



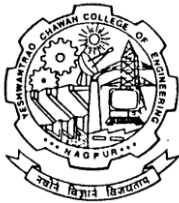
Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Syllabus Open Elective-I

Course Code	Course Title
CV1325	OE I : Environmental Management
CV1327	OE I : Building Services Engineering
CV1329	OE I : Construction Techniques
CV1330	OE I : Transportation Engineering Basic
ME1315	OE-I: Operations Research Techniques
ME1317	OE-I: Automobile Engineering
ME1321	OE-I: Plastic Engineering
EL1316	OE I : Renewable Energy Generation Systems
EL1320	OE I :Electrical Machines and their applications
EL1321	OE I : Testing and Maintenance of Electrical Equipments
EE1320	OE I: Data Acquisition & Signal Conditioning
EE1322	OE I: Microprocessor & Microcontroller
EE1323	OE I: Consumer Electronics
ET1331	OE 1 : Microcontroller & Embedded Systems
ET1333	OE 1 : Principles of Communication Engineering
ET1335	OE 1 : Fundamentals of Image Processing
CT1342	OE I: Introduction to DBMS
CT1343	OE I: Operating System Concepts
CT1344	OE I: Essentials of IT
IT1322	OE I: Web Technology
IT1325	OE I: Object oriented programming (Java)
GE1313	OE I : Numerical Solution of Partial Differential Equations



Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Syllabus Open Elective-I

V SEMESTER

CV1325	OE I : Environmental Management			L=3	T=0	P=0	CREDITS = 3
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration	
	15	15	10	60	100	3 Hours	

COURSE OBJECTIVES	COURSE OUTCOME
<ol style="list-style-type: none">To understand the various organisation impacts on the environment.To evaluate environmental problem define from natural and resource management.To understand the principles and benefits of effective resources.	<p>At the end of the course, students will be able to</p> <ol style="list-style-type: none">Identify the scientific and social aspects of environmental issues.Understand the procedure of environmental protection by legislation.Understand the role of environmental management system in protecting the resources.
Mapped Program Outcomes: c, f, h, j, k	

UNIT – 1 :

Sustainable development -carrying capacity based development planning process, assimilative and supportive capacity, Environmental Management in India. Concept of EIA, environmental attributes, nature of impact – directly & indirectly measurable impacts

[06 Hrs.]

UNIT – 2 :

Screening and scoping in EIA, terms of reference for conducting EIA, methodologies of EIA-checklists, matrices, overlays, cost benefit analysis & adaptive environment and management, networks.

Framework of EIA - baseline data collection, prediction of impacts, evaluation of impacts, Battelle environmental evaluation system, environmental quality monitoring budgetary provisions for implementing control measures.

[07 Hrs.]

UNIT – 3 :

Environmental appraisal of projects, MoEF questionnaire for environmental clearance, element of public participation & hearing, case studies on EIA, critical environmental issues and formulation of strategies of EMP, environmental management plan, development of action plans for critical environmental education programmes.

[07 Hrs.]

UNIT – 4 :

Environmental legislation – basic concepts, critical issues, civil liability, various enactment and their provisions – , Environmental Protection Act 1986, environmental tribunal & its functions. Implementation mechanism of environmental legislation, Role of State & Central boards of pollution control, local government social action groups, and environmental policies.

[07 Hrs.]

UNIT – 5 :

Environmental Audit- Concept of EA, environmental statement, procedural aspects of conducting environmental audit, pre-audit phase, on-site audit phase & post-audit phase, water audit, health & safety audit.

[06 Hrs.]

UNIT – 6 :

Resource Management: Biotic & Abiotic resources, renewable and non-renewable resources, bio-energy resource, depletion of resources – causes & effects, resource utilization, , optimal use of resources,.

Human Resources – importance of socio-economic studies in development projects.

[06 Hrs.]

Text Books :

- Anand Bal, An Introduction to Environmental Management, Himalaya Publishing House.
- John Rau & Wooten, Environmental Impact Assessment, Mc Graw Hill.
- W.F. Canter, Environmental Impact Assessment, McGraw Hill.
- Harry W. Gehm, Jacob I. Bregman, Handbook on pollution Control Acts, Central Pollution Control Board, New Delhi.
- R.K. Sagra, S.Bhardwaj, The New Environmental Age, Ashish Pub. House, New Delhi.

References Books :

- Rosencranz, S. Divan, M.L. Noyal, Environmental Law and Policy in india, Cases, Materials And Statutes, Tripathi Pvt. Ltd. Bombay.

**V SEMESTER**

CV1327	OE I : Building Services Engineering			L= 3	T=0	P=0	CREDITS = 3
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration	
	15	15	10	60	100	3 Hours	

COURSE OBJECTIVES	COURSE OUTCOME
At the end of the course the student will be able to 1. Understand basic concepts of various building services. 2. Understand various aspects of natural light and ventilation. 3. Understand various methods of acoustics and sound insulation. 4. Understand various equipments and installations used in building services.	1. An ability to understand relivance of services related to lighting, ventilation & acoustics & understand the methodologies, materials & equipments in this regards. 2. An ability to understand special installations in buildings such as electrical, air conditioning, heating & mechanical ventilation & related practices. 3. An ability to understand specifications & usage of mechanical installations like lifts, security systems etc & special features required as per need. 4. An ability to understand causes of fires in buildings and their preventive & protective strategies.
Mapped Program Outcomes: a, c, f, h, i, j, k	

UNIT – 1 :

Lighting: Day lighting, Fenestration, Daylight Factor.

Ventilation: Functions of ventilation, supply of fresh air, convective cooling, Stack effect, physiological cooling, provision for air movement; wind effect, Air flow through buildings, cross-ventilation, position and size of openings, air flow around buildings, humidity control.

[07 Hrs.]

UNIT – 2 :

Acoustics, Sound Insulation and Noise Control: Basic terminology and definitions, Physics of sound. Behaviour of sound in an enclosed space. Requisites for acoustic environment, Acoustic design approaches for different building types, with reference to applicable standards. Selection of acoustic materials. Noise and its control, control of structure borne sound and noise from different mechanical equipment.

[06 Hrs.]

UNIT – 3 :

Electrical and Allied Installations: Different types of wiring need of earthing, comparison between fuse and MCB, substation, types of lightening fixtures, electricity distribution in multistoried building. Building protection against lightening, Planning and layout of electrical installations within a building complex.

[07 Hrs.]

UNIT – 4 :

Air Conditioning, Heating and Mechanical Ventilation: Requirement of air conditioning, air conditioning system, elements of air conditioning, Working and Pressure-Enthalpy (heat) diagram of vapour compression cycle, refrigeration effect, Thermodynamics of human body.

[06 Hrs.]

UNIT – 5 :

Mechanical Equipment & Installation: Installation of lifts and escalators, different types of Security and alarm systems. Hot Water Provision (Solar and Electrical), Special features required for physically handicapped and elderly, Conveyors, Vibrators, Concrete mixers.

[07 Hrs.]

UNIT-6

Causes of fire in buildings: Planning considerations in buildings using non-combustible materials, staircases and lift lobbies, fire escapes, A.C. systems, Fire detection and fire fighting systems. Heat and smoke detectors, Fire alarm system, Automatic sprinklers.

[06 Hrs.]

Text Books:

1. Building services, B.S. Patil, Orient Longman.
2. Building Services Engineering, Fred Hall, Roger Greeno, Butterworth-heinemann, 2007.
3. Building Services Engineering, David V. Chadderton, Taylor & Francis Group, 2007.

Reference Books:

1. E.R. Ambrose, "Heat Pumps and Electric Heating", John and Wiley and Sons, Inc., New York, 1968.
2. Handbook for Building Engineers in Metric systems, NBC, New Delhi, 1968.
3. R.G. Hopkinson and J.D.Kay, "The Lighting of buildings", Faber and Faber, London, 1969.
4. William H. Severns and Julian R. Fellows, "Air-conditioning and Refrigeration", John Wiley and Sons, London, 1988.
5. A.F.C. Sherratt, "Air-conditioning and Energy Conservation", the Architectural Press, London, 1980.
6. National Building Code.



