GONDWANA UNIVERSITY, GADCHIROLI.

STUDY COMMITTEE IN MATHEMATICS
B.SC. I (MATHEMATICS)
SEMESTER WISE SYLLABUS

WITH EFFECT FROM
2012-13
SYLLABUS
B.SC. PART I  SEMESTER I
PAPER I
MAT 101:  ALGEBRA AND TRIGONOMETRY
TOTAL MARKS: 75 (60+15)

Unit I

Unit II
Definition of rank of a matrix. Theorems on consistency of a system of linear equations Application of matrices to a system of linear (homogeneous and non-homogeneous equations) Eigen values, Eigen vectors and characteristic equation of a matrix. Caley Hamilton’s theorem

Unit III
Relation between roots and coefficients of a general polynomial equation in one variable Transformation of equations. Descarte’s rule of signs. Solution of cubic equations ( cardon method)

Unit IV

References
4. S.L. Loney, plane trigonometry part- II Macmillan and company, London
6. Prof. T.M. Karade and M.S. Bendre, Algebra and Trigonometry Sonu Nilu.
SYLLABUS
B.SC.  PART I  SEMESTER I

MAT 102:  DIFFERENTIAL AND INTEGRAL CALCULUS

TOTAL MARKS: 75 (60+15)

Unit I
Limit and continuity of a function $\varepsilon - \delta$ definition of limit and continuity two sided continuity. Theorem on differentiation, Mean value theorem, Rolles theorem, Lagranges mean value theorem Cauchy’s generalised Mean value theorem. Marlaurin Series and Taylors series expansion, curvature.

Unit II
Higher orders derivative calculation of $n^{th}$ derivative some standard result. Determination of $n^{th}$ Derivative of rational function, $n^{th}$ Derivative of product of the power of Sines and Cosine. Leibnitz’s theorem $n^{th}$ Derivative of product of the two function. Indeterminant form.

Unit III
Integral of irrational and transcendental function. Integral based on

\[
\sqrt{x^2 + a^2}, \quad \sqrt{x^2-a^2}, \quad \sqrt{a^2-x^2}
\]

Reduction formula for $\int \sin^n x \, dx$ and $\int \cos^n x \, dx$

Reduction formula for $\int \sin^p x \, \cos^q x \, dx$

Reduction formula for $\int \tan^n x \, dx$ and $\int \cot^n x \, dx$

Reduction formula for $\int \sec^n x \, dx$ and $\int \cosec^n x \, dx$

Reduction formula for

\[
\int \frac{1}{(x^2+a^2)^n} \, dx
\]

Reduction formula for $\int x^m (ax^2+b)^p \, dx$

Unit IV
Improper integral, Gamma function, Properties of Gamma function, Beta function, Properties of Beta function.

References

1) Gabriel klambaue, Mathematical Analysis, Marcel Dekkar, Inc, New York, 1975
2) N. Piskunovv, Ditterental and integral calculate peace publisher, Moscro.
4) Gorakhpur Prasad, Ditteroential calculus Pothishala private ltd. Allahabad.
7) Prof. T.M. Karade and M.S. Bendre, Calculas and Differential Equations Sonu, Nilu, Nagpur
SYLLABUS
B.SC. PART I SEMESTER – II
MTH:103 PAPER – III VECTOR CALCULUS, GEOMETRY & DIFFERENCE EQUATION
TOTAL MARKS: 75 (60+15)

Unit I

Unit II

Unit III

Unit IV
Formation of difference equation. Order of difference equation. Linear difference equation. Homogeneous linear equation with constant coefficient. Non homogeneous linear equation. Particular integrals

Reference Books.

1) Murray R. Spiegel, Vector Analysis, Schaum
2) Erwin Kreyszig, Advanced Engineering Mathematics
   John Wiley and Sons, 1999
3) N. Saran and S. N. Nigam, Introduction to
   Vector Analysis, Pothishala Pvt. Ltd.
4) Shanti Narayan, A textbook of Vector Calculus
5) S. L. Loney, The elements of coordinate
6) R. J. T. Bell, Elementary treatise on coordinate
   Geometry of three dimensions Wiley Eastern Ltd. 1994
7) N. Sharan and R. S. Gupta, Analytical Geometry of three dimensions.
8) Gorakh Prasad and H. C. Gupta, Text Book on
9) P. K. Jain and Khalil Ahmad. A textbook of Analytical Geometry of three dimensions
   Wile Eastern Ltd. 1994
10) Prof. T.M. Karade and M.S. Bendre, Vector Analysis and Geometry,
    Sonu Nilu, Nagpur
SYLLABUS
B.SC. I SEMESTER – II
PAPER –IV
MAT:104 DIFFERENTIAL EQUATION AND ANALYSIS
TOTAL MARKS: 75(60+15)

Unit – I

Exact Differential equations. Linear differential Equation. Equation reducible to linear form. First order and higher degree equations solvable for x,y,p. Clairaut’s differential equations. Orthogonal trajectories

Unit – II

Linear differential equation with constant coefficient. Operator method to find the particular integral. Linear differential equation of second order. Wronskian. Method of Variation of parameter

