UNIVERSITY OF MUMBAI

Syllabus for Sem I & II
Program: B.Sc.
Course: Physics

(Credit Based Semester and Grading System for Academic year 2016-17)

Syllabusfor B.Sc. Physics(Theory&Practical)
Aspercreditbasedsystem
FirstYearB.Sc.2016–2017.

TherevisedsyllabusinPhysicsasper creditbasedsystemfortheFirstYearB.Sc.Course willbeimplementedfromtheacademicyear**2016–2017.**

Preamble:

The systematic and planned curricula from these courses shall motivate and encourage learners to understand basic concepts of Physics.

Objectives:

- To develop analytical abilities towards real world problems
- To familiarize with current and recent scientific and technological developments
- To enrich knowledge through problem solving, hands on activities, study visits, projects etc.

Course code	Title	Credits
	Semester I	
USPH101	Classical Physics	2
USPH102	Modern Physics	2
USPHP1	Practical I	2
		Total= 06
	Semester II	
USPH201	Mathematical Physics	2
USPH202	Electricity and Electronics	2
USPHP2	Practical II	2
		Total=06

SEMESTER-I

Name of the Programme	Duration	Semester	Subject
B.Sc.inPhysics	Sixsemesters	I	Physics
CourseCode	Title	Credits	
USPHP1	**Practical I**	2	

Leaning Outcome:

On successful completion of this course students will be able to:

i) To demonstrate their practical skills.
ii) To understand and practice the skills while doing physics practical.
iii) To understand the use of apparatus and their use without fear.
iv) To correlate their physics theory concepts through practical.
v) Understand the concepts of errors and their estimation.

A. <u>Regularexperiments:</u>

1	J by Electrical Method: To determine mechanical equivalent of heat (Radiation correction by graph method)
2	Torsional Oscillation: To determine modulus of rigidity η of a material of wire by torsional oscillations
3	Bifilar Pendulum
4	Spectrometer: To determine of angle of Prism.
5	Y by vibrations: To determine Y Young's Modulus of a wire material by method of vibrations- Flat spiral Spring
6	To determine Coefficient of Viscosity (η) of a given liquid by Poisseuli's Method
7	Surface Tension/ Angle of contact
8	Combination of Lenses To determine equivalent focal length of a lens system by magnification method.
9	Spectrometer: To determine refractive index μ of the material of prism
10	To study Thermistor characteristic Resistance vs Temperature
11	Constant volume/constant pressure
12	Newton's Rings To determine radius of curvature of a given convex lens using Newton's rings.
13	Wedge Shaped Film

B. Skill Experiments:

1.	Use of Verniercalipers, Micrometer Screw Gauge, Travelling Microscope
2.	Graph Plotting : Experimental, Straight Line with intercept, Resonance Curve etc.
3.	Spectrometer: Schuster's Method
4.	Use of DMM
5	Absolute and relative errors calculation.

C) Any one out of following isequivalent to two experiments from section A and/ or B

1. Students should collect the information of at least five Physicists with their work. Report that in journal.
2. Students should carry out mini-project upto the satisfaction of professor In-charge of practical.
3. Study tour. Students participated in study tour must submit a study tour report.

Minimum 8experimentsfrom the listshouldbecompletedinthe first semester. Any four skill experimentsaretobereportedinjournalCertifiedjournalis a must tobeeligibletoappearforthesemesterendpractical.

Theschemeofexaminationfortherevisedcoursein Physicsat theFirstYearB.Sc.Semester endexaminationwillbeasfollows.

SemesterEnd Practical Examination:
Schemeof examination:

There will be no internal assessment for practical.
Acandidatewillbeallowedtoappearforthesemester end practical examinationonlyifthecandidatesubmits aCertified journalatthetimeofpracticalexaminationofthe semester oracertificatefrom theHeadoftheDepartment /Institute totheeffectthathecandidate hascompleted the practicalcourseofthatsemesterofF.Y.B.Sc.Physicsasperthe minimumrequirement. The duration of the practical examination will be two hours per experiment. There will be two experiments through which the candidate will be examined in practical. The questions on slips for the same should be framed in such a way that candidate will be able to complete the task and should be evaluated for its skill and understanding of physics.

SEMESTER II

Name of the Programme	Duration	Semester	Subject
B.Sc.inPhysics	Sixsemesters	II	Physics
CourseCode	Title	Credits	
USPHP2	**Practical II**	2	

Leaning Outcome:

i) To understand and practice the skills while doing physics practical.
ii) To understand the use of apparatus and their use without fear.
iii) To correlate their physics theory concepts through practical.
iv) Understand the concepts of errors and their estimation.

A) Regular experiments:

1	Flywheel
2	To study Zener Diode as Regulator
3	To study load regulation of a Bridge Rectifier
4	LR Circuit: To determine the value of given inductance and phase angle
5	CR Circuit: To determine value of given capacitor and Phase angle
6	Frequency of AC Mains: To determine frequency of AC mains.
7	LCR series Resonance: To determine resonance frequency of LCR series circuit.
8	To study NAND and NOR gates as Universal Building Blocks
9	To study EX-OR Gate, half adder and full adder and verify their truth tables.
10	To verify De Morgan's Theorems
11	Thevenin's Theorem: To verify Thevenin's theorem for DC circuits
12	Norton's Theorem: To verify Norton's Theorem for DC circuits
13	LDR Characteristics: To study the dependence of LDR resistance on intensity of light.

B) List of Demo-experiments: (Min. four)

1.	Angular Momentum conservation (Rotating Platform)
2.	Light dependent switch
3.	Laser beam divergence, Intensity
4.	Use of Oscilloscope
5	Charging and discharging of a capacitor

6	Use of PC for graph plotting
7	Clipper and Clamper circuits.

C) Any one out of following isequivalentto two experiments from section A and/ or B

1. Students should collect the information of at least fourPhysics events and their outcome. Report that in journal.
2. Students should carry out mini-project up to the satisfaction of professor In-charge of practical
3. Study tour. Students participated in study tour must submit a study tour report.

Minimum 8experimentsfrom the listshouldbecompletedinthe first semester. Any four skill experimentsaretobereportedinjournalCertifiedjournalis musttobeeligibletoappearforthe semester endpractical.

Theschemeofexaminationfortherevisedcoursein Physicsat theFirstYearB.Sc.Semester endexaminationwillbeasfollows.

SemesterEnd Practical Examination:
Schemeof examination:

There will be no internal assessment for practical

A candidate will be allowed to appear for the semester end practical examination only if the candidate submits a Certified journal at the time of practical examination of the semester or a certificate from the Head of the Department /Institute to the effect that the candidate has completed the practical course of that semester of F.Y.B.Sc. Physics as per the minimum requirement. The duration of the practical examination will be two hours per experiment. There will be two experiments through which the candidate will be examined in practical. The questions on slips for the same should be framed in such a way that candidate will be able to complete the task and should be evaluated for its skill and understanding of physics