V SEMESTER

CV1329	OE I : Construction Techniques			L=3	T=0	P=0	CREDITS = 3
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration	
	15	15	10	60	100	3 hours	

COURSE OBJECTIVE	COURSE OUTCOMES
1. To study and understand the construction techniques applied to engineering construction for sub structure, super structure. 2. To study and understand the Safety in Construction Operations. 3. To study and understand the construction Equipment used in Engineering	After completion of course the student will be able 1. The construction techniques to be used in the construction of building and 2. Students will know about the demolition techniques, Importance of rehabilitation, Strengthening etc.
Mapped Program Outcomes: a, d , i ,k	

UNIT – I :

Introduction to Cement and Concrete: Introduction to types of cement, grade of cement, mortar, concrete mix design, mix proportion and specification. Ready mix concrete, transit mixer, pumped concrete, self-compacting concrete, porous concrete, light weight concrete, asphalt etc., use of ecofriendly materials in construction.

[07 Hrs.]

UNIT – II :

Construction Equipment: Introduction To Various Construction Equipment Earth moving Machinery, Concreting Equipment, Compacting Equipment, Material Handling Equipment And Transportation Equipment.

[06 Hrs.]

UNIT – III :

Type of structure: load bearing, Frame & Composite. Components of structure.

Sub Structure Construction: - Types Of Foundation and Footings, Foundation in Black Cotton Soil, Underground and Underwater Construction, Dewatering In Shallow and Deep Excavations Using Different Methods, Introduction to Shuttering and Scaffolding and Types.

[07 Hrs.]

UNIT – IV :

Super structure construction: Stone Masonry: Uses & Types, Brick Masonry: Uses & Types, Partitions, arches, lintels, stairs, introduction to formwork for various components of structure, pointing and plastering, roofs, painting, varnishing and distempering etc.

[06 Hrs.]

UNIT – V :

Importance of rehabilitation repairs and retrofitting as a part of construction engineering. Difference between the terms.

Strengthening of existing structures - repairs to overcome low member strength, deflection, cracking, chemical disruption, weathering, wear, fire, leakage, marine exposure, use of nondestructive testing techniques for evaluation, load testing of structure.

[07 Hrs.]

UNIT – VI :

Safety in Construction Operations– Types of hazard, safety of accidents on various construction sites such as buildings, dams, tunnels, bridges, roads, etc. safety in use of construction equipment e.g. vehicles, cranes, hoists and lifts etc. safety of scaffolding and working platforms. Safety while using electrical appliances. Explosives used.

[06 Hrs.]

Text Books.

1. M.S. Shetty, " Concrete Technology": S Chand & Co., 6th edition, S. Chand & Company, Limited, 2008
2. Rangwala, Building Construction, 32nd Edition, Charotar Publishing House Pvt. Ltd.2014

References Books :

Construction Planning, Equipment and methods – Peurifoy-Tata McGraw Hill Publication

1. Sankar, S.K. and Saraswati,S., Construction Technology, Oxford University Press, New Delhi, 2008
2. Sushil Kumar, Building Construction, 19th Edition, Standard Publisher Distributors 2001, New Delhi, 2001.
3. Elements of Civil Engineering: By S. S. Bhavikatti, Vikas Publishing House Pvt Limited, 2004
4. Basic Civil Engineering: By Dr. B. C. Punmia, Ashok Kumar Jain, Arun Kumar Jain, Firewall Media, 2003
5. SP 70 (2001): Handbook on Construction Safety Practices



Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Syllabus Open Elective-I

V SEMESTER

CV1330	OE I : Transportation Engineering Basic			L=3	T=0	P=0	CREDITS = 3
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration	
	15	15	10	60	100	3 Hours	

COURSE OBJECTIVES	COURSE OUTCOME
<ol style="list-style-type: none">To expose the students to various modes of transportation systems and their interrelation, planning aspects, design, construction and maintenanceTo Understand purposes, location and planning of various facilities.	<ol style="list-style-type: none">On completing the course, the students will have the ability to Plan and Design various civil Engineering aspects of Railways, Airports and Harbour.
Mapped Program Outcomes: a, b, c, e,h,l	

UNIT – 1 :

Railway transportation and its development, Various organizations, Long term operative plans for Indian Railways. Classification of Railway lines and their track standards, Railway terminology, Traction and tractive Resistance, different Types of Tractions.

[06 Hrs.]

UNIT – 2 :

Permanent Way: Alignment Surveys, Requirement, gauges, track section, Coning of wheels, Stresses in railway track, high speed track. Geometric design of railway track, Gauge, Gradient, speed, super elevation, cant deficiency, Negative super elevation, curves.

[07 Hrs.]

UNIT – 3 :

Airports development of Air Transportation in India: Airport site selection. Modern aircraft's. Airport obstructions: Zoning Laws, Imaginary surfaces, Approach and Turning zone, clear zone, Windrose diagram, cross wind component.

[06 Hrs.]

UNIT – 4 :

Runway Orientation and configuration. Basic runway length and corrections, runway geometric design standards. Taxiway Layout and geometric design standards. Taxiway and other areas. Air traffic control: Need, Network, control aids, Instrumental landing systems.

[07 Hrs.]

UNIT – 5 :

Definition of Terms - Harbours, Ports, Docks, Tides and Waves, Littoral Drift, Sounding, Area, Depth, Satellite Ports - Requirements and Classification of Harbours - Site Selection & Selection Investigation – Speed of water, Dredging, Range of Tides, Waves and Tidal Currents, Littoral Transport with Erosion and Deposition,

[06 Hrs.]

UNIT – 6 :

Winds & Storms, Position and Size of Shoals - Shore Considerations- Proximity to Towns/Cities, Utilities, Construction Materials, Coast Lines - Dry and Wet Docks, Planning and Layouts - Entrance, Position of Light Houses, Navigating - Terminal Facilities – Port Buildings, Warehouse, Transit Sheds, Inter-modal Transfer Facilities, Mooring Accessories.

[07 Hrs.]

Text Books:

- Railway Engineering, Saxena,, Dhanpat Rai Publication.
- Airport Planning & Design, Goyal & Praveen Kumar, Galgotia Publication
- Harbour, Dock And Tunnel Engineering, R. Srinivasan, Charotar publishing house.
- Rangwala, Railway Engineering, Charotar Publishing House, 1995.
- Rangwala, Airport Engineering, Charotar Publishing House, 1996.
- Srinivasan R. Harbour, "Dock and Tunnel Engineering", 26th Edition 2013.

Reference Books:

- Textbook on Transportation Engineering, S. P. CHANDOLA, 200, S. Chand Publishers, New Delhi
- Planning and Design of Airports, Robert Horonjeff, Francis Mckelvey, William Sproule, Seth Young, Fifth Edition 2010, McGraw Hill Professionals



5th Semester

ME1315	OE I : Operations Research Techniques	L=3	T=0	P=0	Credits=3
--------	---------------------------------------	-----	-----	-----	-----------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Objective	Course Outcome
To develop in the engineering students the ability to analyze any engineering problem in a simple and logical manner and to apply to its solution a few, well understood basic principles. [a,k,m]	The student will be able to 1.(I) Use basic operations research techniques for solving linear programming problems. Learn to formulate and solve real-world problems as linear programs, CPM, PERT for better decision –making. [a,k,m]
	(II) Solve transportation Models and Assignment Models [a,k,m]
	(III) Understand the characteristics of different types of decision-making environments and the appropriate decision making approaches and tools to be used in each type. [a,k,m]

Unit 1

[7 hrs]

Introduction to OR & Basic OR Models, Definition Characteristics and limitations of OR linear programming solutions of LPP by graphical methods and simplex method. Sensitivity analysis & formulation of Dual of LPP. [a,k,m]

Unit 2

[8 hrs]

