



puters, LED, photocells, solar lights etc.

- l) Illustrate the conditions for light amplification in various LASER and laser based instruments and optical devices.
- m) Appreciate the potential of optical fiber in fields of medicine and communication.
- n) Express importance of nanoscience and nanotechnology and impact of nanotechnology to the society.

### References:

1. Text Book of Physics for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi
2. Applied Physics, Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, Delhi
3. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
4. Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi.
5. Modern approach to Applied Physics-I and II, AS Vasudeva, Modern Publishers.
6. A Textbook of Optics, N Subramanyam, Brij Lal, MN Avahanulu, S Chand and Company Ltd.
7. Introduction to Fiber Optics, Ajoy Ghatak and K Thyagarajan, Cambridge University Press India Pvt. Ltd, New Delhi.
8. Nanoscience and Nanotechnology, KK Choudhary, Narosa Publishing House, Pvt. Ltd. New Delhi.
9. Nanotechnology: Importance and Applications, M.H. Fulekar, IK International Publishing House Pvt. Ltd, New Delhi.
10. e-books/e-tools/ learning physics software/websites etc.

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Course Code	:	ES 102
Course Title	:	Introduction to IT Systems
Number of Credits	:	2 (L: 2, T: 0, P: 0)
Prerequisites (Course code)	:	NIL
Course Category	:	ES

### Course Objectives::

This course is intended to make new students comfortable with computing environment - Learning basic computer skills, Learning basic application software tools, Understanding Computer Hardware, Cyber security awareness

### Course Content:

#### UNIT 1:

Basic Internet skills: Understanding browser, efficient use of search engines, awareness about Digital India portals (state and national portals) and college portals.

General understanding of various computer hardware components – CPU, Memory, Display, Keyboard, Mouse, HDD and other Peripheral Devices.

#### UNIT 2:

OS Installation (Linux and MS Windows), Unix Shell and Commands, vi editor.

#### UNIT 3:



HTML4, CSS, making basic personal webpage.

#### UNIT 4:

Office Tools: OpenOffice Writer, OpenOffice Spreadsheet (Calc), OpenOffice Impress.

#### UNIT 5: Information security best practices.

Class lectures will only introduce the topic or demonstrate the tool, actual learning will take place in the Lab by practicing regularly.

#### Suggested Lab Work:

This is a skill course. Topics/concepts taught in the class should be practiced in the Lab same week and practiced regularly during the semester till student becomes confident about it. This course is all about some theory and a lot of practice.

#### References:

- R.S. Salaria, Computer Fundamentals, Khanna Publishing House
- Ramesh Bangia, PC Software Made Easy – The PC Course Kit, Khanna Publishing House
- Online Resources, Linux man pages, Wikipedia
- Mastering Linux Shell Scripting: A practical guide to Linux command-line, Bash scripting, and Shell programming, by Mokhtar Ebrahim, Andrew Mallett

#### Course outcomes:

At the end of the course student will be able to comfortably work on computer, install and configure OS, assemble a PC and connect it to external devices, write documents, create worksheets, prepare presentations, protect information and computers from basic abuses/attacks.

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Course Code	:	ES104
Course Title	:	Fundamentals of Electrical and Electronics Engineering
Number of Credits	:	3 (L: 2, T: 1, P: 0)
Prerequisites	:	NIL
Course Category	:	ES

#### Course Objectives:

To provide basic knowledge of the different elements and concepts of electrical engineering field and to learn basic concepts of various active and passive electronic components, Signals, Op-Amp and their applications, Digital Electronics and their applications to help students deal with electrical and electronics engineering principles and applications in industrial processes of different fields.

#### Course Content:

##### UNIT I Overview of Electronic Components & Signals:

Passive Active Components: Resistances, Capacitors, Inductors, Diodes, Transistors, FET, MOS and CMOS and their Applications. Signals: DC/AC, voltage/current, periodic/non-periodic signals, average, rms, peak values, different types of signal waveforms, Ideal/non-ideal voltage/current sources, independent/dependent voltage current sources.

##### UNIT II Overview of Analog Circuits: