DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

CIRCULAR NO.ACAD/NP/B.Sc.-Ist Yr./SEM.-I & II/157/2013

It is hereby notified for information of all concerned that, on the recommendations of the Boards of Studies, Ad-hoc Boards, and Faculty of Science, the Academic Council at its meeting held on 25-03-2013 has accepted the following revised syllabi for B.Sc. First Year progressively under the Faculty of Science :-

Sr. No.	Revised Syllabus	
[1]	B.Sc. [Physics]	Semester- I & II,
[2]	B.Sc. [Dairy Science & Technology]	Semester- I & II,
[3]	B.Sc. [Industrial Chemistry]	Semester- I & II,
[4]	B.Sc. [Geology]	Semester- I & II,
[5]	B.Sc. [Chemistry]	Semester- I & II,
[6]	B.Sc. [Botany]	Semester- I & II,
[7]	B.Sc. [Electronics] Science	Semester- I & II,
[8]	B.Sc. [Fisheries]	Semester- I & II,
[9]	B.Sc. [Microbiology]	Semester- I & II,
[10]	B.A. [Statistics]	Semester- I & II,
[11]	B.Sc. [Statistics]	Semester- I & II,
[12]	B.Sc. [Zoology]	Semester- I & II,
[13]	B.Sc. [Textile and Interior Decoration]	Semester- I & II,
[14]	B.Sc. [Home Science]	Semester- I & II,
[15]	B.A. / B.Sc. [Mathematics]	Semester- I & II.

This is effective from the Academic Year 2013-2014 and onwards.

These **syllabi are available on the University Website www.bamu.net**

All concerned are requested to note the contents of this circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO.ACAD/NP/B.SC.-IST YEAR/
Sem-I & II/2013/5132-541
A.C.S.A.I.No.327[9].

Date:- 08-05-2013.

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Director,
Board of College and
University Development.

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Copy forwarded with compliments to :-

1] **The Principals, affiliated concerned Colleges,**
Dr. Babasaheb Ambedkar Marathwada University.

2] The Director, University Network & Information Centre, UNIC, with **a request to upload the above all syllabi on University Website [www.bamu.net].**

Copy to :-

1] The Controller of Examinations,

2] The Superintendent, [B.Sc. Unit],

3] The Superintendent, [B.A. Unit],

4] The Superintendent, [Eligibility Unit],

5] The Programmer [Computer Unit-1] Examinations,

6] The Programmer [Computer Unit-2] Examinations,

7] The Director, [E-Suvidha Kendra], in-front of Registrar's Quarter,
Dr. Babasaheb Ambedkar Marathwada University,

8] The Public Relation Officer,

9] The Record Keeper,
Dr. Babasaheb Ambedkar Marathwada University.

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S/-080513/-*

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

Syllabus

B.A./B.Sc. Mathematics
Semester – I & II
(With Effect from June 2013)

Syllabus

B.A. / B.Sc. (Mathematics) Semester- I (With effect from June 2013)

MAT 101: Differential Calculus **Marks : 50.**

1. Prerequisite:

Functions: Domain and range of a function, independent and dependent variables, polynomial functions and rational functions, constant functions and identity functions, one-one functions, onto function, invertible functions, composite function. [1]
Limit and Continuity: Limit of a function, left handed and right handed limits, non existence of limit, theorems on limits (statements only), theorems on continuity (statements only), discontinuity, types of discontinuity. [1]

2. Differentiations:

Derivative of a function, derived function, derivability implying continuity, geometrical interpretation of a derivative, hyperbolic functions, derivatives of hyperbolic and inverse hyperbolic functions, logarithmic differentiation, derivative of implicit functions. [1]

3. Successive Differentiation:

Higher order derivatives, calculation of n th derivatives, some standard results, determination of n th derivative of rational functions, the n th derivatives of the products of the powers of sines and cosines, Leibnitz's theorem: n th derivative of the product of two functions.[1]

4. Mean Value Theorems:

Rolle's Theorem, Lagrange's mean value theorem, meaning of the sign of the derivative, Cauchy's mean value theorem, higher derivatives, Taylor's theorem, Maclaurin's theorem, Maclaurin's power series for a given function. [1]

5. Partial Differentiation:

Function of two variables, limit of a function of two variables, continuity of a function of two variables at a point, limit of a continuous function, partial derivatives, partial derivatives of higher order, homogeneous function, Euler's theorem on homogeneous function, total differentials, differentiation of composite function and implicit function.[1].

