GONDWANA UNIVERSITY

GADCHIROLI

Proposed Syllabus For

B.Sc. Mathematics

Semester-I & Semester-II

Under Choice Based Credit System

(C.B.C.S.)

with effect from

Academic Year :2017-18

(Considered and approved in B.O.S.)

Semester-I

USMT-01

Differential and Integral Calculus

Max Marks : 60+15

Unit –I

Limit and continuity (ε and δ definition). Types of discontinuities, theorems on limit and continuity. Differentiability of functions, successive differentiation, Leibnitz's theorem.

Unit –II

Mean Value theorem, Roll's theorem, Cauchy's generalized mean value theorem, Lagrange's mean value theorem, Taylors theorem with Lagrange's &Cauchy's form of remainder, Maclaurins Series &Taylors Series of sin x , cos x , e^x ,log (1+ x), $(1+ x)^m$

Unit –III

Improper integral Gamma function properties of Gamma function , Beta function , Properties of Beta function Indeterminate forms L' Hospitals rule.

Unit –IV

Double integration, properties of double integration, Iterated integral, Change of order integration, Transformation of Double integral in polar form.

Reference Books

1. H. Anton, I.birens and S.Davis, *Calculus* , John Wiley and Sons, Inc.,2002.
2. G.B. Thomas and R. L. Finney, *Calculus,* Pearson Education,2007.
3. Text Book of Differential Calculus –Gorakh Prasad .
4. Integration for degree student –Dr.P.K.Mittal, S. Chand & Co. New Delhi.
5. Text Book of Differential Calculus –Musheer Ahmad, Macmillan India Ltd. Delhi - 2006.
6. Wilfred Kaplan & D.J.Lewis,*Calculus & linear algebra combined edition*.

USMT-02

Differential Calculus and Trigonometry

Max Marks: 60+15

Unit –I

Limit and continuity of functions of two variables, Partial Differentiation, Differential, and Chain rule.

Unit –II

Homogeneous function, Euler's theorem, Jacobian , Maxima & minima, Lagrange's Multiplier method ,Taylor's theorem for function of two variables.

Unit –III

Tangent & normal, curvature asymptotes singular points, tracing of curve parametric representation of curve, tracing of curve in Cartesian form.

Unit –IV

De Moivre's theorem & its application , square root of complex number, inverse circular & hyperbolic functions , logarithm of complex quantity, summation of series. C+iS Method .

Reference Books

1. H.Anton , I. Birens and S. Davis, *Calculus* , John Wiley and Sons , Inc., 2002
2. G.B. Thomas and R.L. Finney, *Calculus* ,Pearson Education ,2007
3. Text book of Differential calculus – Gorakh Prasad Pothishala Pvt.Ltd. Allahabad
4. Calculus –H Antan I Birens & S Davis , John Velly & son 2002.
5. Wilfred Kaplan & D.J.Lewis,*Calculus & linear algebra combined edition*.
6. S. L. Loney, *Plane trigonometry part-II*, Macmillan & compaany,London.

Semester-II

USMT-03

Ordinary Differential Equations and Difference Equations

Max Marks: 60+15

Unit –I

First order exact differential equation, integrating factor, rules to find an integrating factors , Linear equation , Bernoulli's equation, First order higher degree equations solvable for x,y,p, Orthogonal Trajectory**.**

Unit –II

Simultaneous differential equations, Linear equation with constant coefficients complementary function operator to find the Particular integral.

Unit –III

Linear equation with Variable coefficient Cauchy's Euler's homogeneous Linear differential equation , Wronskian & its properties , method of variation of parameter .

Unit –IV

Formation of Difference equation . Order of difference equation .Liner difference equation. Homogeneous linear equation with constant coefficient . Non homogeneous linear equation Particular integrals.

Reference Books

1. *Differential equations* N.Ch.S.N.Iyengar , Anmol Publication Pvt.Ltd.

2. D.A.Murry, Introductory Course in Differntial Equations , orient Longman (India) 1967.

3.G.F.Simmons, Differential Equation Tata Mc Graw2 Hill 1972.

4.Shepley L.Ross, *Differential Equations*, 3rd Ed., John Wiley and Sons, 1984.

5. H.C.Saxena,*Calculus of Finite Differences & Numerical Analysis*,S.Chand & Co.Ltd,New Delhi,1976. Scope: chapter 8

USMT-04

Partial Differential Equation

Max Marks:60+15

Unit –I

Linear partial differential equation of first order . Formation partial differential equation by eliminating the arbitrary constant and arbitrary function .Total differential equation Lagrange's linear partial differential equation.

Unit –II

Compatible Differential Equations. Condition of Compatibility . Non linear partial differential equations.

Type I $f(p,q)=0$

Type II $Z=px+qy+f(p,q)$

Type III $F(z,p,q) =0$

Type IV $F(x,p)= G(y,q)$

Charpit's method

Unit –III

Homogeneous partial differential equation with constant coefficient solution of partial differential equation complementary function and particular integral, Jacobbi's method.

Unit –IV

Non- Homogeneous linear partial differential equation, Equation reducible to linear . partial differential equation . with constant coefficient classification of second order partial differential equation.

Reference Books

1. *Differential equations* N.Ch.S.N.Iyengar , Anmol Publication Pvt.Ltd.
2. D.A.Murry , Introductory Course in Differential Equation , orient Longman (Indioa)11967.
3. G.F.Simmons , Differential Equations ,Tata Mc Graw Hill 1972.
4. Shepley L.Rss, *Differential Equations* ,3rd Ed., John Wiley and Sons, 1984.
5. I. Sneddon *Elements Of partial Differential Equations,* Mc Graw-Hill, International Edition ,1967.

B.Sc. (MATHEMATICS)

SEMESTER WISE DISTRIBUTION OF MARKS AND CREDITS

Sr. No.	Class	Semester	Theory Paper Marks		Internal Assessment Marks	Total Marks
			Paper I	Paper II		
1	B. Sc	I	60	60	15+15	150
2	B. Sc	II	60	60	15+15	150
			100	100	100	300

Semester	**Papers**	**University Exam.**	**Internal Assessment**	**Total**
		Marks - Credits	**Marks - Credits**	**Marks – Credits**
I	2(Core Course)	$2 \times 60 - 2 \times 2$	$2 \times 15 - 2 \times 1 = 2$	150-6
II	2(Core Course)	$2 \times 60 - 2 \times 2$	$2 \times 15 - 2 \times 1 = 2$	150-6

DISTRIBUTION OF MARKS FOR INTERNAL ASSESSMENT

Sr. No.	Activities	Max. Marks
1	Attendance	05(Compulsory)
	Any Two of the Following Activities	
1	Seminar	05
2	Unit Tests	05
3	Home Assignments	05

Total Marks -15

Minimum Passing Marks -06