Assignment Model, Travelling Salesman Problem by branch and bound method transshipment model, Transportation Model. [a,k,m]

Unit 3

[7 hrs]

Dynamic programming structure and characteristics of Dynamic programming application of Dynamic programming to resource allocation, Inventory control & linear programming. [a,k]

Unit 4

[8 hrs]

Project Management : Drawing of Network, CPM & PERT, probability of completion of project, cost analysis, Allocation and updating of Networks. [a,k]

Unit 5

[7 hrs]

Replacement Models : Concept of equivalence , Interest Rate, Present worth ,economic Evolutions of Alternatives, Group replacement models. Inventory control models, Analysis of single product deterministic models. [a,k]

Unit 6

[8 hrs]

Waiting line situations, Queuing Theory and models (No derivations expected simulations, concept and its applications in waiting line situations, inventory and networks. [a,k]

Reference books:				
1	Operation Research		Heera & Gupta	
2	Operation Research		JK Sharma	
3	Operation Research		Askhedkar & Kulkarni	
4	Operation Research		Vohra ND	
5	Operation Research		Liberman	



5th Semester

ME1317	OE I : AUTOMOBILE ENGINEERING	L=3	T=0	P=0	Credits=3
---------------	--------------------------------------	------------	------------	------------	------------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Objective	Course Outcome
The main objective of the syllabus to understand basic knowledge about Automobile systems which are used in the regular vehicle. The modernization in automobile is also included to understand recent trend in the field.[d,i,k]	(I) Student should understand basic operations of Automobile engine and power transmission systems.[d,i,k]
	(II) Student should understand basic operations various control system in automobile.[d,i,k]
	(III) Student should understand electrical system and various safety equipments automobile.[d,i,k]

UNIT-1:

[8 hrs]

- Introduction, Automobile history and development and classification. Vehicles layout.
- Engine construction and working of 2 stroke and 4-stroke cycle.
- Introduction to Fuel supply system: Carburettor and fuel injection.(Only basic)
- Engine cooling and lubrication systems., .[d,i,k]

UNIT-2:

[8 hrs]

- Resistance to vehicle motion: Air, Road and gradient resistance and power calculation.
- Clutch** – Necessity, requirements of a clutch system. Types of Clutches: Single & multi plate clutch, Diaphragm clutch and centrifugal clutch.
- Gear box**: Necessity of gear box , working principle, Classification :Sliding mesh, constant mesh, synchromesh, synchromesh and Transfer case gear box, Gear Selector mechanism, lubrication and control. Introduction to Automatic Transmission. .[d,i,k]

UNIT-3:

[8 hrs]

- Transmission system: Propeller shaft, Universal joint, constant velocity joint, Hotchkiss drive, torque tube drive.
- Differential - Need and working. Differential lock.
- Rear Axles and Front Axles
- Wheel and Tyres: tyres specification, factors affecting tyre performance. .[d,i,k]

UNIT-4:

[8 hrs]

- Steering systems, principle of steering, Steering linkages, steering geometry and wheel alignment, steering gear box and its types,
- Suspension systems – Function, conventional and Independent suspension System, Telescopic shock absorber. [d,i,k]

UNIT-5:

[8 hrs]

- Drum and Disc brakes, Comparison.
- Brakes - Need, types : Mechanical, hydraulic (Master and wheel cylinder), Air brakes.
- Electrical systems: Battery construction. Specification. Operation of Batteries. Charging of battery, Alternator.
- Starter motor, Battery Ignition and magneto ignition systems, Lighting, Horn, Side indicator , wiper.[d,i,k]

UNIT-6:

[8 hrs]

- Automobile air-conditioning, Panel board instruments. Overhauling, Engine tune up
- Recent Advances in automobiles such as ABS, Power Steering, Collision avoidance, Navigational aids and Intelligent vehicle highway system. .[d,i,k]

Reference books:

S.N.	Title of Book	Edition	Authors	Publication
1	Automotive Technology		H.m.Sethi	Tata McgraHill
2	Automobile Engineering-I & II	First Edition - 2010	P.S.Gill	S.K.Kataria & sons
3	Automotive Mechanics		Joseph Heitner	
4	Motor Vehicle Technology		J.A. Dolan	
5	Automotive Engines		W.H. Crouse	



5th Semester

ME1321	OE I : Plastic Engineering	L=3	T=0	P=0	Credits=3
---------------	-----------------------------------	------------	------------	------------	------------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Course Objectives	Course Outcome
To familiarize students with : 1. Various Plastic materials, Their properties and applications 2. Different plastic processing techniques	Students will be able to : 1. Select the suitable plastic material for given application 2. Select suitable plastic processing technique

Unit 1 [7 Hrs]
Chemistry and Classification of Polymers - Properties of Thermo Plastics - Properties of Thermosetting Plastics - Applications - Merits and Disadvantages.[c]

Unit 2 [8 Hrs]
Extrusion - Blow Molding – Thermo Forming – Rotomolding [c]

Unit 3 [7 Hrs]
Compression and Transfer Molding - study of compression molds [c]

Unit 4 [7 Hrs]
Injection Molding- study of injection molding machines and molds. [c]

Unit 5 [8 Hrs]
General Machining properties of Plastics - Machining Parameters and Their effect - Joining of Plastics -Mechanical Fasteners - Thermal bonding - Press Fitting. Testing of plastic [c]

Unit 6 [8 Hrs]
Fibers - Glass, Boron, Carbon, Organic, Ceramic and Metallic Fibers - Matrix Materials - Polymers, Metals and Ceramics. Open Mould Processes, Bag Molding, Compression Molding with BMC and SMC - Filament winding - Pultrusion - Centrifugal Casting - Injection Molding - Application of PMC's. [c]

.Reference books:				
S.N.	Title of the book	Edition (Year of publication)	Author(s)	Publisher
1	Plastic Engineering		Patten	
2	Plastic Processing		R. J. Crawfordt	
3	Plastics Extrusion technology	1988	F.Hensen,	
4	Injection Moulding Machines	1983	F.ohannaber	Hanser Publishers,
5	Polymer extrusion	1990	C.Rauwendaal,	Hanser Publishers,
6	Blow Moulding Handbook	1989	D.V.Rosatao,	Hanser Publishers,
7	Modern Plastics Moulding		E.B Seamour,	John Wiley.
8	Manufacturing Engineering & Technology	6st Edition (2013)	S Kalpakjian & SR Schmid	Pearson Education Canada
9	Machining of Plastics	1981	Akira Kobayashi,	Mc-Graw Hill.



5th Semester

EL1316	OE I : Renewable Energy Generation Systems	L= 3	T=0	P=0	Credits=3
---------------	---	-------------	------------	------------	------------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Course Objective	Course Outcomes
This subject introduce the different renewable energy sources to the students. Students get knowledge of Electric Power generation by wind, solar, small hydro.	<ol style="list-style-type: none"> 1. Basic aspects of renewable energy supply presenting fundamental characteristics of the resource base (solar radiation, wind energy, geothermal, etc.) and principles of related technical systems (photovoltaic, wind, hydroelectric power generation, etc.). 2. Solar radiation geometry, basic concepts of solar energy to heat conversion, different types of solar energy collectors with different applications. 3. Concepts of wind energy conversion system, types of WECS and their connection with the grid. 4. Basics of geological process, tapping geothermal energy, biomass energy resources and its conversion processes. 5. Basic concept of Mini & Micro hydro-plants with site selection criteria. 6. Basic concepts of energy from ocean including tidal and wave energy with focus on conversion cycles from ocean energy to electrical energy. Fundamentals of fuel cells

Mapped Program Outcomes	a	b	c	d	e	f	i	j
-------------------------	---	---	---	---	---	---	---	---

UNIT-1: Introduction

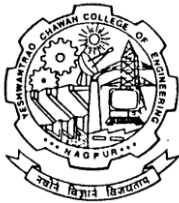
Fundamentals of Renewable / Non-renewable Energy Sources, Renewable Energy sources, Renewable Energy Potential in India, Renewable Energy Sources and their sustainable development. Storage methods for renewable energy sources

UNIT-2: Solar Energy

Principles, scope and applications, solar radiation, its measurement & prediction, flat plate collectors-design & theory, solar water heating, solar dryers, solar stills, solar cooling and refrigeration. Solar cells, thermal storage, street lighting, solar power generation.

