Nagar Yuwak Shikshan Sanstha's
Yeshwantrao Chavan College of Engineering
(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)
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Summary

1.2.1 Percentage of new courses introduced of the total number of courses across all programs offered during the years

- **Minutes of relevant BOS meetings**
- **Curriculum/ Syllabus of the courses**

Y.C. COLLEGE OF ENGINEERING AUTONOMOUS INSTITUTION SEAL NAGPUR

Principal
Yeshwantrao Chavan
College of Engineering
Wanadongri Hingna Road,
NAGPUR - 441110

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1.1.3 Details of courses offered by the institution that focus on employability/ entrepreneurship/ skill development during the year.

1.2.1 Details of new courses introduced across all programmes offered during the year

S.N.	Name of the Course	Course Code	Activities/Content with a direct bearing on Employability/ Entrepreneurship/ Skill development	Link to the relevant document
	CE			
1	PE-II : Construction Management And Machinery	CV2363	Project management: Introduction, Types of projects, Various phases of project, Project Proposal, Components of planning, Objectives of planning, Factors affecting planning, Organizational setup, Typical layout of a few major construction projects.Job Planning: Bar diagrams & Bar charts, Application of Network techniques (CPM & PERT) for planning. Estimation of critical path and project duration. Resource planning, Resource Allocation, Resource leveling, Optimization of project cost, Cost slope concept.	
2	PE-II : Construction Management (Coursera Platform)	CV2370	Construction Project Management,Construction Scheduling I,Construction Scheduling II,Construction Cost Estimating and Cost Control I,Construction Cost Estimating and Cost Control II,Construction Finance:	
3	PE-III : Energy Conversion and Management	CV2415	Waste to Energy options: physical, thermochemical and bio chemical processes, Combustion, Gasification, pyrolysis; Fuels Derived anaerobic digestion, Biogas Technology, Future Technologies for Waste to Energy Systems.	
4	PE-V : Structural Engineering Practices	CV2440	Importance, determination & calculation of different loads like Dead load, live load, wall load, seismic load, wind load, finish load, temperature load, vibratory load, etc. Various load combinations,Three dimensional Modeling of the Structure, Boundary Conditions, Section Properties, Applications of Loading, Static & Dynamic Analysis of structure, Design of structure, Understanding & Interpretation of the results, Deformation control, Mode Shapes, Vibrations, Acceptance Criteria's, Tolerances, Reinforcement detailing of Structures as per SP24 and as per exposure conditions, Fire Rating, etc.	
5	PE-I Environmental Management	CV2323	Introduction to Environmental Impact Assessment:, Environmental Impact Statement, Methodologies of EIA. MoEF questionnaire for environmental clearance, Environmental Audit,Resource Management	
	ME			
	NIL			
	EL			
1	PEI: Grid Integration of Renewable Energy	EL2366	National action plan on climate change: National Solar Mission	
2	PEI: Switched Mode Power Supply	EL2367	Resonant Load Converters, SMPS Using Resonant Circuit	
3	PEI: Programming in C for beginners	EL2368	Decision Making and Looping	
4	PEII: Sensors and Actuators	EL2428	Design and fabrication process of Microsensors	
5	PEII: Micro Grid	EL2429	Sizing of Micro Grid	
6	PEIII: Converters and Configurations of Renewable Energ	EL2426	PQ issues in grid interconnections for PV and wind systems	
7	PEIII: Distributed Generation in power System	EL2427	Necessity of energy storage, specifications of energy storage	
8	PEIV: Industrial Safety	EL2436	Various methods for analyzing hazards, Risk assessment analysis	
9	PEIV: Project Planning	EL2437	Documentation required for project handover, Preparing a project report for failure reference.	
	EE			
1	PE-VI:Introduction to remote sensing and image analysis	EE2445	Complete syllabus	
	ETC			
	NIL			
	CT			
	NIL			
	IT			
1	OE I: Introdcution to Data Science	IT2373	Employability & Skill Development-Statistical hypothesis generation and testing, Chi-Square test, t-Test, Analysis of variance, Correlation analysis, Maximum likelihood test,Model Evaluation using Visualization – Residual Plot – Distribution Plot – Polynomial Regression and Pipelines – Measures for In-sample Evaluation – Prediction and Decision Making,Scalable and parallel computing with Hadoop and Map-Reduce	
2	OE II: Concepts of Web Programming	IT2383	Employability & Skill Development-Development Environment, Node.js Basics, Node.js Module, File System,Loading library. Directives: Data Binding, ng-init, ng-repeat, ng-app & ng-model directives, custom directives.2 way binding, Validating User Input, Status, ng-empty, ng-touched, ng-valid, ng-pending. Data Binding: Synchronization between model and view. AngularJS Controllers: ng-controller, Controller Methods, External Files.Scope: $scope, understanding the scope, $rootScope	
	CSE			
1	Fundamentals of Economics	GE2312	Skill Development	
2	Database Management Systems	CSE2301	Skill Development	
3	Design & Analysis of Algorithms	CSE2303	Skill Development	
4	PE I: Business Intelligence	CSE2311	Employability	
5	PE I: Web Technologies	CSE2313	Employability	
6	PE I:Mobile operating System	CSE2317	Employability	
7	OE I: Database System Essentials	CSE2331	Skill Development	
8	OE I: Introduction to Image Processing	CSE2332	Skill Development	
9	OE II: Introduction to Web Technology	CSE2342	Skill Development	
10	OE II: Introduction to Cloud Computing	CSE2343	Skill Development	
11	Fundamentals of Management	GE2311	Skill Development	
12	Computer Networks	CSE2351	Skill Development	
13	Compilers	CSE2353	Skill Development	
14	Software Engineering	CSE2355	Skill Development	
15	PE II: Digital Image Processing	CSE2361	Skill Development	
16	PE II: Internet of Things	CSE2363	Employability	
17	PE II: Neural Network and applications	CSE2365	Skill Development	
18	Discrete Mathematics and Graph theory	AIML2201	Skill Development	
19	Formal Language & Automata Theory	AIML2202	Skill Development	
20	Lab: Formal Language & Automata Theory	AIML2203	Skill Development	
21	Data Structures	AIML2204	Skill Development	
22	Lab: Data Structures	AIML2205	Skill Development	
23	Computer Architecture & Organisation	AIML2206	Skill Development	
24	Lab: Software	AIML2207	Skill Development	
25	Linear Algebra	AIML2251	Skill Development	
26	Operating Systems	AIML2252	Skill Development	
27	Lab: Operating Systems	AIML2253	Skill Development	
28	Software Engineering	AIML2254	Skill Development	
29	Lab: Software Engineering	AIML2255	Skill Development	
30	Design & Analysis of Algorithms	AIML2256	Skill Development	

1.1.3 Details of courses offered by the institution that focus on employability/ entrepreneurship/ skill development during the year.

1.2.1 Details of new courses introduced across all programmes offered during the year

S.N.	Name of the Course	Course Code	Activities/Content with a direct bearing on Employability/ Entrepreneurship/ Skill development	Link to the relevant document
31	Lab: Design & Analysis of Algorithms	AIML2257	Skill Development	
32	Database Management Systems	AIML2258	Skill Development	
33	Lab: Database Management Systems	AIML2259	Skill Development	
	FYC			
1	Introduction to German Language	GE2317/GE2367	Complete Syllabus	
2	Introduction to Spanish Language	GE2319/GE2369	Complete Syllabus	
3	Introduction to French Language	GE2320/GE2370	Complete Syllabus	
4	Introduction to Japnese Language	GE2322/GE2377	Complete Syllabus	
5	Fundamental of Management	GE2311	Functions of Management, HR, Marketing and Finance, Indian Contract Act, Indian Companies Act, Methods of performance appraisal and training, Preparation of project proposal, SWOT Analysis, Project techniques for planning, monitoring and controlling, Market Research, Marketing strategies for pricing and sales promotion, Market segmentation and targeting, Market research, Profit and wealth maximisation, Profit and loss account, balancesheet, Concept of Risk and Return , Break Even Analysis, Budgets & Budgetary Control, Make or Buy Analysis	
6	Technical Communication	22AIDS104/22AML102/22CSD204	Complete Syllabus	
7	Professional Communication Skills	22CV104/22ME104/22IoT204	Complete Syllabus	

Civil Engineering

VI Semester
CV2370 - PE-II : Construction Management

COURSE OBJECTIVES	COURSE OUTCOME
Students will be introduced to 1. Construction project management processes. 2. Principles and Techniques of construction scheduling 3. Overview of construction cost estimating and cost control 4. Financial aspects involved in construction project management	Students will be able to 1. Analyze the construction project management processes. 2. Apply the knowledge of construction scheduling. 3. Apply the knowledge of construction cost estimating and cost control. 4. Explain the financial aspects involved in construction project management..
Mapped Program Outcomes : 1, 6, 7, 8, 9, 10, 11, 12	

UNIT–1 : **Construction Project Management**: Course Overview, Construction Industry Overview, Project Delivery, Lean Project Delivery, Sustainability in the Construction Industry, Environment, Health and Safety of Construction Processes, Building Information Modeling and Technology Trends in Construction, International View of Construction Projects, Role of a Construction Manager, Introduction to Project Planning.	**[06 Hrs.]**
UNIT–2 : **Construction Scheduling I:** Introduction to Construction Scheduling, The Role of the Scheduler in Construction Management, Linear Construction Operations and Line of Balance, Technology Applications for Scheduling, Scheduling for Large Programs, Risk Allocation and Planning, Lean Design in Construction Scheduling.	**[06 Hrs.]**
UNIT–3 : **Construction Scheduling II:** Bar (Gantt) Charts, Activity Precedence Diagrams, Types of Construction Activity Relationships, Forward and Backward Pass Calculations, Critical Path, Activity Floats, Understanding Work Dates and Calendar Dates, Activity on Arrow, Program Evaluation & Review Technique (PERT) and Range Estimating.	**[07 Hrs.]**
UNIT–4 : Construction Cost Estimating and Cost Control I:Construction Cost Estimating and Cost Control Overview, Understanding Design in the Construction Industry, Introduction to the Types of Cost Estimates, Quantity Take-Off and Measurement, Pricing.	**[07 Hrs.]**
UNIT–5 : Construction Cost Estimating and Cost Control II: Building the Estimate Procurement, Post Contract and Cost Estimation within a Project, Construction cost Control methods, Earned Value Method (EVM), Close Out Period, Cost Estimation in Practice, Project Cash Flow, Technology Trends in Cost Estimating and Cost Control, Program Cost Estimating, Lean in Cost Control	**[07 Hrs.]**
UNIT–6 : Construction Finance: Introduction To The Construction Finance Course, The Mathematics of Money, Real Estate Finance for Development Projects, Financial Plans for Development Projects, Project Finance, Risk In Project Finance, Public - Private Partnerships.	**[06 Hrs.]**

VI Semester
CV2370 - PE-II : Construction Management

Text Books :

1. Construction Planning and Management – Purifoy
2. Construction Planning and Management – Dr U K Shrivastava, Galgotia Publ.
3. Project Planning & Management – B C Punmia
4. Laws related to buildings and engineering contracts in India- Gajaria G T, LexisNexis Butterworths India Publisher, 2000.
5. Punmia B.C. & Khandelwal K.K., Project Planning & Control with PERT&CPM, Laxmi Publications, New Delhi,1990.

Reference Books :

1. Construction Contracts- Jimmie Hinze McGraw Hill,
2. Contracts and the legal Environment for Engineers and Architects- Joseph T Bockrath, McGraw Hill,
3. Srinath L, CPM & PERT, Affiliated East-West Press Pvt. Ltd., New Delhi.
4. P.S. Gahlot & B.M. Dhir, Construction Planning and Management, New Age International.
5. Chaudhary Roy, Project Management, Tata McGraw Hill, New Delhi.

VII Semester
CV2415 - PE-III : Energy Conversion & Management

COURSE OBJECTIVES	COURSE OUTCOME
Students will be introduced to 1. Energy crisis and energy management, and the importance of energy conservation. 2. Techniques of energy analysis and the associated energy conversion technologies. 3. Energy management systems and their essential elements.	Students will be able to 1. Analyze energy crisis, and of environmental and sustainability concerns associated with the energy management. 2. Work on energy conservation and having the knowledge of energy conversion strategies and methods. 3. Understand the Energy Management Systems
Mapped Program Outcomes : 1,2,3,5,6,7,12	

UNIT–1 : Significance of Energy Conversion and Environment, Overview of Global and Indian Energy Scenario; Environmental Impacts of Energy Conversion, Principles of Waste Minimization and Energy Recovery.	**[07 Hrs.]**
UNIT–2 : Renewable and Non-Renewable Energy Sources; Estimation of Potential of Energy Recovery from various Sources, Energy economics.	**[06 Hrs.]**
UNIT–3 : Energy Conversion Methods: Thermal, hydro, nuclear, solar, wind, tidal etc. their principles and application.	**[07 Hrs.]**
UNIT–4 : Waste to Energy options: physical, thermochemical and bio chemical processes, Combustion, Gasification, pyrolysis; Fuels Derived anaerobic digestion, Biogas Technology, Future Technologies for Waste to Energy Systems.	**[06 Hrs.]**
UNIT–5 : Introduction to Microbial Fuel cell, Gas generations and collection in landfills, Measurements and Control; Energy and Resources Conservation Strategies and Policies.	**[07 Hrs.]**
UNIT–6 : Intelligent Green Building, Green Rating Systems Alternative Construction Materials& methods Testing and Verification.	**[06 Hrs.]**

Text Books :

1. D. O. Hall, G. W. Barnard and P. A. Moss, Biomass for Energy in the Developing Countries, Current Roles, Potentials, Problems, Prospects, Pergamon Press Ltd, 1st edition.
2. W. C. Turner, Energy Management Handbook Wiley New york 1st edition.
3. P. Meier, Energy System Analysis for Developing countries, Sringer Verlag 1st edition.
4. Dorthy J De Renzo, Energy from Bioconversion of Waste materials, Noyes data Corporation USA 1st edition.

Reference Books :

1. G.D. Rai, Non-Conventional Energy Source, Standard Publishers Distributors.
2. Fowler J. M. Energy and the Environment McGraw Hill New York 2nd edition.
3. B.H. Khan, Non-Conventional Energy Resources, 2nd Edition, McGraw Hill Companies.

VI Semester
CV2363- PE-II : Construction Management And Machinery

COURSE OBJECTIVE	COURSE OUTCOMES
Students will be able to understand 1. The concepts related with Construction management system and Role of engineering in developing economics of country, which involves Planning, scheduling, controlling, organizing of project and Execution of the project with economic development & prosperity. 2. To learn basic principles of Construction Management & Various networking techniques (CPM and PERT) of project controlling in the context of various construction aspects. 3. Development of projects by managing resources and its scarcity, Various management functions to control and analysis of equipment management and material management. 4. Exposure to equipments of drilling and blasting techniques and concrete equipments and economics.	Students will have the ability to 1. Understand and analyze scope and role of civil engineer in developing economy of Nation and construction industry. 2. Evaluate the development of network technique of major projects, material and equipment and its safety management. 3. Develop knowledge about quality and finance management system carried out in industry. 4. Practical exposure to various major construction equipments used in construction and economics of demand and supply.
Mapped Program Outcomes : 1,4,8,9,10,11,12	

UNIT–1 : **Construction Industry**: Nature, Characteristics, size and structures. Role in economic development of nation, Employment generation and Infrastructure development related to other industries. **Construction Management**: Necessity, Application of management functions viz. Planning, Organizing, Staffing, Leading and controlling to the construction. **Construction manager**: Role, Qualities, Ethics, Duties, Responsibilities, Authorities. **Legal Aspect and Laws Applicable to Construction Industry**: Works contract act, Child labour act, Workman's compensation Act, Employees provided fund Act 1952, Minimum wages Act, Payment of bonus Act 1965, Maternity leave Act.	**[06 Hrs.]**
UNIT–2 : Project management: Introduction, Types of projects, Various phases of project, Project Proposal, Components of planning, Objectives of planning, Factors affecting planning, Organizational setup, Typical layout of a few major construction projects. **Job Planning**: Bar diagrams & Bar charts, Application of Network techniques (CPM & PERT) for planning. Estimation of critical path and project duration. Resource planning, Resource Allocation, Resource leveling, Optimization of project cost, Cost slope concept.	**[07 Hrs.]**
UNIT–3 : **Material management**: Functions, objectives, purchasing, procedures, records, stock taking, inventory control, EOQ, ABC analysis, material storing. **Equipment managemen**t: Classification of construction equipments, factors affecting selection, Operation & Maintenance cost, Depreciation & Replacement cost, Economic life, Down time cost, Cost of owning equipment. **Safety Management**: Construction hazards, safety in construction, industry & at work site. National safety council, safety organization, accidents, its cost, cause, types & preventions, losses during natural calamities, floods &fire, preventive measures. Safety equipment, Preparation of safety programmes for construction works.	**[06 Hrs.]**

VI Semester
CV2363- PE-II : Construction Management And Machinery

UNIT–4 : **Construction Equipment:** Introduction to Construction Equipment: Their contribution and importance in construction Industry. Classification of Equipment. **Money & Banking**: Functions Commercial & Central Banks. **Financial Management:** Objectives, Law of flow of funds. Financial Accounting Systems, Accounting methods- cash basis, Actual Basis, Percentage completion basis, Completed contract basis.	**[07 Hrs.]**
UNIT–5 : **Equipments for major projects**: Excavating machines such as Power shovels, Drag Line, Bulldozer, Scrapper, Drilling & blasting equipments, material transporting & handling equipment such as cranes, hoists, conveyer belts, dumpers, cableways, rail system (size, performance & limitations). **Concrete equipments**: Different types of mixers, vibrators, batch mixing plants, Transportation of concrete, concrete pumps & placers, Shotcreting, Guniting & its equipment.	**[07 Hrs.]**
UNIT–6 : **Economics**: Nature & scope of Economics & relationship with Engineering. Supply and Demand Mechanism. Application of MIS: System Development, Data processing, Flow-charting, DBM, Data communication System Developments, Data processing, Application in Civil Engineering Industry. Study of Introduction and Application of construction management software (any one) in civil engineering Industry.	**[06 Hrs.]**

Text Books :

1. Shrivastava U.K., Construction Planning and management, Galgotia publication.
2. Khanna O.P, Industrial Engineering & Management, Dhanpat Rai & Sons, New Delhi, 1992.
3. Verma Mahesh, Equipment Management, S.Chand &Sons
4. Punmia B.C. & Khandelwal K.K., Project Planning & Control with PERT&CPM, Laxmi Publications, New Delhi,1990.
5. BL Gupta, Amit Gupta, Construction Management & Machinery, Standard Publishers Distributors, 2010.

Reference Books :

1. Peurifoy, M.H, Construction Management, McGraw Hill, New York.
2. Srinath L, CPM & PERT, Affiliated East-West Press Pvt. Ltd., New Delhi.
3. P.S. Gahlot & B.M.Dhir, Construction Planning and Management, New Age International.
4. Chaudhary Roy, Project Management, Tata McGraw Hill, New Delhi.

