

GUJARAT TECHNOLOGICAL UNIVERSITY

BRIDGE COURSE

PHYSICS

B.E. 1st YEAR (w.e.f July 2014)

CONTENTS:

Sr. No.	Subject Content
1.	<u>Unit-I Introduction to Mechanics:-</u> • Inertia • Impulse, Friction and Inertia • Energy, Conservation of Energy • Momentum, Conservation of Momentum
2.	<u>Unit-2 Electricity and Magnetism:-</u> • Electric Current • Electromagnetic Induction
3.	<u>Unit-3 Basic Electronics:-</u> • Basic circuit component- Resistors, Capacitors, Transistors, ICs • Solid state electronic components – Diodes, LEDs, Solar Cell
4.	<u>Unit-4 Properties of Matter:-</u> • Pressure • Buoyancy Force • Tension and Compression

Course Planning :-

Bridge Course duration : 04 Weeks

Every Week four Hours

02 Hours of Minor Activity

02 Hours of Major Activity

Hour-1 (Basic understanding of Topic)

1. Presentation of Topic by teacher (with the help of PPTs/Videos or simple chalk and Board).
2. Doubt Solving session on the topic covered by teacher.
3. Making of groups of students by teacher (at least 6 Groups, 10 to 11 students per group).

Hour-2 (Minor Activity relevant to topic covered in hour-1 to strengthen Understanding)

1. Minor Activity suggested by teacher to students by providing material and guideline related to activity.
2. Students will perform Minor Activity as suggested by teacher.
3. Students will conclude the activity (one or two group of students can present what they have learnt during activity)
4. Teacher will evaluate the process as per rubrics given for the activity.

Hour-3,4 (Major Activity relevant to topic covered in hour-1 to strengthen Understanding)

1. Major Activity suggested by teacher to students by providing material and guideline related to activity.
2. Students will perform the Major activity suggested by teacher.
3. Students will conclude the activity (one or two group of students can present what they have learnt during activity)
4. Teacher will evaluate the process as per rubrics given for the activity.

Evaluation of Bridge course

Continuous evaluation is done on the basis of rubrics given below, teacher will evaluate every activity (04 Minor and 04 Major) activity and take average all to produce final outcome bridge course at the end of the Bridge course.

Rubrics for the evaluation :

Sr. No.	Evaluation Criterion	Marks
01.	Involvement the student during activities.	10
02.	Communication and interaction of students among the groups.	10
03.	Presentation skill	10
04.	Critical Thinking	10
05.	Team work	10
	Total	50

Learning Resources :-

Course Material :-

- Presentations, Video and Course planning are provided.

Books:-

1. Feynman Lectures on Physics Volume 1, 2 and 3.
2. Principles of Physics, Halliday, Resnik and Walker, Wiley India
3. Physics for Scientists and Engineers, Raymond A. Serway, John Jewett, Cengage Learning.
4. Concept of Physics Volume-I and Volume-II by H C Verma

Useful sites :-

- www.howstuffworks.com
- <http://www.nuffieldfoundation.org/practical-physics> ,
- <http://physicsbridgecourse.blogspot.in>
- http://web.mit.edu/physics/people/faculty/lewin_walter.html
<http://www.sciencetheater.net/>

Suggested Activities:

Unit –I Introduction to Mechanics

- **Minor Activity** : Motion of simple pendulum and energy conservation of Energy
- **Major Activity** : Measurement of Kinetic Friction with different surfaces and with different angle of inclination.

Unit –II Electricity and Magnetism

- Minor Activity : Making of Simple Motor
- Major Activity : Making of Crank Generator

Unit –III Basic Electronics

- **Minor Activity** : Use of multimeter for the measurement of carbon resistance and its comparison with colour code
- **Major Activity** : Testing of some basic component (P N Junction diodes, Transistors) with the help of multimeter and understanding of basic applications of diodes and transistors.

Unit –IV Properties of Matter

- **Minor Activity** : Measurement of elasticity of different materials.
- **Major Activity** : Measurement of Pressure and thrust in liquids.

Other suggested activities :

1. To measure the force of limiting friction for rolling of a roller on a horizontal plane.
2. To study the conservation of energy of a ball rolling down on an inclined plane (using a double inclined plane).
3. To study dissipation of energy of a simple pendulum by plotting a graph between square of amplitude and time.
4. To study the conservation of energy of a ball rolling down on an inclined plane (using a double inclined plane).
5. To study dissipation of energy of a simple pendulum by plotting a graph between square of amplitude and time.
6. To measure resistance, voltage (AC/DC), current (AC) and check continuity of a given circuit using multimeter.
7. To study effect of intensity of light (by varying distance of the source) on an L.D.R.
8. To construct a switch using a transistor and to draw the graph between the input and output voltage and mark the cut-off, saturation and active regions.
9. To study the earth's magnetic field using a tangent galvanometer.