Physics Group (Sem-II)

COURSE WISE DETAILED CURRICULUM

23FY101 Engineering Physics

Lectures : 3 Hrs/Week

Credit : 3

Evaluation Scheme

IA : 10 Marks

ISE : 30 Marks

ESE : 60 Marks

Course Objectives: The objective of the course is to

1) Provide the useful fundamental concepts of Physics to all Engineering disciplines.

2) Make the student aware of new techniques in Physics applicable to engineering practices.

3) Encourage them to understand engineering and technical development.

Course Outcomes:

COs	At the end of successful completion of the course, the student will be able to	Bloom's Taxonomy
CO1	**Summarize** the knowledge of basic quantum mechanics to understand Wave particle dualism and uncertainty principle.	Understand
CO2	**Demonstrate** the different crystal structure and their properties by Understanding crystal physics.	Understand
CO3	**Apply** the theory and phenomenon of nanophysics to produce nanomaterials.	Apply
CO4	**Define** the basic requirements of Architectural Acoustics.	Remember
CO5	**Illustrate** the diffraction and polarization phenomenon of light.	Understand
CO6	**Explain** the concepts and applications of LASER and necessary tools for Nuclear power plant.	Understand

Description:

Engineering Physics course is offered as the basic science course. This course contains crystal structures and their properties, Approaches and techniques of nanomaterial and nanotechnology, Basic concepts of Architectural acoustics, Different phenomenon's of light, wave –particle dualism and uncertainty principle and nuclear energy. These are useful fundamental concepts of Physics to all Engineering disciplines and to make the student aware of new techniques in Physics applicable to engineering practices.

Prerequisites:	1:	Fundamentals of properties of wave and particle and types of the solid.
	2:	Different phenomenon of light and sound.

	3:	Basics of Atomic Physics and Nuclear energy	
Section – I			
Unit 1	**Wave Mechanics**		
	Introduction, Wave-particle dualism (De-Broglie's Hypothesis -light and matter), De-Broglie's wavelength in terms of Kinetic Energy, Potential Difference and Temperature, Properties of matter waves, Heisenberg's uncertainty principle for position and momentum, Compton Effect (statement, explanation and formula), Photoelectric Effect, Numerical.		**06 Hrs**
Unit 2	**Crystallography**		
	Introduction, Basics of crystal structure -Space Lattice, Basis, crystalline solid and Unit cell (geometry and types), Seven crystal system, Properties of unit cell for SC, BCC and FCC (number of atoms per unit cell, coordination number, atomic radius and packing density), Relation between density and lattice constant, Miller indices (procedure and sketches for planes), Bragg's x-ray spectrometer, Numerical.		**07 Hrs**
Unit 3	**Nanoscience and Nanotechnology**		
	Introduction, Nanomaterials, Nanoscience and Nanotechnology, Top down and bottom up approaches, Production techniques - Ball milling and Colloidal, Types of nanomaterial, Properties of material at nanoscale (Surface to Volume ratio and Quantum confinement effect), Applications of nanomaterials, Characterizations - Scanning Tunneling Microscope and Atomic Force Microscope.		**06 Hrs**
Section – II			
Unit 4	**Architectural Acoustics**		
	Introduction, Reverberation, Reverberation time, Absorption coefficient, Average absorption coefficient, Sabine's formula for reverberation time (no derivation), Factors affecting architectural acoustics and their remedy, Numerical.		**06 Hrs**
Unit 5	**Wave Optics**		
	Introduction, Theories of light, Interference of light and types, Diffraction of light and types, Construction of diffraction grating, Theory of fraunhofer diffraction by double slit, Resolving power of plane transmission grating, Polarization of light, double refraction, Huygens' theory of double refraction, Specific Rotation, Quarter wave plate and half wave plate, Laurent's half shade polarimeter, Numerical.		**07 Hrs**

Unit 6	**LASER and Nuclear Physics**	
	LASER: Introduction, Absorption, spontaneous emission and stimulated emission of radiations, Population inversion, Pumping energy, Characteristics of laser beams, Ruby laser. **Nuclear Physics:** Introduction, Nuclear Fission, Energy released by 1 Kg of U235, Nuclear fission reactor, Nuclear fusion, Thermonuclear reactions (proton-proton chain and Carbon Nitrogen cycle), Numerical.	**07 Hrs**

References:

Text Books	
1	M. N. Avadhanulu and P. G. Kshirsagar, "A Text book of Engineering Physics", S.Chand and Company, New Delhi.
2	R. K. Gaur and S. L. Gupta "Engineering Physics", Dhanpat Rai Publications, New Delhi.
Reference Books	
1	R. K. Gaur & Gupta S. L, Engineering Physics –Dhanapat Rai Publication
2	B. L. Theraja -Modern Physics - S. Chand & Company Ltd., Delhi
3	Subramanyam & BrijLal, A Text Book of Optics –S. Chand & Company (P.) Ltd.
4	M. N. Avadhanulu & P. G. Kshirsagar - A Text Book of Engineering Physics -S. Chand Publication.
5	B. K. Pandey and S. Chaturvedi- Engineering Physics, Cengage Learning

Web Links/ Video Lectures

Sr. No	Unit No./Topic	Web Links/ Video Lectures
1	Unit No. 1	https://nptel.ac.in/courses/115/101/115101010/
2	Unit No. 2	https://nptel.ac.in/courses/115/104/115104109/
3	Unit No. 2	https://nptel.ac.in/courses/115/105/115105099/
4	Unit No. 3	https://nptel.ac.in/courses/115/101/115101007/
5	Unit No. 5	https://nptel.ac.in/courses/115/105/115105083/
6	Unit No. 6	https://nptel.ac.in/courses/115/102/115102124/
7	Unit No. 6	https://nptel.ac.in/courses/115/104/115104043/
8	Physics	http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html
9	Physics	https://en.wikipedia.org/wiki/Fundamentals_of_Physics

23FY201 Engineering Mathematics-II

Lectures : 3 Hrs/Week

Credit : 3

Evaluation Scheme

IA : 10 Marks

ISE : 30 Marks

ESE : 60 Marks

Course Objectives: The objective of the course is to

1) Model a real life scenario into differential equations and solve them analytically and numerically
2) Learn different methods of solving improper and multiple integral

Course Outcomes:

COs	At the end of successful completion of the course, the student will be able to	Bloom's Taxonomy
CO1	**Solve** ordinary differential equations of order one and degree one .	Understand
CO2	**Apply** numerical methods to solve ordinary differential equations of first order and first degree.	Apply
CO3	**Evaluate** double and triple integrals.	Understand
CO4	**Use** double integration to find area , mass of plane lamina.	Apply
CO5	**Evaluate** definite integrals using Gamma and Beta functions	Apply
CO6	**Estimate** definite integrals using numerical methods	Apply

Description:

Engineering Mathematics-II course is offered as the basic science course. This course contains Mathematical methods and techniques that are typically used in engineering to solve complex engineering problems. This course has six units namely i) Differential equation of first order first degree and Applications, ii)Numerical Solution of Differential Equation of order one degree One, iii)Integral Calculus, iv) Numerical Integration, v) Multiple Integrations and vi) Application of Multiple Integrals

Prerequisites:	1:	Trigonometric identities and Logarithmic identities
	2:	Differentiation and integration formulae
	3:	Shapes of basic curves like circle, parabola, ellipse, straight line.