VII Semester
CV2440 - PE-V : Structural Engineering Practices

COURSE OBJECTIVE	COURSE OUTCOMES
1. To make the students aware about Structural Engineering Practices and pre-requisites in initiating structural design 2. To provide the students the knowledge about various standards and specifications frequently referred by Structural Engineers and their use in practice 3. To make the students aware about architectural plans, structural analysis and design of structural elements, identification of points for discussion between an architect and structural designer 4. To design an RCC building and prepare structural drawings.	1. An Ability to understand structural engineering practices and pre-requisites. 2. An ability to understand relevant standards and software related to structural design. 3. An ability to understand important construction process related to structural members. 4. An ability to design building components and prepare detailed structural drawings.
Mapped Program Outcomes : 1,2,3,4,12 **PSO** : i	

UNIT–1 : Importance of various architectural building plans and sections for the structural design. Structural behavior, Design basis, Design Intent, Standards, Manuals, Methods, material testing, Material Properties, Mix design, Quality Control, Different Tests & checks carried out at site, cube tests, buckling, creep, Shrinkage, etc. Professional ethics	**[07 Hrs.]**
UNIT–2 : Preparation of the structural framing plan of the building, beam locations, column positions, column orientations, shear walls locations. Introduction of SP16, IS:1893, IS:13920	**[06 Hrs.]**
UNIT–3 : Importance, determination & calculation of different loads like Dead load, live load, wall load, seismic load, wind load, finish load, temperature load, vibratory load, etc. Various load combinations.	**[06 Hrs.]**
UNIT–4 : Three dimensional Modeling of the Structure, Boundary Conditions, Section Properties, Applications of Loading, Static & Dynamic Analysis of structure, Design of structure, Understanding & Interpretation of the results, Deformation control, Mode Shapes, Vibrations, Acceptance Criteria's, Tolerances, , .	**[7 Hrs.]**
UNIT–5 : Foundations – Importance of soil exploration, Various types of Foundation, Selection of type of foundation. Construction Methods.	**[07 Hrs.]**
UNIT–6 : Reinforcement detailing of Structures as per SP24 and as per exposure conditions, Fire Rating, etc.	**[06 Hrs.]**

Text books:

1. P.C. Vergese, Limit State Design of Reinforced Concrete, Prentice Hall Publishers, 2nd edition, 2008
2. Shah and Karve, Reinforced Concrete Structures, Structures Publishers, Pune, 5th edition, 2015.
3. Sinha S.N, Reinforced Concrete Design, Tata McGraw Hill Publishing Company Limited, New Delhi, 2007
4. Ashok K. Jain, Reinforced Concrete –Limit State Design, Nem chand and Brothers, 7th edition,2012

Reference books:

1. P.C. Varghese, Advanced Design of Structures, Prentice Hall Publishers,2009
2. Punmia B.C.,Jain A.K.,Jain A.K,Reinforced Concrete Structures (Vol-I),Laxmi Publications Pvt Ltd, New Delhi, 2007
3. N. Krishana Raju,Prestressed Concrete,Tata McGraw Hill Publishing Company Limited, New Delhi, 5th edition 2012

V Semester
CV2323– PE-I : ENVIRONMENTAL MANAGEMENT

COURSE OBJECTIVES	COURSE OUTCOME
1. To develop, implement, monitor and maintain environmental strategies, policies, programmes and systems that promote sustainable development 2. To oversee the environmental performance including compliance with environmental legislation across the organization, and coordinating all aspects of pollution control, waste management, environmental health and conservation 3. To lead the implementation of environmental policies and practices and raise awareness, at all levels of an organization, about the emerging environmental issues.	At the end of the course the student will be able to- 1. Identify the scientific and social aspects of environmental issues. 2. Understand the procedure of environmental protection by legislation. 3. Understand the role of environmental management system in protecting the resources.
Mapped Program Outcomes : 6,7,8,10,12	

UNIT–1 : Introduction to Environmental Management Development and Environment, environmental attributes, nature of impact – primary, secondary, tertiary, shot –term long-term, local and regional, reversible & Irreversible impacts. **Overview of impacts** –directly & indirectly measurable impacts with respect to air, noise, land, biological & socio-economic environment.	**[06 Hrs.]**
UNIT–2 : Introduction to Environmental Impact Assessment: need for EIA, concept of EIA, elements of EIA Role and Status of EIA in India EIA Procedures, Environmental Impact Statement, Methodologies of EIA.	**[07 Hrs.]**
UNIT–3 : MoEF questionnaire for environmental clearance, critical environmental issues and formulation of strategies of EMP, environmental management plan, development of action plans for critical environmental education programmers. EMS.	**[07 Hrs.]**
UNIT–4 : Environmental legislation – basic concepts, critical issues, civil liability, various enactment and their provisions – Water Act (1974, 1988), forest Conservation Act (1980), Air Act (1981, 1988), Water (Cess) Act 1977, Environmental Protection Act 1986, public Liability & Insurance Act, Motor Vehicle Act 1989, Rules, 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, procedural aspects of conducting environmental audit, Eco-Labeling, LCA.	**[06 Hrs.]**
UNIT–6 : Resource Management: depletion of resources – causes & effects, resource utilization, , optimal use of resources.	**[06 Hrs.]**

V Semester
CV2323– PE-I : ENVIRONMENTAL MANAGEMENT

Text Books :

1. Anand Bal, An Introduction to Environmental Management, Himalaya Publishing House.,2009
2. John Rau & Wooten, Environmental Impact Assessment, Mc Graw Hill.
3. Larry Canter, Environmental Impact Assessment, McGraw Hill.
4. Harry W. Gehm, Jacob I. Bregman, handbook on pollution Control Acts, Central Pollution Control Board, New Delhi.
5. R.K. Sapra, S. Bhardwaj, the New Environmental Age, Ashish Pub. House, New Delhi.

References Books :

1. Rosencrannz, S. Divan, M.L. Nobal, Environmental Law and Policy in India, Cases, Materials and Statutes, Tripathi Pvt. Ltd. Bombay.

Electrical Engineering

Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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SoE No. EL-202.1

B.TECH SCHEME OF EXAMINATION 2020-21

(Revised Scheme of Examination w.e.f. 2022-23 onward)

Electrical Engineering

SN	Sem	Type	Sub. Code	Subject	T/P	Contact Hours				Credits	% Weightage			ESE Duration Hours
						L	T	P	Hrs		MSEs*	TA**	ESE	
TOTAL FIRST & SECOND SEM										47				
Third Semester														
1	3	BS	GE2201	Engineering Mathematics III	T	3	0	0	3	3	30	20	50	3 Hours
2	3	PC	EL2201	Analog Electronics	T	3	0	0	3	3	30	20	50	3 Hours
3	3	PC	EL2202	Lab. : Electronics Engineering Workshop	P	0	0	2	2	1		60	40	
4	3	PC	EL2203	Electrical Machines	T	4	0	0	4	4	30	20	50	3 Hours
5	3	PC	EL2204	Lab.:Electrical Machines	P	0	0	2	2	1		60	40	
6	3	PC	EL2205	Network Analysis	T	3	0	0	3	3	30	20	50	3 Hours
7	3	PC	EL2206	Lab.:Computer Programming	P	0	0	2	2	1		60	40	
8	3	PC	EL2207	Electrical Measurement & Instrumentation	T	3	0	0	3	3	30	20	50	3 Hours
9	3	PC	EL2208	Lab.:Electrical Measurement & Instrumentation	P	0	0	2	2	1		60	40	
				TOTAL		16	0	8	24	20				
Fourth Semster														
1	4	BS	GE2204	Advance Mathematical Techniques	T	3	0	0	3	3	30	20	50	3 Hours
2	4	PC	EL2251	Electrical Machines in Power System	T	3	0	0	3	3	30	20	50	3 Hours
3	4	PC	EL2252	Lab.:Electrical Machines in Power System	P	0	0	2	2	1		60	40	
4	4	PC	EL2253	Electrical Energy Generation System	T	3	0	0	3	3	30	20	50	3 Hours
5	4	PC	EL2254	Lab.:Renewable Energy System	P	0	0	2	2	1		60	40	
6	4	PC	EL2255	Electric & Magnetic Fields	T	3	0	0	3	3	30	20	50	3 Hours
7	4	PC	EL2256	Lab.:Electrical Engineering Workshop	P	0	0	2	2	1		60	40	
8	4	PC	EL2257	Microprocessor	T	3	0	0	3	3	30	20	50	3 Hours
9	4	PC	EL2258	Lab.:Microprocessor	P	0	0	2	2	1		60	40	
10	4	PC	EL2259	Signals & Systems	T	4	0	0	4	4	30	20	50	3 Hours
				TOTAL		19	0	8	27	23				
List of Audit Courses														
1	3	HS	GE2121	Env Studies for 3 Sem. EL,ET,CT	A	3	0	0	3	0				
2	3	HS	AU2123	YCCE Communication Aptitude Preparation (YCAP3)	A	3	0	0	3	0				
3	4	HS	AU2125	YCCE Communication Aptitude Preparation (YCAP4.2) for EL,EE,ET	A	3	0	0	3	0				

MSEs* = Two MSEs of 15 Marks each will conducted and marks of these 2 MSEs will be considered for Continuous Assessment

TA ** = for Theory : 5 marks on lecture quizzes, 11 marks on TA2+TA4 activitied decided by course teacher, 4 marks on class attendance

TA = for Practical : MSPA will be 15 marks each**

		June 2022	1.05
Chairperson	Dean (Acad. Matters)	Date of Release	Version

Applicable for AY 2022-23 Onwards

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SoE No. EL-202.1

B.TECH SCHEME OF EXAMINATION 2020-21

(Revised Scheme of Examination w.e.f. 2022-23 onward)

Electrical Engineering

SN	Sem	Type	Sub. Code	Subject	T/P	Contact Hours				Credits	% Weightage			ESE Duration Hours
						L	T	P	Hrs		MSEs*	TA**	ESE	
Fifth Semester														
1	5	HS	GE2312	Fundamental of Economics	T	3	0	0	3	3	30	20	50	3 Hours
2	5	PC	EL2301	Power Electronics	T	3	0	0	3	3	30	20	50	3 Hours
3	5	PC	EL2302	Lab.:Power Electronics	P	0	0	2	2	1		60	40	
4	5	PC	EL2303	Fundamentals of Power System	T	3	0	0	3	3	30	20	50	3 Hours
5	5	PC	EL2304	Electrical Drives	T	3	0	0	3	3	30	20	50	3 Hours
6	5	PC	EL2305	Lab.:Electrical Drives	P	0	0	2	2	1		60	40	
7		OE		Open Elective - I *	T	3	0	0	3	3	30	20	50	3 Hours
8	5	OE		Open Elective - II *	T	3	0	0	3	3	30	20	50	3 Hours
				TOTAL		**18**	**0**	**4**	**22**	**20**				

Audit Courses														
1	5	HS	AU2127	YCCE Communication Aptitude Preparation (YCAP5.2) for EL,EE,ET	A	3	0	0	3	0				

Open Electives -I

1	5	OE	EL2311	OEI:Renewable Energy Generation System
2	5	OE	EL2312	OEI:Electrical Machines and their Applications
3	5	OE	EL2313	OEI:Testing and Maintenance of Electrical Machines
4	5	OE	EL2314	OEI: Solar power plant design and Installation

Open Electives -II

4	5	OE	EL2321	OEII:Electrical Energy Audit and Safety
5	5	OE	EL2322	OEII:Utilization of Electrical Energy
6	5	OE	EL2323	OEII:Power System Engineering

MSEs* = Two MSEs of 15 Marks each will conducted and marks of these 2 MSEs will be considered for Continuous Assessment

TA ** = for Theory : 5 marks on lecture quizzes, 11 marks on TA2+TA4 activitied decided by course teacher, 4 marks on class attendance

TA = for Practical : MSPA will be 15 marks each**

		June 2022	1.05
Chairperson	Dean (Acad. Matters)	Date of Release	Version

Applicable for AY 2022-23 Onwards

Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

SoE No. EL-202.1

B.TECH SCHEME OF EXAMINATION 2020-21

(Revised Scheme of Examination w.e.f. 2022-23 onward)

Electrical Engineering

SN	Sem	Type	Sub. Code	Subject	T/P	Contact Hours				Credits	% Weightage			ESE Duration Hours
						L	T	P	Hrs		MSEs*	TA**	ESE	
Sixth Semester														
1	6	HS	GE2311	Fundamental of Management	T	3	0	0	3	3	30	20	50	3 Hours
2	6	PC	EL2351	Control System	T	3	0	0	3	3	30	20	50	3 Hours
3	6	PC	EL2352	Lab.:Control System	P	0	0	2	2	1		60	40	
4	6	PC	EL2353	Power System Analysis	T	3	0	0	3	3	30	20	50	3 Hours
5	6	PE		**Professional Elective I**	T	3	0	0	3	3	30	20	50	3 Hours
6	6	PE	EL2354	**Lab.**:Simulation of Power Electronics & Power System	P	0	0	2	2	1		60	40	
7	6	OE		**Open Elective III ***	T	3	0	0	3	3	30	20	50	3 Hours
8	6	OE		**Open Elective IV ***	T	3	0	0	3	3	30	20	50	3 Hours
9	6	PC	EL2355	Lab.:Substation Design	P	0	0	2	2	1		60	40	
10	5/6	STR	EL2360	**Industry Visit and its report**	P	0	0	0	0	1		60	40	
					TOTAL	**18**	**0**	**6**	**24**	**22**				

Professional Electives -I

1	6	PE	EL2361	**PEI:**Advanced Power Electronics
2	6	PE	EL2362	**PEI**:Electrical Distribution in Power System
3	6	PE	EL2363	**PEI:**Illumination Engineering (MOOC)
4	6	PE	EL2364	**PEI:**Electric Vehicles
5	6	PE	EL2365	**PEI**:Electric Power Utilization
6	6	PE	EL2366	**PEI:** Grid Integration of Renewable Energy
7	6	PE	EL2367	**PEI:** Switched Mode Power Supply
8	6	PE	EL2368	**PEI:** Programming in C for beginners

Open Electives -III

9	6	OE	EL2371	**OEIII**:Renewable Energy Generation System
10	6	OE	EL2372	**OEIII**:Electrical Machines and their Applications
11	6	OE	EL2373	**OEIII**:Testing and Maintenance of Electrical Machines
12	6	OE	EL2374	**OEIII**:Solar power plant design and Installation

Open Electives -IV

13	6	OE	EL2381	**OEIV:**Electrical Energy Audit and Safety
14	6	OE	EL2382	**OEIV**:Utilization of Electrical Energy
15	6	OE	EL2383	**OEIV**:Power System Engineering
16	6	OE	EL2384	**OEIV**: Electrical Wiring: Estimation and Costing

Audit Courses											
1	6	HS	AU2128	YCCE Communication Aptitude Preparation (YCAP6.1) for CV,EL	**A**	3	0	0	3	0	

MSEs* = Two MSEs of 15 Marks each will conducted and marks of these 2 MSEs will be considered for Continuous Assessment

TA ** = for Theory : 5 marks on lecture quizzes, 11 marks on TA2+TA4 activitied decided by course teacher, 4 marks on class attendance

TA = for Practical : MSPA will be 15 marks each**

		June 2022	**1.05**
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SoE No. EL-202.1

B.TECH SCHEME OF EXAMINATION 2020-21

(Revised Scheme of Examination w.e.f. 2022-23 onward)

Electrical Engineering

SN	Sem	Type	Sub. Code	Subject	T/P	Contact Hours				Credits	% Weightage			ESE Duration Hours
						L	T	P	Hrs		MSEs*	TA**	ESE	
Seventh Semester														
1	7	PC	EL2401	Switchgear & Protection	T	3	0	0	3	3	30	20	50	3 Hours
2	7	PC	EL2402	Lab.:Switchgear & Protection	P	0	0	2	2	1		60	40	
3	7	PC	EL2403	High Voltage Engineering	T	3	0	0	3	3	30	20	50	3 Hours
4	7	PC	EL2404	Lab.:High Voltage Engineering	P	0	0	2	2	1		60	40	
5	7	PE		**Professional Elective II**	T	3	0	0	3	3	30	20	50	3 Hours
6	7	PE		**Professional Elective III**	T	3	0	0	3	3	30	20	50	3 Hours
7	7	PE		**Professional Elective IV**	T	3	0	0	3	3	30	20	50	3 Hours
8	7	STR	EL2409	Mini Project	P	0	0	4	4	2		60	40	
9	7	STR	EL2410	Campus Recrutment Training (CRT)	P	0	0	0	0	2		100		
					TOTAL	**15**	**0**	**8**	**23**	**21**				

Professional Electives -II

1	7	PE	EL2411	**PEII:** Fundamentals of Power Quality
2	7	PE	EL2412	**PEII:**Electrical Installation Design
3	7	PE	EL2413	**PEII:**Electrical Machine Design
4	7	PE	EL2421	**PEII:** Power System Operation and Control
5	7	PE	EL2422	**PEII:** Sensors and Actuators

Professional Electives -III

5	7	PE	EL2422	**PEIII**:FACTS Devices
6	7	PE	EL2423	**PEIII**: Electrical Energy Management and Audit
7	7	PE	EL2424	**PEIII:**Advanced Control System
8	7	PE	EL2425	**PEIII:**Artificial Intelligence Based System

Professional Electives -IV

9	7	PE	EL2431	**PEIV:**Advanced Electrical Drives
10	7	PE	EL2432	**PEIV**:Fundamentals of Smart Grid
11	7	PE	EL2433	**PEIV**:Computer Methods in Power System
12	7	PE	EL2434	**PEIV**:EHVAC-HVDC Transmission

Coursera Electives

1	6	PE	EL2366	**PEI**:Energy Production, Distribution and Safety
1	7	PE	EL2435	**PEIV**: Power Electronics Specialization

MSEs* = Two MSEs of 15 Marks each will conducted and marks of these 2 MSEs will be considered for Continuous Assessment

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TA = for Practical : MSPA will be 15 marks each**

		June 2022	1.04
Chairperson	Dean (Acad. Matters)	Date of Release	Version

Applicable for AY 2020-21 Onwards

Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

SoE No. EL-202.1

B.TECH SCHEME OF EXAMINATION 2020-21

(Revised Scheme of Examination w.e.f. 2022-23 onward)

Electrical Engineering

SN	Sem	Type	Sub. Code	Subject	T/P	Contact Hours				Credits	% Weightage			ESE Duration Hours
						L	T	P	Hrs		MSEs*	TA**	ESE	
Eigth Semester														
1	8	STR	EL2451	Major Project	**P**	0	0	12	12	9		60	40	
2	8	STR	EL2452	Extra curricular Activity Evaluation	**P**	0	0	0	0	1		100		
				TOTAL		**0**	**0**	**12**	**12**	**10**				
				GRAND TOTAL		**86**	**0**	**46**	**132**	**163**				

MSEs* = Two MSEs of 15 Marks each will conducted and marks of these 2 MSEs will be considered for Continuous Assessment

TA ** = for Theory : 5 marks on lecture quizzes, 11 marks on TA2+TA4 activitied decided by course teacher, 4 marks on class attendance

TA = for Practical : MSPA will be 15 marks each**

		June 2022	**1.05**	**Applicable for AY 2022-23 Onwards**
Chairperson	**Dean (Acad. Matters)**	**Date of Release**	**Version**	

Electroncis Engineering

Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

SoE No. EE-202.1

B.TECH SCHEME OF EXAMINATION 2020-21

(Revised Scheme of Examination w.e.f. 2022-23 onward)

Electronics Engineering

SN	Sem	Type	Sub. Code	Subject	T/P	Contact Hours				Credits	% Weightage			ESE Duration Hours
						L	T	P	Hrs		MSEs*	TA**	ESE	
Seventh Semester														
1	7	PC	EE2401	Digital System Design	**T**	3	0	0	3	3	30	20	50	3 Hours
2	7	PC	EE2402	**Lab.**: Digital System Design	**P**	0	0	2	2	1		60	40	
3	7	PE		Professional Elective-III	**T**	3	0	0	3	3	30	20	50	3 Hours
4	7	PE		Professional Elective-IV	**T**	3	0	0	3	3	30	20	50	3 Hours
5	7	PE		Lab. : Professional Elective-IV	**P**	0	0	2	2	1		60	40	
6	7	PE		Professional Elective-V	**T**	3	0	0	3	3	30	20	50	3 Hours
7	7	PE		Professional Elective-VI	**T**	3	0	0	3	3	30	20	50	3 Hours
8	7	STR	EE2409	Mini Project	**P**	0	0	4	4	2		60	40	
9	7	STR	EE2410	Campus Recrutment Training (CRT)	**P**	0	0	0	0	2		100		
					TOTAL	**15**	**0**	**8**	**23**	**21**				

Professional Electives -III

1	7	PE III	EE2411	PE III: Switching Theory & Finite Automata
2	7	PE III	EE2412	PE III :Power Electronics
3	7	PE III	EE2413	PE III: Wireless Sensor Network
4	7	PE III	EE2414	PE III: VLSI Signal Processing

Professional Electives -IV

1	7	PE IV	EE2421	PE IV: Wireless Communication
	7	PE IV	EE2422	**Lab:** PE IV:Wireless Communication
2	7	PE IV	EE2423	PE IV: RF and Microwave
	7	PE IV	EE2424	**Lab:** PE IV: RF and Microwave
3	7	PE IV	EE2425	PE IV: Analog VLSI Design
	7	PE IV	EE2426	**Lab. :** PE IV: Analog VLSI Design
4	7	PE IV	EE2427	PE IV: Operating Systems
	7	PE IV	EE2428	**Lab:** PE IV:Operating Systems

Professional Electives -V

1	7	PE V	EE2431	PE V: Industrial Automation
2	7	PE V	EE2432	PE V: Nano Electronics
4	7	PE V	EE2433	PE V: Optical Communication
5	7	PE V	EE2434	PE V: RF Circuit Design

Professional Electives -VI

1	7	PE-VI	EE2441	PE-VI: E-Commerce and Data Analytics
2	7	PE-VI	EE2442	PE-VI: Micro Electro Mechanical Systems (MEMS)
3	7	PE-VI	EE2443	PE-VI: Biomedical Instrumentation
4	7	PE-VI	EE2444	PE-VI: Computer Organization
5	7	PE-VI	EE2445	PE VI : Introduction to Remote Sensing and Image Analysis

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TA = for Practical : MSPA will be 15 marks each**

		June 2020	1.04	Applicable for AY 2020-21 Onwards
Chairperson	Dean (Acad. Matters)	Date of Release	Version	

VII Semester
EE2445 – PE VI: Introduction to Remote Sensing and Image Analysis

Course Objective	Course Outcome
Course Objective Students should be able to 1) Understand Remote Sensing & sensor Concepts 2) Understand the fundamentals and image characteristics of remote sensing. 3) Learn image enhancement techniques 4) Study image classification technique and hyperspectral image analysis	**Course Outcome** Students will be able to 1) Comprehend the basic and applied principles of remote sensing, RS image characteristics 2) Understand and evaluate image spatial and spectral transforms and their effect on image quality and data integrity 3) Apply the image correction techniques and classification algorithms on remote sensing images 4) Analyze high-dimensional remote sensing imagery with appropriate remote sensing data and processing methods.