UNIT-3: Wind Energy

Introduction, Historical development, Wind energy resources, sites identification, blade element theory, aerofoil design, component of wind energy conversion system, wind turbine generator classification, and windmill and wind electrical generator, Advantages, disadvantages, economics and present status of wind energy generation systems, grid connection of wind energy.



Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Syllabus Open Elective-I

5th Semester

EL1316	OE I : Renewable Energy Generation Systems	L= 3	T=0	P=0	Credits=3
---------------	---	-------------	------------	------------	------------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

UNIT-4: Geothermal Energy and Biomass Energy

Introduction, history of geothermal resources, basics of geological process, dry rock and hot aquifer analysis, geothermal exploration, geothermal well drilling and fluid extraction, utilization of geothermal resources, geothermal heat pump, site of geothermal energy in India. Biomass energy resources and conversion processes, urban waste to energy conversion.

UNIT-5: Mini & Micro hydro-plants

Introduction, Classification of water turbines, hydroelectric system, essential components of hydroelectric system, system efficiency, advantages and disadvantages of hydroelectric system, present Indian power scenario of mini-micro hydro.

UNIT-6: Ocean Energy

Ocean thermal energy conversion (OTEC), Open cycle and closed cycle OTEC, Ocean wave energy conversion, tidal energy conversion. Introduction of Fuel cells.

Text Books				
S.N	TITLE	EDITION	AUTHOR	PUBLICATION
1	Non Conventional Sources of Energy	4 th edition	G.D.Rai	Khanna Publisher
2	Energy Technology: Nonconventional Renewable and Conventional		S. Rao and B.B Parulekar	Khanna Publisher New Delhi

Reference books				
S.N	TITLE	EDITION	AUTHOR	PUBLICATION
1	Solar Energy : Principles of Thermal collection and storage	3 rd edition, 1994	S.P.Sukhatme, J.K.Nayak	Tata McGraw Hill
2	Wind and Solar Power System		M. R. Patel	CRC Press, New York
3	Renewable Energy Sources Basic Principles and Applications		G. N. Tiwari and M. K. Ghoshal	Narosa Publishing House, New Delhi



5th Semester

EL1320	OE I : Electrical Machines and their Applications	L= 3	T=0	P=0	Credits=3
---------------	--	-------------	------------	------------	------------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Course Objective	Course Outcomes
This subject introduce the applications of different machines and commonly used drives.	<ol style="list-style-type: none"> 1. Principle, construction, operation, testing, performance evaluation and application of Single Phase Transformer. 2. Construction, operation, performance of autotransformer, copper saving and kVA rating as compared to two winding transformer. 3. Principle, construction, winding connection, vector grouping, parallel operation and application of three phase transformer. 4. Principle, construction, operation and speed control of DC motors. 5. Principle, construction, operation, performance, starting and speed control of three phase induction motor and its operation as a generator. 6. Principle, construction, types, performance of single phase induction motor and special motors like stepper motor and BLDC motor. 7. Principle, construction, operation and performance of three phase synchronous generator and motor. 8. Criteria for selection of suitable motors.

Mapped Program Outcomes	a	b	c	e	h	i	k	l
-------------------------	---	---	---	---	---	---	---	---

Unit 1: Introduction to Drives and Speed Control:

Classification of Drives, brief idea about commonly used drives (AC and DC) drives in industry, speed- torque characteristics of different drive motors, their behaviour under starting and running conditions.

Unit 2:

Need of starter, Starting methods, Braking and Speed Control of AC and DC motors.

Unit 3: Selection Criterion for Drive Motors:

Criterion for selection of motors, Duty Cycle, Power Rating for Continuous and Intermittent Duty Cycles, Environment and Enclosures, Transmission System, Insulation Classes.

Unit 4: Single and Three Phase Transformers:

Performance parameters and their determination, working of an Auto-transformer, Application as testing, Instrument Transformer, Transformer In Electronic Circuitry, Special function transformers (welding, furnaces etc.), Variable Voltage Source, Concept of three phase transformer, Comparison between a unit and bank of Single Phase Transformers, Connections and Applications.

Unit 5: Special Machines:

Brushless DC motor: – Principle, Construction, Operation, Converter for BLDC, rotor position sensors (Hall sensors), Stepper Motors: – types, slewing, Torque – Speed Characteristics, Application, Stepper Motor Converter, Universal Motor

Unit 6: Applications

Application of Single and Three Phase Motors as Pumps in Cement Industry, Rolling Mills etc.

Text books				
S.N	Title	Year/Edition	Author	Publisher
1	A Course in Electrical Power	First-2005	Soni, Gupta, Bhatnagar	Dhanpat Rai and Company
2	Fundamentals of Electric Drives	2nd Edition	G. K.Dubey	Narosa Publications
3	Electric Machines	2nd Edition	Ashfaq Husain	Dhanpat Rai and Company

Reference Books:

S.No	Title	Year/Edition	Author	Publisher
1	A Course in Electrical Power	First-2005	Soni, Gupta, Bhatnagar	Dhanpat Rai and Company
2	Fundamentals of Electric drives	2nd Edition	G. K.Dubey	Narosa Publications
3	Electric Machines	2nd Edition	Ashfaq Husain	Dhanpat Rai and Company



5th Semester

EL1321	OE I : Testing and Maintenance of Electrical Equipment's	L= 3	T=0	P=0	Credits=3
--------	--	------	-----	-----	-----------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Course Objective	Course Outcomes
To adopt various testing and maintenance procedures for electrical equipments by providing effective insulation to enhance their life and working condition	<ol style="list-style-type: none"> 1) Terminologies used in IE Act for maintaining the electrical safety in workplace ,procedures to be adopted before and after get in contact with the electrical shock,reasons and remedial actions to be adopted. 2) To understand the various electrical equipment testing methods such as routine,type and special tests also preventive maintenance techniques to be adopted to avoid the breakdown maintenance 3) To understand the various tests to be conducted on various electrical machines such as routine,type and special tests to avoid the breakdown maintenance 4) Classification of various insulating materials as per IS Standards and its use base on IS and IE Code 5) Various tests to be conducted on the transformer and its associated equipments 6) Designing of electrical machine foundation,alignment and behaviour of rotating machine during loading and unloading
Mapped program outcomes:a,b,c,d,e,g,h,i,j	

Unit 1: Safety & Prevention of Accidents

Definition of terminology used in safety; safety, hazards, accident, major accident hazard, responsibility, authority, accountability, monitoring, I.E. Act & statutory regulations for safety of persons & equipments working with electrical installation, Dos & don'ts for substation operators as listed in IS Meaning & causes of electrical accidents factors on which severity of shock depends, Procedure for rescuing the person who has received an electric shock, methods of providing artificial respiration, Precautions to be taken to avoid fire due to electrical reasons, operation of fire extinguishers.

Unit 2: General Introduction

Objectives of testing significance of I.S.S. concept of tolerance, routine tests, type tests, special tests, Methods of testing a) Direct, b) Indirect, c) Regenerative. Concept of routine, preventive & breakdown maintenance, advantages of preventive maintenance, procedure for developing preventive maintenance schedule, Factors affecting preventive maintenance schedule. Introduction to total productive maintenance.

Unit 3: Testing & maintenance of rotating machines

Listing type test, routine test & special test as per I.S. 2026-1981. Procedure for conducting following tests: Measurement of winding resistance, no load losses, & no load current, Impedance voltage, load losses, Insulation resistance, Induced over voltage withstand test, separate source voltage withstand test, Impulse voltage withstand test, Temperature rise test of oil & winding, Different methods of determining temp rise- back to back test, short circuit test, open delta (delta – delta) test. Preventive maintenance & routine maintenance of distribution transformer as per I.S. 10028 (part III): 1981, Periodic checks for replacement of oil, silica gel.