Section – I

Unit 1	**Differential equation of first order first degree and Applications** Exact Differential Equation, Reducible to Exact Differential Equation, Linear Differential Equation, Reducible to Linear,	**8 Hrs**

	Application to orthogonal trajectory (Cartesian and Polar)	
Unit 2	**Numerical Solution of Differential Equation of order one degree One**	
	Eulers Method Eulers modified Method Runge-Kutta Method of order four Taylor Series Method	**7 Hrs**
Unit 3	**Multiple Integrations**	
	Evaluation of double integral (Cartesian and Polar) Change of order of integration (Cartesian and polar) Evaluation of triple integration Change of Cartesian to spherical coordinates	**8 Hrs**
Section – II		
Unit 4	**Application of Multiple Integrals**	
	Area using double integration Mass of plane lamina using double integration Moment of inertia of plane lamina Volume using triple integration	**6 Hrs**
Unit 5	**Integral Calculus**	
	Gamma Function and properties Beta function and properties Differentiation Under Integral Sign (with constant limits only)	**7 Hrs**
Unit 6	**Numerical Integration**	
	Trapezoidal Rule Simpson's (1/3) rule Simpson's (3/8) rule Weddle's rule	**6 Hrs**

Note-Minimum 06 Assignments should be given covering all units

TextBooks	
1	Higher Engineering Mathematics, Dr. B. S. Grewal, S. Chand and Company, 40th Edition.
ReferenceBooks	
1	Advanced Engineering Mathematics", H. K. Das, S. Chand Publication, 8th Edition.
2	A Text Book of Applied Mathematics",Vol. I and II, P. N.Wartikar and J. N. Wartikar, Vidyarthi GrihaPrakashan, Pune.
3	A textbook of Engineering Mathematics, N. P. Bali, Iyengar, Laxmi Publications (P) Ltd, New Delhi
4	Advanced Engineering Mathematics,ErwinKreyszig, Wiley India Pvt. Ltd

Web Links/ Video Lectures

Sr. No	Unit No.	Web Links/ Video Lectures
1	1	**https://nptel.ac.in/courses/111/106/111106100/**
2	2	https://nptel.ac.in/courses/111/107/111107063/
3	3,4,5	https://nptel.ac.in/courses/111/105/111105122/
4	6	**https://youtu.be/_cgzqVmvqtQ**

23FY103 Basic Electrical and Electronics Engineering

Lectures	**:**	2 Hrs/Week	**Evaluation Scheme**	
Credit	**:**	2	**IA**	**:** 10 Marks
			ISE	**:** 30 Marks
			ESE	**:** 60 Marks

Course Objectives: The objective of the course is to

Provide the Knowledge with an introductory and broad treatment in the field of Electrical and Electronics Engineering.

Course Outcomes:

COs	At the end of successful completion of the course, the student willbe able to	Bloom's Taxonomy
CO1	**Apply** the KCL and KVL to determine the current and voltage of DC circuits .	Apply
CO2	**Describe** the basic concepts of Magnetic circuits.	Understand
CO3	**Describe** the concepts of Basic Electronics components.	Understand
CO4	**Illustrate** the Nature of single phase AC series and parallel RLC circuits by calculating impedence power factor and power consumption.	Apply
CO5	**Explain** the concept of 3 phase supply Generation , transmission , Utilization and its advantages.	Understand
CO6	**Solve** the problems related to power losses to determine the efficiency of single phase transformer.	Apply

Description:

Basic Electrical & Electronics Engineering course is offered as the engineering science course. This course contains. Basic knowledge of Electrical & Electronics engineering and its advantages, applications. This course has six units namely i) Analysis of D.C. Circuits, ii) Magnetic circuits, iii) Fundamentals of electronics iv) Single phase AC circuits, v) Three phase AC circuits, vi). Single phase Transformer

Prerequisites:	1:	Battery, Potential difference and current flow concept.
	2:	Few basic electrical and Electronics components identification
	3:	Difference between AC & DC circuits

Section – I

Unit 1	**Analysis of D.C. Circuits**	
	Concept of EMF,Potential difference, current, Power, Energy, Resistance, Ohms law,	

	Kirchhoff's laws, Mesh & Node analysis. (Numerical treatment on Mesh & Node analysis of two loops)	**05 Hrs**
Unit 2	**Magnetic circuits**	
	Concept of MMF, reluctance, magnetic flux, Magnetic flux density, magnetic field strength, Comparison of Electric & magnetic circuit, , Analysis of Series magnetic circuits.	**04 Hrs**
Unit 3	**Fundamentals of Electronics**	
	Introduction of Diode and V-I characteristics, Rectifier configuration, Analysis of Half wave Rectifier ,Full wave Rectifier and Bridge Rectifier, Introduction of Transistor.	**05 Hrs**
Section – II		
Unit 4	**Single phase A.C Circuits**	
	Faradays laws, Lenz's Law, generation of sinusoidal voltage, Analysis of pure Resistive, Inductive, Capacitive circuits, Analysis of series R-L,R-C, R-L-C circuits. (Numerical treatment on series R-L, R-C, R-L-C circuits)	**05 Hrs**
Unit 5	**Three phase A.C. Circuits**	
	Advantages of three phase system**,** Generation of three phase AC supply, phase sequence, Balanced system, Relation between line & phase quantities in Balanced star and Delta connected circuits.	**04 Hrs**
Unit 6	**Single phase Transformer**	
	Construction, operating principle, types, EMF Equation, Turns Ratios, Ideal Transformer, Power losses. (Numerical treatment on EMF Equation)	**05 Hrs**

References:

Text Books	
1)	P.V.Prasad and S.Shivan Raju – Electrical Engineering Concepts and applications – cenagage learning.
2)	B.H.Deshmukh, Electrical Engineering Concepts and applications
3)	Robert L.Boysted and Louis Nashelsky ,Electronics devices and circuit theory – Pearson education
Reference Books	
1)	B.L.Theraja – Electrical Technology Vol.1.- S.Chand publications.
2)	Nagarath I.J. and D.P.Kothari – Basic Electrical Engineering (2001) – Tata McGraw Hill.
3)	Bharati Dwivedi and Anurasg Tripathi – Fundamentals of Electrical engineering – Willey Precise.

