PHY 111 FUNDAMENTALS OF PHYSICS 2(2+0)

UNIT I
Wave Motion, Sound and Radiation
Basic Definitions, Types of waves, Ultrasonics, Electromagnetic radiation, Wave & Particle Theory

UNIT II
Modern Physics
Quantum Theory
Failure of classical mechanics, Plank's hypothesis and radiation law, Plank's quantum theory

UNIT III
Classification of Solids
Energy levels in solids, band theory, Conductors, semiconductors and insulators; bonds in semi-conductors; types of semiconductors and its conductivity, Junction diode; junction transistors, Superconductivity and its types, properties, theories etc., Lasers and its properties: Spontaneous and stimulated emission of radiation; Absorption, Radiation population inversion, pumping and active system, Optical Feedback, Threshold condition, Laser Modes, Classes of Lasers, Mode Locking, Einstein coefficients. Types of lasers. Uses of laser.

UNIT IV
Fibre Optics
Introduction, Principle, Structure and classification, Numerical aperture, types of optical fibre, Fibre optics communication system, Multi mode and single mode fibre, Scalar wave equation and the modes of a fibre, Pulse dispersion, Multimode fibers with optimum profiles, First and second generation fibre optic communication systems, Advantages of optical fibre communication, Applications and uses

Reference Books
1. Ghatak, Optics, Tata McGraw Hill, 3rd Edition
2. R K Gaur and S L Gupta, Engineering Physics, Dhanpat Rai Publications, New Delhi
3. Neamen, Donald A., Semiconductor Physics and Devices, 3rd Ed. McGraw Hill, 2007, ISBN 0-07-232107-5—ISBN 0-07-119862-8(ISE).
4. Lasers and Non linear optics – B B Laud, New Age International
5. Modern Physics by B S Agarwal (Pragati Prakashan)

Web Materials
1. http://www.nptel.iitm.ac.in/courses/Webcoursecontents/IIT%20Guwahati/engg_physics/index_cont.htm
2. http://ncert.nic.in/html/learning_basket.htm
3. http://science.howstuffworks.com/laser1.htm
4. http://physics-animations.com/Physics/English/optics.htm
5. http://physics-animations.com/Physics/English/waves.htm
6. http://www.epsrc.ac.uk
7. http://www.pitt.edu/~poole/physics.html#light
8. http://de.physnet.net/PhysNet/optics.html

ENG 111 ENGLISH FOR SPEAKING AND WRITING SKILLS 2(1+1)

UNIT I

Listening

Principles – Active and Passive Listening – Process of Active Listening- Interactive Listening, Listening cloze – Barriers to Listening-Listening to the audio and video CD's of TOEFL and IELTS and audio video CD's of B.B.C and audio CD's of BEC.

UNIT II

Speaking

Influence of L_1 on L_2 – Conversation practice – Dialogue – Principles and Practice.

UNIT III

Reading

Reading with fluency and accuracy – Critical reading (analysis, evaluation and synthesis) – SQ3R - Skimming and Scanning – Reading Cloze.

UNIT IV

Writing

Personal writing (Personal letters and E-mail) – Public writing (Complaints) – Social writing (Conveying congratulations, Condolence, Notice, Circulars) – Creative writing (Popular articles) and Institutional writing (Assignments and Scientific article writing) - Essay Writing.

Practical

1. Listening – Principles, Kinds and Process - Barriers to Listening – Study
2. Interactive listening – Listening to IELTS and TOEFL CD's – Discussion and Exercises
3. Listening cloze – Task from Cambridge BEC
4. Speaking – Influence of L_1 on L_2 – Problems and Analysis
5. Dialogue – Study of Principles and Practice
6. Critical Reading and SQ3R – Discussion
7. Reading cloze – Tasks from Cambridge IELTS
8. Skimming and Scanning – Tasks from Barron's TOEFL
9. Personal Writing and Public Writing – Personal letters, E-mail, Complaints and Fan mail
10. Social and Creative writing – Conveying congratulations, Condolence, Notices, Circulars and assignments
11. Institutional writing – Report writing, Note taking, Rejoinders and Scientific Article Writing
12. Essay Writing – Study of definition and kinds

