cluster Elective) B-2: Applied graph theory

Paper: VIII-B-3: Project work

(BY ORDER)

JOINT REGISTRAR
Academic

To
The Chairman and all members, Board of Studies (UG) in Mathematics. ANU.
All the Principals of the Affiliated Colleges under ANU area.
Copy to:
The Dean, Physical Science, ANU.
The Dean, CDC, ANU.
The Coordinator, UG (Exams), ANU
The Addl. Controller of Examinations, ANU.
The In-Charge, ANU website.
The P.A. to Vice-Chancellor/ Registrar/Rector, ANU.

Andhra Pradesh State Council of Higher Education
CBCS B.A./B.Sc. **Mathematics** Course Structure
w.e.f. 2015-16 (Revised in April, 2016)

Corrected copy
25/9/17

Year	Seme-ster	Paper	Subject	Hrs.	Credits	IA	EA	Total
1	I	I	Differential Equations & Differential Equations Problem Solving Sessions	6	5	25	75	100
	II	II	Solid Geometry & Solid Geometry Problem Solving Sessions	6	5	25	75	100
2	III	III	Abstract Algebra & Abstract Algebra Problem Solving Sessions	6	5	25	75	100
	IV	IV	Real Analysis & Real Analysis Problem Solving Sessions	6	5	25	75	100
3	V	V	Ring Theory & Vector Calculus & Ring Theory & Vector Calculus Problem Solving Sessions	5	5	25	75	100
		VI	Linear Algebra & Linear Algebra Problem Solving Sessions	5	5	25	75	100
	VI	VII	**Electives: (any one)** VII-(A) Laplace Transforms VII-(B) Numerical Analysis & Elective Problem Solving Sessions	5	5	25	75	100
		VIII	**Cluster Electives:** VIII-A-1: Integral Transforms	5	5	25	75	100
			VIII-A-2: Advanced Numerical Analysis	5	5	25	75	100
			VIII-A-3: *Project work* or	5	5	25	75	100
			VIII-B-1: Graph Theory VIII-B-2: Applied Graph Theory VIII-B-3: *Project work*					

Chairman B.O.S
V.S.S. Anuja Member BOS
Ch. Shivaramakrishna BOS
M. Ramesh Member BOS

B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS

SEMESTER – VI, PAPER – VII-(A)

ELECTIVE-VII(A); LAPLACE TRANSFORMS

60 Hrs

UNIT – 1 (12 hrs) Laplace Transform I : -

Definition of - Integral Transform – Laplace Transform Linearity, Property, Piecewise continuous Functions, Existence of Laplace Transform, Functions of Exponential order, and of Class A.

UNIT – 2 (12 hrs) Laplace Transform II : -

First Shifting Theorem, Second Shifting Theorem, Change of Scale Property, Laplace Transform of the derivative of f(t), Initial Value theorem and Final Value theorem.

UNIT – 3 (12 hrs) Laplace Transform III : -

Laplace Transform of Integrals – Multiplication by t, Multiplication by t^n – Division by t. Laplace transform of Bessel Function, Laplace Transform of Error Function.

UNIT –4 (12 hrs) Inverse Laplace Transform I : -

Definition of Inverse Laplace Transform. Linearity, Property, First Shifting Theorem, Second Shifting Theorem (Only Statements of theorems Without proofs), Examples.

UNIT –5 (12 hrs) Inverse Laplace Transform II : -

Inverse Laplace transforms of Derivatives–Inverse Laplace Transforms of Integrals – Multiplication by Powers of 'P'– Division by powers of 'P'.

Reference Books :-

1. Laplace Transforms by A.R. Vasistha and Dr. R.K. Gupta Published by Krishna Prakashan Media Pvt. Ltd. Meerut.
2. Fourier Series and Integral Transforms by Dr. S. Sreenadh Published by S.Chand and Co., Pvt. Ltd., New Delhi.
3. Laplace and Fourier Transforms by Dr. J.K. Goyal and K.P. Gupta, Published by Pragathi Prakashan, Meerut.
4. Integral Transforms by M.D. Raising hania, - H.C. Saxsena and H.K. Dass Published by S. Chand and Co., Pvt.Ltd., New Delhi.

Suggested Activities:

Seminar/ Quiz/ Assignments

Chairman B.O.S

Member BOS

Member BOS

Member BOS

B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS
SEMESTER – VI, PAPER – VII-(B) ELECTIVE–
VII-(B); NUMERICAL ANALYSIS

60 Hrs

UNIT- I: (10 hours)

Errors in Numerical computations : Errors and their Accuracy, Mathematical Preliminaries, Errors and their Analysis, Absolute, Relative and Percentage Errors, A general error formula.