Web Links/ Video Lectures

Sr. No	Unit No.	Web Links/ Video Lectures
1	1	https://nptel.ac.in/courses/108/106/108106172/
2	2	https://nptel.ac.in/courses/108/106/108106172/
3	3	https://nptel.ac.in/courses/108/108/108108122/
4	4	https://nptel.ac.in/courses/108/105/108105053/
5	5	https://nptel.ac.in/courses/108/105/108105053/
6	6	https://nptel.ac.in/courses/108/105/108105017/

23FY104 Basic Civil Engineering

Lectures : 2 Hrs/Week

Credit : 2

Evaluation Scheme

IA : 10 Marks

ISE : 30 Marks

ESE : 60 Marks

Course Objectives: The objective of the course is to

1. Learn the brief introduction of all aspects under civil engineering
2. Understand basic concepts of Surveying, Transportation Engineering

Course Outcomes:

COs	At the end of successful completion of the course, the student will be able to	Bloom's Taxonomy
CO1	**Illustrate** linear and angular measurements by considering principles and significance of Surveying	Knowledge
CO2	**Identify** nature of ground by using methods of leveling	Apply
CO3	**List** components of pavements, railway track and water supply scheme	Understand
CO4	**Demonstrate** basic knowledge of Civil Engineering and explain principles of building planning and Bye laws.	Understand, Evaluate
CO5	**Explain** various components and it's uses of building.	Evaluate
CO6	**Study** various building materials and it's uses.	Apply

Description:

This course include principles of building planning, building components and their functions, building materials, surveying and its principles, leveling transportation engineering, irrigation

Prerequisites:	1:	Properties of materials
	2:	Measurements
	3:	Principles

Section – I

Unit 1	**Linear and Angular Measurements**	
	Principles of surveying, Linear measurements- Chain Surveying, Instruments used- Metric chain, errors in chaining, Ranging(Direct only)- Instruments Used, nominal scale and R.F., chaining, offsetting &	**05Hrs**

	numerical, Angular Measurements- Compass survey, Meridian, bearing and its types, system of bearing, Types of compass: prismatic and surveyor compass, Calculation of included angles, correction for local attraction, Numerical.	
Unit 2	**Leveling**	
	Terms used in leveling, use of Dumpy level and Auto Level, Temporary adjustments. Methods of reduction of levels, types of leveling, Numerical.	**04 Hrs**
Unit 3	**Introduction to Transportation, Environmental Engineering**	
	Components of rigid and flexible pavement, components of railway track (Broad Gauge), Water Treatment Plant- Components with Flow Diagram	**04 Hrs**
Section – II		
Unit 4	**Introduction to Civil Engineering and Building Planning**	
	Introduction, branches of civil engineering , Relevance of civil engineering in the overall development of the country, Principles of planning, Introduction to Bye-Laws regarding building line, height of building, open space requirements, F.S.I., setbacks, Ventilation, sanitation as per municipal corporation area requirement.	**05Hrs**
Unit 5	**Components of Building**	
	A) Sub-structure: Elements of sub-structures and their Functions of elements B) Super-structure: Elements of super-structures and their Functions of elements	**05Hrs**
Unit 6	**Building Materials and Design**	
	Building Materials- cement blocks- properties and specification, Cement- Types, grades, properties and uses in brief, Concrete-Plain and reinforced cement concrete and ready mix concrete and their grades, Use and properties of bricks, steel, timber, Use and properties of roofing materials etc**.**	**03Hrs**

References:

Text Books	
1	Basic Civil Engineeringby G. K. Hiraskar, DhanpatRai Publication
2	Basic Civil Engineering by S. S. Bhavikatti, New Age International Publications
3	Building Construction by S P Arora & S P Bindra, DhanpatRai Publications
Reference Books	
1	Surveying by N. Basak, Tata Mc-Graw Hill Publication
2	Surveying Vol.I, Vol.II, Vol.III by B.C. Punmia, Laxmi Publication
3	Civil Engineering Materials - Technical Teacher's Training Institute, Chandigarh
4	Irrigation Engineering by B. C. Punmia, DhanpatRai Publications

Web Links/ Video Lectures

Sr. No	Unit No.	Web Links/ Video Lectures
1	**1**	https://nptel.ac.in/courses/105/103/105103093/
2	**2**	https://nptel.ac.in/courses/105/102/105102088/
3	**3**	https://nptel.ac.in/courses/105/102/105102088/
4	**4**	https://nptel.ac.in/courses/105/107/105107122/
5	**5**	https://nptel.ac.in/courses/105/107/105107122/
6	**6**	https://nptel.ac.in/courses/105/101/105101087/

23FY105 Cyber Security

Lectures : 02 Hrs/Week

Credit : 02

Evaluation Scheme

IA : 10 Marks

ISE : 30 Marks

ESE : 60 Marks

Course Objectives: The objective of the course is to
1. To study different types of cyber crime and network security. 2. To study different authentication methods, protocols and Email security. 3. To study digital forensics, types and digital evidence acquisition. 4. To study VAPT Audit and its purpose.

Course Outcomes:

COs	At the end of successful completion of the course, the student willbe able to	Bloom's Taxonomy
CO1	**Describe** cyber security , cyber crime &its types.	Understand
CO2	**Explain** data loss prevention , smart phone security & software security	Apply
CO3	**Apply** methods for authentication .	Apply
CO4	**Describe** email phishing, email spoofing & infection types.	Remember
CO5	**Indentify** different techniques & tools for acquiring digital evidence.	Remember
CO6	**Explain** the role of VAPT in ensuring the security of information system.	Understand

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Description:

This course is geared towards generating and enhancing awareness about cyber security challenges and the concepts of cyber security.

Prerequisites:	1:	Fundamental knowledge of Computer.
	2:	Fundamental knowledge of Mobile Application.
	3:	Awareness of internet.

Unit 1	**Introduction To Cyber Security:** • Definition of Cyber Security, Types of Cyber Security,Definition of Cyber Crime, Types of Cyber Crime, • Cyber crime's Impact on individuals, Organizations and Society • Cyber Investigation Vs Cyber Security Audit	**04 Hrs**

Unit 2	**Network and Internet Security** • Mobile/Smartphone Security • Definition and concepts of Data Loss Prevention (DLP) Web/Internet Security • Software Security	**04 Hrs**
Unit 3	**Internet Banking And Mobile Banking** • Authentication Methods (Passwords, PIN's, OTP's and Biometrics) • Secure Communication Protocol- SSL/TLS • Man in the Middle Attack (MITM) Mobile Device • Management (MDM) • For telephonic complaint - dial 1930 • Physical Complaint - First Information Report (FIR) to Police Station • Online Complaint on www.cybercrime.gov.in/webform/helpline.aspx • In Case of Mobile stolen/lost, file complaint on www.ceir.gov.in	**05 Hrs**
Unit 4	**Email Security** • Introduction to Email Security, • Definition and concepts of Email Phishing • Definition and types of Email Spoofing (Domain Spoofing and Name Spoofing) • Infection Types - Malware Email, Spam Email, Virus infected Email, • Email Attack with embedded links, • Case Studies-Trojan Horse Attack	**05 Hrs**
Unit 5	**Digital Forensics** • Introduction Digital Forensics ➢ Overview of Digital Forensics and its role in Investigation • Types of Digital Forensics • Digital Evidence Acquisition (Case Studies) ➢ Techniques and tools for acquiring digital evidence ➢ Forensic imaging and data preservation methods ➢ Validation and verification of acquired evidence	**05 Hrs**
Unit 6	**Vulnerability Assessment and Penetration Testing (VAPT) Audit** • Introduction to VAPT Audit ➢ Overview of VAPT Audit and its Purpose ➢ Role of VAPT in ensuring the security of information system • Purpose of VAPT Audit	**05 Hrs**

References:

Recommended Books	
	1. Cyber Crime Impact in the New Millennium, by R. C Mishra , Auther Press. Edition 2010. 2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by SumitBelapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011) 3. Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver,Create Space Independent Publishing Platform. (Pearson , 13th November, 2001) 4. Electronic Commerce by Elias M. Awad, Prentice Hall of India Pvt Ltd. 5. Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers. 6. Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt.Ltd. 7. Fundamentals of Network Security by E. Maiwald, McGraw Hill.

23FY106 Communication Skills (Sem - I)

Lectures	**:**	01 Hrs/Week	**Evaluation Scheme**	
Credit	**:**	1	**IA**	**:** 10 Marks
			ISE	**:** 40 Marks

Course Objectives: The objective of the course is to

- To acquaint students with basic English Grammar and help students in improving language skills
- To familiarize students with concept, various types, barriers and filters of communication
- To assist students in developing Vocabulary
- To aid them in understanding corporate meetings
- To train the students to compose and write the business letters effectively

Course Outcomes:

COs	At the end of successful completion of the course, the student will beable to	Bloom's Taxonomy
CO1	**Understand** basic concepts of grammar	Understand
CO2	**Understand** communicative techniques to participate in several activities	Understand
CO3	**Recall** appropriate vocabulary	Apply
CO4	**Demonstrate** interpersonal skills with precision and competence in different scenario.	Apply
CO5	**Write** business letters by using appropriate language tools	Apply

Description:

In the era of globalization, the most commonly used medium to express oneself is English language, especially in the industry, where almost all the service manuals, installation and commissioning manuals of the various equipment are in English and the technologist has to interpret them correctly. English is the dire need, not only for the Indian industry, but also worldwide, where the Engineering Graduates have the opportunity to take up jobs. Therefore, the basic English reading and writing skills have become almost mandatory for employment in the industry. Hence, English language has become quite a necessity for engineering students. This course is therefore designed to help the students to learn the correct grammatical structures and use the relevant vocabulary while reading and writing. Also introduce the communication theory, report writing & business correspondence to them.

Prerequisites:	1:	Basic Knowledge of English Grammar
	2:	Reading and Listening Comprehension
	3:	Basic knowledge of Writing Skills

Unit 1	**Rapid Review of English Grammar**	
	• Parts of Speech • Types of Sentences, Tenses / Verbal forms	**02 Hrs**
Unit 2	**Introduction to Communication**	
	• Nature, Importance and Process of Communication • Basic Types: Verbal- Non- verbal Communication • Barriers & Filters to Communication	**02 Hrs**
Unit 3	**Organizational Communication**	
	• Nature of Communication.-Formal & Informal • Directions of Communication: Upward, Downward, Horizontal, Internal, External • Levels of Communication	**02 Hrs**
Unit 4	**Vocabulary Building**	
	• Synonyms & Antonyms, Prefixes and Suffixes • Words often Confused: Homonym & Homophone • Idioms and Phrases	**02 Hrs**
Unit 5	**Corporate Meetings**	
	• Significance and Types of Meeting • Strategies of Conducting and Attending Meeting Effectively • Record Keeping: Notice, Agenda and Minutes	**02 Hrs**
Unit 6	**Business Correspondence**	
	• Importance of Correspondence & Elements of Letter Writing • Structure or Layouts (American & British) • Letter Writing: Simple application letters (Applications for various occasions etc.), • Letters: Inquiry, Order Placement, Complaint and its Adjustment, Invitation Letter	**04 Hrs**

References:

Recommended Books	
01	*Communication Skills by Meenakshi Raman and Sangeeta Sharma, Oxford University Press 2016 1st Edition.*
02	*Communication Skills for Engineers by S. Mishra & C. Muralikrishna (Pearson)*
03	*Basic Communication Skills for Technology by Rutherford, Andrea J. (2002).. Delhi: Pearson Education Asia*
04	*Mastering Communication by Nicky Stanton, Palgrave Master Series*
05	*Comfort, Jeremy, et al. (2011) Speaking Effectively: Developing Speaking Skills for Business English. Cambridge: Cambridge University Press. (Reprint)*
06	*Sharma, R. C. and Krishna Mohan, Basic Correspondence and Report Writing: A Practical Approach to Business and Technical Communication, Tata McGraw-Hill Publishing Company Limited, India ,5th Edition, 2017*
07	*Written Communication in English by Saran Freeman (Orient Longman)*
08	*Seely, J. The Oxford Guide to Writing and Speaking, Oxford University Press, India 3rd Edition , 2013*

09	*High School English Grammar and Composition by Wren and Martin, Blackie, 2000*
10	*Essential English Grammar (Elementary & Intermediate) Raymond Murphy (CUP)*
11	*Sethi, J. and Dhamija P.V. A Course in Phonetics and Spoken English Prentice-Hall of India 2nd Edition, 2006*
12	*English Language Laboratories, by Nira Konar, PHI Learning, 2014*
13	*Perspective of Communication and Communicative Competence, M.V. Rodriques, Concept Publishing Company, New Delhi-10059*
	www.buisnesscommunicationskills.com
	www.kcitraing.com
	www.mindtools.com

23FY101T Engineering Physics

Practical : 2 hr/week

Credit : 1

Evaluation Scheme

ISA : 25 Marks

POE : NA

Course Objectives: The objective of the course is

- To furnish the conceptual understanding of the basic principles.
- To make the students gain practical knowledge to relate with the Physics theory.
- To encourage them to understand technical development.
- To achieve perfectness in experimental skills and the study of practical applications will bring more confidence and ability to develop the skills needed to set up the equipment.

Course Outcomes:

COs	At the end of the successful completion of the course, the student will be able to	Bloom's Taxonomy
CO1	**Explain** the need for precise measurement practices for data recording.	Understand
CO2	**Interpret** the principle, concept, working and applications of wave optics, band gap energy as well as Crystal relevant experiments.	Apply
CO3	**Apply** the techniques and skills associated with modern scientific tools regarding LASER and Nuclear plants.	Apply
CO4	**Develop** scientific communication skills while performing the experiments and interpreting the results to communicate effectively the scientific activities	Apply

Description:

This course aims to make the students gain practical knowledge to relate with the theoretical studies and to use the principle in the right way to implement modern technology. The experiments are selected from various areas of Physics like Measurements, Wave Optics, Lasers, Solid state physics and Basic Electronics. The Engineering Physics Laboratory manualis written in a simple scientific language with aim, apparatus, theory, diagrams, formula, graphs and questions. These experiments will help the students to expertise in the analysis of various concepts in Optics, measurements, crystallography andelectronics-related topics.

Prerequisites:	1:	Higher secondary level Physics
	2:	Fundamentals of wave optics, Band theory and crystal.

Practical/Experiment Topic
(Minimum 8 experiments should be completed)

Number	Practical/Experiment/TutorialTopic	Hrs.	Bloom's Taxonomy
1	Measurements in Physics	02	Remember
2	Resistor and Capacitor Code	02	Remember
3	Measurement of Band Gap Energy	02	Understand
4	Study of seven Crystal Structure, Bravais Lattice and Properties of unit cell	02	Apply
5	Study of Symmetry Elements of Cubic Crystal	02	Apply
6	Determination of Interplaner distance using XRD pattern	02	Apply
7	Miller Indices	02	Apply
8	Divergence of LASER Beam	02	Apply
9	Resolving power of Telescope	02	Apply
10	Specific rotation by Polarimeter	02	Apply
11	Wavelength of different spectral lines of mercury using grating.	02	Analyze
12	Determination of wavelength of LASER using diffraction grating.	02	Analyze
13	The grating constant of the diffraction grating	02	Apply
14	Determination of e/m of an electron	02	Apply
15	Resolving power of diffraction grating	02	Apply

References:

TextBooks	
1	Engineering Physics Lab Manual, TKIET Warananagar
2	Madhusudhan Rao, Engineering Physics Lab Manual, Scitech Publication
3	O.P. Singh, Vipin Kumar, R.P. Singh,Engineering Physics Practical Manual, Ram Prasad Publication
ReferenceBooks	
1	Resnick Halliday, Physics Volume-I, Krane -John Wiley & Sons Pub.
2	Resnick Halliday, Physics Volume-II, Krane -John Wiley & Sons Pub.

Virtual Lab Link:

1. **Experiment name-** Diffraction Grating (**Lab Name-**Optics virtual lab)
http://vlab.amrita.edu/?sub=1&brch=281&sim=334&cnt=1

2. **Experiment name-** Crystal Structure (**Lab Name-**solid state physics virtual lab)
http://vlab.amrita.edu/?sub=1&brch=282&sim=370&cnt=1

3. **Experiment name-**Laser beam divergence and spot size (**Lab Name-**laser optics virtual lab)
http://vlab.amrita.edu/?sub=1&brch=189&sim=342&cnt=1

4. **Experiment name-** Numerical Aperture of Optical Fiber (**Lab Name-**laser optics virtual lab)
http://vlab.amrita.edu/?sub=1&brch=189&sim=343&cnt=1

5. **Experiment name-** B-H Curve (**Lab Name-**solid state physics virtual lab)
http://vlab.amrita.edu/?sub=1&brch=282&sim=1507&cnt=1

6. **Experiment name-** Photoelectric effect (**Lab Name-**modern physics virtual lab)
http://vlab.amrita.edu/?sub=1&brch=195&sim=840&cnt=1

7. Experiment name- Energy Band Gap of Semiconductor (**Lab Name-**Basics of Physics lab)
https://bop-iitk.vlabs.ac.in/exp/energy-band-gap/

23FY201T-ENGINEERING MATHEMATICS – II TUTORIAL

Tutorial/Practical : 1 hr/week
Credit : 1

Evaluation Scheme
ISA : 25 Marks
POE : NA

CourseObjectives: The objective of the course is to
. Model a real life scenario into differential equations and solve them analytically and numerically
. Learn different methods of solving improper and multiple integral.

Course Outcomes:

COs	**At the end of successful completion of the course, the student will be able to**	**Bloom's Taxonomy**
CO1	**Solve** linear and nonlinear ordinary differential equations of order one and find orthogonal trajectory.	Knowledge, Application
CO2	**Find** numerical solutions of ordinary differential equations of first order and first degree.	Knowledge
CO3	**Compute** double and triple integrals.	Knowledge
CO4	**Find** area , mass of plane lamina using double integral.	Application
CO5	**Evaluate** definite integrals using Gamma and Beta functions.	Evaluation
CO6	**Solve** definite integral numerically.	Knowledge

Description:

Engineering Mathematics-II course is offered as the basic science course. This course contains Mathematical methods and techniques that are typically used in engineering to solve complex engineering problems. This course has six units namely i) Differential equation of first order first degree andApplications,ii)NumericalSolutionofDifferentialEquationoforderonedegreeOne,iii)Integral Calculus, iv) Numerical Integration, v) Multiple Integrations and vi) Application of Multiple Integrals

Prerequisites:	1:	Trigonometric identities and Logarithmic identities
	2:	Differentiation and integration formulae
	3:	Shapes of basic curves like circle, parabola, ellipse, straight line.