Unit 4: Testing & maintenance of Insulation

Classification of insulating materials as per I.S. 8504(part III) 1994, factors affecting life of insulating materials, measurement of insulation resistance & interpretation of condition of insulating. Methods of measuring temperature of internal parts of windings/machines & applying the correction factor when the machine is hot.

Unit 5: Testing & maintenance of Transformer

Properties of good transformer oil, list the agents which contaminates the insulating oil, understand the procedure of following tests on oil as per I.S. 1692-1978: a) acidity test; b) sludge test; c) crackle test; d) flash point test. Filtration of insulating oil protection of electrical equipments (insulation) during the period of inactivity. Methods of cleaning the



Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Syllabus Open Elective-I

5th Semester

EL1321	OE I : Testing and Maintenance of Electrical Equipment's	L= 3	T=0	P=0	Credits=3
--------	--	------	-----	-----	-----------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

insulation covered with loose, dry dust, sticky dirt, & oily viscous films, procedure for cleaning washing & drying of insulation & revarnishing. Methods of internal heating & vacuum impregnation.

Unit 6: Installation

Factors involved in designing the machine foundation, Requirement of different dimension of foundation for static & rotating machines procedure for levelling & alignment of two shafts of directly & indirectly coupled drives, effects of misalignment. Installation of rotating machines as per I.S. 900-1992. Use of various devices & tools in loading & unloading, lifting, carrying heavy equipment.

Text Books:

S. N.	Author	Title	Publisher
01.	B. V. S. Rao	Operation and Maintenance of Electrical machines Vol - I	Media Promotors & Publisher Ltd. Mumbai
02.	B. V. S. Rao	Operation and Maintenance of Electrical machines Vol - II	Media Promotors & Publisher Ltd. Mumbai

Reference Books:

S. N.	Author	Title	Publisher
01.	B. L. Theraja	Electrical Technology Vol I to IV	S. Chand & Co., New Delhi
02.	C. J. Hubert	Preventive Maintenance Hand Books & Journals	-----



5th Semester

EE1320	OE I : Data Acquisition & Signal Conditioning	L= 3	T = 0	P = 0	Credits = 3
--------	---	------	-------	-------	-------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Objective	Outcome
<p>➤ The course gives an overview about the data acquisition methods, to acquaint students with ADCs and DACs and various data acquisition techniques.</p>	<p>STUDENTS</p> <ol style="list-style-type: none"> 1. Will be able to identify the basic model of data acquisition system. 2. Will understand the various methods and attributes of signal conditioning. 3. Will understand the various types of data acquisition hardware. 4. Will understand the serial data communication standards. 5. Will be introduced to various IEEE standards.

UNIT-1:

Definition of data acquisition and control, Fundamentals of data acquisition, Signal conditioning, Data acquisition and control system configuration, Computer plug-in I/O, Distributed I/O, Stand-alone or distributed loggers/controllers, Analog and digital signals: Classification of signals, Sensors and transducers, Transducer characteristics, Resistance temperature detectors (RTDs), Thermistors, Thermocouples, Strain gauges, Wheatstone bridges.

(8 Hours)

UNIT-2:

Signal conditioning: Types and classes, Field wiring and signal measurement, Noise and interference, Minimizing noise, Shielded and twisted-pair cable.

(7 Hours)

UNIT-3

Plug-in data acquisition boards, A/D Boards, Single ended Vs differential signals, Resolution, dynamic range and accuracy of A/D boards, Sampling rate and the Nyquist theorem, Sampling techniques, D/A boards, Digital I/O boards.

(7 Hours)

UNIT-4:

Serial data communications, Transmission modes – simplex and duplex, RS-232-C interface standard, RS-485 interface standard, Comparison of the RS-232 and RS-485 standards, Serial interface converters, Protocols, Error detection.

(8 Hours)

UNIT-5

IEEE 488 Standard, Introduction, Electrical and mechanical characteristics, Physical connection configurations, Device types, Bus structure, GPIB handshaking, Device communication, Requirements of IEEE 488.2 controllers, Standard commands for programmable instruments (SCPI).

(7 Hours)

UNIT-6:

Ethernet and field buses for data acquisition, Physical layer, Medium access control, Difference between 802.3 and Ethernet, The universal serial bus (USB), USB overall structure, Topology.

(8 Hours)

Text books:

1	Data Acquisition for Instrumentation and Control Systems	John Park and Steve Mackay
---	--	----------------------------

Reference books:

1	Electronic Analog Digital Conversion	1 st Edition	H. Schmid	Tata McGraw Hill
2	Data Converters	1 st Edition , 1993	B. S. Sonde	Tata McGraw Hill



Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Syllabus Open Elective-I

5th Semester

EE1322	OE I : Microprocessor & Microcontroller	L = 3	T = 0	P = 0	Credits = 3
---------------	--	-------	-------	-------	-------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Objective	Outcome
To understand the architecture, programming and addressing modes of Intel 8085 and 8051 To study the instruction set and programming of 8085 and 8051 To understand various interfacing of devices for various applications.	Students 1. Will be able to understand the architecture of 8085 and 8051. 2. Will demonstrate the ability to identify, Formulate and design program for an assigned task. 3. Will be able to interface Peripheral devices. 4. Will apply the knowledge of microprocessor and microcontroller in their respective field.

UNIT-1:

Concept of bit, byte & word, Micro Computer organization with I/O devices and memory. Microprocessor, address, data & control bus, RAM / ROM memory.

UNIT-2:

Architecture of 8085 Intel microprocessor, pins diagram of 8085, Demultiplexing of Address & Data Bus, Generation of various control signals for I/O & Memory Organization.

UNIT-3

Addressing mode, Basic Instruction set, Subroutine instructions like CALL, PUSH, POP, XTHL instructions and their uses. Interrupts-Interrupt structure of 8085, Programs based on instructions.

UNIT-4:

Salient features of microcontroller 8051, Architecture of 8051, Pins diagram of 8051, SFRs of 8051, Addressing modes, Instruction set, Simple programs based on arithmetic, logical operations, BCD arithmetic, bit manipulations. Reset Circuit of 8051.

UNIT-5

Advanced instructions, delay programs. Interfacing of LED, 7 segment display, switches, LCD display interfacing Matrix Keyboard interfacing.

UNIT-6:

Different modes of timer/Counters, applications of timer, Interfacing of ADC & DAC. Serial Communication.

Text books:

1	Programming & Interfacing 8085	Ramesh Gaonkar	Penram Publication
2	8051 Microcontroller	Kenneth Ayala	Penram Publication

Reference books:

1	8085 Microprocessor	Ajit Pal	Tata Mc-Graw Hill
2	0000 to 8085	Shridhar Ghosh	PHI
3	The 8051 Microcontroller & Embedded System	M. A. Mazidi, J. G. Mazidi	Pearson



Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Syllabus Open Elective-I

5th Semester

EE1323	OE I : Consumer Electronics	L= 3	T = 0	P = 0	Credits = 3
--------	------------------------------------	------	-------	-------	-------------

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Objective	Outcome
To give knowledge and competencies regarding consumer electronic equipments	STUDENTS 1. Will be aware of the safety aspects in this field 2. Will understand the basics of Audio Video Engineering 3. Will know about current trends in electronics equipments 4. Will know about the recent trends in communication and computing equipments

Unit -I

Standards and Safety norms: Electronics and Electrical safety norms and standards, Electronic products covered under compulsory registration

Unit -II

Audio Systems: Sound Recording and reproduction, Hi-Fi Sound System, Audio Mixers, Graphics Equalizers, Public Address System.

Unit -III

Video Systems: Color fundamentals, Luminance and Chrominance signal , Color camera, digital television systems.

Unit IV

Wireless Technology & Mobile phones: Mobile Phones, various wireless technologies, Introduction to 3G, WiFi Technology, GSM

Unit -V

Air conditioner and Refrigerators: Fundamentals, Refrigeration cycles, compressors, home automation

Unit -VI

Computers: Recent microprocessor, Pentium family architecture and salient features , Recent Memories technologies (RAM, HDD), Computer peripherals

Text Books:

1. S.P. Bali, "Consumer Electronics", Pearson Education, First Edition
2. B. R. Gupta, Vandana Singhal, "Consumer Electronics", S. K. Kataria & Sons, 2006
3. J.S. Chitode, "Consumer Electronics", Technical Publication,
4. for unit-I Electronics Standards of India www.electronicstds.gov.in
5. Related internet sites



5th Semester

ET1331	OE I : Microcontroller & Embedded Systems		L= 3	T = 0	P = 0	Credits = 3
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
		15	15	10	60	100
Course Objectives Students should be able to 1. Understand the architecture of 8051 microcontroller. 2. Learn assembly language programming of microcontroller. 3. Understand concepts of Embedded C and operation of timers . 4. Study serial communication and concept of interrupt programming. 5. Understand the interfacing of LCD, RTC and EPROM with microcontroller. 6. Understand the interfacing of ADC, DAC and Stepper Motor with microcontroller.			Course Outcomes Students will be able to 1. Explore the architecture of 8051 2. Develop assembly -language programs for embedded systems. 3. Apply the basics of Embedded C to develop programs and interface TIMERS with 8051 microcontroller. 4. Apply the concept of interrupts and establish serial communication with various peripherals. 5. Interface off chip peripherals like LCD, RTC & EPROM. 6. Interface off chip peripherals like stepper motor, ADC & DAC.			
UNIT-1 Overview of 8051 Microcontroller family, Introduction to MCS 51 family, Architecture, Memory organization, Internal RAM, Flag Register, Register Banks, SFRs , Functional pin description and various resources of MCS 51. Hardware Overview. Addressing modes, Instruction set.						06 Hrs
UNIT-2 Assembly language programming, Loop, Jump and Call instructions, Bit manipulation, 8051 I/O programming, Delay Programs. I/O Interfacing such as LED, switches, 7segment display, keyboard matrix programming						06 Hrs
UNIT-3 8051 programming in C: Data types and time delay, I/O programming, Logic operations, Data conversion programs, Lookup table access. Timer programming in assembly and C: Various modes of operation, SFR related to timer operation.						06 Hrs
UNIT-4 Serial Port programming in assembly and C: Basics of serial communication, 8051 connection to RS 232. Serial data transfer programs. 8051 interrupts, Interrupts programming in assembly and C, programming timer interrupt, external interrupt, serial interrupt						06 Hrs
UNIT-5 Interfacing and programming for LCD, Interfacing RTC, EEPROM using I2C Bus and programming.						06 Hrs
UNIT-6 Interfacing of ADC, DAC, stepper motor, DC motor, Servo motor.						06 Hrs

Text books:				
1	The 8051 Microcontroller and Embedded systems using assembly & C	2 nd edition	by Muhammad Ali Mazidi	Pearson Education Asia LPE
2	8051 Microcontrollers programming and practice		By Mike Predcko	S.Chand
3	The 8051 Microcontroller Architecture, programming and Applications		By Kenneth Ayala	Cengage Learning
Reference books:				
1	Intel or Atmel MCS 51 Family Microcontrollers Data Sheets		Douglas V Hall	Tata Mc Graw Hill



5th Semester

ET1333	OE I : Principles of Communication Engineering		L= 3	T = 0	P = 0	Credits = 3
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs
Course Objective Students should be able to			Course Outcome Students will be able to			
<ol style="list-style-type: none"> Study fundamentals of EM waves and types of noise. Understand continuous and discrete modulation schemes. To explore various types of angle modulation To introduce the concept of demodulation or detector Learn AM and FM transmitters & receivers. To analyze different continuous as well as Pulse modulation schemes. 			<ol style="list-style-type: none"> Utilize the concept of radiation and propagation of signals in various applications. Analyze different types of noise. Analyze various modulation schemes & apply the concepts of modulation for the design of communication systems. Know the fundamental of various types of angle modulation Understand the types of detector Describe the working of Transmitter and Receiver in communication systems. Analyze various Pulse modulation schemes 			

UNIT-1

Frequency spectrum of EM waves, their properties, wave propagation, Noise, Types of noise, source, noise figure calculation.

06 Hrs

UNIT-2

Need for modulation, Basic scheme of a modern communication system, Derivation of expression for an amplitude modulated wave. Carrier and side band components. Modulation index. Spectrum and BW of AM Wave. Relative power distribution in carrier and side bands. Working principles and typical application as Square Law Modulator, Ring Modulator.

06 Hrs

UNIT-3

Expression for frequency modulated wave and its frequency spectrum (without Proof and analysis of Bessel function) Modulation index, maximum frequency deviation and deviation ratio, BW of FM signals, Carson's rule. Need for pre-emphasis and de-emphasis, Comparison of FM and AM in communication systems, Varactor diode modulator, Derivation of expression for phase modulated wave, modulation index, comparison with frequency modulation.

06 Hrs

UNIT-4

Principles of demodulation of AM wave using diode detector circuit; Basic principles of FM detection using slope detector, Foster-Seeley discriminator, Ratio detector.

06Hrs

UNIT-5

Radio receivers: Basic functions of radio receiver, Characteristics of radio receiver, Block diagram of AM radio receiver and FM radio receiver.

06 Hrs

UNIT-6:

Pulse Modulation: PAM, PWM, PPM (waveforms and applications), Comparison of PAM, PWM, PPM
Digital Modulation: Sampling theorem, PCM, DM-ASK, FSK, PSK.

06 Hrs

Text books:				
1	Electronics Communication		Kennedy	Tata McGraw Hill, New Delhi
2	Radio Engineering		GK Mittal	Khanna Publishers, New Delhi
3	Principles of Communication Engineering		Anokh Singh	S.Chand & Co., New Delh
Reference books:				
1	Principles of Communication Engineering		Roody, Coolin	
2	Principles of Communication Engineering		Manoj Kumar	Satya Prakashan, New Delhi



5th Semester

ET1335	OE I : Fundamentals of Image Processing		L= 3	T = 0	P = 0	Credits = 3
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
		15	15	10	60	100
Course Objective Students should be able to 1. Understand the principles of image formation, sampling and quantization. 2. Learn the algorithms of intensity transformation and filtering 3. Study the performance of digital images in frequency domain. 4. Learn segmentation and compression of digital images through various algorithms			Course outcomes Students will be able to 1. Analyze the image sampling, quantization 2. Apply basic intensity transformation techniques for image enhancement 3. Apply filtering techniques in spatial and frequency domain. 4. Interpret the digital images in frequency domain by using various transform techniques. 5. Implement and evaluate the methodologies for image segmentation. 6. Implement the algorithms for image compression.			