UNIT-1: Remote Sensing Concepts Review of Remote Sensing Concepts: spatial and radiometric characteristics – spectral and temporal characteristics, Optical Radiation Model: The wave/ particle models - energy/matter interaction – Radiometric Correction–Atmospheric Correction, Image sensors
UNIT-2: Digital Image Formation and Characteristics Digital Image Formation: point spread functions – sampling and quantization Digital Image Characteristics: Univariate and multivariate image statistics – noise models- power spectral density- co-occurrence matrix
UNIT-3: Image Enhancement and Spectral Transforms Contrast enhancement – band rationing – principal component analysis – vegetation transforms – texture transforms, Spatial Transforms: convolution concept - low and high pass filtering – spatial transformations – Fourier transform
UNIT 4: Geometric Correction Sensor geometry and empirical models for geometric corrections techniques. Distortion Correction, Sensor compensation, Noise reduction, Radiometric Calibration

Unit 5: RS Image Classification Thematic Information Extraction: review of supervised and unsupervised Image classification – Maximum Likelihood and Bayesian classification, Non-parametric & parametric classification
Unit 6: High Dimension Image Analysis Subpixel classification: Linear mixing model, fuzzy set classification, Hyperspectral Image Analysis: Feature extraction, classification algorithms for hyperspectral data, Applications of Remote Sensing

Text books:				
1	Remote Sensing: Models and Methods for Image Processing	Third Edition,2007	Robert Schowengerdt A.	Elsevier
2	Remote Sensing Digital Image Analysis	4th Edition, 2006	John A. Richards, Xiuping Jia	Springer

Reference books:				
1	Introductory Digital Image Processing: A Remote Sensing Perspective	Fourth Edition, 2016	Jhon R. Jensen	Pearson Series
2	Physical Principles of Remote Sensing	Third Edition, 2012	W.G. Rees	Cambridge UniversityPress

Information Technology

Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

SoE No. IT-202.1

B.TECH SCHEME OF EXAMINATION 2020-21

(Revised Scheme of Examination w.e.f. 2022-23 onward)

Information Technology

SN	Sem	Type	Sub. Code	Subject	T/P	Contact Hours				Credits	% Weightage			ESE Duration Hours
						L	T	P	Hrs		MSEs*	TA**	ESE	
				TOTAL FIRST & SECOND SEM						**47**				
Fifth Semester														
1	5	HS	GE2312	Fundamental of Economics	**T**	3	0	0	3	3	30	20	50	3
2	5	PC	IT2301	Data Base Management Systems	**T**	3	0	0	3	3	30	20	50	3
3	5	PC	IT2302	**Lab :** Data Base Management Systems	**P**	0	0	2	2	1		60	40	
4	5	PC	IT2303	Software Engineering	**T**	3	0	0	3	3	30	20	50	3
5	5	PE		**Professional Elective - I**	**T**	3	0	0	3	3	30	20	50	3
6	5	PE		**Lab : Professional Elective-I**	**P**	0	0	2	2	1		60	40	
7	5	OE		**Open Elective-I**	**T**	3	0	0	3	3	30	20	50	3
8	5	OE		**Open Elective-II**	**T**	3	0	0	3	3	30	20	50	3
9	5	STR	IT2310	**Industrial Visit and Learning**	**P**	0	0	0	0	1		100		
				TOTAL FIFTH SEM		**18**	**0**	**4**	**22**	**21**				

Professional Electives -I

1	5	PE-1	IT2311	PE I: Web Programming
	5	PE-1	IT2312	PE I: Lab.: Web Programming
2	5	PE-1	IT2313	PE I: Data Analysis and Statistics
	5	PE-1	IT2314	PE I: Lab.: Data Analysis and Statistics
3	5	PE-1	IT2315	PE I: Customer Relationship Management
	5	PE-1	IT2316	PE I: Lab. Customer Relationship Management
4	5	PE-1	IT2317	PE I: Mobile Operating System
	5	PE-1	IT2318	PE I: Lab. Mobile Operating System
5	5	PE-1	IT2391	PE I: Java Full Stack Development Part-1
	5	PE-1	IT2392	PE I: Lab. Java Full Stack Development Part-1
6	5	PE-1	IT2393	PE I: Dot Net Full Stack Development Part-1
	5	PE-1	IT2394	PE I: Lab. Dot Net Full Stack Development Part-1

Open Electives -I

1	5	OE I	IT2321	OE I: Industry 4.0
2	5	OE I	IT2322	OE I: Core JAVA
3	5	OE I	IT2323	OE I: Introduction to Data Science

Open Electives -II

1	5	OE-II	IT2331	OE II: Introduction to Machine Learning
2	5	OE-II	IT2332	OE II: Information Security
3	5	OE-II	IT2333	OE II: Concepts in Web Programming

Audit Courses											
1	5	HS	AU2126	YCCE Communication Aptitude Preparation (YCAP5.1) for CV,ME,CT,IT,CSE	**A**	3	0	0	3	0	

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TA ** = for Theory : 5 marks on lecture quizzes, 11 marks on TA2+TA4 activitied decided by course teacher, 4 marks on class attendance

TA = for Practical : MSPA will be 15 marks each**

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Chairperson	**Dean (Acad. Matters)**	**Date of Release**	**Version**

Applicable for AY 2022-23 Onwards

V Semester
IT2323 - OE-1: Introduction to Data Science

Course Learning Objective	Course Outcomes
Student will able: 1. To understand basic of data science and its application world around. 2. To identify and describe the methods and techniques commonly used in data science. 3. To study about data preprocessing, data preparation steps. **4.** To learn and use various data analysis tool to explore and understand data.	After completion of the course: 5. Identify and describe the methods and techniques commonly used in data science 6. Demonstrate proficiency with the methods and techniques for obtaining, organizing, exploring, and analyzing data. 7. Recognize how data analysis, inferential statistics, modeling, machine learning, and statistical computing can be utilized in an integrated capacity 8. Demonstrate the ability to clean and prepare data for analysis and assemble data from a variety of sources.

Course Outcomes	Statement	Mapped PO												PSO	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Identify and describe the methods and techniques commonly used in data science	3	3											3	3
2	Demonstrate proficiency with the methods and techniques for obtaining, organizing, exploring, and analyzing data.	3	3	3										3	3
3	Recognize how data analysis, inferential statistics, modeling, machine learning, and statistical computing can be utilized in an 3integrated capacity	3	3	3		3								3	3
4	Demonstrate the ability to clean and prepare data for analysis and assemble data from a variety of sources.	3	3	3										3	3
IT		3	3	3		3								3	3

UNIT I		**[05 Hrs.]**
Unit – I: Introduction to Data Science – Evolution of Data Science – Data Science Roles – Stages in a Data Science Project – Applications of Data Science in various fields – Data Security Issues.		
UNIT II		**[05 Hrs.]**
Unit – II: Data Collection and Data Pre-Processing Data Collection Strategies – Data Pre-Processing Overview – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization.		
UNIT III		**[06 Hrs.]**
Unit – III: Exploratory Data Analytics Descriptive Statistics – Mean, Standard Deviation, Skewness and Kurtosis – Box Plots – Pivot Table – Heat Map – Correlation Statistics – ANOVA.		
UNIT IV		**[08 Hrs.]**
Unit – IV: Model Development Simple and Multiple Regression – Model Evaluation using Visualization – Residual Plot – Distribution Plot – Polynomial Regression and Pipelines – Measures for In-sample Evaluation – Prediction and Decision Making.		
UNIT V		**[08 Hrs.]**
Unit – V: Model Evaluation Generalization Error – Out-of-Sample Evaluation Metrics – Cross Validation – Overfitting – Under Fitting and Model Selection – Prediction by using Ridge Regression – Testing Multiple Parameters by using Grid Search.		
UNIT VI		**[08 Hrs.]**
Unit VI- Case study based on data analytics Tool(R Language,Tabelue,Python)		

Text books:

Sr.No	Title of Book	Edition	Author	Publication
1	The Intersection of IoT and Data Science", PACKT, 2016.		Jojo Moolayil, "Smarter Decisions :	
2	Doing Data Science		Cathy O'Neil and Rachel Schutt	O'Reilly, 2015.

Reference books:				
Sr.No.	Title of Book	Edition	Author	Publication
1	"Data Science and Big data Analytics"		David Dietrich, Barry Heller, Beibei Yang,	EMC 2013
2	Handbook of Research on Cloud Infrastructures for Big Data Analytics		Raj, Pethuru	IGI Globa

V Semester

IT2333 - OE-2: Concepts in Web Programming

Objective	Course Outcome
The student should be able to 5. Get familiar with basics of HTML, HTML tags, DHTML CSS. 6. Get familiar with client server architecture and able to develop a web application using java technologies 7. Get familiar with markup languages with their structures and syntax. 8. To get familiarised with PHP frame work	On completion of this course, the student will be able to 5. Understand the different tags of HTML and Implement interactive web pages using HTML , DHTML and CSS. 6. Understand client server architecture and Develop interactive web pages using java script and client and server side programming. 7. Understand the concept of Markup languages and Make the use of mark up languages in development of web pages. 8. Understand the concepts of PHP and Develop web applications using PHP

Unit No.	Contents	Max. Hrs.
1	Creation of web pages: HTML tags, special characters, images, tables, forms, the hyperlinks, Frames	8
2	Dynamic HTML (DHTML): Introduction, Cascading Style Sheets (CSS), DHTML Document Object Model and Collections	8
3	Scripting Languages:- Java Script objects and forms, server side and client side scripting languages	6
4	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	7
5	The importance of being asynchronous, Blocking vs. non-blocking code, Server-side JavaScript, What is Node.js?, Why use Node.js?,Features, Process Model, Setup Node.js Development Environment, Node.js Basics, Node.js Module, File System	7
6	Introduction to AngularJS, AngularJS Expressions: Numbers, Strings, Objects, Arrays, Expressions using {{ }} and ng-bind. Modules: Creating a module, adding a controller & directive, myApp.js, myCtrl.js, Loading library. Directives: Data Binding, ng-init, ng-repeat, ng-app & ng-model directives, custom directives.2 way binding, Validating User Input, Status, ng-empty, ng-touched, ng-valid, ng-pending. Data Binding: Synchronization between model and view. AngularJS Controllers: ng-controller, Controller Methods, External Files.Scope: $scope, understanding the scope, $rootScope	6

V Semester
IT2333 - OE-2: Concepts in Web Programming

Text Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	The Complete Reference HTML and XHTML		Thomas A.Powell	McGraw Hill Pub
2	Learning angular JS		Dayley, Brad Dayley	

Reference Books				
SN	Title	Edition	Authors	Publisher
1	Learning PHP, MySQL, JavaScript, and CSS: A Step-by-Step Guide to Creating Dynamic Websites		Robin Nixon	

Computer Science and Engineering

Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

SoE No. CSE-202.1

B.TECH SCHEME OF EXAMINATION 2020-21

(Scheme of Examination w.e.f. 2022-23 onward)

Computer Science & Engineering

SN	Sem	Type	Course Code	Course Name	T/P	Contact Hours				Credits	% Weightage			ESE Duration Hours
						L	T	P	Hrs		MSEs*	TA**	ESE	
Fifth Semester														
1	5	HS	GE2312	Fundamentals of Economics	**T**	3	0	0	3	3	30	20	50	3 Hours
2	5	PC	CSE2301	Database Management Systems	**T**	3	0	0	3	3	30	20	50	3 Hours
3	5	PC	CSE2302	Lab: Database Management Systems	**P**	0	0	2	2	1		60	40	
4	5	PC	CSE2303	Design & Analysis of Algorithms	**T**	4	0	0	4	4	30	20	50	3 Hours
5	5	PC	CSE2304	Lab: Design & Analysis of Algorithms	**P**	0	0	2	2	1		60	40	
6	5	PE		Professional Elective-I	**T**	3	0	0	3	3	30	20	50	3 Hours
7	5	PE		Lab: Professional Elective-I	**P**	0	0	2	2	1		60	40	
8	5	OE		Open Elective - I *	**T**	3	0	0	3	3	30	20	50	3 Hours
9	5	OE		Open Elective - II *	**T**	3	0	0	3	3	30	20	50	3 Hours
10	**5/6**	**STR**	**CSE2310**	**Seminar**	**P**	**0**	**0**	**0**	**0**	**1**		100		
					TOTAL	**19**	**0**	**6**	**25**	**23**				

Professional Electives -I

1	5	PE-I	CSE2311	PE I: Business Intelligence
	5	PE-I	CSE2312	PE I: Lab: Business Intelligence
2	~~5~~	PE-I	CSE2313	PE I: Web Technologies
	5	PE-I	CSE2314	PE I: Lab: Web Technologies
3	5	PE-I	CSE2315	PE I: Introduction to Geographical Information System
	5	PE-I	CSE2316	PE I: Lab: Introduction to Geographical Information System
4	5	PE-I	CSE2317	PE I: Mobile Operating System
	5	PE-I	CSE2318	PE I: Lab: Mobile Operating System

Open Electives -I

1	5	OE-I	CSE2331	OE I: Database System Essentials
2	5	OE-I	CSE2332	OE I: Introduction to Image Processing
3	5	OE-I	CSE2333	OE I: Programming with Python

Open Electives -II

1	5	OE-II	CSE2341	OE II: Software Testing for Beginners
2	5	OE-II	CSE2342	OE II: Introduction to Web Technology
3	5	OE-II	CSE2343	OE II: Introduction to Cloud Computing

Audit Courses											
1	5	HS	AU2126	YCCE Communication Aptitude Preparation (YCAP5.1) for CV,ME,CT,IT,CSE, IIoT, AIDS, CSD, AIML	**A**	3	0	0	3	0	

MSEs* = Two MSEs of 15 Marks each will conducted and marks of these 2 MSEs will be considered for Continuous Assessment

TA ** = for Theory : 5 marks on lecture quizzes, 11 marks on TA2+TA4 activitied decided by course teacher, 4 marks on class attendance

TA = for Practical : MSPA will be 15 marks each**

		June 2022	1.01
Chairperson	**Dean (Acad. Matters)**	**Date of Release**	**Version**

Applicable for AY 2022-23 Onwards

V Semester

GE2312 Fundamentals of Economics

Objective	Course Outcome
1. Recognizes consumer's behaviour and pricing. 2. Extrapolates an operations in market with productions constrain. 3. Describes the national income accounting and public finance. 4. Interprets international trade and institutions.	Upon successful completion of the course, the student will be able to: 1. Discover the fundamental concept of Economics 2. Interpret the concept of micro -economics. 3. Generalize the ideas of macroeconomics. 4. Describe national and international trade

Unit No.	Contents	Max. Hrs.
1	**Introduction to Economics and Consumers' Behaviours:** Definitions, meaning and importance of economics Utility analysis: concept and measurement (cardinal and ordinal), Law of diminishing marginal utility, exceptions to law of diminishing marginal utility, law of equi-marginal utility, Indifference curve analysis: Meaning and properties of indifference curve, marginal rate of substitution, budget constraint, Complement and substitute goods, Consumer's equilibrium. Demand Analysis: Meaning and determinants of demand, law of demand, exception to law of demand, Elasticity of Demand-price, cross and income elasticity, measurement of elasticity of demand.	8
2	**Production and Costs:** Factors of Production: Land, Labour, Capital, Enterprise and their peculiarities, Importance of Capital in production process. Entrepreneur and Innovations, Product and Process innovations, Concepts and types of costs: Fixed vs variable, total, average and marginal costs, Short run and long run cost curves. Law of Variable proportions (Law of diminishing marginal returns) and Return to Scale (Increasing, constant and decreasing), Economies and diseconomies of scale. Depreciation: Meaning and various method of calculating depreciation	6
3	**Market structures - equilibrium output and price:** Forms of market structures: Perfect competition, monopolistic competition, oligopoly, duopoly and monopoly, Demand and revenue curves for firm and industry in various forms of market structure, Total, average and marginal revenue curves, equilibrium of firms and industries under various forms of market structures, Price discrimination - Degrees and conditions of discrimination.	7
4	**National income accounting:** Concepts of GDP and GNP, Estimation of GDP and GDP at factor and market prices, at constant and current prices, difference between GDP and NDP, GNP and NNP, per capita income as a measure of economic well-being, concepts of economic growth and development, Factors affecting economic growth and development. Capital formation and accumulation.	5
5	**Money, Banking and Public Finance** Money: definition, functions and role, Evolution of money, Banking-reserve ratios and credit creation by commercial banks, Functions of a central bank and instruments of credit control, Functions of money market. Inflation: Meaning, types, causes and consequences, measures to control inflation, Concepts of deflation and Stagflation. Sources of public revenue and forms of government expenditure, Taxation: Cannons of taxation. Classification of taxes-Direct (Income tax, Wealth tax, Corporation tax, tax on capital, capital gains, etc) and Indirect Taxes (GST, Import duties), Revenue and capital expenditure.	7

6	**International Trade and Institutions:** Definitions of closed vs. open economy, small open economy, Concept of exchange rate- Fixed, flexible and managed, Role of Multilateral institutions, viz., IMF, World Bank, WTO (GATT) in promoting, Trade, growth and international financial transactions.	5

Text Books

SN	Title	Edition	Authors	Publisher
1	Modern Economics	13th Edition	H. L. Ahuja	S. Chand Publisher
2	Modern Economic Theory	3rd Edition	K. K. Devett	S. Chand Publisher

Reference Books

SN	Title	Edition	Authors	Publisher
1	Advance Economic Theory	17th Edition	H. L. Ahuja	S. Chand Publisher
2	International Trade	12th Edition	M. L. Zingan	Vindra Publication
3	Macro Economics	11th Edition	M. L. Zingan	Vindra Publication
4	Monitory Economics	1th Edition	M. L. Zingan	Himalaya Publisher
5	Economics of Development and Planning	12th Edition	S. K. Misra and V. K. Puri	Himalaya Publishing House
6	Economics		Samuelson	

V Semester

CSE2301– Database Management Systems

Objective	Course Outcome
1. To learn different database system concepts 2. To learn the designing of Entity Relationship Diagram. 3. To know relational data model, relational algebra & SQL Queries. 4. To understand relational database design. To know about data integrity issues	Upon successful completion of the course, the student will be able to: 1. Analyze & compare different levels of abstraction & data independence. 2 .Design Entity Relationship Diagram for any scenario. 3. Solve queries based on relational algebra & SQL. 4. Identify functional dependencies & normalize the database and apply ACID properties. 5. Analyze transaction management, various concurrency control protocols and crash recovery methods.

Unit No.	Contents	Max. Hrs.
1	**Introduction to Database Management System:** General File System and Database system Concepts and Architecture, Data Models, Schemas and Instances, Abstraction & Different Levels of Data Abstraction, Data Independence: Logical & Physical Independence.	5
2	**Entity-Relationship Model**: Entities and Entity Sets, Relationships and Relationship Sets, Attributes, Mapping Constraints, Keys, Entity Relationship Diagram, Reducing E-R Diagrams to Tables, Generalization, Aggregation, Design of an E-R Database Scheme	5
3	**SQL:** Data definition language (DDL), Data Manipulation Language (DML), Basic structure of SQL Queries, Set operations, Null Values, Nested subqueries, views, modification of database, transaction, Joins. **Advanced SQL:** SQL data types & schemas, Integrity Constraints, Domain Constraints, Assertions, triggers, Advanced SQL Features.	6
4	**Relational Data Model**: Structure of Relational Databases, **Relational Database Design**: Pitfalls in Relational Database Design, Functional Dependencies, Normalization using Functional Dependencies, Alternative Approaches to Database design. **Relational Algebra**: Structure of relational databases, Fundamental Relational-Algebra Operations, Additional relational algebra operations, extended relational algebra operations, modification of the databases	7
5	**Data Storage and Querying:** Storage and File Structure, Indexing and Hashing, Query Processing, query-evaluation. **Transaction Management**: ACID Properties, Implementation of ACID Properties, Database processes to support ACID Properties, Schedules, and Testing of Serializability.	7
6	**Concurrency Control**: Lock-based Protocols, Timestamp Based Protocols, Validation Techniques, Multiple Granularity, Multi version Timestamp Protocol, Transaction isolation levels, Read consistency. **Crash Recovery**: Failure Classification, Log Based Recovery, Buffer Management, Checkpoints, Shadow Paging.	6

Text Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Database System Concepts	latest	Korth, Silberschatz, sudarshan	McGraw-Hill publication
2	Fundamentals of Database Systems	latest	Elmasri, Navathe & Gupta	Pearson Education.

Reference Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	SQL & PL / SQL for Oracle 11g Black Book Kindle Edition	3rd Edition	Dr. P.S. Deshpande	Dreamtech Press
2	Database Systems	3rd Edition	Connolly, Begg	Pearson Education
3	Database Systems	6th Edition	S. K. Singh,	Pearson Education

V Semester
CSE2302– Lab.: Database Management Systems

Sr. No.	List of Experiment
1	Creating a schema -To implement different basic Data Definition Language (DDL) & Data Manipulation Language(DML) Commands in SQL.
2	To design an ER Diagram.
3	Answer each of the following questions. The questions are based on the following relational schema: Emp(*eid:* integer, *ename:* string, *age:* integer, *salary:* real) Works(*eid:* integer, *did:* integer, *pcttime:* integer) Dept(*did:* integer, *dname:* string, *budget:* real, *managerid:* integer) a. Give an example of a foreign key constraint that involves the Dept relation. What are the options for enforcing this constraint when a user attempts to delete a Dept tuple? b. Write the SQL statements required to create the preceding relations, including appropriate versions of all primary and foreign key integrity constraints. c. Define the Dept relation in SQL so that every department is guaranteed to have a manager. d. Write an SQL statement to add John Doe as an employee with *eid* = 101, *age* = 32 and *salary* = 15, 000. e. Write an SQL statement to give every employee a 10 percent raise. f. Write an SQL statement to delete the Toy department.
4	Given a schema , apply BETWEEN…AND, NOT BETWEEN, IN, NOT IN, IS NULL, IS NOT NULL clause on created database.
5	Given a schema , implement aggregate function & grouping commands.
6	Given a schema , implement basic set operations in SQL
7	Write the following queries in SQL for the following schema. Suppliers(sid: integer, sname: string, address: string) Parts(pid: integer, pname: string, color: string) Catalog(sid: integer, pid: integer, cost: real) 1. Find the pnames of parts for which there is some supplier. 2. Find the snames of suppliers who supply every part. 3. Find the snames of suppliers who supply every red part.