Tutorials

Number	Practical/Experiment/TutorialTopic	Hrs.	Bloom's Taxonomy
1	Exact and reducible exact differential equation	2	Knowledge
2	Linear, reducible to linear diff equation and Applications	2	Knowledge, Application
3	Evaluation of double and triple integration	2	Knowledge
4	Change of order of integration	2	Knowledge
5	Area by double integral, Mass of Lamina	2	Knowledge, Application
6	Gamma function and Differentiation under integral sign	2	Knowledge
7	Beta functions and properties	2	Knowledge
8	Euler and Eulers modified method	2	Knowledge
9	Taylor series and Runge Kutta of order four	2	Knowledge
10	Trapezoidal and Simpson (1/3) rule Simpsons (3/8)th andWeddles rule	2	Knowledge

References:

TextBooks	
1	Higher Engineering Mathematics, Dr. B. S. Grewal, S. Chand and Company, 40th Edition.
ReferenceBooks	
1	Advanced Engineering Mathematics", H. K. Das, S. Chand Publication, 8th Edition.
2	A Text Book of Applied Mathematics",Vol. I and II, P. N.Wartikar and J. N. Wartikar, Vidyarthi GrihaPrakashan, Pune.
3	A textbook of Engineering Mathematics, N. P. Bali, Iyengar, Laxmi Publications (P) Ltd, New Delhi
4	Advanced Engineering Mathematics,ErwinKreyszig, Wiley India Pvt. Ltd

23FY103T Basic Electrical & Electronics Engineering Lab (Sem- I & II)

Tutorial/Practical : 2 hr/week
Credit : 1

Evaluation Scheme
ISA : 25 Marks

Course Objectives: The objective of the course is to
Provide the students with an introductory and broad treatment of the field of Electrical and Electronics engineering.

Course Outcomes:		
COs	**At the end of successful completion of the course, the student will be able to**	**Bloom's Taxonomy**
CO1	**Make** electrical connection for different circuits	Understand
CO2	**Apply** the different laws	Apply
CO3	**Analyze** V-I characteristics of Bridge circuits	Analyze
CO4	**Determine** the efficiency of transformer	Evaluate

Description:		
Basic Electrical Engineering course is offered as the engineering science course. This course contains basic knowledge of electrical engineering and its advantages, applications. This course has six units namely i) Analysis of D.C.Circuits, ii) Magnetic circuits, iii) Single phase AC circuits, iv) Three phase AC circuits, v) Single phase Transformer and vi). Fundamentals of electronics		
Prerequisites:	1:	Battery , Potential difference and current flow concept.
	2:	Few basic electrical components identification
	3:	Difference between AC & DC circuits
	4:	Few basic electronics components identification

Experiment

Number	**Practical/ Experiment/Tutorial Topic**	**Hrs**	**Bloom's Taxonomy**
1	Laboratory sessions covering, general introduction to	2	Understand

	electrical engineering laboratory, experimental setups, Instruments etc. Electrical symbols		
2	Electric shocks & precautions against shocks	2	Understand
3	Study of Ohm's law	2	Apply
4	Verification of Kirchhoff's Voltage law & Kirchhoff's Current law	2	Apply
5	B-H Curve for magnetic material	2	Understand
6	Study of Half wave Rectifier	2	Understand
7	Study of Full wave Rectifier	2	Understand
8	Determination of Reactance's for series R-L-C circuit	2	Apply
9	Demonstration of Power factor Improvement by static capacitor	2	Apply
10	Polarity & Ratio test for Single phase Transformer	2	Apply
11	Load tests on single phase transformer	2	Apply
12	Study of Basic method of Earthing, Use of Fuse & MCB	2	Understand
13	Study of different luminaries including Mercury Vapour lamp, fluorescent tube, CFL & LED lamp	2	Understand

References:

Text Books:	
1)	P.V.Prasad and S.Shivan Raju – Electrical engineering concepts and applications – cenagage learning.
2)	B.H.Deshmukh, Electrical engineering concepts and applications
3)	Robert L.Boysted and Louis Nashelsky ,Electronics devices and circuit theory – Pearson education
Reference Books:	
1)	B.L.Theraja – Electrical Technology Vol.1.- S.Chand
2)	Nagarath I.J. and D.P.Kothari – Basic Electrical Engineering (2001) – Tata McGraw Hill.
3)	Bharati Dwivedi and Anurasg Tripathi – Fundamentals of Electrical engineering – Willey Precise.

23FY104T-BasicCivilEngineering Lab

Tutorial/Practical : 2 hr/week
Credit : 1

Evaluation Scheme
ISA : 25 Marks
POE : NA

Course Objectives: The objective of the course is to
1. To learn the brief introduction of all aspects under civil engineering 2. To understand basic concepts of Surveying, Transportation Engineering

Course Outcomes:

COs	At the end of successful completion of the course, the student will be able to	Bloom's Taxonomy
CO1	**Identify** and apply different distance measurement tools.	Application
CO2	**Determine** positions of an object by compass.	Evaluation
CO3	**Find** the elevations of given points.	Evaluation
CO4	**Illustrate** principle of planning	Understand

Description:		
Thiscourseincludeprinciplesofbuildingplanning,buildingcomponentsandtheirfunctions,building materials,surveyinganditsprinciples,levelingtransportationengineering,irrigation		
Prerequisites:	1:	Distance measurement
	2:	Directions with respect to North
	3:	Nature of ground

Number	Practical/Experiment/TutorialTopic	Hrs.	Bloom's Taxonomy
1	Measurement of Distances	2	Application
2	Traversing by Compass	2	Application
3	Reduction of levels by Collimation Plane Method	2	Application,Analysis
4	Finding out gradient of line by Rise &fall method	2	Application,Analysis
5	Site visit for study of various construction processes and Building planning	2	Application
6	Drawing a line plan of residential building by applying Principles of planning	2	Application
7	Drawing sheet showing various building components	2	Application

References:

Text Books	
1	BasicCivilEngineeringbyG. K. Hiraskar,DhanpatRaiPublication
2	BasicCivilEngineeringbyS. S. Bhavikatti,NewAgeInternationalPublications
3	BuildingConstructionbySP Arora&S PBindra,DhanpatRaiPublications
ReferenceBooks	
1	SurveyingbyN.Basak,TataMc-GrawHillPublication
2	SurveyingVol.I,Vol.II,Vol.IIIbyB.C.Punmia,LaxmiPublication
3	CivilEngineeringMaterials-TechnicalTeacher'sTrainingInstitute,Chandigarh
4	IrrigationEngineeringbyB. C. Punmia,DhanpatRaiPublications

23FY105 Cyber Security – PRACTICAL

Tutorial/Practical	:	02 hr/week	**Evaluation Scheme**	
Credit	:	1	**ISA**	: 25 Marks
			POE/OE	: 25 Marks

Course Objectives: The objective of the course is to		
Study how to report cyber crime, phishing emails, secure net banking, VAPT Audit format.		
Course Outcomes:		
COs	**At the end of successful completion of the course, the student will be able to**	**Bloom's Taxonomy**
CO1	**Understand** different cyber crime.	**Understand**
CO2	**Understand** phishing E mails.	**Understand**
CO3	**Understand** VAPT Audit.	**Understand**
CO4	**Apply** authentication methods.	**Apply**

Description:		
Course deals with understanding of different types of Cyber Security, Cyber Crime.		
Prerequisites:	1:	Fundamental knowledge of Computer.
	2:	Fundamental knowledge of Mobile Application.
	3:	Awareness of internet.

