

ELECTIVE COURSE

EC-202(2) Introduction to Science and Technology

Course Introduction

This course offers an introduction of Science and Technology to students from non-science background. The course will deliver positive and informed values and attitudes towards themselves, others and science and technology.

Objectives

The student would be able:

- 1.) To develop their knowledge and understanding of the role of science in creating/ changing: the environment, information & communication, life-styles products and services, agriculture, health and nutrition.
- 2.) To understand the impact of technologies people select and use; how these technologies affect other people, the environment and the future
- 3.) To introduce students to the some aspects of science of the future times and how it will affect human kind.

No. of Credits: 2

Theory Sessions per week: 2

Teaching Hours: 20 hours

UNIT	TOPICS / SUBTOPICS
1	Introduction to Science and technology and its role
	<ul style="list-style-type: none">• Introduction to Science<ul style="list-style-type: none">○ History of science○ Major Historical Scientific and technological achievements in India• Role of science and technology in today's world<ul style="list-style-type: none">○ Science and technology and the developing countries○ Science Policy in India○ Role of science in India○ Societal aspects of science and technology in India
	<ul style="list-style-type: none">• Emergence of modern Science in India<ul style="list-style-type: none">○ Science & technology in the 20th century○ Science and technology infrastructure in India Today○ Overview of India's achievements in Science & tech. sphere○ Variety of Science Communication Media
2	Nuclear Technology & Material Technology
	<ul style="list-style-type: none">• Nuclear Technology<ul style="list-style-type: none">○ Nuclear Energy<ul style="list-style-type: none">▪ Introduction and Scientific basis of nuclear energy

	<ul style="list-style-type: none"> ○ Advantages and Disadvantages of nuclear Fission Energy ○ Reactor Safety systems ○ Radioisotopes & its applications ○ Medical Diagnosis using nuclear medicine ○ Radiotherapy ○ Radiation and Environment ○ Radiation damage and its study ○ Research and development in nuclear technology in India
	<ul style="list-style-type: none"> • Material Technology <ul style="list-style-type: none"> ○ Nanoscience and nanotechnologies <ul style="list-style-type: none"> ▪ Basics of Nanoscience ▪ Introduction to Nanomaterials ○ Applications of Nanotechnology ○ Cryogenics ○ Laser and Photonics <ul style="list-style-type: none"> ▪ Photonics and its applications ▪ Lasers and its applications
3	Space Technology & Earth Sciences in India
	<ul style="list-style-type: none"> • Space Technology <ul style="list-style-type: none"> ○ Launch Vehicle Technology ○ Propulsion method for launch vehicles ○ Satellites and their orbits(GTO orbits) ○ Global Positioning System ○ Scientific Experiments on the space station ○ Remote Sensing ○ Some Important Indian satellites ○ Brief about PSLV & GSLV
	<ul style="list-style-type: none"> • Earth Sciences in India <ul style="list-style-type: none"> ○ Introduction to earth science • Meteorological science <ul style="list-style-type: none"> ○ Meteorology ○ Weather Prediction ○ Weather Modification and cloud seeding
4	Defence and Biotechnology
	<ul style="list-style-type: none"> • The effects of weapons of Mass destruction • Nuclear Weapons • Effects of Nuclear weapons • Biological and toxin weapons • Missile Technologies • Defence in India <ul style="list-style-type: none"> ○ Defence Research and development organization ○ BRAHMOS cruise missiles ○ Stealth technology and aircraft

	<ul style="list-style-type: none"> • Biotechnology <ul style="list-style-type: none"> ○ What is Biotechnology? ○ Important techniques used in Biotechnology ○ Nanobiotechnology ○ Cloning ○ Bioinformatics technology ○ Major Application Areas of Biotechnology
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Text Book:

Science and technology

Publisher: Tata McGraw Hill

Author: Ashok Kumar Singh

Chapters 1 to 13, 26 to 30 and 33 to 39 (to be covered)

Reference Books:

1. CONCEPTS OF NUCLEAR PHYSICS

Publisher: Tata McGraw Hill

By Bernard Cohen

2. The Good Earth: Introduction to Earth Science

Publisher: Tata McGraw Hill

By David McConnell, David Steer,
Katharine Owens, Catherine Knight

3. Understanding Space: An Introduction to Astronautics + Website

Publisher: Tata McGraw Hill

By Jerry Sellers, William Astore,
Robert Giffen, Wiley Larson