



IK GUJRAL PUNJAB TECHNICAL UNIVERSITY JALANDHAR, PUNJAB
(Department of Academics)

Ref. No. IKG-PTU/DA/ 1752

Date: 16-5-2019

Director / Principal / Faculty Incharge /HOD
All Affiliated Institutes / University Campus/ Regional Campus
IKG Punjab Technical University Jalandhar, Kapurthala

Subject : Implementation of bridge course for the engineering students for B. Tech degree in IKGPTU main campus, constituent campuses and affiliated colleges.


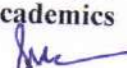
The bridge course are the foundation classes, which will be mandatorily organized for B. Tech students. The AICTE has proposed the bridge course program copy of which is attached herewith. The purpose of this module is to bridge the gap between the student's opted advanced courses at B. Tech level and their intermediate level. This program will be of approximately three weeks duration. During the induction program, it is proposed that (beside other subjects) bridge in basic Physics, Chemistry and Mathematics should be taught to these students in the induction program.

- Duration of the Bridge Course : Three weeks
- Subject to be taught : Physics, Chemistry, Mathematics
- Scheme and syllabus of bridge course is given below:

Sr. No.	Subject	Total lecture to be taught	Modules / Syllabus
1	Chemistry	20	Annexure-A
2	Mathematics	22	Annexure-B
3	Physics	22	Annexure-C

The Engineering colleges should make mandatory adjustment in the timetable of induction program for different modules in the field of Physics, Chemistry and Mathematics for B. Tech. entrants.

With Regards,


(Dr. Balkar Singh)
Director Academics


A copy is forward to:

1. Incharge Secretariat to Vice-Chancellor
2. Registrar
3. Controller of Examination, IKGPTU
4. Director (Main Campus), IKGPTU

(Annam - A)

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

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

Syllabus of above contents is as per
AICTE guidelines, displayed on the website
of AICTE.

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