UNIT-1: Introduction

Origin of Digital Image processing, Fundamental Steps in image processing, Component of Image processing system, elements of visual perception, Sampling and quantization, Concept of gray levels, Relationship between pixels

06Hrs

UNIT-2: Intensity Transformation

Background, Basic intensity transformation techniques: Image negative, log transformation, power law transformation, piecewise linear transformation, Histogram processing: Histogram Equalization, Histogram Matching, Local histogram processing

06Hrs

UNIT-3 : Image Filtering

Mechanics of Spatial filtering, Smoothing spatial filters: Linear and Order statistic filters, Sharpening filters: Foundation, Laplacian and Gradient, Filtering in frequency in frequency domain

06Hrs

UNIT-4 : Image Transforms

2-D FFT, Properties. Discrete cosine Transform, Discrete sine transform, Haar transform, Hadamard Transform, Slant transform

06Hrs

UNIT-5: Image segmentation

Detection of discontinuities, Edge linking and boundary detection, Thresholding, Region based segmentation

06Hrs

UNIT-6: Image compression

Redundancies and their removal methods, Measuring information, Fidelity criteria, Image compression models, Source encoder and decoder, Error free compression, Lossy compression

06Hrs

Text books:				
1	Digital Image Processing	2nd edition	R.C. Gonzalez & R.E. Woods	Addison Wesley/Pearson education publication 2002.
2	Digital Image Processing		S. Jayaraman, S. Esakkirajan, T Veerakumar	McGraw-Hill



Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Syllabus Open Elective-I

5th Semester

CT1342	OE I: Introduction to DBMS			L=3	T=0	P=0	Credits=3
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration	
	15	15	10	60	100	3Hrs	
OBJECTIVES				OUTCOMES			
To understand basic database concepts by students whose basic degree is not in Computer or IT.				Students should be able to design database for given situation, write appropriate queries for accessing database.			
PO, PSO MAPPING:- b, c, e, k							

Unit I

An Overview of the Database Management System

What is database?, Why database?, database system, database management system (DBMS), advantages of DBMS.

Unit II

An Architecture of the Database system

Three levels of architecture, mappings, role of database administrator(DBA), E-R model, three approaches of DBMS- relational, hierarchical and network.

Unit III

Relational Database Management System (RDBMS)

Introduction, RDBMS terminology, relational model, base tables, keys.

Unit IV

The SQL Language

Introduction, Characteristics of SQL, data definition commands

Unit V

Data manipulation commands

Unit VI

Introduction to XML

Books:

1. Silberschatz A, Korth H.F and Sudarshan S, "Data base System Concepts", Fifth Edition, Tata McGraw-Hill.
2. R. Elmasri, S. B Navathe, " Fundamentals of Database System", Pearson Education.

Reference Books:

1. Leon A and Leon M, "Fundamentals of DBMS", Vijay Nicole & Tata McGraw-Hill.
2. Gill P.S, "DBMS", I.K. International.
3. Singh S.K, "Database Systems: Concepts, Design & Applications", Pearson Education.
4. Leon A and Leon M, "Database Management Systems", Vikas Publishing House.



Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Syllabus Open Elective-I

5th Semester

CT1343	OE I: Operating System Concepts				L=3	T=0	P=0	Credits=3
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration		
	15	15	10	60	100	3Hrs		
OBJECTIVES					OUTCOMES			
To understand the concepts of Linux and its potential. The students will also get hand on experience of Linux after undergoing this course.					Students should be able to use LINUX environment to implement some concepts.			
PO, PSO MAPPING:- b,c,e,,k,								

UNIT I:

Introduction: History of Linux and Unix, Linux Overview, Linux releases, open linux

UNIT II:

Linux Commands and Filters : Mkdir, CD, rmdir, pwd, ls, who, whoami, cat, more, fail, head, concept of, mv, chmod, grep, wc, comm., split, sort, diff, kill, write, wall, merge, mail, news

UNIT III:

Shell: The command line special characters and file arguments, standard input/output and redirection, pipes, redirecting and piping with standard errors, shell scripts, jobs.

UNIT IV:

Linux file Structure: Linux files, file structure, listing displaying and printing files, managing directories, file and directory operations.

UNIT V:

Vi Editor: Vi editing commands advanced Vi editing commands, line editing commands, options in Vi.

UNIT VI:

System Administration: System management, managing users, installing and managing devices, floppy disk management, file system administration, backups.

Text Books

1. Linux – The Complete Reference by Richard Peterson, Tata McGraw Hill, New Delhi
2. Linux – Install and Configuration Black Book by Die Annleblanc and Issac Yates, IDG Books India Private Ltd., Delhi
3. Unleashed Linux by Tech Media Publishers.



5th Semester

CT1344	OE I: Essentials of IT				L=3	T=0	P=0	Credits=3
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration		
	15	15	10	60	100	3Hrs		
OBJECTIVES					OUTCOMES			
1. To understand the problem Solving using algorithms 2. To understand how to design and test simple programs to implement Object Oriented concepts using Java 3. To Understand how the database systems can be modeled 4. To understand the implementation of RDBMS concepts using SQL 5. To understand the method and components to design the static and dynamic web pages 6. To understand the basic concepts of software engineering					1. Able to do Problem Solving using algorithms 2. Able to Design and test simple programs to implement Object Oriented concepts using Java 3. Able Designing and modeling of simple databases 4. Able to implement simple data store using RDBMS concepts and SQL 5. Able to design the static and dynamic web pages 6. Able to use the software engineering concepts in development of small projects			
PO, PSO MAPPING:-								

Unit I:

Programming fundamentals of Java: problem solving skills, Algorithm – representation using pseudo code, algorithm properties. Programming in java- programming constructs in JAVA, control structures type casting, SDLC overview and need for Object oriented approach, object oriented concepts, introduction to UML.

Unit II:

OO fundamentals – Java Implementation: OO fundamentals, coding standards, reference variables and objects in memory, methods, 'this' reference.
Data structures: data structures, linear data structures, non- linear data structures.

Unit III:

Data base basics- data storage, need for DBMS, functions of DBMS, data perspectives in DBMS, types of data models, relational model and keys, Database Design – Database life cycle, Data requirements, logical design – ER modeling, converting ER model to relational schema, functional dependency, normalization.

Unit IV:

SQL – need for sql, types of sql statements, data types in SQL, SELECT statement with various operators, single row and multi row functions, group by and having clauses.

Unit V:

Introduction to web technologies:

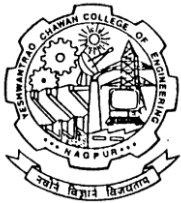
Computer Networks, HTML tags and CSS, Implementation of Java Scripts, Operators and control structures, function and dialog boxes, DOM element.

Unit VI:

Software Engineering – Basics, SE models and approaches, Requirement developing activities, software design and construction, software testing, introduction to user experience, Project categories and project management phases, software quality.

Books:

1. Andrew S. Tanenbaum , : Structured Computer Organization , PHI, 4th edition, 1999
2. John L. Hennessy, David Goldberg, David A. Patterson, Computer Architecture : A Quantitative Approach, 2nd Edition Published by Morgan Kaufman Publishers, 1996
3. Silberschatz and Galvin, Operating System Concepts, John Wiley & Sons ,Sixth edition
4. Andrew Tanenbaum, Modern Operating Systems, Pearson Education



5th Semester

IT1322	OE I : Web Technology		L=3	T=0	P=0	Credits=3
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs.

Course Learning Objective	Course Outcomes
<ol style="list-style-type: none"> Non-programming technologies that are fundamental to understanding communication between web browsers and servers as well as how information is displayed by browser To understand & learn to design web pages Presents basic information about cascading style sheets (CSS), a style sheet technology designed to work with HTML and XML documents. Study of JavaScript as a programming language, largely independently of how it might relate to a web browser. Considers several different technologies related to XML as presentation script. Understand the fundamentals of ASP.NET and how all of them work. 	After completion of the course students will be able to: <ol style="list-style-type: none"> Understand the internet communication technologies & design dynamic web sites Design & develop database-driven web sites Design & develop to design dynamic websites Develop to design JavaScript WebPages. To be able to use the concept of xml, CSS and DHTML To be able to develop a static and dynamic websites.

Course Outcomes	Statement	Mapped PO												PSPO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	
IT1322.1	Understand the internet communication technologies & design dynamic web sites		H	H			L	L		L						
IT1322.2	Design & develop database-driven web sites		H	H			L	L		L						
IT1322.3	Design & develop to design dynamic websites		H	H			M	L		L						
IT1322.4	Develop to design JavaScript WebPages.		M	H			M	L		M						
IT1322.5	To be able to use the concept of xml, CSS and DHTML		M	M			H	L		L						
IT1322.6	To be able to develop a static and dynamic websites.		H	M			M	L		M						
IT1322			H	H			M	L		L						

UNIT I

[07 Hrs.]