	4. Find the pnames of parts supplied by Acme Widget Suppliers and by no one else. 5. Find the sids of suppliers who supply a red part and a green part. 6. Find the sids of suppliers who charge more for some part than the average cost of that part (averaged over all the suppliers who supply that part). 7. For each part, find the sname of the supplier who charges the most for that part. 8. Find the sids of suppliers who supply only red parts.
8	To create and manipulate various database object of table using views.
9	To implement Transaction Control Language (TCL) commands.
10	To display file database connectivity using JDBC.
11	Write a program in PL/SQL to check given number is even or odd

V Semester

CSE2303 - Design & Analysis of Algorithms

Objective	Course Outcome
1. To introduce basic algorithmic techniques, time requirements of an algorithm and mathematical techniques used in analysis of algorithms 2. Learn analysis of algorithms for a wide variety of foundational problems occurring in computer science applications with discussions on complexity and NP-completeness.	After completion of the course, student will be able to: **CO1 :** Remember the concepts of algorithms, **CO2 :** Understand time requirements of an algorithm and mathematical techniques used in analysis of algorithms. **CO3 :** Analyze the Complexities of different algorithms for a wide variety of foundational problems occurring in computer science applications. **CO4 :** Apply the knowledge of different algorithms with discussions on complexity. **CO5 :** Evaluate the knowledge of algorithms with Complexity and NP-completeness.

Unit No.	Contents	Max. Hrs.
1	Mathematical foundations, summation of arithmetic and geometric series, Σn, Σn2, bound summations using integration, Analysis of algorithms, analyzing control structures, worst case and average case analysis, Asymptotic notations, Analysis of sorting algorithms such as selection sort, insertion sort, bubble sort, heap sort, external Sorting, lower bound proof.	6
2	Recursive functions and recurrence relations, solutions of recurrence relations using technique of characteristic equation and generating functions, elementary and advanced data structures with operations on them and their time complexity, Amortized analysis.	7
3	Divide and conquer basic strategy, binary search, quick sort, merge sort, Fast Fourier Transform etc. Greedy method –basic strategy, application to job sequencing with deadlines problem, minimum cost spanning trees, single source shortest path etc.	7
4	Dynamic Programming basic strategy, multistage graphs, all pair shortest path, single source shortest paths, optimal binary search trees, traveling salesman problem, Matrix Chain Multiplication, Longest Common Subsequent.	6
5	Basic Traversal and Search Techniques, breadth first search, connected components, Backtracking basic strategy, 8 – Queen‟s problem, graph colouring, Hamiltonian cycles etc.	6
6	NP-hard and NP-complete problems basic concepts, non-deterministic algorithms, NP-hard and NP- complete, Cook‟s Theorem, decision and optimization problems, polynomial reduction.	6

Text Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Algorithm Design,	Latest edition	Klienberg and Tardos	Pearson
2	Computer Algorithms	Third	Horowitz, Sahani, Rajsekharan	Galgotia Publications Pvt. Ltd.
3	Introduction to Algorithms	Third	Thomas H. Cormen	Prentice Hall of India.

Reference Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Fundamentals of Algorithms	Second	Brassard and Bratley	Prentice Hall

V Semester

CSE2304 – Lab.: Design & Analysis of Algorithms

Sr. No.	List of Experiment
1	To Compute and Analyze its time complexity of various sorting algorithm. • Bubble sort • Insertion sort • Selection Sort
2	To implement and compute time complexity of given problem using Divide and Conquer algorithm. • Merge sort • Quick sort • Binary Search
3	To implement and compute time complexity of Job sequencing problem using Greedy Method for different number of inputs.
4	To implement and compute time complexity of Knapsack Problem using Greedy Method for different number of inputs.
5	To implement and compute time complexity of Dijikstra Problem using Greedy programming for different number of inputs.
6	To implement the given problem using minimum cost spanning trees. • Kruskal Algorithm • Prim Algorithm
7	To implement and compute time complexity of All Pair Shortest Path using dynamic programming for different number of inputs.
8	To implement and compute time complexity of Travelling Salesman Problem using dynamic programming for different number of inputs.
9	To implement and compute time complexity of 8 Queens's problem using backtracking for different number of inputs.
10	To implement and compute time complexity of Graph coloring problem using backtracking for different number of inputs.

V Semester

CSE2311 – PE I: Business Intelligence

Objective	Course Outcome
Student will : 1. Understand the business relevance and technical basics of business intelligence (BI), knowledge management (KM), and decision support and describe how OLAP is different from OLTP. 2. Appreciate the use of SQL for BI 3. Understand principles of dimensional modeling. 4. Understand Business intelligence system architecture, its building blocks, life cycle of a typical BI project 5. Get acquainted to popular BI tool for getting insight into the business data.	After completion of the course Students will be able to : ➢ Assemble BI as a Process, identify its application in various domains and functional area, its roles and responsibilities. ➢ Identify functions of building blocks in N_tier BI ecosystem ➢ Identify different stages in Lifecycle of a BI project. ➢ Differentiate between traditional BI and self-service BI (PO1-2) 1. Apply SQL as a universal language for BI (PO2-3) 2. Model a business scenario; identify the metrics, indicators, various dimensions, and aggregation strategies and make recommendations to achieve the business goal (PO3-3) 4.Obtain hands on experience with some popular BI software for analysis, reporting, visualization of results (PO1-2, PO2-2,PO3-2,PO5-3)

Unit No.	Contents	Max. Hrs.
1	Introduction to Business Intelligence : What is business intelligence, why do we need BI, EIS,MIS,DSS& BI, information pyramid-data, information, Knowledge & intelligence. Basis For operational, tactical & strategic decision making , OLTP vs. OLAP, Requirement gathering in BI through business question BI in various domains and functional area	8
2	SQL the universal language for Business Intelligence :Introduction to RDBMS, Language for retrieving data from a database,various clauses in a SQL retrieving data from multiple tables- joins filtering, sorting & grouping datasets, Introduction to DDL & DML statements, various built- in functions in SQL,Use of sub- queries,data dictionary and dynamic SQL.	7
3	Principles of Dimensional modeling: Foundation for fact based decision making, star and snowflake schema, Pros& cons of the star/snowflake schema dimensional model, Slowly changing dimension tables, Fact-less fact strategy, Time dimension.	7

4	Business Intelligence system architecture: Need for enterprise class business intelligence infrastructure, The BI ecosystem, Building blocks of a n- tier BI system-servers & communication protocols ,The central repository-metadata, Information consumption user interfaces-desktop vs. web vs. Mobile. Open architecture, Scalability, performance in BI-in memory analytics.	6
5	BI Project Lifecycle :Typical BI project lifecycle, Requirements gathering & analysis-functional & non- functional requirements, reports and dashboards design- mock – up and storyboarding, Testing in a BI project, BI project deployment, Post production support, Applications of BI, BI best practices	6
6	Self-service Analytics : What is Self-service Analytics, What are the use cases of self-service analytics, Business Paradigm vs IT paradigm and the Paradigm Shift with self-service analytics, Challenges of Self-service Analytics. Introduction to MicroStrategy Desktop – Overview	6

Text Books

SN	Title	Edition	Authors	Publisher
1	Data Warehousing ETL toolkit, Indian edition.	Latest	Ralph Kimball and Margy Ross	wiley
2	Fundamentals of Business Analytics	Latest	R.N.Prasad, Seema Acharya	wiley
3	Business Intelligence: The Savvy Manager's Guide	Latest	David Loshin	

Reference Books

SN	Title	Edition	Authors	Publisher
1	Data Warehousing in the real world A practical guide for building Decision Support System		Sam Anahory, Dennis Murray,	PEARSON

V Semester

CSE2312 – PE I: Lab: Business Intelligence

Sr. No.	Name of Practical
1	Exploring HR schema of Oracle, Implementation of queries based on range, relational operators, sorting, and concatenation.
2	Implementation of queries based on character matching, aggregate functions, set operations
3	Implementation of queries based on Joins (joining 2 or more tables), sub queries.
4	a. Design a multidimensional data cube for given data Using EXCEL b. Perform OLAP- slicing operation on it
5	Creation Of Dashboard Using EXCEL
6	Exploring Tableau OR/ MICROSTRATEGY ANALYTIC DESKTOP (MSTR) : Installation tool,Importing Data from file, Data Wrangling (Editing Data).
7	Visualization Of Data Using different visualizations in Tableau/ MSTR analytic desktop, Filtering data, and delivering Insights from data
8	Create reports and Dashboard with defined insights /requirements in Tableau/MSTR analytic desktop. (Sample Data to be provided)

V Semester

CSE2313 – PE I: Web Technologies

Objective	Course Outcome
1. To learn basic aspects of Web services, Server side scripting, Advanced CSS 2. To introduce with AJAX 3. To learn Basics of Advanced Client side programming 4. To learn JavaScript	On completion of this course, the student will be able to 1. Design Web pages using HTML. 2. Build an interactive website with CSS3 3. Develop basic programming skills using JavaScript 4. Use features of Client side programming

Unit No.	Contents	Max. Hrs.
1	**Web Essentials**: Clients, Servers, and Communication, Overview of Internet, Intranet, Basic Internet Protocols (HTTP, FTP, SMTP), WWW, HTTP: HTTP Request and Response message, Client Side Scripting, Server Side Scripting.	**6 Hours**
2	**Hyper Text Markup Language (HTML5):** Structure of an HTML Program, Basic HTML Tags (Headings, Paragraph, Division, Text formatting, Image element, Anchors), HTML Lists (Ordered Lists, Unordered Lists, Description Lists), HTML Links (Href Attribute, Target Attribute), HTML colors, Table handling in HTML, HTML Layout Elements (Semantic Elements), HTML Style Attribute, HTML class and id Attribute, HTML Forms, HTML Media(video, audio, YouTube).	**6 Hours**
3	**Cascading Style Sheets (CSS3):** Introduction to CSS3, Differences between CSS3 and earlier CSS specifications, Inserting CSS: Inline, Internal, External, CSS3 selectors, CSS3- Colors, Backgrounds, Borders, Text, Font, List, CSS3 Box Model, CSS3 Navigation Bar (Vertical, Horizontal), Media Queries, Basics of Responsive Web Designs, Introduction to Bootstrap.	**6 Hours**
4	**Client Side Scripting with JavaScript:** Introduction to JavaScript, Variables and Data Types, Operators and Expressions in JavaScript, Functions In JavaScript, Arrays, Loops and control statement, RegExp, Dialog Boxes, JavaScript Events. Event Handling and Form Validation, Error Handling, Handling Cookies, XML, JSON. Introduction to Web Frameworks- React JS, Angular JS.	**6 Hours**
5	**Advanced Client side programming**: WebSockets, Server-Sent Event (SSE), WebRTC, Web Graphics & Canvas, WebGL, WebWorkers, SVG. Libraries: Modernizr, Polyfills, Polymer.	**6 Hours**
6	Server Side Programming: Introduction to the server-side programming, Server-side web frameworks like Node JS/Express JS, Django. etc.	**6 Hours**

Text Books

SN	Title	Edition	Authors	Publisher
1	Web Technologies Black Book: HTML, JavaScript, PHP, Java, JSP, XML and AJAX	latest	-	Kogent Learning Solutions Inc.

Reference Books				
SN	Title	Edition	Authors	Publisher
1	HTML & CSS: The Complete Reference	Fifth Edition	Thomas A. Powell	The McGraw-Hill Companies, Inc.
2	Web Technologies	latest	Ivan Bayross	BPB Publication

MOOCs Links and additional reading, learning, video material	
1	https://nptel.ac.in/courses/106105084
2	https://www.youtube.com/watch?v=uUhOEj4z8Fo
3	https://www.w3schools.com/js/js_events.asp

V Semester

CSE2314 – PE I: Lab: Web Technologies

Course Objectives:

Student will:

1. To introduce with the internet technology
2. To study the basic of web page designing
3. To introduce the validations in the web page
4. To introduce the concepts of data storage using XML
5. To learn the advance technique for designing the interactive web page

Course Outcomes:

Upon successful completion of the course students will be able to

1. Understand various internet technologies
2. To design the web pages using some basic techniques
3. To design and implement the interactive web pages
4. To use the XML technology to store the data
5. To design and develop the interactive web pages using the advanced technique

Sr. No.	List of Experiment
1	Implement basic HTML Tags. Write a HTML code to illustrate the usage of the following - Ordered Lists - Unordered Lists - Description Lists
2	Write a HTML code to display data in tabular form (row* column) using HTML table tags
	Write a HTML code to create a home page having three links: About us, Services and Contact us create separate web pages for the three links.
3	Create web forms by using form tags in HTML. (Use any example)
4	Develop and demonstrate the usage of inline, internal and external style sheet using CSS3.
5	Create a single page responsive website using Bootstrap

6	Write JavaScript to validate the following fields of the Registration page. 1. First Name (Name should contains alphabets and the length should not be less than 6 characters). 2. Password (Password should not be less than 6 characters length). 3. E-mail id (should not contain any invalid andmust follow the standard pattern name@domain.com) 4. Mobile Number (Phone number should contain 10 digits only). 5. Last Name and Address (should not be Empty).
7	Create a simple script to download images using AJAX Or Develop and demonstrate the usage of jQuery
8	Introduction to XML program to demonstrate the use of External and Internal DTD
9	Create a web page which show the use of Canvas & SVG.
10	Develop a small web application using suitable web service framework and implement it.

V Semester

CSE2315 – PE I: Introduction to Geographical Information System

Objective	Course Outcomes
1) Get overview of fundamental concepts of GIS, applications and study. 2) Explore the Coordinate Systems, Map Projections metadata, spatial data, spatial analysis and new trends in GIS. 3) Comprehend the Making and sharing of maps.	**On completion of this course, the student will be able to:** 1) Demonstrate the fundamental concepts of GIS and relate the various GIS applications used by industries and government organization 2) Develop the apprehension of Coordinate Systems, Map Projections, metadata, spatial data, spatial analysis and new trends in GIS. 3) Design and share maps

Unit No.	Contents	Max. Hrs.
1	**Introduction to GIS:** Concepts of GIS, Applications currently used by Industry &Govt and their common usages. Fundamental concepts of GIS: GIS terminologies, various components of GIS software and types of GIS applications. The GIS Software Market, Role of GIS in smart cities.	6
2	**Fundamentals of Coordinate Systems and Map Projections**: History of Coordinate Systems, Geographic Coordinate Systems, Map Projections and Geo referencing.	7
3	**Fundamentals of Spatial Data:** Introduction to Spatial Data Formats, Creation of Vector data, Organization of Spatial Data and Displaying Spatial Data, metadata and spatial data standards.	7
4	**Making Sharing Maps:** Map Creation and Design, Sharing Maps as Services, Sharing Spatial Data and using shared Spatial Data.	6
5	**Fundamentals of Spatial Analysis:** Spatial Analysis, analyzing Vector and Raster data, overview of analysis tools, analyzing Spatial Relationships and sharing Analysis Results	7
6	**New trends in GIS:** GIS Trends Changing the World, Machine learning in GIS, Geospatial big data, Integration of GIS with different technologies, GIS with LiDar data.	7

Text Books

SN	Title	Edition	Authors	Publisher
1	An Introduction to Geographical Information Systems	3rd t Edition(2006)	D. Ian Heywood, Sarah Cornelius & Steve Carver	Pearson Prentice Hall

Reference Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Getting to Know ArcGIS	4th Edition(2015)	Michael Law & Amy Collins	Esri Press
2	Mathematical Modeling in Geographical Information System global Positioning System and Digital Cartography	4th Edition(2006)	H. S. Shrama, D. R.Ram, Rama Prasad & P. R. Binda	Concept Publishing Company

V Semester

CSE2316 – PE I: Lab: Introduction to Geographical Information System

Sr. No.	Aim of Practical
1	To explore different proprietary GIS and Open GIS software.
2	To study the installation of GIS Desktop Software and explore various components of the GIS Desktop Software.
3	To explore various coordinate systems. Download any shape file and explore its coordinate system and change the existing coordinate system.
4	To create Geodatabase, layer files and shape files from the scratch.
5	To explore data formats using GIS Desktop Software and vector data points such as points, lines and polygon and create the map using simple vector data structure.
6	To create map in data view and layout view.
7	To install GIS Server, creating web services out of GIS maps or data, Sharing maps, using GIS web services.
8	Geoprocessing tools
9	Model builder
10	Project

V Semester

CSE2317 – PE I: Mobile Operating System

Course Outcomes:
Upon successful completion of the course the students will be able to 1. Understand the basics of mobile programming. 2. Apply mobile programming concepts. 3. Design user interfaces. 4. Design mobile database. 5. Analyse inter – application communication.

Unit No.	Contents	Max. Hrs.
1	**Introduction to Mobile Programming** Mobility Technology Trends, Mobile Ecosystem Overview, Mobile Devices Overview, Mobile Development, Methodology, Wireless Networks Overview, Proximity Technologies.	5
2	**Introduction to Android** Android Overview, Basic building blocks, Introduction to Activities/Fragments, Introduction to Services, broadcast receivers, content providers, Android Application Structure, Source Files, Resources, Assets, Manifest, Basic IDE Operation (Android Studio), Project Creation and Handling (App Creation through Wizard), Running App on AVD and Device, DDMS and Debugging, Layout Overview, Linear Layout, Relative Layout, Frame Layout, Widgets (UI Controls) Overview, Text View, Image View, button.	6
3	**User Interface Designing** Notifications, Toast, Dialog, Listview and Adapter, View Re-usability, Spinner, Complex View, Android Component overview, Intent Resolution, Activity Stack, Launch Modes , Activity Flags, Service Overview, Service Lifecycle, Service Usage and Applicability, Message Binder.	6
4	**Data Management** Data Storage Overview, Persistant v/s Local, Shared Preferences, Internal Storage, SQLite Data Base, Thread, process overview, Async Task, Loaders, Handlers, Intent and Intent Filters, Broadcast receiver Overview, Manifest Registration vs Component Registration, Unregistration, SMS, Boot, Network etc., Action Bar and Context Menu.	6
5	**Inter - Application Communication** Inter app communication requirement overview, Intents Based, Gallery, Camera, SMS App, Contacts, Content provider Overview ,Need and Usage, Content Provider structure, URI Permissions, Views, triggers, Network communication basics, Connecting to server/ request creation, Response Formats XML/JSON, Rest / Web	6

	Services.	
6	**Advanced User Interface Designing** Style and Themes, View and layout animation, Localization, Orientation and Config Change Handling, Handling multiple resolution devices, Device and Tablet consideration, Support Library, Application Signing, Application Distribution, Application Publishing, Google Play, Query solving topics, Recycling view adapter, SQLite DB, Drawer, Tab Layout (view Pager 2), http request using retrofit, Navigation Drawer, Android Application Architecture and Unit Testing, Introduction to Jetpack, Introduction to Daggers, Introduction to AndroidX	7

Reference Books

SN	Title	Edition	Authors	Publisher
1	Programming the Mobile Web	2nd ed., 2013	Maximiliano Firtman	O'Reilly Media, Inc.

Text Books

SN	Title	Edition	Authors	Publisher
1	Mobile Design and Development	2009	Brian Fling	O'Reilly Media, Inc
2	Android Programming: The Big Nerd Ranch Guide	2nd edition, 2015	Bill Phillips, Chris Stewart, Brian Hardy, and Kristin Marsicano	Big Nerd Ranch LLC

V Semester

CSE2318 PE I: Mobile Operating System Lab

Sr. No.	Experiments based on
1	Study of Mobile devices & their history.
2	Study of Mobile Apps Architecture.
3	Installation of Android Studio.
4	Modification to AndroidManifest File.
5	Develop an app making use of Android layout.
6	Develop an app based on Android widgets.
7	Design & Develop an app making use of Event Handling.
8	Develop an app to demonstrate fragment manager.
9	Design & Develop an app making use of mobile database.
10	Design & Develop an app based on inter application communication.

V Semester

CSE2331 – OE I: Database System Essentials

Objective	Course Outcome
To understand basic database concepts by students whose basic degree is not in Computer or IT.	Upon successful completion of the course the students will be able to 1. Understand the basics concepts of Database System and its modelling, compare SQL and NoSQL databases. 2. Solve queries based on SQL and procedures using PL-SQL, & Analyse data dependencies & normalization. 3. Understand Query Processing and evaluate queries. 4. Understand ACID Properties and database system Architecture.

Unit No.	Contents	Max. Hrs.
Unit:1	**Database system Essentials**: Purpose of Database systems, Example of Database Applications, Basic Terminologies, Data Models, Entity–Relationship Model, Relational Model.	6 Hours
Unit:2	**Relational Databases:** Introduction, SQL, DDL, DML, DCL, Database Integrity and Security, Relational–Database Design, Object–Oriented Databases, Object–Relational Databases, database constraints, functional dependencies and normalization.	7 Hours
Unit:3	**Data Storage and Querying:** Storage and File Structure, Indexing and Hashing, Data Retrieval, Query Processing, data-access techniques, query-evaluation.	6 Hours
Unit:4	**Transaction Management**: Introduction, transaction atomicity, consistency, isolation, and durability, concurrency control, serializability, locking, time stamping. Deadlock issues.	6 Hours
Unit:5	**Database System Architecture**: Centralized systems, client–server systems, parallel and distributed architectures, and network types,	6 Hours
Unit :6	**PL-SQL and No SQL:** Introduction to Pl-SQL, Block Structure: Variables, Decision Structures & Loops, Basic Pl-SQL programming. Overview of NoSQL Databases, SQL Vs NO SQL, Types of NoSQL Database	5 Hours

Text Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Database System Concepts	7th Edition	Silberschatz–Korth–Sudarshan	McGraw–Hill, 2019

Reference Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Fundamentals of Database Systems	5th Edition	Elmasri, Navathe & Gupta	Pearson Education
2	Database Systems	5th Edition	S. K. Singh	Pearson Education

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://link.springer.com/openurl?genre=book&isbn=978-1-4613-6193-0
2	https://onlinelibrary.wiley.com/doi/book/10.1002/9780470168042
MOOCs Links and additional reading, learning, video material	
1	https://onlinecourses.nptel.ac.in/noc21_cs04/preview
2	https://onlinecourses.nptel.ac.in/noc22_cs80/preview

V Semester

CSE2332 – OE I: Introduction to Image Processing

Objective	Course Outcome
1. Overview the Fundamental concepts of Digital Image Processing 2. Explore image enhancement techniques in spatial domain and frequency domain 3. Understand the fundamental concept of image compression 4. To Study various similarity based, and dissimilarity-based image segmentation approaches. 5. Understand the basic concepts of image representation and description.	Upon successful completion of the course the students will be able to CO1: Understand basic principles of image processing. CO2: Analyze images using processing algorithms/Techniques. CO3: Apply the concepts to implements basic image processing algorithms/operations.