6. Prerequisite:

Scalar product of two vectors, sign of the scalar product, length of a vector as a scalar product, angle between two vectors, commutativity, distributivity, right handed and left handed vector triads, vector product, some properties of vector product, scalar triple product, distributive law, some properties of scalar triple product, vector triple product.[2]

7. Differential Operators:

Point Functions: scalar valued point functions, vector valued point functions, limits and continuity, directional derivatives, Cartesian representation of point functions and their directional derivatives, directional derivatives of point functions along co-ordinate axes and along any line, gradient of a scalar point function, character of gradient as a point function, the operator ∇, operator $a.\nabla$, divergence and curl, gradient, divergence and curl of sums and product. [2]

Text Book:

[1]. Shanti Narayan: Differential Calculus, Shyamlal Charitable Trust, 2004

Scope:
Chapter 2: Articles 2.1, 2.11, 2.12, 2.31, 2.32, 2.4 2.42, 2.5
Chapter 3: Articles 3.2, 3.21, 3.22, 3.3, 3.6, 3.61, 3.62, 3.8, 3.81
Chapter 4: Articles 4.1, 4.11, 4.12, 4.14, 4.15, 4.7, 4.71, 4.72, 4.9, 4.10
Chapter 5: Complete
Chapter 7: Articles 7.1, 7.2, 7.3, 7.5, 7.6, 7.61
Chapter 10: Articles 10.1, 10.2, 10.3, 10.4, 10.41, 10.5, 10.51, 10.6, 10.61, 10.8, 10.81, 10.9, 10.91, 10.93, 10.94

[2]. Shanti Narayan and P. K. Mittal : Vector Analysis, S. Chand and Company Ltd, 2007.

Scope:
Chapter 3: Articles 3.1, 3.1.1 to3.1.9, 3.1.10 (statements only)
Chapter 5: Articles 5.2, 5.2.1, 5.3, 5.3.1 to 5.3.3, 5.3.4, 5.3.5, 5.3.6, 5.3.7, 5.5, 5.5.1, 5.6, 5.7, 5.7.1 to 5.7.3, 5.8
Chapter 10: Articles 10.1, 10.1.1 to 10.1.2, 10.2, 10.2.1 to10.2.3, 10.3, 10.3.1 to 10.3.2, 10.4, 10.4.1 to 10.4.2, 10.5, 10.6, 10.7, 10.7.1 to 10.7.2, 10.9, 10.10, 10.11, 10.12, 10.12.1 to10.12.2, 10.14, 10.15 (results 1 to 6).

Note: Questions on prerequisite may not be asked.

MAT 102: Differential Equations **Marks: 50**

1. Prerequisite:

Ordinary and partial differential equations, order and degree of Differential equations, Solutions: general, particular, singular.

2. Equations of The First Order and of The First Degree:

Exact differential equations, Linear equations, Equations reducible to the linear form.

3. Linear Equations with Constant Coefficients:

Linear equations, complementary functions, particular integral, complete integral, The linear equations with constant coefficients and second member zero, case of auxiliary equation having equal roots, case of auxiliary equation having imaginary roots, the symbol D, the linear equation with constant coefficients and second member a function of x, the symbolic function $1/f(D)$, methods of finding the particular integral, short methods of finding particular integrals corresponding to the terms e^{ax}, x^m, $\sin ax$, $\cos ax$, $e^{ax}V$ and xV in the second member.

4. Linear Equations with Variable Coefficients:

The homogeneous linear equation, methods of finding solution, the symbolic functions $f(\theta)$ and $1/f(\theta)$, methods of finding the particular integral, integral corresponding to a term of form x^m in the second member, equations reducible to homogeneous linear form.

5. Exact Differential Equations and Equations of Particular Forms:

Exact differential equations, criterion of an exact differential equation, the integration of an exact equation: first integral, equations of the form $\frac{d^n y}{dx^n} = f(x)$, equation of the form $\frac{d^2 y}{dx^2} = f(y)$.

6. Ordinary Differential Equations with More Than Two Variables:

Simultaneous differential equations which are linear, simultaneous equations of the First order.

7. Partial Differential Equations:

Definitions, derivation of a partial differential equation by the elimination of constants,, Derivation of a partial differential equation by the elimination of arbitrary functions.

Text Book:

D. A. Murray : Introductory Course in Differential Equations, Khosla Publishing House, New Delhi, 2003.

Scope:
Chapter 1: Articles 1, 2, 4
Chapter 2: Articles 11, 12,13,20,21
Chapter 6: Articles 49 to 53, 56 to 64
Chapter 7: Articles 65 to 71
Chapter 8: Articles 73 to 77
Chapter 11: Articles 98, 99
Chapter 12: Articles 107, 108, 109

Note:Questions on prerequisite may not be asked.

