



ਮਹਾਰਾਜਾ ਰਣਜੀਤ ਸਿੰਘ ਪੰਜਾਬ ਤਕਨੀਕੀ ਯੂਨੀਵਰਸਿਟੀ, ਬਠਿੰਡਾ
ਡੱਬਵਾਲੀ ਰੋਡ, ਬਠਿੰਡਾ - 151001

Maharaja Ranjit Singh Punjab Technical University

DABWALI ROAD, BATHINDA-151001

[A State University Estb. by Govt. of Punjab Act No. 5(2015) u/s 2(f) & Approved u/s 12B of UGC Act, 1956]

ਐਸੋ. ਡੀਨ (ਅਕਾਦਮਿਕ ਮਾਮਲੇ) 3883

Associate Dean (Academic Affairs)

Ref. No.: DAA/MRSPTU/2022/

Date: 29/07/2022

Sub.: Regarding Bridge Course for B.Tech. students admitted in 2021-22 batch onwards.

The content of the Bridge Course is available on the AICTE website and link for the same has been provided below:

S. No.	Subject Code	Module	Link of AICTE website
1.	BMNCC0-042	Lecture Based Modules for Physics (Annexure –I)	https://www.aicte-india.org/sites/default/files/final%20physics.pdf
2.	BMNCC0-043	Lecture Based Modules for Chemistry (Annexure –II)	https://www.aicte-india.org/sites/default/files/final%20chemistry.pdf
3.	BMNCC0-044	Lecture Based Modules for Mathematics (Annexure –III)	https://www.aicte-india.org/sites/default/files/final%20maths.pdf


1. These bridge courses can be taught by arranging extra lectures in the evening and their contact hours can be limited to 2 hours/week.
2. Bridge course for Mathematics can be offered in the first semester for all branches of B.Tech. for the concerned students only.
3. Bridge course for Chemistry can be offered in the first/ second semester simultaneously along with the regular subject of Chemistry for all branches of B.Tech. for the concerned students only.
4. Similarly bridge course for Physics can be offered in the second/first semester simultaneously along with the regular subject of Physics for all branches of B.Tech for the concerned students only.
5. One of the bridge courses may be offered during SIP, so as to build confidence and reduce overload on the student during running semester.
6. These bridge courses shall be of non-credit nature, but it should be compulsory for the concerned students to obtain **satisfactory** grade to continue their studies as a B.Tech student and to obtaining the final degree.
7. The departments shall offer these bridge courses and adopt the following criterion to evaluate students. They shall preserve the records and send the evaluation report to examination branch.

S. No.	Activity	Maximum Marks	Passing Criteria
1.	Evaluation by written exam after completion of bridge course curriculum. This exam should be on the same pattern as of MST in CBCS 2016.	24	≥ 12 marks
2.	Three quizzes of 6 marks each	18	≥ 3 marks, in any two quizzes.
3.	Atleast one assignment	08	≥ 4 marks
	Total	50	

The **satisfactory** grade should be given if aggregate marks are more than or equal to 25 (i.e. 50%) and the student qualify above said three passing criteria.

If student fails to obtain **satisfactory** grade, he/she needs to appear in the bridge course again whenever offered.

- The Examination branch shall include the Bridge Course completion certificate in DMC/ Degree of the student.


Associate Dean (Academic Affairs)



**Lecture Based
Modules for Bridge Course in
Physics**



All India Council for Technical Education
Nelson Mandela Marg, Vasant Kunj, New Delhi 110 070
www.aicte-india.org

I - Approved

PHYSICS MODULES

(For AICTE Approved Colleges)

Prepared by

Department of Physics
Indian Institute of Technology
(Banaras Hindu University)

Varanasi - 221005

Content

Module	Lecture Required
1. Mechanics	02
2. Mechanical Properties of Solids and Fluids	03
3. Waves and Oscillations	03
4. Electricity and Magnetism	03
5. Electromagnetic Signal	02
6. Optics	02
7. Semiconductor Electronics	03
8. Modern Physics	02
9. Atomic and Nuclear Physics	02