PE 111 NATIONAL SERVICE SCHEME 1*(0+1)

Introduction to National Service Scheme – objectives and motto of NSS – programme planning and development – kinds of activities in regular and special camping programmes – aspects of NSS programmes – institutional, rural and urban projects – village/slum adoption – organisational and administrative arrangements of NSS at national, state, university and college levels – each student has to undergo a minimum of 240 hours of regular service in two consecutive and attend one special camp of ten days duration in the following activities to complete the course – environmental enrichment and conservation – plantation of trees, their preservation and upkeep.

Construction of rural roads, cleaning of village ponds, popularisation of bio-gas plants, prevention of soil erosion, health, family welfare and nutrition programmes, mass immunisation, blood donation, integrated child development, population education – programme, aimed at creating awareness for improvement of the status of woman – production oriented programmes – teaching improved agricultural technologies, rodent control and pest management, weed control, soil testing, guidance in animal husbandry and poultry farming and small savings. Programmes of work during emergencies and natural calamities like cyclones, floods and earthquake – assisting the authorities in distributions of rations, medicines and clothes – assisting health authorities in inoculation, supply of medicines etc. – reconstruction of huts, relief and rescue work – adult education, programmes of continuing education of school dropouts, coaching of students from economically weaker sections, organisation of youth clubs, discussions on eradications of social evils like castism, regionalism, corruption, untouchability etc. non-formal education of rural youth – awareness programmes on drug abuse and AIDS – voter awareness campaign.

OR

PE 111 NATIONAL CADET CORPS 1*(0+1)

Organisation – NCC – Director General, Directorate, group – army – infantry – section – company – battalion, military history various wars – post and after independence of India, introduction to defense services – system of NCC training, foot drill – attention, stand at ease and stand easy – sizing – forming up in three ranks, open and close order march – dressing – getting on parade, dismissing and falling out – saluting – marching, arms drill – shoulder arm – order arm – present arm – guard of honour – ceremonial drill.

Weapon training – rifle – buoyant – light machine gun – sten machine carbine – introduction and characteristics – stripling – assembling and cleaning – loading and unloading – firing, field – craft – visual training – targets – judging distance – fire discipline and fire control orders – battle craft – field signals – description of ground – section formatic – section battle drill – scouts and patrols – ambush – field engineering – map reading – conventional signs – grid systems – use of service protractor – prismatic compass and its use, self-defense – general principles – precautions and training – attacks and counter attacks – marching and searching – first aid – hygiene and sanitation – civil defense – leadership – NCC song.

OR

PE 111 PHYSICAL EDUCATION 1*(0+1)

Definition, rules and regulations of anyone of the games and Athletic events. Warming up and conditioning exercise are compulsory for each student – conditioning and calisthenics for various Athletic activities. Exercise for strength, agility, co-ordination, flexibility, co-operation, vital capacity endurance, speed and for various systems of our body and team spirit.

Compulsory skill development in anyone of the following games

Basket Ball, Volley Ball, Ball Badminton, Foot Ball, Kho-Kho, Chess, Kabaddi, Cricket, Table Tennis, Shuttle Badminton, Gymnastics, Athletics viz. Jumps, Throws, Hurdles

Aims and Objectives of Yoga – Asanas: i.e. Padmasana, Pujankasana, Sarvangasana, Chakrasana,

Dhanurasana, Halasana, Mayurasana and Savasana. Asanas for Ailments, Back pain, Arthritis, Abdominal problems, Stress, Fatigue, Insomnia, Obesity, Circulation, Hypertension, Varicose veins, Respiration, Heart, Digestion, head Aches, Depression, Addiction and eye problems.

Mental Balance and Importance – Development of concentration Suriyanamaskar – Advance skills of any one of the games which were taught in the I Semester.