Syllabus

B.A / B.Sc. (Mathematics) Semester- II

MAT 201: Integral Calculus : **Marks: 50.**

1. Methods of Integration:

Reduction formulae. [1]

2. Integration of Algebraic Rational Functions:

Case of non-repeated linear factors, case of non-repeated linear or repeated linear factors, case of linear or quadratic non repeated factors [1]

3. Integration of Trigonometric Functions:

Integration of $\sin^n x$, $\cos^n x$ and reduction formulae for integration of $\sin^n x$, $\cos^n x$ [1]

4. Definite Integral as The Limit of a Sum:

Introduction, fundamental theorem.[1]

5. Areas of Plane Regions:

Areas of a region bounded by a curve, x-axis and two ordinates.[1]

6. Rectification, Length of Plane Curves:

Introduction, expression for lengths of curves $y = f(x)$, expressions for lengths of arc $x = f(y)$; $x = f(t)$, $y = \phi(t)$; $r = f(\theta)$. [1]

7. Volumes and Surfaces of Revolution:

Introduction, expressions for the volume obtained by revolving about either the axis [1]

8. Integral Transformation:

Introduction, line integrals, circulation, irrotational vector point functions, surface integrals, volume integrals, reduction of volume to surface integral, physical interpretation of Gauss theorem, reduction of surface to line integrals, condition for irrotational vector functional, Green's theorem.[2]

Text Books:

[1]. Shanti Narayan : Integral Calculus, S. Chand and Company Limited 1999.

Scope:
Chapter 2: Articles 2.8
Chapter 3: Articles 3.1 to 3.4
Chapter 4: Articles 4.1, 4.2
Chapter 6: Articles 6.1, 6.2
Chapter 7: Articles 7.1
Chapter 8: Articles 8.1, 8.2, 8.3, 8.31
Chapter 9: Articles 9.1, 9.2

[2]. Shanti Narayan and P. K. Mittal : Vector Analysis, S. Chand and Company Ltd, 2007.

Scope:
Chapter 11: Articles 11, 11.1, 11.1.1 to 11.1.2, 11.2, 11.2.1, 11.3, 11.3.1, 11.5, 11.6, 11.7, 11.8, 11.9, 11.11.

Note: Questions on prerequisite may not be asked.

MAT 202: Geometry **Marks:50.**

1. The Plane:

Equations of the first degree in x, y, z, transformation to the normal form, determination of plane under given conditions, equations of the plane through three given points, systems of planes, two sides of a plane, length of the perpendicular from a point to a plane, bisectors of angles between two planes, joint equation of two planes.

2. Right Line:

Equations of a line, equations of a straight line in terms of its direction cosines and the co-ordinates of a point on it, equations of a line through two points, symmetrical and unsymmetrical forms of the equations of a line, transformation of the equations of a line to the symmetrical form, angle between a line and a plane, the condition that a given line may lie in a given plane, the condition that two given lines are coplanar, number of arbitrary constants in the equations of a straight line, sets of conditions which determine a line, the shortest distance between two lines, the length and equations of the line of shortest distance between two straight lines, length of perpendicular from a given point to a given line.

3. Sphere:

Definition and equation of the sphere, equation of the sphere through four given points, plane section of a sphere, intersection of two spheres, equation of a circle, sphere through a given circle, intersection of a sphere and a line, equation of a tangent plane.

4. Cones, Cylinders:

The right circular cone, equation of a right circular cone, the right circular cylinder, equation of a right circular cylinder.

5. The Conicoid:

Central conicoids, intersection of a line and a central conicoid, tangent lines and tangent plane at a point, condition that a plane may touch a central conicoid.

Text Book:

[1] Shanti Narayan: *Analytical Solid Geometry*, S. Chand and Company Ltd, New Delhi, 1998

Scope:
Chapter 2: Articles 2.1, 2.3, 2.31, 2.32, 2.4, 2.41, 2.42, 2.5, 2.6, 2.7, 2.71, 2.8
Chapter 3: Articles 3.1, 3.11, 3.12, 3.13, 3.14, 3.2 to3.5, 3.51, 3.6, 3.61, 3.7
Chapter 6: Articles 6.11, 6.12, 6.13, 6.2, 6.31, 6.32, 6.4, 6.41, 6.5, 6.6
Chapter 7: Articles 7.61, 7.62, 7.81, 7.82
Chapter 8: Articles 8.24, 8.3, 8.31, 8.32

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