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.

★ ★ ★ ★ ★ ★ ★
******

Director,
Board of College and University Development.

..2..

:: [2] ::

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.

-=**=-

S/-080513/-*

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD.

Revised Syllabus of

B.Sc. Ist Year

Physics

Semester - I & II

[Effective from 2013-14 & onwards]

Dr.Babasaheb Ambedkar Marathwada University, Aurangabad
B. Sc. I Year Physics Syllabus
Semester I & II
(Revised syllabus Effective from June 2013)

Semester	Course Code	Paper	Title of Paper	Periods	Marks
I	Phy101	I	Mechanics, Properties of Matter and Sound	45	50
I	Phy102	II	Heat and Thermodynamics	45	50
I	Phy103	III	Practical	45	50
II	Phy104	IV	Geometrical and Physical Optics	45	50
II	Phy105	V	Electricity and Magnetism	45	50
II	Phy106	VI	Practical	45	50

Note: - Scheme of Practical Examination
Student should perform one experiment in semester-II from paper III+VI
Scheme of Practical Examination
Experiment- (75marks) + Oral (15marks) + Record book (10 marks) = 100 Marks

30.1.2013
Chairman
BOS in physics

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
B. Sc. I Year Physics Syllabus
Semester I & II
(Revised syllabus Effective from June 2013)

Semester	Course Code	Paper	Title of Paper	Periods	Marks
I	Phy101	I	Mechanics, Properties of Matter and Sound	45	50
I	Phy102	II	Heat and Thermodynamics	45	50
I	Phy103	III	Practical	45	50
II	Phy104	IV	Geometrical and Physical Optics	45	50
II	Phy105	V	Electricity and Magnetism	45	50
II	Phy106	VI	Practical	45	50

Note: - Scheme of Practical Examination
Student should perform one experiment in semester-II from paper III+VI
Scheme of Practical Examination
Experiment- (75marks) + Oral (15marks) + Record book (10 marks) = 100 Marks

B. Sc. I Year Physics (Semester-I)
(Mechanics, Properties of Matter and Sound)
Course Code – Phy101
Paper – I

Periods – 45 **Marks – 50**

1. Mechanics: - 13 periods

Compound Pendulum- expression of time period, Interchangeability of centre of suspension and oscillation, Kater's Pendulum.

Newton's law of Gravitation (Statement only) , Gravitational Field , Gravitational Potential, Gravitational Potential of mass, Gravitational potential and field due to spherical shell and solid sphere (at a point, outside , inside and on the surface).

2. Elasticity: - 10 periods

Introduction , Moduli of Elasticity (Elastic constants), Twisting couple on a cylinder, Bending of Beam – Bending moment, cantilever loaded at free end – (a) When weight of beam is ineffective, (b) When weight of beam is effective, Depression of Beam loaded at centre

3. Viscosity and Surface Tension: 12 Periods

Viscosity - Introduction, energy of liquid in motion, Bernoulli's Theorem, practical applications: (i) Law of hydrostatic pressure (ii) Filter pump, Poiseuille's formula.
Surface Tension - Introduction, Difference of pressure across a curved surface, Determination of S.T. by Jaeger's method.

4. Ultrasonic and Acoustics: - 10 periods

Ultrasonic - Piezo – electric effect, Piezo – electric Generator, Magnetostriction effect, Magnetostriction oscillator, Applications of ultrasonic – Depth of sea, Chemical effects, Medical applications.
Acoustics - Reverberation, Acoustical demands of an auditorium, Sabine's Law – Derivation of Reverberation time, conditions of good acoustical designs of room.

References:-

1) Elements of Properties of Matter – D. S. Mathur
(S. Chand , 11 th edition , 1992)
2) Physics for Degree students – C. L. Arora and P.S.Heme
(S. Chand , I st edition 2010)
3) Mechanics and Electrodynamics – Brijlal ,N. Subrahmanyam , Jivan Seshan
(S.Chand , 7 th edition)
4) Text Book of sound – Khanna and Bedi
(Atma Ram and sons, 1989 edition)
5) Text Book of sound – N. Subrahmanyam and Brijlal
(Vikas Publishing House 2 nd Revised edition)

B. Sc. I Year Physics (Semester-I)
(Heat and Thermodynamics)
Course Code – Phy102
Paper – II

Periods – 45 **Marks – 50**

1) Thermal Conductivity: - 10 periods

Transference of heat, Coefficient of thermal conductivity, Rectilinear flow of heat along a metal bar, Methods of radial flow of heat-(i)spherical shell method and (ii)Flow of heat along the wall of a cylindrical tube, comparison of conductivities of different metals.

2) Real Gases and Transport Phenomena: - 12 periods

Real Gases – Introduction, Reason for modification of gas equation, Van der Waals equation of state , comparison with experimental curves, critical constants, constants of Van der Waals equation.

Transport phenomena–Introduction, Mean free path, sphere of influence, and expression for mean free path, variation of mean free path with temperature and pressure, transport phenomena, viscosity, Thermal conductivity (their interrelationship, dependence on temperature and pressure).

3) Thermodynamics: - 12 periods

Adiabatic process, Adiabatic equation of a perfect gas, Isothermal process, Indicator diagram, work done during isothermal process and adiabatic process, reversible and irreversible process, Second law of thermodynamics. (Kelvin and Clausius statement), Heat engines, Carnot's ideal heat engine, Carnot's cycle (work done and Efficiency).

4) Entropy and Thermodynamic relations: - 11 Periods

General notation of entropy, change of entropy is independent of path, change of entropy in reversible and irreversible process, Formulation of second law in terms of entropy, Maxwell's thermodynamical relations, Applications of Maxwell's relations –i) Clausius – Clapeyron equation , ii) T-ds equations.

Reference Books:-

1) Heat Thermodynamics and Statistical Physics - Brijlal, N.Subrahmanyan , P.S. Heme (S.Chand , 2007 Edition) .
2) Text Book of Heat and Thermodynamics–J. B. Rajam, C.L. Arora (S. Chand, 9th Edition)
3) Heat and Thermodynamics– S. S. Singhal, J. P. Agarwala, S.Prakash (Pragati Prakashan)
4) Thermodynamics & Statistical physics-S. L. Kakani

B. Sc. I Year Physics (Semester- II)
(Geometrical and Physical Optics)
Course Code – Phy104
Paper – IV

Periods – 45 **Marks – 50**

1) Geometrical Optics and Optical Instruments: - 12 periods

Cardinal points of optical system - Focal points, Principal points, Nodal points and corresponding planes, coaxial lens system - equivalent focal length and cardinal points.
Huygens's Eyepiece, Ramsden's eyepiece and their cardinal points,

2) Interference: - 10 periods

Interference in thin film due to reflected and transmitted light, wedge shaped thin film, Newton's rings by reflected light, determination of wavelength, Michelson's Interferometer, type of fringes, determination of wavelength and difference in wavelength.

3) Diffraction: 13 periods

Introduction, Diffraction at a thin wire , Fraunhofer diffraction at double slit (Interference and diffraction maxima, minima), Plane Transmission diffraction grating, Determination of wavelength (Normal incidence), Resolving power of optical instruments (Rayleigh's criterion), R. P. of prism and grating.

4) Polarization: - 10 periods

Introduction, Malus law, Double refraction, Huygens's theory of double refraction in uniaxial crystal, Nicol prism.
Optical activity, Fresnel's theory of optical rotation, specific Rotation, Laurentz's half – shade polarimeter, Determination of specific rotation of sugar solution.

Reference Books:-

1) Text Book of optics – N. Subrahmanyam & Brijlal (S. Chand, 1987 Edition)
2) Optics and Spectroscopy – R.Murugeshan, K. Sivaprasath(S. Chand , 7 th Revised Edition)
3) A text book of optics- D. S. Mathur.
4) Optics- Ghatak. IInd edition.

B. Sc. I Year Physics (Semester- II)
(Electricity and Magnetism)
Course Code – Phy105
Paper – V

Periods – 45 **Marks – 50**

1) Vector Algebra : - 12Periods

Dot and cross product (Revision), scalar triple product and it's geometrical interpretation, vector triple product, gradient of a scalar and it's physical interpretation, Divergence and curl of vector function and their physical interpretation, line, surface and volume integrals, Gauss's divergence theorem and Stoke's theorem .

2) Electrostatics: - 13 Periods

Coulomb's Law , Electric field , field due to point charge, flux of electric field, Gauss's law (with proof) , Differential from of Gauss law , electric potential , potential due to a point charge, Potential and field due to electric dipole.

Dielectrics, polarization of dielectric, Gauss's law in dielectrics, Relation between **D**, **E** and **P.**

3) Magnetostatics: - 10 Periods

Magnetic field , Magnetic induction , magnetic flux , Biot-Savart law, Magnetic induction due to straight conductor carrying current , magnetic induction on the axis of solenoid ,Ampere's Law, Differential form Ampere's Law, Moving coil ballistic Galvanometer - expression for charge.

4) Transient Currents: - 10 periods

Growth and decay of current in a circuit containing L and R , charge and discharge of a capacitor through resistor, Growth and decay of charge in LCR circuit.

Reference Books: -

1) Mathematical Methods in physics – D.Biswas(New central book agency , 2009 edition)
2) Electricity and Magnetism – R.Murugeshan(S. Chand, 2008 edition)
3) Electrodynamics – Gupta, Kumar, Singh (Pragati Prakashan, Meerut, 18th edition 2005)
4) Foundations of Electromagnetic Theory-Ritz, Milford, Chirstey IIIrd edition.

****

B. Sc. I Semester
Physics paper III (Phy103)
List of experiment

1. Determination of acceleration due to gravity by Kater's pendulum.
2. Y by bending of a beam loaded at center.
3. Determination of Y by Cantilever (Oscillation method)
4. η by Maxwell's needle.
5. M.I. by bifilar suspension.
6. Determination of Y and η of the material of a flat spiral spring.
7. S.I. by Jaeger's method.
8. Determination of coefficient of viscosity by Poisseuille's method.

Note: - At least six experiments should be performed.

B.Sc. II Semester
Physics Paper VI (Phy106)
List of experiment

1. Y by Searle's apparatus.
2. M.I. of fly wheel.
3. Thermal conductivity of bad conductor by Lee's disc method.
4. Study of CRO
   (Measurement of frequency and voltage sensitivity AC/DC.)
5. Field along axis of circular coil.
6. I-H curve.
7. Calibration of spectrometer.
8. Dispersive power of prism.

Note: - At least six experiments should be performed.

Additional activities

a. Demonstration of experiment

1. Signal generator and CRO (sine, Square wave signal, measurement of ac voltage and frequencies.
2. Spectrometer (Reading and scale, observe the spectrum, measure refractive index for different colors).
3. Electromagnetic induction using two coil.
4. Determination of least count and range for at least four measurement instruments.

b. Mini Project /Seminars/ Hands on activities.

1. Students should carry out one mini project or seminar.
2. Study of any two laboratory equipments.

c. Study tour (industrial/research institute)

-==-**

S*/-060313/-

S*/-110513/-