History of the internet, internet address and domains, Basic tools of internet access, Domain name system (DNS), email, ftp, TELNET(Remote Login),news, Introduction to World Wide Web(WWW):The basics of www and browsing working of web browser and web server, Web browser Architecture, Web server and its deployment

UNIT II

[08 Hrs.]

Web Page Designing: Standard use for www documents on internet, HTTP, MIME, SGML, DTD, MTNL, URL, Static and Dynamic Web sites, Creation of web pages: HTML tags, special characters, images, tables, forms, the hyperlinks, Frames

UNIT III

[07 Hrs.]

Dynamic HTML (DHTML):
Introduction, Cascading Style Sheets (CSS), DHTML Document Object Model and Collections

UNIT IV

[07 Hrs.]

Scripting Languages:- Java Script objects and forms, server side and client side scripting languages



Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Syllabus Open Elective-I

5th Semester

IT1322	OE I: Web Technology		L=3	T=0	P=0	Credits=3
Evaluation Scheme	MSE-I	MSE-II	TA	ESF	Total	ESE Duration
	15	15	10	60	100	3 Hrs.

UNIT V

[07 Hrs.]

XML: XML basics, understanding mark-up languages, structures and syntax, valid Vs. Well formed XML, DTD (document type Definitions) classes, Element Type Declaration, Attribute Declarations, Limitations of DTDs, XML processor, Introduction to Schema, Complex Types, Extensible Style sheet Language Transformations (XSLT), Basics of Parsing

UNIT VI

[07 Hrs.]

ASP.NET-An Overview: Introduction, Popular Web Technologies, What is ASP. NET, An overview of the .NET Framework, ASP.NET Details, Server Controls and Web Controls, Validation Controls, Database Processing, ActiveX Controls

Textbook

Web Technology A Developer's Perspective	Eastern Economy Edition	N.P.Gopalan and J.Akilandeswari	PHI Pub
ASP.net made simple	First Indian Edition 2001	BPB editorial board	BPB Pub
XML in action web technology	Eastern Economy Edition	William J. Pardi	PHI Pub
The Complete Reference HTML and XHTML	4 th Edition	Thomas A.Powell	McGraw Hill Pub

Reference Books:

Designing Interactive Web sites	2 nd edition	James I. Mohler & John M. Duff	Thomson Learning
Step by Step XML	2 nd Edition	Michael J. Young	PHI



5th Semester

IT1325	OE I : Object Oriented programming (JAVA)		L=4	T=0	P=0	Credits=4
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs.

Course Learning Objective	Course Outcomes
<ol style="list-style-type: none"> Learn the Concepts of Java programming language Learn Java's syntax, idioms, patterns, and styles to write simple JAVA program. To develop object centric thinking and to use object oriented features of JAVA to write complex programs. Learn the essentials of the Java class library, and learn how to learn about other parts of the library when you need them in application development Understand How to handle exceptions appropriately. Become familiar with the concept of an I/O stream. 	After completion of the course students will be able to: <ol style="list-style-type: none"> To understand basic features of JAVA as an object oriented-programming language. Be able to write, compile, test and run simple Java programs Be able to think write object based programs with object oriented features Demonstrate the ability to use simple data structures like arrays in a Java program. Use and explain the difference between a String and String Buffer object Demonstrate exceptions that can be recognized and handled by the Java programming language. Understand stream classes, Use it to save and read the data in a file.

Course Outcomes	Statement	Mapped PO												PSPO			
		1	2	3	4	5	6	7	8	9	10	11	12	1	2		
IT1325.1	To understand basic features of JAVA as an object oriented-programming language	L	M												M	L	
IT1325.2	Be able to write, compile, test and run simple Java programs	M	H												M	M	
IT1325.3	Demonstrate exceptions that can be recognized and handled by the Java programming language	H	L												M	L	
IT1325.4	Demonstrate the ability to use simple data structures like arrays in a Java program. Use and explain the difference between a String and StringBuffer object	H	M												M	M	
IT1325.5	Demonstrate exceptions that can be recognized and handled by the Java programming language	M	M												M	L	
IT1325.6	Understand stream classes, Use it to save and read the data in a file	M	L												M	M	
IT1325		M	L												M	M	

UNIT I

[07 Hrs.]

Introduction to Programming Methodologies, Introduction to Object oriented programming, Objects and Classes, Characteristics of OOP, Encapsulation and data Abstraction, Inheritance, Polymorphism, Dynamic Binding, Structured Versus Object oriented programming, Merits and demerits of object oriented methodology, introduction to Java as OOP language

UNIT II

[08 Hrs.]

Building blocks of java: Data types, Variable declarations, operators and Assignments, control structures, Identifying objects and classes, Declaring Classes and objects, Creating Classes and objects, methods, argument passing, Recursion, this keyword, constructors, Visibility control

**5th Semester**

IT1325	OE I : Object Oriented programming (JAVA)		L=4	T=0	P=0	Credits=4
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs.

UNIT III**[07 Hrs.]**

Java as OOP language, Other Class Modifiers: static, final, Abstract, Method overloading, Super keyword, Overriding (polymorphism), nested inner classes, packages (encapsulation), Interfaces (multiple Inheritances)

UNIT IV**[07 Hrs.]**

Arrays and Strings: Arrays, One Dimensional Arrays, Two Dimensional Arrays, variable size arrays, Strings and String Buffer classes, Wrapper Classes

UNIT V**[07 Hrs.]**

Exception handling mechanism: Fundamentals exception types, uncaught exception, try-catch Block, displaying description of an exception, multiple catch clauses, nested try-catch statements, throw, throws, finally, built in exceptions, creating own exception subclasses

UNIT VI**[07 Hrs.]**

I/O Streams: Introduction to stream classes, use of stream classes, I/O stream, bytes stream, character stream, pre-defined stream, reading console input, reading character, reading string, writing console output, the print write class, reading & writing files ,transient and volatile modifiers

Text books:				
1	Thinking in Java	4 th Edition (2006)	Bruce Eckel	Prentice Hall
Reference books:				
1	Programming with Java	4th Edition Dec-2009	E. Balagurusamy	TATA McGraw-Hill
2	Java2 Complete Reference	5th Edition, sep-2002	Herbert Schildt	McGraw-Hill



Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Syllabus Open Elective-I

GE1313	OE I : NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS				L=3	T=0	P=0	Credits=3
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration		
	15	15	10	60	100	3 Hrs		

Unit 1: Finite difference methods :

Finite difference approximations for derivatives, boundary value problems with explicit boundary conditions, implicit boundary conditions, error analysis, stability analysis, convergence analysis.

Unit 2: Partial Differential Equations:

Classification of partial differential equations, finite difference approximations for partial derivatives and finite difference schemes.

Unit 3: Parabolic equations:

Schmidt's two level, multilevel explicit methods, Crank-Nicolson's two level, multilevel implicit methods, Dirichlet's problem, Neumann problem, mixed boundary value problem.

Unit 4: Hyperbolic Equations:

Explicit methods, implicit methods, one space dimension, two space dimensions, ADI methods.

Unit 5: Elliptic Equations:

Laplace equation, Poisson equation, iterative schemes, Dirichlet's problem, Neumann problem, mixed boundary value problem, ADI methods.

Unit 6: Finite Element Method:

Conduction Heat Transfer: Basic equations of heat transfer, Governing differential equation for heat conduction, Formulation of finite element method for heat conduction, Galerkin's methods, 1D, 2D heat conduction, Transmission equation/ heat equation/wave equation.

Recommended Text Books :

1. G.D.Smith : Numerical Solution of Partial Differential Equations, Oxford Uni. Press
2. T Veerarajan, T ramachandran: Numerical Methods, McGraw Hill Education.
3. C S Krishnamoorthy : Finite Element Analysis, Tata McGraw Hill, second Edition.

Reference Books:

1. M. K. Jain, R. K. Jain, R. K. Mohanty: Numerical Method for Partial Differential Equations.
2. William F Ames: Numerical Method for Partial Differential Equations, Third Edition.