UNIT – II: (12 hours)

Solution of Algebraic and Transcendental Equations: The bisection method, The iteration method, The method of false position, Newton Raphson method, Generalized Newton Raphson method.

UNIT – III: (12 hours) Interpolation - I

Interpolation : Errors in polynomial interpolation, Finite Differences, Forward differences, Backward differences, Central Differences.

UNIT – IV: (12 hours) Interpolation - II

Newton's formulae for interpolation. Central Difference Interpolation Formulae, Gauss's central difference formulae, Stirling's central difference formula, Bessel's Formula.

UNIT – V : (14 hours) Interpolation - III

Interpolation with unevenly spaced points, Lagrange's formula, Error in Lagrange's formula, Divided differences and their properties, Newton's general interpolation Formula, Inverse interpolation.

Reference Books :

1. Numerical Analysis by S.S.Sastry, published by Prentice Hall of India Pvt. Ltd., New Delhi. (Latest Edition)
2. Numerical Analysis by G. Sankar Rao published by New Age International Publishers, New – Hyderabad.
3. Finite Differences and Numerical Analysis by H.C Saxena published by S. Chand and Company, Pvt. Ltd., New Delhi.
4. Numerical methods for scientific and engineering computation by M.K.Jain, S.R.K.Iyengar, R.K. Jain.

Suggested Activities:

Seminar/ Quiz/ Assignments

Chairman B.O.S
Member BOS
Member BOS
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B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS, SEMESTER – VI, CLUSTER – A, PAPER – VIII-A-1

Cluster Elective- VIII-A-1: INTEGRAL TRANSFORMS

60 Hrs

UNIT – 1 (12 hrs) Application of Laplace Transform to solutions of Differential Equations : -

Solutions of ordinary Differential Equations.

Solutions of Differential Equations with constants co-efficient

UNIT – 2 (12 hrs) Application of Laplace Transform : -

Solution of simultaneous ordinary Differential Equations.

UNIT – 3 (12 hrs) Application of Laplace Transforms to Integral Equations : -

Definitions : Integral Equations-Abel's, Integral Equation-Integral Equation of Convolution Type, Integro Differential Equations.

UNIT –4 (12 hrs) Fourier Transforms-I : -

Definition of Fourier Transform – Fourier's in Transform – Fourier cosine Transform – Linear Property of Fourier Transform – Change of Scale Property for Fourier Transform.

UNIT – 5 (12 hrs) Fourier Transform-II : -

Convolution Definition – Convolution Theorem for Fourier transform.– parseval's Indentify – .

Finte Fourier Transforms : -

Finte Fourier Sine Transform – Finte Fourier Cosine Transform.

Reference Books :-

1. Integral Transforms by A.R. Vasistha and Dr. R.K. Gupta Published by Krishna Prakashan Media Pvt. Ltd. Meerut.
2. A Course of Mathematical Analysis by Shanthi Narayana and P.K. Mittal, Published by S. Chand and Company pvt. Ltd., New Delhi.
3. Fourier Series and Integral Transforms by Dr. S. Sreenadh Published by S.Chand and Company Pvt. Ltd., New Delhi.
4. Lapalce and Fourier Transforms by Dr. J.K. Goyal and K.P. Gupta, Published by Pragathi Prakashan, Meerut.
5. Integral Transforms by M.D. Raising hania, - H.C. Saxsena and H.K. Dass Published by S.Chand and Company pvt. Ltd., New Delhi.

Suggested Activities:

Seminar/ Quiz/ Assignments

Chairman B.O.S

V.S.S Anuja Member BOS

H. Laxman Member BOS

B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS
SEMESTER – VI: PAPER – VIII-A-2
ELECTIVE – VIII-A-2: ADVANCED NUMERICAL ANALYSIS

60 Hrs

Unit – I (10 Hours)

Curve Fitting: Least – Squares curve fitting procedures, fitting a straight line, nonlinear curve fitting.

UNIT- II : (12 hours)

Numerical Differentiation: Derivatives using Newton's forward difference formula, Newton's backward difference formula. Derivatives using central difference formula, stirling's interpolation formula, Newton's divided difference formula.

UNIT- III : (12 hours)

Numerical Integration: General quadrature formula on errors, Trapozoidal rule, Simpson's 1/3 – rule, Simpson's 3/8 – rule, and Weddle's rules.

UNIT – IV: (14 hours)

Solutions of simultaneous Linear Systems of Equations: Solution of linear systems – Direct methods, Matrix inversion method, Gaussian elimination methods, Gauss-Jordan Method,.Iterative methods. Jacobi's method, Gauss-siedal method.

UNIT – V (12 Hours)

Numerical solution of ordinary differential equations: Introduction, Solution by Taylor's Series, Euler's method, Runge – Kutta methods.

Reference Books :

1. Numerical Analysis by S.S.Sastry, published by Prentice Hall India (Latest Edition).
2. Numerical Analysis by G. Sankar Rao, published by New Age International Publishers, New – Hyderabad.
3. Finite Differences and Numerical Analysis by H.C Saxena published by S. Chand and Company, Pvt. Ltd., New Delhi.
4. Numerical methods for scientific and engineering computation by M.K.Jain, S.R.K.Iyengar, R.K. Jain.

Suggested Activities:

Seminar/ Quiz/ Assignments

Chairman B.O.S

V.S.S Anuja Member BOS

Member BOS

H. Ramesh Member BOS

B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS
SEMESTER – VI, CLUSTER-C, PAPER – VIII-C-1
Cluster Elective–VIII-B-1: GRAPH THEORY

60 Hrs

UNIT – I (12 hrs) Graphs and Sub Graphs :

Graphs , Simple graph, graph isomorphism, the incidence and adjacency matrices, sub graphs, vertex degree, Hand shaking theorem, paths and connection, cycles.

UNIT – II (12 hrs)

Applications, the shortest path problem, Sperner's lemma.

Trees :

Trees, cut edges and Bonds, cut vertices, Cayley's formula.

UNIT – III (12 hrs) :

Applications of Trees - the connector problem.

Connectivity

Connectivity, Blocks and Applications, construction of reliable communication Networks,

UNIT – IV (12 hrs):

Euler tours and Hamilton cycles

Euler tours, Euler Trail, Hamilton path, Hamilton cycles , dodecahedron graph, Petersen graph, hamiltonian graph, closure of a graph.

UNIT – V (12 hrs)

Applications of Eulerian graphs, the Chinese postman problem, Fleury's algorithm - the travelling salesman problem.

Reference Books :

1. Graph theory with Applications by J.A. Bondy and U.S.R. Murthy published by Mac. Millan Press
2. Introduction to Graph theory by S. Arumugham and S. Ramachandran, published by scitech Publications, Chennai-17.
3. A Text Book of Discrete Mathamatics by Dr. Swapan Kumar Sankar, published by S.Chand & Co. Publishers, New Delhi.
4. Graph theory and combinations by H.S. Govinda Rao published by Galgotia Publications.

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Member BOS
M. Ramesh Member – BOS

B.A./B.Sc. THIRD YEAR MATHEMATICS SYLLABUS
SEMESTER – VI, CLUSTER-C, PAPER – VIII-C-2
Cluster Elective -VIII-B-2: APPLIED GRAPH THEORY

60 Hrs

UNIT – I (12 hrs) :

Matchings

Matchings – Alternating Path, Augmenting Path - Matchings and coverings in Bipartite graphs, Marriage Theorem, Minimum Coverings.

UNIT –II (12 hrs) :

Perfect matchings, Tutte's Theorem, Applications, The personal Assignment problem -The optimal Assignment problem, Kuhn-Munkres Theorem.

UNIT –III (12 hrs) :

Edge Colorings

Edge Chromatic Number, Edge Coloring in Bipartite Graphs - Vizing's theorem.

UNIT –IV (12 hrs) :

Applications of Matchings, The timetabling problem.

Independent sets and Cliques

Independent sets, Covering number , Edge Independence Number, Edge Covering Number - Ramsey's theorem.

UNIT –V (12 hrs) :

Determination of Ramsey's Numbers – Erdos Theorem, Turan's theorem and Applications, Sehur's theorem. A Geometry problem.

Reference Books :-

1. Graph theory with Applications by J.A. Bondy and U.S.R. Murthy, published by Mac. Millan Press.
2. Introduction to graph theory by S. Arumugham and S. Ramachandran published by SciTech publications, Chennai-17.
3. A text book of Discrete Mathematics by Dr. Swapan Kumar Sarkar, published by S. Chand Publishers.
4. Graph theory and combinations by H.S. Govinda Rao, published by Galgotia Publications.

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Member BOS
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