Unit – III


Unit – IV

Series of non-negative terms. Comparison test, Cauchy’s integral test, Ratio test. Alternating Series, Leibnitz’s theory, Absolute and conditional convergence. Series of arbitrary terms

Reference

1) D. A.Murry, Introductory Course in Differential Equations, orient Longman (India), 1967
2) G. F. Simmons, Differential Equations Tata Mc Graw Hill 1972
3) E. A. Codington, An Introduction to ordinary Differential Equations and their Application C. B. S. Publisher and Distributors, Delhi, 1985.
4) O. E. Stanaitis, An introduction to sequences, Series and improper integral
   Holden-Dev Inc. San Francisco, California.
6) Prof. T.M. Karade and M.S. Bendre, Calculas and Differential Euations, Sonu Nilu.Nagpur
B.Sc. Part I

Semester I:

Paper I : MAT 101 ALGEBRA AND TRIGONOMETRY
          TOTAL MARKS: 75 (60+15)

Paper II : MAT 102 DIFFERENTIAL AND INTEGRAL CALCULUS
          TOTAL MARKS: 75 (60+15)

Semester II :

Paper III : MAT 103 VECTOR CALCULUS, GEOMETRY & DIFFERENCE EQUATION
            TOTAL MARKS: 75(60+15)

Paper IV : MAT 104 DIFFERENTIAL EQUATION AND ANALYSIS
           TOTAL MARKS: 75(60+15)

Teaching Pattern:

1. Four Lectures per week per paper.
2. One tutorial per week per section per paper.
### Paper Pattern and Evaluation Scheme

**Theory:** Two theory papers for every Semester each of 60 Marks and time duration is of three clock hours.

**Internal Assessment:** TOTAL Marks  30 Per Semester 15 on each paper
- Considering Students Attendance, Class Performance,
- Unit test, Home Assignments, Class seminar

**Question Paper Pattern:**
- Time 3 Hours
- All questions are compulsory
- Total Marks: 60
Question I (12 Marks)

Unit I
A) 6 Marks
B) 6 Marks

OR

Unit I
C) 6 Marks
D) 6 Marks

Question II (12 Marks)

Unit II
A) 6 Marks
B) 6 Marks

OR

Unit II
C) 6 Marks
D) 6 Marks

Question III: (12 Marks)

Unit III
A) 6 Marks
B) 6 Marks

OR

Unit III
C) 6 Marks
D) 6 Marks

Question IV: (12 Marks)

Unit IV
A) 6 Marks
B) 6 Marks

OR

Unit IV
C) 6 Marks
D) 6 Marks

Question V: (12 Marks)

Unit V Eight Short Questions (Attempt any Six) two from each unit, with each of two marks

Evaluation Scheme

1. Theory and Internal Assessment will be separate heads of passing.
2. To pass the internal assessment, student must secure at least 6 marks out of 15 in each paper.
   In case a student fail in Internal assessment he/she will have to submit the same before the commencement of next examination.
3. In case a student fails in theory but passes in IA, the marks of these carried over in each paper.
4. Total marks must be 40 percent in aggregate for a student to be declared pass.
Proceedings of the meeting of the Subject committee in Mathematics held on April 24, 2012

As per the notification of Gondwana University Subject committee in Mathematics of the Gondwana University met at 11.30 am on Dated April 23, 2012 at University Administrative Hall, Dr. Lalsingh Khalsa Chairman Subject committee was in chair. Dr Lalsingh Khalsa placed the agenda itemwise before the committee for the consideration and approval of Committee.

Item No.1 To consider and confirm the Semester wise Syllabus for B.Sc.I and Msc I (Mathematics)

Resolution No.1 Dr Ladke L.S. placed the copies of Syllabus for observation and discussed in the meeting. All the members with some suggestions accepted the semesterwise syllabus for B.Sc. I and M.Sc. I for 2012-13. and it was unanimously confirmed.

Item No.II To discuss on teaching Pattern

Resolution No.2 Dr. Lalsingh Khalsa explained the teaching pattern of both papers in each semester for B,Sc I and M.Sc. I It was discussed among members and finally with some changes teaching plan was accepted unanimously.

Item-III To discuss on Paper pattern and evaluation scheme.

Resolution 2- Pattern of both papers for each semester was discussed thoroughly and decided to set the questions on each unit with intra unit choice based.

While discussing on evaluation scheme it was decided that Theory and Internal Assessment will be separate heads of passing and frame some rules of evaluation.

There was no other item for discussion

Dr. L.H. Khalsa Chairman Study Committee thanked all the members for their valuable participation and Co-operation.

Following members were present at the meeting

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<tr>
<th>Sr.No.</th>
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<th>Signature</th>
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<tr>
<td>1.</td>
<td>Dr Khalsa L.H.</td>
<td>Chairman</td>
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<td>2.</td>
<td>Dr.Thengane K.D.</td>
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<td>3.</td>
<td>Dr. Singaru S.S.</td>
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<td>Dr Varhade D.N.</td>
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<td>Dr.Ladke L.S.</td>
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