Practical

Nos	Practical/ Experiment/Tutorial Topic	Hrs	Bloom's Taxonomy
01	Checklist for reporting cyber crime at Cyber crime Police Station.	02	**Knowledge**
02	Checklist for reporting cyber crime online.	02	**Knowledge**
03	Reporting phishing emails. (Spoofing, Phishing)	02	**Knowledge**
04	Checklist for secure net banking.	02	**Knowledge**
05	Basic checklist, privacy and security settings for popular Social media platforms.	02	**Knowledge**
06	Configuring security settings in Mobile Wallets and UPIs	02	**Knowledge**
07	VAPT Audit format.	02	**Knowledge**
08	Setting and configuring two factor authentications in the Mobile phone.	02	**Knowledge**

References:

Recommended Books

1. Cyber Crime Impact in the New Millennium, by R. C Mishra , Auther Press. Edition 2010.
2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011)
3. Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver, Create Space Independent Publishing Platform. (Pearson , 13th November, 2001)
4. Electronic Commerce by Elias M. Awad, Prentice Hall of India Pvt Ltd.
5. Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers.
6. Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt. Ltd.
7. Fundamentals of Network Security by E. Maiwald, McGraw Hill.

23FY106T Communication Skills (Sem - I) – PRACTICAL

Tutorial/Practical : 02 hr/week
Credit : 1

Evaluation Scheme
ISA : 25 Marks

Course Objectives: The objective of the course is to
•To acquaint students with basic English Grammar and help students in improving language skills •To assist students in developing Vocabulary and phonetic drill •To aid them in understanding corporate meetings •To train the students to compose and write the business letters effectively

Course Outcomes:

COs	At the end of successful completion of the course, the student will be able to	Bloom's Taxonomy
CO1	**To formulate** grammatical sentences correctly and apply communicative techniques effectively	Understand
CO2	**Understand** and use vocabulary effectively	Understand & Apply
CO3	**Display** standard writing skills while composing business letters and report preparation	Create

Description:

This course is designed to help the students to practice the correct grammatical structures and use the relevant vocabulary while reading and writing. Also give them practical experience of corporate meetings, Phonetics, Intonation and articulation Drill. Similarly provide them with basic structure and lay out of report writing & business correspondence.

Prerequisites:	1:	Basic Knowledge of English Grammar
	2:	Reading and Listening Comprehension
	3:	Basic knowledge of Writing Skills

Practical

Number	Practical/ Experiment/Tutorial Topic	Hrs	Bloom's Taxonomy
01	Star of Life: Introducing Yourself	02	Apply
02	Vocabulary Building Exercises	02	Remember
03	Vocabulary Building Exercises	02	Remember
04	Grammar Activities – Irregular verb list	02	Understand
05	Conducting & Attending Meeting	02	Apply
06	Conducting & Attending Meeting	04	Apply
07	Practice on writing General Applications	02	Apply
08	Practice on Business Correspondence	02	Apply

References:

Recommended Books	
01	*Communication Skills by Meenakshi Raman and Sangeeta Sharma, Oxford University Press 2016 1st Edition.*
02	*Communication Skills for Engineers by S. Mishra & C. Muralikrishna (Pearson)*
03	*Basic Communication Skills for Technology by Rutherford, Andrea J. (2002).. Delhi: Pearson Education Asia*
04	*Mastering Communication by Nicky Stanton, Palgrave Master Series*
05	*Comfort, Jeremy, et al. (2011) Speaking Effectively: Developing Speaking Skills for Business English. Cambridge: Cambridge University Press. (Reprint)*
06	*Sharma, R. C. and Krishna Mohan, Basic Correspondence and Report Writing: A Practical Approach to Business and Technical Communication, Tata McGraw-Hill Publishing Company Limited, India ,5th Edition, 2017*
07	*Written Communication in English by Saran Freeman (Orient Longman)*
08	*Seely, J. The Oxford Guide to Writing and Speaking, Oxford University Press, India 3rd Edition , 2013*
09	*High School English Grammar and Composition by Wren and Martin, Blackie, 2000*
10	*Essential English Grammar (Elementary & Intermediate) Raymond Murphy (CUP)*
11	*Sethi, J. and Dhamija P.V. A Course in Phonetics and Spoken English Prentice-Hall of India 2nd Edition, 2006*
12	*English Language Laboratories, by Nira Konar, PHI Learning, 2014*
13	*Perspective of Communication and Communicative Competence, M.V. Rodriques, Concept Publishing Company, New Delhi-10059*
	www.buisnesscommunicationskills.com
	www.kcitraing.com
	www.mindtools.com

23FY107T Engineering Drawing

Tutorial/Practical : 2 hr/week
Credit : 1

Evaluation Scheme
ISA : 25 Marks
OE : 25 Marks

Course Objectives: The objective of the course is to

1. Communicate information by graphical means.
2. Understand and read drawing and present the same.

Course Outcomes:

COs	At the end of successful completion of the course, the student will be able to	Bloom's Taxonomy
CO1	**Draw** the neat drawings of engineering curves.	Remember
CO2	**Understand** the Projection of Point, straight lines, Plane.	Remember
CO3	**Construct** neat Sketch of orthographic Projection, isometric drawings.	Apply
CO4	**Prepare** the objects by developing surfaces of solids with cutting planes.	Apply

Description:

Engineering Drawing Course consists of drawings on each unit. Students solve the more problems and draw drawings so they can Visualize and construct objects.