Unit No.	Contents	Max. Hrs.
Unit:1	Fundamentals of Image Processing: Digital Image Fundamentals: Elements of Visual Perception, Light and the Electromagnetic Spectrum, Image Sensing and Acquisition, Image Sampling and Quantization, Some Basic Relationships between Pixels, Linear and Nonlinear Operations.	6 Hours
Unit:2	Image Transformations: Image Enhancement in the Spatial Domain: Basic Grey Level Transformations, Histogram Processing, Basics of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters.	7 Hours
Unit:3	Image Processing: Color Image Processing: Color Fundamentals, Color Models, Pseudocolor Image Processing, Basics of Full-Color Image Processing, Color Transformations, Smoothing and Sharpening, Color Segmentation	6 Hours
Unit:4	Image Segmentation :Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region-Based Segmentation, Segmentation by Morphological Watersheds	6 Hours
Unit:5	Image Compression: Image Compression: Fundamentals, Some Basic Compression Methods -Run Length Coding, Huffman Coding, Arithmetic Coding, Bit Plane Coding, Block Truncation Coding. JPEG Compression.	6 Hours
Unit :6	Morphological Image Processing: Morphological Image Processing: Preliminaries, Erosion and Dilation, Opening and Closing, Hit or Miss Transformation, Some Basic Morphological Algorithms, Grey Scale Morphology.	6 Hours

Text Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Digital Image Processing, (DIP/3e)		Gonzalez and Woods	Prentice Hall - 2008

Reference Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Digital Image Processing		Kenneth R Castleman	Pearson Education
2	Fundamentals of Digital image Processing		Anil Jain.K	Prentice Hall of India
3	Digital Image Processing		S Jayaraman	Mc Graw Hill India 2017.

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/
MOOCs Links and additional reading, learning, video material	
1	https://onlinecourses.nptel.ac.in/noc21_cs04/preview
2	https://onlinecourses.nptel.ac.in/noc22_cs80/preview

V Semester

CSE2333 – OE I: Programming with Python

CSE 2333	Programming with Python			L= 3	T=0	P=0	Credits=3
Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total		ESE Duration
	15	15	20	50	100		3 Hrs

Course Outcomes
Upon successful completion of the course the students will be able to : 1. Understand the basic data types, built in data structures, control statements and loops and write simple programs in Python. 2. Understand and apply the concepts of functions, modules and packages and write programs using them. 3. Design and develop classes in Python. 4. Solve real world problems and develop applications using Python.

Unit No.	Contents	Max. Hrs.
Unit:1	**Introduction to Python**: Build-in Data types & variables, arithmetic operators, assignment statement, print & input function, relational and logical operators, if, if – else & nested if- else statements, writing simple programs.	6 Hours
Unit:2	**Data Structures:** Built in data structures: Lists, Dictionaries, Tuples, Sets, and Arrays,mutability. Programs based on the built-in data structures	6 Hours
Unit:3	**Looping: Loop statements:** For, while, continue and break statements, list comprehension. Bitwise operators, Real world problem solving	6 Hours
Unit:4	**Functions:** Library functions in Python standard library, user defined Functions, returning values, local & global variables, global statement, doc strings for functions, developing useful functions, Modules and Packages, using import statement	6 Hours
Unit:5	**Introduction to Object oriented programming in Python:** Features of object-oriented programming, Python Object and Classes: defining classes, member variables, doc strings for classes, Private members, Operator Overloading, inheritance, and polymorphism	6 Hours
Unit:6	**Application Development:** Data visualization, basic file handling, Exception handling, developing applications in Python	6 Hours

Text Books

SN	Title	Edition	Authors	Publisher
1	Learn Python Programming	Third Edition	Fabrizio Romano, Heinrich Kruger	PACKT Publishing

		Jan 2021	1.00	Applicable for AY 2021-22 Onwards
Chairperson	Dean (Acad. Matters)	Date of Release	Version	

Reference Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Introduction to Computation and Programming Using Python	Second Edition	John V. Guttag	PHI EEE (MIT Press)

MOOCs Links and additional reading, learning, video material	
1	https://onlinecourses.nptel.ac.in/noc20_cs70/preview
2	https://onlinecourses.nptel.ac.in/noc20_cs83/preview

V Semester

CSE2341 – OE II: Software Testing for Beginners

Objective	Course Outcome
1. Understand Software testing fundamentals / principles. 2. Learn systematic approach to software testing using strategies. 3. Explore Methods and tools of testing software.	Upon successful completion of this course, the student will be able to: 1. Formulate problem by following Software testing life cycle. 2. Design Manual Test cases for Software Project. 3. Demonstrate utilization of testing automation though testing tool.

Unit No.	Contents	Max. Hrs.
1	**Software Testing Basics:** Basic concepts of Testing: Need of Testing, Basic concepts-errors, faults, defects, failures, objective of testing, central issue in testing, Testing activities, V-Model, Sources of information for test cases, Monitoring and Measuring Test Execution, Test tools and Automation, Limitation of Testing.	6
2	**Unit Testing:** Unit Testing: Concepts of Unit Testing, Static Unit Testing, Defect Prevention, Dynamic Unit Testing, Mutation Testing, Debugging, Tools for Unit Testing.	6
3	**Control Flow Testing:** Control Flow Testing: Outline of Control Flow Testing, Control Flow Graphs, Path in Control Flow Graph, Path selection criteria, All path coverage criteria, Statement coverage, Path coverage.	7
4	**Integration Testing:** Data Flow and System Integration Testing: Introduction Data flow testing, Data flow graph, Data flow testing criteria, Fundamentals of System Integration: Types of interfaces and interface errors, System integration testing, Software and Hardware integration.	7
5	**System Testing:** System Testing: Taxonomy of system test, Basic Test, Functionality test, Robustness test, Performance test, Scalability test, Stress test, Load and Stability test, Reliability test, Regression test, Documentation Test.	6
6	**Test Cases:** Test Design: Test cases, Necessity of test case documentation, Test case design methods, Functional specification-based test case design, Use case bases, application based test case design, level of test execution.	6

Text Books				
S.No	**Title**	**Edition**	**Authors**	**Publisher**
1	Software Testing and Quality Assurance		Kshirsagar Naik and PriyadarshiniTripathi	Wiley Publication
2	Software Testing Principles, Techniques and Tools		M.G. Limaye	McGraw Hills

Reference Books				
S.No	**Title**	**Edition**	**Authors**	**Publisher**
1	Foundations of Software Testing		Aditya P. Mathur	Pearson Education
2	Software Testing Tools		Dr. K. V. K. K. Prasad	Dream Tech

MOOCs Links and additional reading, learning, video material	
1	https://onlinecourses.nptel.ac.in/noc21_cs13/preview
2	https://onlinecourses.nptel.ac.in/noc19_cs71/preview

V Semester

CSE2342 – OE II: Introduction to Web Technology

Course Outcomes:
Upon successful completion of the course the students will be able to 1. Design Web pages using HTML5 2. Build an interactive website with CSS3 3. Develop basic programming skills using JavaScript 4. Create XML documents and Schemas.

Unit No.	Contents	Max. Hrs.
Unit:1	**Introduction to internet:** Overview of Internet, Intranet, WWW, Internet Protocols (HTTP, FTP, SMTP), Email, broadband.	6 Hours
Unit:2	**Introduction to HTML5:** Web server, Web Client/Browser, Structure of an HTML Program, Basic HTML Tags(Headings, Paragraph, Division, Text formatting, Image, Anchors), HTML Lists (Ordered Lists, Unordered Lists, Description Lists), HTML Attributes, HTML Links (Href Attribute, Target Attribute).	6 Hours
Unit:3	**Table handling in HTML and Creating Forms:** Table handling in HTML: width and border attribute, CELLPADDING attribute, CELLSPACING attribute, COLSPAN and ROWSPAN attributes, background color attribute, HTML Forms: Elements to Capturing Form Data, Properties of Form Elements, HTML Layout Elements(Semantic Elements), HTML style attribute, HTML class and id attribute.	6 Hours
Unit:4	**Cascading Style Sheets (CSS3):** Introduction to CSS, Differences between CSS3 and earlier CSS specifications, CSS Syntax, CSS selectors, Inserting CSS: Inline, Internal, External, CSS properties: Background, Text, Font, Border, Margin, Padding, List, Dimension, and Classification.	6 Hours
Unit:5	**Java Script:** Introduction to Java Script, Functions of Javascript, Variables and Data Types, Operators, Loops and control statement: if Statement, if...else Statement, else if Statement, JavaScript Switch Statement, JavaScript Functions, JavaScript Loops: for loop, while loop, do...while loop, Dialog Boxes, JavaScript Events.	6 Hours
Unit :6	**Introduction to XML:** What is XML?, Features of XML, XML Syntax and Structure Rules(Start tags, End tags, Empty elements, XML tag attributes),XML Document Type Declaration(DTD, Internal DTD's, External DTD's.	6 Hours

Text Books				
S No	**Title**	**Edition**	**Authors**	**Publisher**
1	Web Technologies Black Book: HTML, JavaScript, PHP, Java, JSP, XML and AJAX			Kogent Learning Solutions Inc.

Reference Books				
S No	**Title**	**Edition**	**Authors**	**Publisher**
1	HTML & CSS: The Complete Reference	Fifth Edition	Thomas A. Powell	The McGraw-Hill Companies, Inc
2	Web Technologies		Ivan Bayross	BPB Publication

MOOCs Links and additional reading, learning, video material	
1	https://nptel.ac.in/courses/106105084
2	https://www.youtube.com/watch?v=uUhOEj4z8Fo
3	https://www.youtube.com/watch?v=mU6anWqZJcc

V Semester

CSE2343 – OE II: Introduction to Cloud Computing

Course Outcomes:
Upon successful completion of the course the students will be able to 1. Understand Cloud Computing Models. 2. Apply Cloud Concepts &Technologies. 3. Analyse Cloud Services & Platforms 4. Use MapReduce to process Big Data on Apache Hadoop.

Unit No.	Contents	Max. Hrs.
Unit:1	**Introduction to Cloud Computing:** Definition of Cloud Computing, Characteristics of Cloud Computing, Cloud Models (Service & Deployment), Cloud Services Examples (IaaS, PaaS, SaaS), Cloud-based Services and Applications (Cloud computing for Healthcare, Manufacturing Industry and Education)	6 Hours
Unit:2	**Cloud Concepts &Technologies:** Virtualization, Load balancing, Scalability & Elasticity, Monitoring, Identity & Access Management, Service Level Agreements	6 Hours
Unit:3	**Cloud Services & Platforms:** Compute Services (Amazon Elastic Compute Cloud, Google Compute Engine, Windows Azure Virtual Machines), Storage Services (Amazon Simple Storage services, Google Cloud Storage, Windows Azure Storage), Database Services (Amazon Relational Data Store, Google Cloud SQL, Windows Azure SQL Database), Application Services (Application Runtimes & Frameworks) Identity & Access Management Services (Amazon Identity & Access Management, Windows Azure Active Directory).	6 Hours
Unit:4	**Hadoop & MapReduce:** Apache Hadoop, Hadoop MapReduce Job Execution, NameNode, Secondary NameNode, JobTracker, TaskTracker, DataNode	6 Hours
Unit:5	**Cloud Application Design:** Design Considerations for Cloud Applications, Scalability, Reliability & Availability, Security, IaaS, SaaS Services for Cloud Applications.	6 Hours
Unit :6	**Cloud Security:** Introduction, CSA Cloud Security Architecture, Authentication, Single Sign On (SSO), Authorization.	6 Hours

Text Books				
S.No	**Title**	**Edition**	**Authors**	**Publisher**
1	CLOUD COMPUTING A Hands -on Approach		Arshdeep Bahga & Vijay Madisetti	Wiley Publication

Reference Books				
S.No	**Title**	**Edition**	**Authors**	**Publisher**
1	CLOUD COMPUTING	**18th edition**	Michael Miller	PEARSON PUBLICATION
2	Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance		Tim Mather, Subra Kumaraswamy, and Shahed Latif	O'Reilly
3	Cloud Computing Bible		Barrie Sosinsky	John Wiley & Sons

MOOCs Links and additional reading, learning, video material	
1	https://onlinecourses.nptel.ac.in/noc21_cs14/preview
2	https://www.simplilearn.com/

Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

(Accredited 'A' Grade by NAAC with a score of 3.25)

Hingna Road, Wanadongri, Nagpur - 441 110

Bachelor of Technology

SoE & Syllabus 2021

6th Semester

(Department of Computer Science & Engineering

Computer Sciences & Engineering

28 June 2019

Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

SoE No. CSE-202.1

B.TECH SCHEME OF EXAMINATION 2020-21

(Scheme of Examination w.e.f. 2022-23 onward)

Computer Science & Engineering

SN	Sem	Type	Course Code	Course Name	T/P	Contact Hours				Credits	% Weightage			ESE Duration Hours
						L	T	P	Hrs		MSEs*	TA**	ESE	
Sixth Semester														
1	6	HS	GE2311	Fundamentals of Management	**T**	3	0	0	3	3	30	20	50	3 Hours
2	6	PC	CSE2351	Computer Networks	**T**	3	0	0	3	3	30	20	50	3 Hours
3	6	PC	CSE2352	Lab: Computer Networks	**P**	0	0	2	2	1		60	40	
4	6	PC	CSE2353	Compilers	**T**	3	0	0	3	3	30	20	50	3 Hours
5	6	PC	CSE2354	Lab: Compilers	**P**	0	0	2	2	1		60	40	
6	6	PC	CSE2355	Software Engineering	**T**	3	0	0	3	3	30	20	50	3 Hours
7	6	PC	CSE2356	Lab: Software Engineering	**P**	0	0	2	2	1		60	40	
8	6	PE		Professional Elective-II	**T**	3	0	0	3	3	30	20	50	3 Hours
9	6	PE		Lab: Professional Elective-II	**P**	0	0	2	2	1		60	40	
10	6	OE		Open Elective - III **	**T**	3	0	0	3	3	30	20	50	3 Hours
11	6	OE		Open Elective - IV **	**T**	3	0	0	3	3	30	20	50	3 Hours
				TOTAL		**21**	**0**	**8**	**29**	**25**				

Professional Electives -II

1	6	PE-II	CSE2361	PE II: Digital Image Processing
	6	PE-II	CSE2362	PE II: Lab:Digital Image Processing
2	6	PE-II	CSE2363	PE II: Internet of Things
	6	PE-II	CSE2364	PE II: Lab: Internet of Things
3	6	PE-II	CSE2365	PE II: Neural Network and applications
	6	PE-II	CSE2366	PE II: Lab Neural Network and applications

Open Electives -III

1	6	OE-III	CSE2371	OE III: Database System Essentials
2	6	OE-III	CSE2372	OE III: Introduction to Image Processing
3	6	OE-III	CSE2373	OE III: Programming with Python

Open Electives -IV

1	6	OE-IV	CSE2381	OE IV: Software Testing for Beginners
2	6	OE-IV	CSE2382	OE IV: Introduction to Cloud Computing
3	6	OE-IV	CSE2383	OE IV: Introduction to Web Technology

Audit Courses											
1	6	HS	AU2130	YCCE Communication Aptitude Preparation (YCAP6.3) for CT, IT, CSE	**A**	3	0	0	3	0	

MSEs* = Two MSEs of 15 Marks each will conducted and marks of these 2 MSEs will be considered for Continuous Assessment

TA ** = for Theory : 5 marks on lecture quizzes, 11 marks on TA2+TA4 activitied decided by course teacher, 4 marks on class attendance

TA = for Practical : MSPA will be 15 marks each**

		June 2022	1.01
Chairperson	**Dean (Acad. Matters)**	**Date of Release**	**Version**

Applicable for AY 2022-23 Onwards

VI Semester
GE2311 - Fundamentals of Management

Objective	Outcome
1. To introduce the fundamentals and legal provision of Management 2. To introduce the Human Resource and Financial practice of organization 3. To Introduce the Project Management 4. To provide knowledge of Marketing Activities of Management	Upon successful completion of the course, the student will be able to: 1. Explain the Legal provision and Functions of Management. 2. Analyze the role of Human Resource and Financial Management in the organization. 3. Analyze the project life cycles. 4. Identify tools and techniques for the marketing of goods and services.

Unit No.	Contents	Max Hrs.
1	**Evolution of Management Thought**: Scientific and Administrative Theory of Management Definition and Concept of Management, Functions of Management: Planning, Organizing, Directing, Coordinating and Controlling, Motivational Theories, Concept of Leadership	6
2	**Legal Aspects of Management:** The Indian Contract Act, 1872 – Formation of Valid Contract, Discharge of Contract, Quasi Contract, Indemnity and Guarantee. The Indian Partnership Act, 1932- Essentials of Partnership, The Companies Act – Nature and Definition of Company, Registration and Incorporation, Memorandum and Article of Association, Kinds of companies, Winding up of the Company	6
3	**Human Resource Management**: Meaning and Scope, Principles of HRD, Job Analysis – Job Description and Job Specification, Job Enrichment, Job Rotation, Training and Development – Purpose and Methods, Performance Appraisal- Purpose, Procedure and Techniques, Grievance Redressal Procedure.	7
4	**Project Management:** Concept, Classification and Characteristics of Project, Project Life Cycle, Project Proposal, Tools and Techniques of Project Management, Network techniques - Introduction and Use of CPM & PERT for planning, SWOT Analysis, Project Risk Analysis, Project Control.	7
5	**Marketing Management**: Definition & scope, Selling & Modern Concepts of Marketing, Market Research, Customer Behaviors, Product Launching, Sales Promotion, Pricing, Channels of Distribution, Advertising, Market Segmentation, Marketing Mix, Positioning, Targeting	6
6	**Financial Management :**Definition & Functions of Finance department, Sources of finance, Types of capital, Profit maximization vs. Wealth Maximization, Functions of Finance Manager in Modern Age, Concept of Risk and Return , Break Even Analysis, Budgets & Budgetary Control, Make or Buy Analysis, Introduction to financial statement – profit and loss A/c and Balance Sheet	6

Text and Reference Books

SN	Title	Edition	Authors	Publisher
1	Principles of Management		Harold Koontz Ramchandra	Tata McGrow hills
2	Marketing Management: Planning, Implementation and Control	3rd Edition	Ramaswamy V.S. and Namakumari S	macmillan publishers
3	Bare Acts – Indian Contract Act, Indian Partnership Act and Company Law			

4	Human Resource Management - Text and Cases	3rd Edition	Dr. V.S.P.Rao	Excel Books
5	A Text book of Human Resource Management	latest	C.B.Mamoria and S.V.Gankar	Himalaya Publishing House
6	Project Management Handbook	1st Edition	Lock, Gower	Routledge
7	Marketing Management	latest	Rajan Saxena	Tata McGraw Hill
8	Foundations of Financial Markets and Institutions	3rd Edition	Fabozzi	Prentice hall
9	Fundamentals of Financial Instruments	latest	Parameswaran	Wiley India
10	Financial Institutions and Markets	3rd Edition	Bhole L M	Tata McGraw-Hill
11	Financial Services	latest	Khan M Y	Tata Mc Graw Hill

VI Semester
CSE2351 – Computer Networks

Objective	Course Outcome
1. Understand the importance of layering architecture and cla different types of networks. 2. Study of different protocols at various layers. 3. Study of modern networking tools.	1. Identify appropriate design issues and explain network reference model. 2. Select appropriate protocol at various layers for the given application. 3. Solve problems in the networking domain. 4. Analyze the performance of network using different tools 5. Design computer networks and sub-networks

Unit No.	Contents	Max. Hrs.
1	Introduction to computer networks and Internet, The uses of computer networks, LAN's, MAN's, WAN's, Heterogeneous Networks Network Topologies, Physical Mediums, Concept of Network Protocols, design issues for layers. Layered Architecture: The OSI reference model. TCP/IP reference model, Comparison of OSI & TCP/IP reference models, Various Losses in the Internet, Brief History of Computer Network.	5
2	Application Layer: Basics of Socket Programming, Transport Layer Programming Interface(TCP, UDP) , Protocols: HTTP (Overview, Persistent and Non-Persistent, Message Format, Cookies, Cachess) , SMTP (Overview, Message Formats) , IMAP, POP, DNS; FTP; Telnet, SSH; Peer-to-Peer Applications, BitTorrent Protocol; Conte Distribution Networks;	7
3	Transport Layer: Relationship Between Transport and Network Layer, TCP and UDP; Multiplexing and Demultiplexing; Principles of Reliable Data Transfer; Go-Back-N and Selective Repeat; TCP: Segment Structure, Round Trip Time Estimation, Reliable Data Transfer, State Transitions, Flow Control, Congestion Control, UDP: Segment Structure	7
4	Network Layer, Subnets: Concept of IP Address, Netmask, Subnet; CIDR; Design of a LAN and WAN,r, Routers, Functions of a Router; Switching; Queueing: Causes, Delays; IPV4: Datagram Format, Fragmentation; Network Address Translation; IPv6 Introduction; Multicasting, , Routing algorithms: Link State, Distance Vector Routing; OSPF, BGP, RIP; Routing Policies	7
5	Link Layer: Review of fundamentals of link layer protocols; Error-Detection and -Correction Techniques Ethernet Switches, LANs, LinkLayer Switches, VLANs, Complete tracking of traversal of a packet over internet between two application, MAC	5
6	Transmission Impairments, Transmission Media: Guided, unguided, Architecture of the Internet, Wireless LANs: IEEE 802.11, IEEE 802., The Public Switched Telephone Network, Switching: circuit, packet and message switching, Modems..	5

Text Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Computer Networking: A Top-Down Approach	Latest Edition/6th	Kurose and Ross	Pearson Publication
2	Computer Networks	Latest Edition	Behrouz A. Forouzan	McGraw-Hill Publication
3	Computer Networks	Latest Edition	A.S. Tanenbaum	Pearson Publication

Reference Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Computer Networks A Systems Approach	ISBN: 9780123850591	Larry Peterson Bruce Davie	Elsevier
2	Data and computer Communication	ISBN-81- 297-0206-1	William Stallings	Pearson Education

VI Semester
CSE2352 – Lab. Computer Networks

Sr. No.	List of Experiment
1	Study of Network Devices and Network cables.
2	Implement Network Utility Commands to observe the network details.
3	Configure TCP/IP to configure Internet on your computer.
4	Configure network using Cisco Packet Tracer software and show packet transmission from source to destination.
5	Configure network using Static routing protocol in Cisco Packet Tracer
6	Use traffic monitoring tool Wire shark to observe network traffic with packet details.
7	To implement Routing algorithm using Cisco Packet Tracer
8	Use TCP dump utility to capture and analyse network traffic
9	To implement Hamming Code using C and C++.
10	Advanced Practical: Study of NSG tool.

VI Semester
CSE2353 – Compilers

Objective	Course Outcome
1. To study the structure of Compiler and FLEX tool for generating lexical analyzer 2. To explore top down, Bottom up parsing approaches and YACC tool for generating syntax analyzer 3. To understand Syntax Directed Translation Scheme. 4. To introduce Symbol Table Management and Error Detection and Recovery with respect to all phases of compilation. 5. To understand Code optimization and Code generation techniques.	Upon successful completion of the course, the student will be able to: 1. Understand basic concepts of compiler design, Lexical analysis process and apply the knowledge of LEX/Flex tool. 2. Explain the role of a syntax analyzer and distinguish between different types of parsers, design and implement a parser using a YACC tool. 3. Apply the knowledge of Syntax directed translation to create intermediate code generation 4. Demonstrate the use of a symbol table throughout compilation. 5. Apply various code optimizing transformations and code generation techniques.

Unit No.	Contents	Max Hrs.
1	Introduction to Compilation Process, Compilers & Translators, Phase structure of Compiler, Design of Lexical Analysis.	6
2	Specifying Syntactic Structure of Programming Language using Context Free Grammars, The role of Parser, Top-down Parsing, Bottom Up Parsing, Predictive Parsers, Recursive Decent Parser.	7
3	Construction of efficient LR Parsers (SLR, CLR & LALR), Canonical Collection of set of items and construction of Parsing table, Implementation of LR Parsing table.	7
4	Syntax Directed Translation: Intermediate Code, Postfix notation, Parse tree and Syntax Trees, Three address codes, quadruples, triples, Translation of Arithmetic Expression, Boolean expressions, Control Statements. Array references, Procedure Calls, Declarations, Case Statements, Use of Compiler writing tools (Lex/ Flex, Yacc / Biason).	7
5	Symbol Tables: Contents, Representing scope information. Error detection and Recovery: Error handling, Lexical-phase, Syntactic phase and semantic phase.	6
6	Introduction to Code Optimization, The principle sources of optimization, Loop optimization, The DAG representation, Introductory Data Flow analysis, Introduction to Code Generation: Object programs, Problems in Code Generation, Register allocation and assignment, Code generation from DAG, Peephole optimization.	7

Text Books

SN	Title	Edition	Authors	Publisher
1	Compilers Principles, Techniques & Tools	2nd Edition	Alfred V. Aho, Jeffrey D. Ullman & Ravi Sethi	Pearson Education
2	Principles of Compiler Design	Latest	Alfred V. Aho, Jeffrey D. Ullman	Narosa Publishing House

Reference Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Compiler Design	4th Edition	Dr. O.G. Kakde	Laxmi Publication
2	Introduction to Compiling Techniques: First Course Using ANSI C, Lex and Yacc	Latest	J. P. Bennett	McGraw-Hill Publication

VI Semester
CSE2354 – Lab.: Compilers

Sr. No.	List of Experiment
1	Implement a Lexical Analyzer using FLEX and develop: A. Program For converting all small case letters to UPPER case letters and Vice-Versa. B. Program to count the words, spaces, and lines in a given input file.
2	Study the LEX/Flex and YACC/Bison tool and Develop: A. LEX program to eliminate comment lines (Single and Multiple) in a text(C program) file and copy the resulting program into a separate file. B. YACC program to recognize valid identifier, operators and keywords in the given text (C program) file.
3	A. Develop a LEX program to recognize valid arithmetic expression. Identifiers in the expression could be only integers and operators could be + and *. Count the identifiers & operators present and print them separately. B. Develop a YACC program to evaluate arithmetic expression involving operators: +, -, *, and /.
4	Develop, Implement and execute a program using YACC tool to recognize all strings ending with b preceded by n a's using the grammar a n b (note: input n value), also create DFA of given grammar using JFLAP
5	Develop a program to find FIRST and FOLLOW of all variables. Write a suitable data structure to store a context fee grammar. Prerequisite is to eliminate left recursion from the grammar before storing
6	Design and Simulate Predictive / LL (1) Parsing Table using JFLAP for the grammar rules: A→ aBa, B→bB .
7	Design and Simulate SLR(1) parsing using JFLAP for the grammar rules: E→ E+T | T, T→ T*F | F, F → (E) | id and parse the sentence: id + id * id.
8	Develop a program for intermediate code generator to generate three address code using LEX & YACC.

VI Semester
CSE2355 – Software Engineering

Objective	Course Outcome
1. Study software engineering best practices and different strategies applicable for software development, software requirement and its design activity. 2. Explore the various testing types and it strategies. 3. Understand configuration management, version control and change control process of Software development. 4. Understand project management, planning, scheduling, risk management, project and process metrics. 5. Get an overview of open source Software Engineering tool viz. Subversion and understand some concepts such as Re-engineering and Reverse engineering.	**Upon successful completion of the course, the student will be able to:** 1. Choose appropriate software engineering process model, requirement engineering principles and software designing fundamentals for a given project. (CO1) 2. Select appropriate testing strategy and apply testing principles for testing a given application. (CO2) 3. Apply basics of software configuration management, version control and change control in software development. (CO3) 4. Evaluate cost estimation, effort and severity of software risk for given application. (CO4) 5. Perform basic operations on Sub-version for software version control. (CO5)

Unit No.	Contents	Max. Hrs.
1	Introduction to Software Engineering, A Generic View of process, Process models: Water fall Model, RAD Model, Prototyping Model, Component Development Model, Agile Model, Requirement Engineering: Requirement Engineering Task Initialization Eliciting Requirement, Developing Use Case, Analysis Model, Negotiation, Validation	6
2	Building the Analysis mode: Requirement Analysis, Analysis Modeling Approaches, Data Modeling Concept, Object Oriented Analysis, Types of Modeling, Design Engineering: Design Concept, Design Model.	7
3	Testing Strategies : Strategic Approach, Strategic issues, Strategies for conventional Software, Strategies for Object Oriented Software, Validation Testing, Testing Tactics: White-Box Testing, Basis Path testing: Flow Graph Notation, Independent Program Paths, Control Structure Testing, Black Box Testing, Introduction to object oriented testing.	7
4	Configuration Management: Base lines, Software Configuration items, The SCM Process, Identification of Objects in the Software Configuration, Version Control, Change Control, Configuration Audit, Status Reporting, SCM Standards.	5
5	Project Management, Metrics for Process and Projects, Project Estimation, Risk Management: Reactive vs. Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection.	7
6	Advanced Topics in Software Engineering: Re engineering Computer aided software engineering, Open source SE tools introduction, Example-Subversion: Overview, Typical subversion usage and work flow.	5

Text Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Software Engineering–A Practitioner's Approach	6th	Roger S. Pressman	McGraw Hill
2	Software Engineering,	9th	Ian Sommerville,	Pearson

Reference Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Object Oriented Software Engineering	6th	Leth Bridge	TATA McGraw Hill

VI Semester
CSE2356 – Lab.: Software Engineering

Sr. No.	List of Experiment
1	Introduction to Software Engineering fundamentals, UML and RATIONAL ROSE Interface.
2	To study and create Software Requirement Specification document for given case study.
3	To study and draw UML Use Case diagram for the given case study.
4	To study and draw UML Class diagram for given Case Study.
5	To study and draw UML Activity diagram for given Case Study.
6	To study and draw UML Sequence Diagram for given Case Study.
7	To study and draw State Diagram for given Case Study.
8	Write a Program to find out the Estimation (cost and effort) by using COCOMO model.
9	To Perform Manual and Automated testing using CASE tool for given Case Study.
10	To Study and execute Version Control using Subversion

VI Semester

CSE2361 – PE II: Digital Image Processing

Objective	Course Outcome
1. Overview the Fundamental concepts of Digital Image Processing 2. Explore image enhancement techniques in spatial domain and frequency domain 3. Understand the fundamental concept of image compression 4. To Study various similarity based, and dissimilarity-based image segmentation approaches. 5. Understand the basic concepts of image representation and description.	1. Describe Basic relationships between pixels. 2. Compare various image enhancement techniques in spatial domain and frequency domain. 3. Illustrate different image compression techniques to understand the advantage of image compression 4. Demonstrate the applications of similarity based and dissimilarity-based approaches for image segmentation. 5. Interpret various representation techniques

Unit No.	Contents	Max. Hrs.	CO
1	**Introduction:** Fundamental Steps in Image Processing, Elements of DIP systems, Elements of Visual Perception, Fundamentals of Image processing, A Simple Image Model, Sampling and Quantization, Some Basic Relationships between Pixels.	5	CO1
2	**Image Enhancement in the Spatial Domain:** Introduction to Spatial and Frequency methods, Basic Gray Level Transformations, Histogram Equalization, Image Subtraction, Image Averaging, Basics of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters.	6	CO2
3	**Transforms:** Introduction to the Fourier Transform, Discrete Fourier Transformation, Fourier Properties, 2DFT, inverse Fourier transform, **Image Enhancement in the frequency Domain:** Filtering in the Frequency Domain, Correspondence between Filtering in the Spatial and Frequency Domain, Smoothing Frequency-Domain Filters, Sharpening Frequency-Domain Filters, Homomorphic Filtering.	7	CO2
4	**Image Compression:** Fundamentals of Image compression, coding redundancy, spatial and temporal redundancy, Measuring Image Information, Fidelity criteria, Image compression models, Basic compression methods, Huffman coding, arithmetic coding, LZW coding, run length coding.	5	CO3
5	**Image Segmentation**: Point Detection, Line Detection, Edge Detection, Gradient Operator, Edge Linking and Boundary Detection, Thresholding, Region-oriented Segmentation.	6	CO4
6	**Image Representation:** Chain Codes, Polygonal Approximations, Signatures, Boundary Segments, Skeleton of a Region. Description: Boundary Descriptors, Shape Numbers, Regional Descriptors, Topological Descriptors. Introduction to color image processing: RGB and HSI color models.	5	CO5

Text books:				
1	Digital Image Processing	3rd edition 2007	Rafael C. Gonzalez and Richard E. Woods	Prentice Hall
2	Digital Image Processing	2009	S Jayaraman	Tata McGraw Hill
Reference books:				
1	Fundamentals of Digital Image Processing	1988	A K Jain	Prentice Hall, 1988
2	Image Processing Principles & Applications	2005	Tinku Acharya & Ajoy K. Ray	Willey Inter-Science

VI Semester
CSE2362 – PE II: Lab: Digital Image Processing

Sr. No.	List of Experiment
1	1. Write a program in MATLAB for following Point processing techniques in spatial domain a. Negation of an image b. Thresholding of an image c. Contrast Stretching of an image
2	. Write a Program in MATLAB to Create a Histogram of a given Image OR *https://cse19-iiith.vlabs.ac.in/objective.php?exp=histo*
3	Write a program in MATLAB to perform following smoothing operations on an image a. Average filter b. Ordered Statistics filter
4	. Write a program in MATLAB to sharp an image using Laplacian mask.
5	. Write a program in MATLAB to segment an image using multilevel thresholding OR *https://cse19-iiith.vlabs.ac.in/objective.php?exp=segment*
6	. Write a program in MATLAB to apply split and merge algorithm on a given image.
7	Write a program in MATLAB to find the code chain of a given image.
8	Write a program in MATLAB to find Euler number of image a given image.
9	Write a program using OpenCV tool to detect the object present in an image.
10	Write a program using OpenCV tool to detect and track the object present in video.

VI Semester
CSE2363 – PE II: Internet of Things

Objective	Course Outcome
1. Get acquainted with various IOT environments. 2. Study IOT architecture and its enabling technologies. 3. Acquire hands on laboratory experience, utilizing IOT kit.	1. Develop various IOT environments 2. Demonstrate IOT architecture and its enabling technologies 3. Analyze IOT environments using various communication technologies 4. Apply various IOT enabling technologies for creation of IOT environments

Unit No.	Contents	Max. Hrs.
1	**Introduction :** Concepts behind the Internet of Things, Characteristics of IoT, IoT enabling technologies, IoT Communication Model, IoT architecture, Applications of IoT, Transducers, Sensors, Sensor classes, Sensor types, Actuators and its types.	6
2	**IOT Protocols**: Application layer: MQTT, COAP, XMPP, AMQP, Network Layer: IPv4, IPv6, 6LoWPAN, IoT Communication protocols: IEEE802.15.4, ZigBee, Wireless HART, Zwave, Bluetooth, NFC, RFID.	7
3	**Wireless Sensor networks**: Components of sensor nodes, Node Behavior in WSNs, Applications, WSN Coverage, OGDC algorithm, Stationary and Mobile Wireless Sensor Networks.	6
4	**Cloud Computing:** Recent Trends in Computing, Characteristics, Components of Cloud Computing, Service Models, Deployment Models, Service Management, Cloud Security, IoT Data analytics, Case studies, Middleware for IoT	6
5	**Machine to Machine Communication**: Node types, IP and Non IP based M2M network Interoperability in Internet of Things: Current Challenges in IoT, Interoperability, Types of Interoperability	6
6	**Software-Defined Networking**: Current Network to SDN, SDN Architecture, Challenges, OpenFlow Protocol, APIs in SDN, Controller Placement, Recent Advances of SDN in IoT, Industrial internet of things, Case studies	6

Text Books

SN	Title	Edition	Authors	Publisher
1	Internet of Things: A Hands-On Approach	Latest	Arsheep Bahga, Vijay Madisetti	Universities Press

Reference Books

SN	Title	Edition	Authors	Publisher
1	Introduction to IOT	Latest	S.Misra , A. Mukherjee, A.Roy	Cambridge university press

VI Semester
CSE2364 – PE II: Lab: Internet of Things

Sr. No.	List of Experiment
1	To study IoT Kit
2	Design a sketch for running of LED's
3	Design a sketch to monitor state of switch by establishing serial communication between Arduino and computer
4	Design a sketch to read analog value of potentiometer by establishing serial communication between arduino and computer
5	Design a sketch for blinking LED's without using delay
6	Design a sketch to develop switch based binary LED counter. Also observe output on serial monitor
7	Design a sketch to create a simple digital clock using LCD display
8	Design a sketch to make use of EEPROM to control devices(LED)
9	To log data of temperature sensor over internet and monitor it from anywhere in the world
10	Use of ESP-32

VI Semester

CSE2365 – PE II: Neural Network and Applications

Course Outcome
Upon successful completion of the course the students will be able to CO 1: understand the basic concepts, underlying mathematics, and differences between Networks CO 2: Apply popular neural network algorithms for solving classification and regression problems CO 3: Identify and Analyse various ways of selecting suitable model parameters for different neural network algorithms. CO 4: Design multi-layer feed-forward neural networks and CNNs using deep learning concepts

Unit No.	Contents	Max. Hrs.
1	**Introduction to Biological and Artificial Neural Networks:** Biological Neurons, General Artificial Neuron Model, MP Neuron, Perceptrons, Neural Network learning Rules, types of neural networks, feedforward vs recurrent neural networks	6
2	**Perceptrons and Machine Learning Basics:** Single Discrete Perceptron algorithm, linear machine and minimum distance classification, gradient descent and Single Continuous Perceptron algorithm Machine learning basics: supervised vs unsupervised learning, various Machine learning tasks like classification, regression, machine Translation, Anomaly detection, etc. Capacity, Overfitting and Underfitting, bias and variance.	6
3	**Multilayer Perceptrons and Backpropagation Algorithm:** Multilayer Perceptrons (MLPs), Representation Power of MLPs, Feed forward Neural Networks, Backpropagation, algorithm, Momentum Based Gradient Descent (GD), Nesterov Accelerated GD, Stochastic GD, AdaGrad, RMSProp, Adam, Applications of MLPs for classification and regression,Performance measures.	6
4	**Regularization:** L1, L2 Regularization, Early stopping, Dataset augmentation, Parameter sharing and tying, Injecting noise at input, any other recent topics.	5
5	**Introduction to Deep Networks:** History of deep learning, Types of deep networks, Introduction to Convolutional Neural Networks, LeNet, AlexNet, ZF-Net, VGGNet, GoogLeNet, ResNet, Transfer learning using CNNs, comparison of shallow and deep networks.	6
6	**Autoencoders:** Auto encoders, Regularization in auto encoders, Denoising auto encoders, Sparse auto encoders, Contractive auto encoders.	5

Text Books

SN	Title	Edition	Authors	Publisher
1	Deep Learning	Latest	Ian Goodfellow, Yoshua Bengio, Aaron Courville	MIT Press
2	Introduction to artificial neural systems	Latest	Jacek M. Zurada	-

		Jan 2021	1.00	Applicable for AY 2021-22 Onwards
Chairperson	Dean (Acad. Matters)	Date of Release	Version	

Reference Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Deep learning with python	Latest	Francois Chollet	Manning
2	Pattern Recognition and Machine Learning	Latest	Christopher Bishop	Springer
3	Neural Networks: A Systematic Introduction	Latest	Raul Rojas	Springer
4	Deep Learning	First	Amit Das, Saptarshi Goswami, Prabir Mitra, Amlan Chakrabarti	Pearson

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://link.springer.com/openurl?genre=book&isbn=978-1-4613-6193-0
2	https://onlinelibrary.wiley.com/doi/book/10.1002/9780470168042
MOOCs Links and additional reading, learning, video material	
1	Deep Learning – Prof. Mitesh Khapra (IIT Ropar), Swayam Course https://onlinecourses.nptel.ac.in/noc22_cs124/preview
2	Neural Networks and Deep Learning, Andrew Ng https://www.coursera.org/learn/neural-networks-deep-learning#syllabus

VI Semester

CSE2366 – PE II: LAB: Neural Network and Applications

Practicals based on above subject

VI Semester

CSE2371 – OE III: Database System Essentials

Objective	Course Outcome
To understand basic database concepts by students whose basic degree is not in Computer or IT.	Upon successful completion of the course the students will be able to 1. Understand the basics concepts of Database System and its modelling, compare SQL and NoSQL databases. 2. Solve queries based on SQL and procedures using PL-SQL, & Analyse data dependencies & normalization. 3. Understand Query Processing and evaluate queries. 4. Understand ACID Properties and database system Architecture.

Unit No.	Contents	Max. Hrs.
Unit:1	**Database System Essentials**: Purpose of Database systems, Example of Database Applications, Basic Terminologies, Data Models, Entity–Relationship Model, Relational Model.	6 Hours
Unit:2	**Relational Databases:** Introduction, SQL, DDL, DML, DCL, Database Integrity and Security, Relational–Database Design, Object–Oriented Databases, Object–Relational Databases, database constraints, functional dependencies and normalization.	7 Hours
Unit:3	**Data Storage and Querying:** Storage and File Structure, Indexing and Hashing, Data Retrieval, Query Processing, data-access techniques, query-evaluation.	6 Hours
Unit:4	**Transaction Management**: Introduction, transaction atomicity, consistency, isolation, and durability, concurrency control, serializability, locking, time stamping. Deadlock issues.	6 Hours
Unit:5	**Database System Architecture**: Centralized systems, client–server systems, parallel and distributed architectures, and network types,	6 Hours
Unit :6	**PL-SQL and No SQL:** Introduction to Pl-SQL, Block Structure: Variables, Decision Structures & Loops, Basic Pl-SQL programming. Overview of NoSQL Databases, SQL Vs NO SQL, Types of NoSQL Database	6 Hours

Text Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Database System Concepts	7th Edition	Silberschatz–Korth–Sudarshan	McGraw–Hill, 2019

Reference Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Fundamentals of Database Systems	5th Edition	Elmasri, Navathe & Gupta	Pearson Education
2	Database Systems	5th Edition	S. K. Singh	Pearson Education

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://link.springer.com/openurl?genre=book&isbn=978-1-4613-6193-0
2	https://onlinelibrary.wiley.com/doi/book/10.1002/9780470168042
MOOCs Links and additional reading, learning, video material	
1	https://onlinecourses.nptel.ac.in/noc21_cs04/preview
2	https://onlinecourses.nptel.ac.in/noc22_cs80/preview

VI Semester

CSE2372 – OE III: Introduction to Image Processing

Objective	Course Outcome
1. Overview the Fundamental concepts of Digital Image Processing 2. Explore image enhancement techniques in spatial domain and frequency domain 3. Understand the fundamental concept of image compression 4. To Study various similarity based, and dissimilarity-based image segmentation approaches. 5. Understand the basic concepts of image representation and description.	Upon successful completion of the course the students will be able to CO1: Understand basic principles of image processing. CO2: Analyze images using processing algorithms/Techniques. CO3: Apply the concepts to implements basic image processing algorithms/operations.