Syllabus

1. **Classical Mechanics:** Centre of Mass, Motion of Centre of mass, Pure Translational and Rotational motion, Torque and angular momentum, Principle of moments (Moment of Inertia), Radius of Gyration, Generalized Motion, Kinematics of rotational motion about a fixed axis.
2. **Mechanical Properties of Solids and Fluids:** Elastic behaviors of solids, Hooke's Law, Young's Modulus, Shear Modulus, Bulk Modulus, Applications of Elastic behaviors of materials, Compressibility, Viscosity, Relative density, Pascal's Law, Streamline Flow, Bernoulli's Principle, Surface Tension, Drops and Bubbles
3. **Waves and Oscillations:** Rectilinear motion, Oscillations or Vibrations, Simple Harmonic Motion, Damped Harmonic motion: Real oscillatory system, Forced or Driven oscillation, TYPES OF WAVES, Superposition of Waves, Reflection and Refraction, Standing Waves and Normal Modes, Beats, Resonance, Doppler's Effect
4. **Electricity and Magnetism:** Physical concepts of gradient, divergence, and curl; Laplacian operator, Concept of electricity and magnetism, Coulomb's law, Electrostatics, Magnetostatics, The Lorentz force, Maxwell's equations
5. **Electromagnetic Signal:** Introduction to Maxwell's equations, The dynamical magnetic field, The dynamical electric field, Electromagnetic Waves
6. **Wave Optics:** Interference of light, Photons, Young's Double Slit Experiment, Huygens's Principle, Diffraction, Diffraction Grating, Polarization
7. **Semiconductor Electronics:** Classification of metals, conductors and semiconductors, Fermi Level, Intrinsic Semiconductor, Extrinsic Semiconductor, $p-n$ junction, Semiconductor Diode, Half-Wave Rectifier, Full-Wave Rectifier, Zener diode, Photodiode, Light emitting diode, Junction Transistor
8. **Modern Physics:** Wave nature of light, Particle nature of light: the photon, De Broglie Hypothesis, Experimental confirmation of de Broglie hypothesis (Davisson and Germer's Experiment)
9. **Atomic and Nuclear Physics:** Matters, Atoms, Atomic Theory: Atomic Theory by John Dalton, Atomic Theory by J. J Thompson, Atomic Theory by Ernest Rutherford, Atomic Theory by James Chadwick, Discovery of the Neutron, Bohr's Postulates, Proton, Neutron, Electron, Limitations of Bohr's Theory

Lecture Based Modules for Bridge Course in Chemistry



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II - SEMESTER

CHEMISTRY MODULES

(For AICTE Approved Colleges)

Prepared by

Department of Chemistry
Indian Institute of Technology
(Banaras Hindu University)
Varanasi - 221005

Module 1 on Coordination Chemistry

1st Lecture: Importance of coordination chemistry, Types of complexes, Classification of Ligands.

2nd Lecture: Crystal Field Theory to explain nature of bonding in octahedral complexes.

3rd Lecture: Crystal Field Theory to explain nature of bonding in tetrahedral, tetragonally distorted octahedral and square planar complexes.

4th Lecture: Magnetic properties of all types of complexes.

5th Lecture: Color of complexes, Interpretation of Intensity of absorption bands in various complexes.

Module 2 on Organic Chemistry

Lecture 1

Introduction to Reaction Intermediates: Carbocations: Generation, stability, reactions and applications in synthetic organic chemistry, Exercise

Lecture 2

Free Radicals: Generation, stability, examples and applications in synthetic organic chemistry, Exercise.

Lecture 3 & 4

Carbenes and Nitrenes: Generation, stability, examples and applications in synthetic organic chemistry, Exercise

Lecture 5

Ylides: Generation, stability, examples and applications in synthetic organic chemistry, Exercise

Lecture 6

Organic[#] Reactions without formation of intermediates: Diels-Alder reaction, S_N2 and E2 reactions, their applications, Exercise

Module 3

Thermodynamics and Equilibrium 3 lectures

Module 4

Basics of Electrochemistry 2 lectures

Module 5

Chemical Kinetics 4 lectures

Lecture Based Modules for Bridge Course in Mathematics



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Nelson Mandela Marg, Vasant Kunj, New Delhi 110 070
www.aicte-india.org

Mathematics Modules
(For AICTE Approved Colleges)

Prepared by

Department of Mathematical Sciences

Indian Institute of Technology

(Banaras Hindu University)

Varanasi - 221005

Contents

Module	Lectures
1. Set Theory, Relations and Functions	03
2. Differential and Integral Calculus	02
3. Matrices and Determinants	02
4. Complex Numbers	03
5. Differential Equations	03
6. Analytical Geometry & Vector Algebra	03
7. Trigonometry	02
8. Probability	02
9. Statistics	02