Prerequisites:	1:	Knowledge of Geometry at SSC Level
	2:	Knowledge of free hand sketch

Practical

Number	Practical/ Experiment/Tutorial Topic	Hrs.	Bloom's Taxonomy
1	Fundamentals of Engineering Drawing	2	Understand
2	Construction of Engineering Curves	4	Apply
3	Draw the Projection of planes (1st Angle Projection only)	4	Apply
4	Draw the orthographic views, (One simple orthographic & one Sectional Orthographic). Four problems on drawing sheet.	4	Apply
5	Draw the isometric view of solid Four problems of isometric view on drawing sheet	4	Create
6	Draw the development of the surfaces of the solids in given conditions of the planes Four problems on drawing sheet.	4	Apply

References:

Text Books	
1	Engineering Drawingby N. D. Bhatt, Charotor Publication House, Bombay
2	Machine Drawing by N. D. Bhatt, Charotor Publication House, Bombay.
3	Engineering Drawing and Graphics Using AutoCAD by T. Jeyapoovan, Vikas Publication.
4	A text book of Engineering Drawing by R. K. Dhawan, S. Chand and Co.
Reference Books	
1	Engineering Graphics with AutoCAD - D. M. Kulkarni, A. P. Rastogi, A. K. Sarkar, (PHI) Publisher 2010.
2	Machine Drawing by K. L. Narayana, New Age Publication
3	Engineering Drawing by N. B. Shaha and B. C. Rana, Pearson Education.
4	Engineering Drawing by Prof. Amar Pathak, WIELY India Publication.

23FY108T Manufacturing Techniques Lab

Tutorial/Practical : 2 hr/week
Credit : 1

Evaluation Scheme
ISA : 50 Marks
POE : NA

Course Objectives: The objective of the course is to
1) Develop a skill in dignity of labour, precision, safety at work place, team working anddevelopment of right attitude 2) Acquire skills in basic engineering practice 3) Develop general machining skills in the students and develop small products

Course Outcomes:		
Cos	**At the end of successful completion of the course the student will be able to**	**Bloom's Taxonomy**
CO1	**Use** the techniques, skills, and modern engineering tools necessary in smithy, welding and sheet metal working and apply them practically.	Understand
CO2	**Learn** the techniques, skills, and modern engineering tools necessary for fitting and carpentry operations and Possess knowledge ofmeasurement and measuring instrument.	Apply
CO3	**Demonstrate** proficiency in using various tools to complete small products , enhancing precision fitting & assembly skills for fabricating components.	Apply

Description:		
Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various **engineering** industries and workshops.		
Prerequisites:	1:	General safety Measures should be taken
	2:	Safety rules regarding each machine or equipment should be followed
	3:	Use of Personal protective equipment.

Number	Practical/ Experiment/Tutorial Topic	Hrs.	Bloom's Taxonomy
1	Safety precautions while working in workshop. Introduction to tools	02	Understand
2	Introduction to smithy operations like, bending, forming upsetting, drawing Smithy tools hammer, hot & cold chisel flatters, tongs, anvil etc, Preparation of job as per the drawing	02	Understand and Apply
3	Preparation of smithy job as per drawing	02	Apply
4	Types of welding likes Gas Welding, arc welding, Welding equipment's, welding of various metals electrode classification and coding, welding joints, and preparation of welding component.	02	Understand and Apply
5	Preparation of welding job as per drawing	02	Understand and Apply
6	Specifications of metal sheets working tools, sheet metal and operations, and prepare the job as per drawing.	02	Understand and Apply
7	Preparation of sheet metal component as per drawing.	02	Understand and Apply
8	Preparation of sheet metal component as per drawing.	02	Understand and Apply
9	Study of various tools ,files, Drills, Taps, Die & Fitting operations to complete small product in fitting shop	02	Understand and Apply
10	Operations to develop small product.	02	Understand and Apply
11	Introduction, Classifications of wood. carpentry joints. carpentry tools to develop carpentry product.	02	Understand and Apply

References:

TextBooks	
1	Elements of Workshop Technology, Vol – I by Hajara Chaudhari, Media Promoters.
ReferenceBooks	
1	Workshop Technology, Vol – I by Gupta and Kaushik, New Heights.
2	Workshop Technology, Vol – I by Chapman, The English Language Book Society
3	Workshop Technology, Vol.-I by H.S. Bawa, TMH Publications, New Delhi

Web Links/ Video Lectures are to be provided to Theory and Practical /Experiments

Practical 1. http://nptel.ac.in/courses/

23FY202A Water Management

Course Objectives: The objective of the course is to

1) Develop understanding of water recourses.
2) Study global water cycle and factors that affect this cycle.
3) Analyze the process for water resources and management.
4) Study the research and development areas necessary for efficient utilization and management of water recourses.

Course Outcomes:

Cos	At the end of successful completion of the course the student will be able to	Bloom's Taxonomy
CO1	**Describe** the global water cycle and its various process along with climate change and its effect on water system**.**	Understand
CO2	**Explain** water recourse planning and management for sustainable development**..**	Apply
CO3	**Illustrate** the development in use of water for agricultural application.	Analyze
CO4	**Identify** process for urban water supply to overcome the urban challenges.	Understand

Description:

Water is a vital resource for all life on the planet. Only three percent of the water resources on Earth are fresh and two-thirds of the freshwater is locked up in ice caps and glaciers. One fifth of the remaining one percent is in remote, inaccessible areas. As time advances, water is becoming scarcer and having access to clean, safe, drinking water is limited among countries. Pure water supply and disinfected water treatment are prerequisites for the well-being of communities all over the world. One of the biggest concerns for our water-based resources in the future is the sustainability of the current and even future water resource allocation. This course will provide students a unique opportunity to study water management activities like planning, developing, distributing and optimum use of water resources. This course covers the topics that management of water treatment of drinking water, industrial water, sewage or
Wastewater ,management of water resources, management of flood protection.

Prerequisites:	1:	Nil

Unit1	Understanding 'water'-Climate change and the global water cycle, understanding global hydrology	

Unit2	Water resources planning and management-Water law and the search for sustainability: a comparative analysis, Risk and uncertainty in water resources planning and management	
Unit3	Agricultural water use-The role of research and development for agriculture water use Urban.	
Unit4	Water supply and management-The urban water challenge, Water sensitive urban design	

ReferenceBooks	
1	R.QuentinGraft,KarenHussey,QuentinGraft,KarenHussey,Publisher,"WaterResources PlanningandManagement", CambridgeUniversityPress, ISBN:9780511974304, 9780521762588.
2	P.C.Basil,"WaterManagement inIndia",ISBN:8180690970,2004.
3	C.A.Brebbia,"WaterResourcesManagement",ISBN:978-1-84564-960-9,978-1-84564-961-6.