Unit No.	Contents	Max. Hrs.
Unit:1	Fundamentals of Image Processing: Digital Image Fundamentals: Elements of Visual Perception, Light and the Electromagnetic Spectrum, Image Sensing and Acquisition, Image Sampling and Quantization, Some Basic Relationships between Pixels, Linear and Nonlinear Operations.	6 Hours
Unit:2	Image Transformations: Image Enhancement in the Spatial Domain: Basic Grey Level Transformations, Histogram Processing, Basics of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters.	7 Hours
Unit:3	Image Processing: Color Image Processing: Color Fundamentals, Color Models, Pseudocolor Image Processing, Basics of Full-Color Image Processing, Color Transformations, Smoothing and Sharpening, Color Segmentation	6 Hours
Unit:4	Image Segmentation :Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region-Based Segmentation, Segmentation by Morphological Watersheds	6 Hours
Unit:5	Image Compression: Image Compression: Fundamentals, Some Basic Compression Methods - Run Length Coding, Huffman Coding, Arithmetic Coding, Bit Plane Coding, Block Truncation Coding. JPEG Compression.	6 Hours
Unit :6	Morphological Image Processing: Morphological Image Processing: Preliminaries, Erosion and Dilation, Opening and Closing, Hit or Miss Transformation, Some Basic Morphological Algorithms, Grey Scale Morphology.	6 Hours

Text Books

SN	Title	Edition	Authors	Publisher
1	Digital Image Processing, (DIP/3e)	3rd edition	Gonzalez and Woods	Prentice Hall - 2008

Reference Books				
SN	**Title**	**Edition**	**Authors**	**Publisher**
1	Digital Image Processing	latest	Kenneth R Castleman	Pearson Education
2	Fundamentals of Digital image Processing	latest	Anil Jain.K	Prentice Hall of India

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/
MOOCs Links and additional reading, learning, video material	
1	https://onlinecourses.nptel.ac.in/noc21_cs04/preview
2	https://onlinecourses.nptel.ac.in/noc22_cs80/preview

VI Semester

CSE2373 – OE III: Programming with Python

Course Outcome
Upon successful completion of the course the students will be able to : 1. Understand the basic data types, built in data structures, control statements and loops and write simple programs in Python. 2. Apply the concepts of functions modules and packages and write programs using them. 3. Design and develop classes in Python. 4. Solve real world problems and develop interesting applications using Python.

Unit No.	Contents	Max. Hrs.
Unit:1	**Introduction to Python**: Build-in Data types & variables, arithmetic operators, assignment statement, print & input function, relational and logical operators, if, if – else & nested if- else statements, writing simple programs.	7 Hours
Unit:2	**Data Structures:** Built in data structures: Lists, Dictionaries, Tuples, Sets, and Arrays. Programs based on the built in data structures	6 Hours
Unit:3	**Looping: Loop statements:** For, while, continue and break statements, list comprehension. Bitwise operators, Real world problem solving based on loops.	6 Hours
Unit:4	**Functions:** Library functions in Python standard library, user defined Functions, returning values, local & global variables , global statement, doc strings for functions, developing useful functions, Modules and Packages, import statement.	6 Hours
Unit:5	**Introduction to Object oriented programming in Python:** Features of object oriented programming, Python Object and Classes: defining classes, member variables, doc strings for classes, Private members, Operator Overloading, inheritance and polymorphism.	7 Hours
Unit :6	**Application Development:** Developing applications using libraries and packages, File handling, Exception handling, developing applications using Python	5 Hours

Text Books

SN	Title	Edition	Authors	Publisher
1	Learn Python Programming	Third Edition	Fabrizio Romano, Heinrich Kruger	PACKT Publishing

Reference Books

SN	Title	Edition	Authors	Publisher
1	Introduction to Computation and Programming Using Python	Second Edition	John V. Guttag	PHI EEE (MIT Press)

MOOCs Links and additional reading, learning, video material	
1	https://onlinecourses.nptel.ac.in/noc20_cs70/preview
2	https://onlinecourses.nptel.ac.in/noc20_cs83/preview

VI Semester

CSE2381 – OE IV: Software Testing for Beginners

Objective	Course Outcome
1. Understand Software testing fundamentals / principles. 2. Learn systematic approach to software testing using strategies. 3. Explore Methods and tools of testing software.	Upon successful completion of this course, the student will be able to: 1. Formulate problem by following Software testing life cycle. 2. Design Manual Test cases for Software Project. 3. Demonstrate utilization of testing automation though testing tool.

Unit No.	Contents	Max. Hrs.
1	**Software Testing Basics:** Basic concepts of Testing: Need of Testing, Basic concepts-errors, faults, defects, failures, objective of testing, central issue in testing, Testing activities, V-Model, Sources of information for test cases, Monitoring and Measuring Test Execution, Test tools and Automation, Limitation of Testing.	6
2	**Unit Testing:** Unit Testing: Concepts of Unit Testing, Static Unit Testing, Defect Prevention, Dynamic Unit Testing, Mutation Testing, Debugging, Tools for Unit Testing.	6
3	**Control Flow Testing:** Control Flow Testing: Outline of Control Flow Testing, Control Flow Graphs, Path in Control Flow Graph, Path selection criteria, All path coverage criteria, Statement coverage, Path coverage.	7
4	**Integration Testing:** Data Flow and System Integration Testing: Introduction Data flow testing, Data flow graph, Data flow testing criteria, Fundamentals of System Integration: Types of interfaces and interface errors, System integration testing, Software and Hardware integration.	7
5	**System Testing:** System Testing: Taxonomy of system test, Basic Test, Functionality test, Robustness test, Performance test, Scalability test, Stress test, Load and Stability test, Reliability test, Regression test, Documentation Test.	6
6	**Test Cases:** Test Design: Test cases, Necessity of test case documentation, Test case design methods, Functional specification-based test case design, Use case bases, application based test case design, level of test execution.	6

Text Books				
S.No	**Title**	**Edition**	**Authors**	**Publisher**
1	Software Testing and Quality Assurance		Kshirsagar Naik and PriyadarshiniTripathi	Wiley Publication
2	Software Testing Principles, Techniques and Tools		M.G. Limaye	McGraw Hills

Reference Books				
S.No	**Title**	**Edition**	**Authors**	**Publisher**
1	Foundations of Software Testing		Aditya P. Mathur	Pearson Education
2	Software Testing Tools		Dr. K. V. K. K. Prasad	Dream Tech

MOOCs Links and additional reading, learning, video material	
1	https://onlinecourses.nptel.ac.in/noc21_cs13/preview
2	https://onlinecourses.nptel.ac.in/noc19_cs71/preview

VI Semester

CSE2382 – OE IV: Introduction to Cloud Computing

Course Outcomes:
Upon successful completion of the course the students will be able to 1. Understand Cloud Computing Models. 2. Apply Cloud Concepts &Technologies. 3. Analyse Cloud Services & Platforms 4. Use MapReduce to process Big Data on Apache Hadoop.

Unit No.	Contents	Max. Hrs.
Unit:1	**Introduction to Cloud Computing:** Definition of Cloud Computing, Characteristics of Cloud Computing, Cloud Models (Service & Deployment), Cloud Services Examples (IaaS, PaaS, SaaS), Cloud-based Services and Applications (Cloud computing for Healthcare, Manufacturing Industry and Education).	6 Hours
Unit:2	**Cloud Concepts &Technologies:** Virtualization, Load balancing, Scalability & Elasticity, Monitoring, Identity & Access Management, Service Level Agreements	6 Hours
Unit:3	**Cloud Services & Platforms:** Compute Services (Amazon Elastic Compute Cloud, Google Compute Engine, Windows Azure Virtual Machines), Storage Services (Amazon Simple Storage services, Google Cloud Storage, Windows Azure Storage), Database Services (Amazon Relational Data Store, Google Cloud SQL, Windows Azure SQL Database), Application Services (Application Runtimes & Frameworks) Identity & Access Management Services (Amazon Identity & Access Management, Windows Azure Active Directory), Open Source Private Cloud Software (CloudStack, Eucalyptus, OpenStack).	6 Hours
Unit:4	**Hadoop & MapReduce:** Apache Hadoop, Hadoop MapReduce Job Execution, NameNode, Secondary NameNode, JobTracker, TaskTracker, DataNode, MapReduce Job Execution Workflow, Hadoop Schedulers, Hadoop Cluster Setup.	6 Hours
Unit:5	**Cloud Application Design:** Design Considerations for Cloud Applications, Scalability, Reliability & Availability, Security, IaaS, SaaS Services for Cloud Applications.	6 Hours
Unit :6	**Cloud Security:** Introduction, CSA Cloud Security Architecture, Authentication, Single Sign On (SSO), Authorization.	6 Hours

Text Books				
S.No	**Title**	**Edition**	**Authors**	**Publisher**
1	CLOUD COMPUTING A Hands -on Approach	Latest	Arshdeep Bahga & Vijay Madisetti	Wiley Publication

Reference Books				
S.No	**Title**	**Edition**	**Authors**	**Publisher**
1	CLOUD COMPUTING	**18th edition**	Michael Miller	PEARSON PUBLICATION
2	Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance		Tim Mather, Subra Kumaraswamy, and Shahed Latif	O'Reilly
3	Cloud Computing Bible	Latest	Barrie Sosinsky	John Wiley & Sons

MOOCs Links and additional reading, learning, video material	
1	https://onlinecourses.nptel.ac.in/noc21_cs14/preview
2	https://www.simplilearn.com/

VI Semester
CSE2383 – OE IV: Introduction to Web Technology

Course Outcomes:
Upon successful completion of the course the students will be able to 1. Design Web pages using HTML5 2. Build an interactive website with CSS3 3. Develop basic programming skills using JavaScript 4. Create XML documents and Schemas.

Unit No.	Contents	Max. Hrs.
Unit:1	**Introduction to internet:** Overview of Internet, Intranet, WWW, Internet Protocols (HTTP, FTP, SMTP), Email, broadband.	6 Hours
Unit:2	**Introduction to HTML5:** Web server, Web Client/Browser, Structure of an HTML Program, Basic HTML Tags(Headings, Paragraph, Division, Text formatting, Image, Anchors), HTML Lists (Ordered Lists, Unordered Lists, Description Lists), HTML Attributes, HTML Links (Href Attribute, Target Attribute).	6 Hours
Unit:3	**Table handling in HTML and Creating Forms:** Table handling in HTML: width and border attribute, CELLPADDING attribute, CELLSPACING attribute, COLSPAN and ROWSPAN attributes, background color attribute, HTML Forms: Elements to Capturing Form Data, Properties of Form Elements, HTML Layout Elements(Semantic Elements), HTML style attribute, HTML class and id attribute.	6 Hours
Unit:4	**Cascading Style Sheets (CSS3):** Introduction to CSS, Differences between CSS3 and earlier CSS specifications, CSS Syntax, CSS selectors, Inserting CSS: Inline, Internal, External, CSS properties: Background, Text, Font, Border, Margin, Padding, List, Dimension, and Classification.	6 Hours
Unit:5	**Java Script:** Introduction to Java Script, Functions of Javascript, Variables and Data Types, Operators, Loops and control statement: if Statement, if...else Statement, else if Statement, JavaScript Switch Statement, JavaScript Functions, JavaScript Loops: for loop, while loop, do...while loop, Dialog Boxes, JavaScript Events.	6 Hours
Unit :6	**Introduction to XML:** What is XML?, Features of XML, XML Syntax and Structure Rules(Start tags, End tags, Empty elements, XML tag attributes),XML Document Type Declaration(DTD, Internal DTD's, External DTD's.	6 Hours

Text Books

S No	Title	Edition	Authors	Publisher
1	eb Technologies Black Book: HTML, JavaScript, PHP, Java, JSP, XML and AJAX			Kogent Learning Solutions Inc.

Reference Books				
S No	**Title**	**Edition**	**Authors**	**Publisher**
1	HTML & CSS: The Complete Reference	Fifth Edition	Thomas A. Powell	The McGraw-Hill Companies, Inc
2	Web Technologies		Ivan Bayross	BPB Publication

MOOCs Links and additional reading, learning, video material	
1	https://nptel.ac.in/courses/106105084
2	https://www.youtube.com/watch?v=uUhOEj4z8Fo
3	https://www.youtube.com/watch?v=mU6anWqZJcc

Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

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Bachelor of Technology

SoE & Syllabus 2022

3rd Semester

(Department of Computer Science and Engineering

B.Tech in CSE (AIML)

Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

B.TECH SCHEME OF EXAMINATION 2022

(Scheme of Examination w.e.f. 2022-23 onward)

(Department of Computer Science & Engineering)

CSE (AIML)

SoE No. 22AML-101

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject	T/P	Contact Hours				Credits	% Weightage			ESE Duration Hours
							L	T	P	Hrs		MSEs*	TA**	ESE	
THIRD SEMESTER															
1	3	BS	GE	22AML301	Distrete Mathematics and Graph theory	**T**	3	1	0	3	4	30	20	50	3 Hours
2	3	PC	CSE	22AML302	Formal Language & Automata Theory	**T**	3	1	0	3	4	30	20	50	3 Hours
3	3	PC	CSE	22AML303	**Lab:** Formal Language & Automata Theory	**P**	0	0	2	2	1		60	40	
4	3	PC	CSE	22AML304	Data Structures	**T**	3	1	0	3	4	30	20	50	3 Hours
5	3	PC	CSE	22AML305	**Lab:** Data Structures	**P**	0	0	2	2	1		60	40	
6	3	PC	CSE	22AML306	Computer Architecture & Organisation	T	3	0	0	3	3	30	20	50	3 Hours
7	3	PC	CSE	22AML307	Software Engineering	T	3	0	0	3	3	30	20	50	3 Hours
8	3	PC	CSE	22AML308	**Lab:** Software Engineering	**P**	0	0	2	2	1		60	40	
9	3	PC	CSE	22AML309	**Lab:** Software Lab.	**P**	0	0	2	2	1		60	40	
					TOTAL		**15**	**3**	**8**	**23**	**22**				
List of Mandatory Learning Course (MLC)															
1	3	HS	T&P	MLC2123	YCCE Communication Aptitude Preparation (YCAP3)	**A**	3	0	0	3	0				
2	3	BSE	AIML	MLC123	Introdcuction to Haskell Programming	**A**	2	0	0	2	0				
FOURTH SEMESTER															
1	4	BS	GE	22AML401	Linear Algebra	**T**	3	0	0	3	3	30	20	50	3 Hours
2	4	PC	CSE	22AML402	Operating Systems	**T**	3	0	0	3	3	30	20	50	3 Hours
3	4	PC	CSE	22AML403	**Lab:** Operating Systems	**P**	0	0	2	2	1		60	40	
2	4	PC	CSE	22AML404	Foundation of Artificial Intelligence	**T**	3	0	0	3	3	30	20	50	3 Hours
3	4	PC	CSE	22AML405	**Lab:** Foundation of Artificial Intelligence	**P**	0	0	2	2	1		60	40	
6	4	PC	CSE	22AML406	Design & Analysis of Algorithms	**T**	3	1	0	3	4	30	20	50	3 Hours
7	4	PC	CSE	22AML407	**Lab:** Design & Analysis of Algorithms	**P**	0	0	2	2	1		60	40	
8	4	PC	CSE	22AML408	Database Management Systems	**T**	3	0	0	3	3	30	20	50	3 Hours
9	4	PC	CSE	22AML409	**Lab:** Database Management Systems	**P**	0	0	2	2	1		60	40	
10	4	PC	CV/CSE	22AML410	Environmental Sustainability, Pollution and Management	**T**	3	0	0	3	3	30	20	50	3 Hrs
					TOTAL		**18**	**1**	**8**	**26**	**23**				
List of Mandatory Learning Course (MLC)															
1	4	HS	T&P	MLC2124	YCCE Communication Aptitude Preparation (YCAP4)	**A**	3	0	0	3	0				
2	4	BSE	AIML	MLC124	Computational Sanskrit	**A**	2	0	0	2	0				

MSEs* = Two MSEs of 15 Marks each will conducted and marks of these 2 MSEs will be considered for Continuous Assessment

TA ** = for Theory : TA1-5 marks on Proctored Online Exam, TA2-12 marks on activitied decided by course teacher, TA3 - 3 marks on class

TA = for Practical : MSPA will be 15 marks each**

		June 2022	1.00
Chairperson	**Dean (Acad. Matters)**	**Date of Release**	**Version**

Applicable for AY 2022-23 Onwards

III Semester
22AML301 : Discrete Mathematics & Graph Theory

Course Outcomes:
Upon successful completion of the course the students will be able to
1. Identify the importance of statements in deriving valid inferences.
2.Use relations and ordering methods to identify the relationship among the inferences.
3.Select suitable algebraic systems to find solution for real time problems.
4.Find the suitable computing methods and applying graph theory concepts to solve complex problems.

Unit:1	**Mathematical Logic and Set Theory**	**6 Hours**
Statement and Notation: Negation, Conjunction, Disjunction, Tautologies, Truth Tables, Basic Concepts of Set Theory, Inclusion & equality of set, Power Set, Ordered Pairs and n-tuples, Operations on Sets, mathematical induction. Propositions, Predicate logic. **Contemporary Issues related to Topic**		

Unit:2	**Relations and Functions**	**6 Hours**
Relations and Ordering, Relation Matrix and Graphs, Partition and Covering of a set, Equivalence relation, Partial order relation, Partially Ordered sets, Functions, Composition of functions, Inverse Functions, Characteristics function of a set. **Contemporary Issues related to Topic**		

Unit:3	**Group Theory**	**7 Hours**
Groups, Subgroups and Homomorphism, Cosets and Lagrange's theorem, Normal subgroups. Semi groups and Monoids Homomorphism of semigroups and monoids, Sub semi groups and monoids. **Contemporary Issues related to Topic**		

Unit:4	**Rings**	**6 Hours**
Definitions and Examples, sub ring, Integral domain, ring homomorphism, ideal of ring polynomial. **Contemporary Issues related to Topic**		

Unit:5	**Field and Lattices**	**7 Hours**
Definitions and Examples, Finite Field, Ordered sets, Hasse Diagrams of partially Ordered sets. Lattices, Bounded Latices, Complements Latices, Definitions and Examples of Finite Field, Ordered sets, Hasse Diagrams of partially Ordered sets. Lattices, Bounded Latices, Complements Latices. **Contemporary Issues related to Topic**		

Unit :6	Graph Theory	7 Hours
Basic concepts of graph theory, Basic definitions, Paths and circuits, Reach ability and connectedness, Matrix Representation of graphs, Tree and their representation and operations, Rooted trees, Path lengths in rooted trees, Multi graphs and weighted graphs, and graph isomorphism, shortest paths in weighted graphs, Hypergraphs, transitive closure, Spanning trees, Kruskal's algorithm, Prim's algorithm. **Contemporary Issues related to Topic**		
	Total Lecture Hours	**39 Hours**

Text books	
1	J. P. Tremblay & R. Manohar, Discrete Mathematics Structure with application to Computer Science, 23rd re-print,2005,Tata McGraw-Hills Publication Company Limited, New Delhi.
2	Lipschutz Schaums's , Outline series ,Discrete Mathematics, 2nd edition, Tata McGraw-Hills Publication Company Limited, New Delhi.

Reference Books	
1	Bernard Kolman ,Robert C.Busby, Sharon Ross, Discrete Mathematical structures, 3rd edition, 2001 Prentice Hall of India, New Delhi.

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Mathematics%20and%20Humanities/

MOOCs Links and additional reading, learning, video material	
1	https://onlinecourses.nptel.ac.in/noc22_ma10/preview
2	https://onlinecourses.nptel.ac.in/noc20_cs82/preview
3	https://nptel.ac.in/courses/111106102

III Semester
22AML302 : Formal Language & Automata Theory

Outcomes

1. Apply basic properties of formal languages and to design finite automata for regular expression and Regular Grammar.
2. Construct context free grammar for various languages.
3. Solve various problems of push down automata for context free language
4. Design Turing Machines for given any computational problem.

UNIT I:	**7**
Alphabet, Symbols, Sets, Strings, Language, Operations, Relations, Design of Finite State Machines, Acceptance of strings and languages, Non Deterministic Finite Automata, Deterministic Finite Automata, Equivalence between NFA and DFA, NFA with ε-transition, Minimization of FA. **Contemporary Issues related to Topic**	
UNIT II:	**7**
Regular sets, Regular expressions, Manipulation of regular expressions, Equivalence between RE and FA. Pumping Lemma, closure properties of regular sets (Proofs not required), Regular grammars, Right linear and left linear regular grammars, inter-conversion between LLG & RLG, Equivalence between regular grammar and F.A., Inter-conversion between RE and RG. **Contemporary Issues related to Topic**	
UNIT III:	**6**
Context free grammar, Derivation trees (Syntax tree and Parse tree), Ambiguous Grammar, Context Free Language (CFL) Normal Form of grammar: Chomsky Normal form, Greibach normal form. **Contemporary Issues related to Topic**	
UNIT IV:	**6**
Push down automata, definition, and model, acceptance of CFL by empty Stack and by final state, equivalence CFL and PDA, Inter-conversion, Closure properties of CFL, DPDA & NDPDA. **Contemporary Issues related to Topic**	
UNIT V:	**7**
Turing machine, Definition, Model of TM, Design of Turing Machine, Computable functions, Recursive Language, Recursive enumerable language, Properties of Recursive enumerable language, Church's hypothesis, Chomsky hierarchy of language, Linear bounded automata , context sensitive language, Universal Turing Machine **Contemporary Issues related to Topic**	

UNIT VI:	6
Un-decidability Problems related to Recursive enumerable language and Turing Machine, post correspondence problem. Recursive function Theory –Basis functions and operations on them. Bounded minimization preemptive μ recursive function ,unbounded minimization and recursive function **Contemporary Issues related to Topic**	
Total Lectures	**39**

Text Books:	
1	Introduction to Automata Theory, Languages, and computation, 3rd Edition, Hopcroft J.E., Rajeev Motwani, Jeffrey D. Ullman, Pearson Education
2	Introduction to languages and the Theory of Computation, 3rd Edition, John C.Martin, Mc Graw Hill

Reference Books::	
1	Introduction to the Theory of Computation, 2nd Edition, Michael Sipser, GALE CENGAGE Learning
2	Theory of Computation, 1st Edition, Dr. O. G. Kakde , Laxmi Publication

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/TOC.pdf

MOOCs Links and additional reading, learning, video material	
1.	https://onlinecourses.nptel.ac.in/noc22_cs63/preview
2.	https://ocw.mit.edu/courses/18-404j-theory-of-computation-fall-2020/pages/lecture-notes/

III Semester
22AML303 : Lab. Formal Language & Automata Theory

Outcomes
1. Apply basic properties of formal languages and to design finite automata for regular expression and Regular Grammar. 2. Construct context free grammar for various languages. 3. Solve various problems of push down automata for context free language 4. Design Turing Machines for given any computational problem.

List of Experiment

Sr. No.	Experiments based on
1	Study of JFLAP tool.
2	Study of other FLAT tools.
3	Design NFA for a string starting with '0' over the alphabet Σ = {0,1} using JFLAP.
4	Using JFLAP, construct NFA for a string ending with 'b' over the alphabet Σ = {a,b}.
5	Construct a DFA for a string containing '00' over the alphabet Σ = {0,1} using any tool.
6	Construct a DFA for a string having second last symbol as 'a' over the alphabet Σ = {a,b} using JFLAP.
7	Build a PDA for a palindrome of even length over the alphabet Σ = {0, 1}.
8	Build a PDA for a palindrome of odd length over the alphabet Σ = {a, b}.
9	Enter the following CFG into JFLAP S → T T S → U T → 0T T → T0 T → # U → 0U00 U → #
10	Design a Turing Machine that concatenates the following strings on the input tape '...□001□110□100□'.

III Semester
22AML304 : Data Structures

Course Outcome
1. To understand fundamental concepts in data structures 2. To apply and analyse algorithms for performing operations on data structures 3. To evaluate the performance of data structures and its applications. 4. Simulate the algorithms for performing operations on data structures.

UNIT I:	7
Introduction to data structures- Need of data structures, Types of data structures, recursion, Arrays, sorting – Bubble sort , Insertion sort, Selection sort, Merge sort, Quick sort and searching techniques- Linear Search and Binary Search, Hashing: Direct-address tables, Hash tables, open addressing, Perfect Hashing **Contemporary Issues related to Topic**	
UNIT II:	7
Stacks and queues: The stack as an ADT, Representation, Stack operation, Application. Queue: The Queue as an ADT, Representation, Queue operation, Circular and Priority queue, Applications of stacks and queues **Contemporary Issues related to Topic**	
UNIT III:	7
Linked Lists: Linked list as an ADT, Singly-linked lists, doubly linked lists and circular linked lists. Operations on linked list etc., Linked stacks and Queues, Applications of lists in polynomial representation, multi-precision arithmetic. **Contemporary Issues related to Topic**	
UNIT IV:	6
Binary Trees: Binary trees, binary trees- basic algorithms and various traversals. Binary Search Trees (BSTs) and insertion, deletion in BSTs. Heaps and heap sort **Contemporary Issues related to Topic**	
UNIT V:	6
Balanced trees: Height-balanced (AVL) trees, Splay tree, Red-black trees, Multi-way trees-B and B+ and applications **Contemporary Issues related to Topic**	

UNIT VI:	6
Graphs: Representation & traversals: Spanning trees, topological sort, shortest path algorithm, all-pairs shortest paths **Contemporary Issues related to Topic**	
Total Lectures	**39**

Text books:	
1.	Data Structures & Program Design in C, Robert Kruse, G. L. Tondo and B. Leung ,Person
2.	"Fundamentals of Data Structures in C", Horowitz, S. Sahni, S. Anderson-freed, University Press,
3.	"Data Structures Using C and C++" , Y. Langsam, M. J. Augenstein and A. M. Tannenbaum, Prentice Hall India,

Reference books:	
1.	Fundamentals of Data Structures in C++ , 2nd, 2009, Ellis Horowitz, Sartaj Sahani, Dinesh Mehta , University Press
2.	Data Structures with C , Seymour Lipschutz , Tata McGraw Hill

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/Book%20Fundamentals%20of%20Data%20Structure%20(1982)%20by%20Ellis%20Horowitz%20and%20Sartaj%20Sahni.pdf
2	http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/Data%20Structures%20Succinctly%20Part%201.pdf

MOOCs Links and additional reading, learning, video material	
1.	https://nptel.ac.in/courses/106102064
2.	https://archive.nptel.ac.in/courses/106/106/106106127/

III Semester
22AML305 : Lab. Data Structures

Course Outcome
1. To understand fundamental concepts in data structures 2. To apply and analyse algorithms for performing operations on data structures 3. To evaluate the performance of data structures and its applications. 4. Simulate the algorithms for performing operations on data structures.

List of Experiment

Sr. No.	Experiments based on
1	Program based on searching- linear , binary search
2	Program based on sorting- quick sort / merge sort
3	Program based on stacks creation and operations on it
4	Program based on queue creation and operations on it
5	Program based on single linked list creation and operations on it
6	Program based on double linked list creation and operations on it
7	Program based on Binary tree : creation and traversal
8	Program based on Binary search tree : creation and searching
9	Program based on graphs :creation and traversal
10	Program based on graph: Prims/ Kruskal algorithm for finding minimum cost spanning tree

III Semester
22AML306 : Computer Architecture & Organization

Course Outcome
On completion of the course, student will be able to 1. Understand and demonstrate the basic computer architecture concepts related to the working of processors, memory systems, and input output systems. 2. Differentiate among various addressing modes and develop ability to write assembly language programs. 3. Comprehend information representation in computer and perform arithmetic operations using algorithms suitable for hardware implementation. 4. Explain and compare techniques for improving the performance of a computer system components like CPU, main memory, input/output system and pipelining.

UNIT I:	6
Basic Structure of Computer Hardware and Software: Functional Units, Basic Operational Concepts, Bus Structures, Software, processor clock and basic performance evaluation, number systems, and arithmetic operations, Memory Locations, addressing and encoding of information, instruction and instruction sequencing, branching, condition codes, zero, one and two address instructions, RISC vs CISC computers. **Contemporary Issues related to Topic**	
UNIT II:	6
Addressing modes, Stacks, and Subroutines, Processing Unit: Some fundamental concepts, Execution of a complete instruction, One, two, and three bus organization, Sequencing of control Signals, Assembly language programming. **Contemporary Issues related to Topic**	
UNIT III:	7
Processor Design, hardwired control, Microprogrammed Control: Microinstructions, Grouping of control signals, Microprogram sequencing, Micro Instructions with next Address field, prefetching microinstructions. **Contemporary Issues related to Topic**	
UNIT IV:	7
Arithmetic (Fixed and Floating point): Number Representation, Addition of Positive numbers, Logic Design for fast adders, Addition and Subtraction, Arithmetic and Branching conditions, Multiplications of positive numbers, Signed- Operand multiplication, Booth's Algorithm , fast Multiplication, Integer Division algorithms, Floating point numbers and operations, IEEE floating point standards **Contemporary Issues related to Topic**	

UNIT V:	7
The Main Memory: Basic concepts, Memory Hierarchy, semiconductor RAM memories, Static RAM vs Dynamic RAM, semiconductor ROM memories, DDRAM, Memory system considerations, Speed , Size and Cost. Cache Memory: cache memory mapping techniques, secondary storage devices, HDD vs SSD, Performance Considerations. **Contemporary Issues related to Topic**	
UNIT VI:	6
Computer Peripherals, I/O modules and I/O Devices, I/O transfers: program controlled, memory mapped and I/o mapped I/O, Interrupt handling and Interrupt driven I/O, DMA. Pipelining: Basic Concepts, Data Hazards and Instruction Hazards. Introduction to GPU and GPU Computing. **Contemporary Issues related to Topic**	
Total Lectures	**39**

Text Books	
1	Computer Organization , 5th edition , V. Carl Hamacher, Zvonko Vranesic, McGraw Hill Publications.
2	Computer Architecture: A Quantitative approach, 6th edition, John L. Hennessy, David A. Patterson ,MK series in computer architecture and design

Reference Books	
1	Computer Organization and Architecture , 6th edition , Willaiam Staliing, Pearson Education
2	Computer Architecture & Organization , 3rd edition ,J.P. Hayes , McGraw Hill Publications

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	file://172.16.1.10/cse/Ebooks/COmputer%20Organization%20Zaky%205th%20.pdf
2	http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Computer%20Technology/53-CAO_V.%20Carl%20Hamacher-GKY.pdf

MOOCs Links and additional reading, learning, video material	
1.	https://nptel.ac.in/courses/106105163

III Semester
22AML307 : Software Engineering

Course Outcome
Upon successful completion of the course, the student will be able to: 1. Choose appropriate software engineering process model, requirement engineering principles and software designing fundamentals for a given project. 2. Select appropriate testing strategy and apply testing principles for testing a given application. 3. Apply basics of software configuration management, version control and change control in software development. 4. Evaluate cost estimation, effort and severity of software risk for given application. 5. Perform basic operations on Sub-version for software version control.

UNIT I:	6
Introduction to Software Engineering, A Generic View of process, Process models: Water fall Model, RAD Model, Prototyping Model, Component Development Model, Agile Model, Requirement Engineering: Requirement Engineering Task Initialization Eliciting Requirement, Developing Use Case, Analysis Model, Negotiation, Validation. **Contemporary Issues related to Topic**	
UNIT II:	6
Building the Analysis mode: Requirement Analysis, Analysis Modeling Approaches, Data Modeling Concept, Object Oriented Analysis, Types of Modeling, Design Engineering: Design Concept, Design Model. **Contemporary Issues related to Topic**	
UNIT III:	7
Testing Strategies : Strategic Approach, Strategic issues, Strategies for conventional Software, Strategies for Object Oriented Software, Validation Testing, Testing Tactics: White-Box Testing, Basis Path testing: Flow Graph Notation, Independent Program Paths, Control Structure Testing, Black Box Testing, Introduction to object oriented testing. **Contemporary Issues related to Topic**	
UNIT IV:	7
Configuration Management: Base lines, Software Configuration items, The SCM Process, Identification of Objects in the Software Configuration, Version Control, Change Control, Configuration Audit, Status Reporting, SCM Standards. **Contemporary Issues related to Topic**	

UNIT V:	7
Project Management, Metrics for Process and Projects, Project Estimation, Risk Management: Reactive vs. Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection. **Contemporary Issues related to Topic**	
UNIT VI:	6
Advanced Topics in Software Engineering: Re engineering Computer aided software engineering, Open source SE tools introduction, Example-Subversion: Overview, Typical subversion usage and work flow. **Contemporary Issues related to Topic**	
Total Lectures	**39**

Text Books	
1.	Software Engineering–A Practitioner's Approach , 6th Edition, Roger S. Pressman,McGraw Hill
2.	Software Engineering, 9th Edition, Ian Sommerville, Pearson

Reference Books	
1.	Object Oriented Software Engineering, 6th Edition, Leth Bridge, TATA McGraw Hill

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://103.152.199.179/YCCE/e-copies%20of%20books/7.Information%20Technology/45.Object_Oriented_Software_Engineering__Practical_Software_Development_using_UML_and_Java%20hal%2056.pdf
2	http://103.152.199.179/YCCE/e-copies%20of%20books/7.Information%20Technology/17.2017_Book_Concise%20Guide%20to%20SE.pdf

MOOCs Links and additional reading, learning, video material	
1.	https://archive.nptel.ac.in/courses/106/105/106105182/

III Semester
22AML308: Lab. Software Engineering

Course Outcome
Upon successful completion of the course, the student will be able to: 1. Choose appropriate software engineering process model, requirement engineering principles and software designing fundamentals for a given project. 2. Select appropriate testing strategy and apply testing principles for testing a given application. 3. Apply basics of software configuration management, version control and change control in software development. 4. Evaluate cost estimation, effort and severity of software risk for given application. 5. Perform basic operations on Sub-version for software version control.

List of Experiment

Sr. No.	Experiments based on
1	Introduction to software engineering fundamentals UML, RATIONAL ROSE Interface/ *Star UML (open Source*)
2	To study and create Software Requirement Specification document for given case study
3	To study and draw UML Use Case diagram for the given case study.
4	To study and draw UML Class diagram for given Case Study.
5	To study and draw UML Activity diagram for given Case Study.
6	To study and draw UML Sequence Diagram for given Case Study.
7	To study and draw State Diagram for given Case Study.
8	Write a Program to find out the Estimation (cost and effort) by using COCOMO OR http://vlabs.iitkgp.ernet.in/se/2/
9	To perform manual and Automated testing using USE- CASE tool using sample GUI OR http://vlabs.iitkgp.ernet.in/se/10/
10	To Study and execute Version Control using Subversion

III Semester

22AML309 : Software Lab.

Course Outcome
After learning the course, the students will be able to 1. Understand the basic data types, built in data structures, control statements and loops and write simple programs in Python 2. Understand the concepts of functions, modules and packages and write complex programs using them. 3. Understand defining and handling Python objects and develop classes required for the given application 4. Develop a useful application in Python.

UNIT I: Introduction	4
Build-in Data types: Data type & Variables, Python Strings, Python built in data structures: Lists, Dictionaries, Tuples, Sets, Arrays. Datatype conversion. Statements: Assignment statement, import statement, print statement, input statement, Python Control Statements: if, if – else, statements, Loop statements: For, while, continue and break, try and except statement, raise, with statements.	
UNIT II: Python Functions, Modules and Packages	3
The def statement, returning values, parameters, arguments, local variables, global variables and global statement, doc strings for functions, Mathematical Function, Generating Random numbers, File Handling.	
UNIT III: Python Object and Classes	2
defining classes and creating classes, member variables, Doc strings for classes, Private members, Python Operator Overloading, Python inheritance and polymorphism, Exception Handling, Python Modules and packages.	
UNIT IV: Developing applications in Python	1
Developing applications in Python using built in and customized modules and packages.	

Text Books:	
1	Learn Python Programming ,Fabrizio Romano, Heinrich Kruger ,Third Edition, 2020,PACKT Publishing
2	Introduction to Computation and Programming Using Python, John V. Guttag, Second Edition,2016 PHI EEE(MIT Press)

MOOCs Links and additional reading, learning, video material	
1.	https://nptel.ac.in/courses/106106145

			July 2022	1.00	Applicable for AY 2022-23 Onwards
Chairperson	Dean (Acad. Matters)	Dean OBE	Date of Release	Version	

III Semester

Department Specific Audit Course

MLC123- Introduction to Haskell Programming

Course Outcome
1. Reason about the correctness of programs.
2. Think in terms of higher-order functions.
3. Use data encapsulation and parametric polymorphism.
4. Give importance to the 'type checking' of values/functions and therefore develop programs relatively faster.

UNIT I:	**6**
Types and Values, Functions, Type Inference, Recursion	
UNIT II:	**7**
Higher-order Functions, Polymorphic Types, Lambda Functions, Algebraic Data Types, Type Classes	
UNIT III:	**6**
Recursive Data Types, I/O	
UNIT IV:	**5**
Advanced Concepts: Functors, Monads	
TOTAL	**24**

Text Books:	
1	Real World Haskell, 1st Edition, Brian O'Sullivan, John Goerzen and Don Stewart, O'Reilly Media

Reference Books	
1	Learn You a Haskell for Great Good! , Miran Lipovača, No Starch Pres
2	Programming in Haskell, 2nd Edition, Graham Hutton, Cambridge University Press

MOOCs Links and additional reading, learning, video material	
1.	https://nptel.ac.in/courses/106106137

Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

(Accredited 'A++' Grade by NAAC with a score of 3.25)

Hingna Road, Wanadongri, Nagpur - 441 110

Bachelor of Technology

SoE & Syllabus 2022

4th Semester

(Department of Computer Science and Engineering

B.Tech in CSE (AIML)

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(Department of Computer Science & Engineering)

CSE (AIML)

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							L	T	P	Hrs		MSEs*	TA**	ESE	
THIRD SEMESTER															
1	3	BS	GE	22AML301	Distrete Mathematics and Graph theory	**T**	3	1	0	3	4	30	20	50	3 Hours
2	3	PC	CSE	22AML302	Formal Language & Automata Theory	**T**	3	1	0	3	4	30	20	50	3 Hours
3	3	PC	CSE	22AML303	**Lab:** Formal Language & Automata Theory	**P**	0	0	2	2	1		60	40	
4	3	PC	CSE	22AML304	Data Structures	**T**	3	1	0	3	4	30	20	50	3 Hours
5	3	PC	CSE	22AML305	**Lab:** Data Structures	**P**	0	0	2	2	1		60	40	
6	3	PC	CSE	22AML306	Computer Architecture & Organisation	T	3	0	0	3	3	30	20	50	3 Hours
7	3	PC	CSE	22AML307	Software Engineering	T	3	0	0	3	3	30	20	50	3 Hours
8	3	PC	CSE	22AML308	**Lab:** Software Engineering	**P**	0	0	2	2	1		60	40	
9	3	PC	CSE	22AML309	**Lab:** Software Lab.	**P**	0	0	2	2	1		60	40	
					TOTAL		**15**	**3**	**8**	**23**	**22**				
List of Mandatory Learning Course (MLC)															
1	3	HS	T&P	MLC2123	YCCE Communication Aptitude Preparation (YCAP3)	**A**	3	0	0	3	0				
2	3	BSE	AIML	MLC123	Introdcuction to Haskell Programming	**A**	2	0	0	2	0				
FOURTH SEMESTER															
1	4	BS	GE	22AML401	Linear Algebra	**T**	3	0	0	3	3	30	20	50	3 Hours
2	4	PC	CSE	22AML402	Operating Systems	**T**	3	0	0	3	3	30	20	50	3 Hours
3	4	PC	CSE	22AML403	**Lab:** Operating Systems	**P**	0	0	2	2	1		60	40	
2	4	PC	CSE	22AML404	Foundation of Artificial Intelligence	**T**	3	0	0	3	3	30	20	50	3 Hours
3	4	PC	CSE	22AML405	**Lab:** Foundation of Artificial Intelligence	**P**	0	0	2	2	1		60	40	
6	4	PC	CSE	22AML406	Design & Analysis of Algorithms	**T**	3	1	0	3	4	30	20	50	3 Hours
7	4	PC	CSE	22AML407	**Lab:** Design & Analysis of Algorithms	**P**	0	0	2	2	1		60	40	
8	4	PC	CSE	22AML408	Database Management Systems	**T**	3	0	0	3	3	30	20	50	3 Hours
9	4	PC	CSE	22AML409	**Lab:** Database Management Systems	**P**	0	0	2	2	1		60	40	
					TOTAL		**15**	**1**	**8**	**23**	**20**				
List of Mandatory Learning Course (MLC)															
1	4	HS	T&P	MLC2124	YCCE Communication Aptitude Preparation (YCAP4)	**A**	3	0	0	3	0				
2	4	BSE	AIML	MLC124	Computational Sanskrit	**A**	2	0	0	2	0				

MSEs* = Two MSEs of 15 Marks each will conducted and marks of these 2 MSEs will be considered for Continuous Assessment

TA ** = for Theory : TA1-5 marks on Proctored Online Exam, TA2-12 marks on activitied decided by course teacher, TA3 - 3 marks on class

TA = for Practical : MSPA will be 15 marks each**

		June 2022	**1.00**
Chairperson	**Dean (Acad. Matters)**	**Date of Release**	**Version**

Applicable for AY 2022-23 Onwards

IV Semester
22AML401 : Linear Algebra

Course Outcomes:
Upon successful completion of the course the students will be able to 1. Solve systems of linear equations using rank of matrix. 2. Determine eigen values and eigen vectors and solve eigen value problems. 3. Explain the concepts of vector space and subspace, span and basis. 4. Apply principles of matrix algebra to linear transformations and inner product.

Unit:1	**Elementary matrix operations**	**6 Hours**
Introduction to Matrices and Determinants, Solution of Linear Equations, Cramer's rule, Inverse of a Matrix. **Contemporary Issues related to Topic**		
Unit:2	**Matrix Algebra**	**6 Hours**
Rank of a matrix, Gaussian elimination, LU Decomposition (Crout's method), Solving Systems of Linear Equations using the tools of Matrices. **Contemporary Issues related to Topic**		
Unit:3	**Diagonalization of matrix**	**7 Hours**
Eigen Values and Eigen vectors, Linear dependence and independence of Eigen Vectors, Orthogonal Eigen vector, Diagonalization of matrix, Cayley-Hamilton Theorem and Sylvester's Theorem. **Contemporary Issues related to Topic**		
Unit:4	**Vector Space**	**7 Hours**
Vector Space, Subspace, Sum of Sub space, linear combination, Linear dependence and independence, Span and basis, Spanning sets, Generators. **Contemporary Issues related to Topic**		
Unit:5	**Linear Transformation**	**7 Hours**
Linear transformation, Ranges and Kernel (null space) of linear transformation, Inverse of linear transformation, Algebra of linear transformation, Singular and non-singular linear transformation. . **Contemporary Issues related to Topic**		
Unit :6	**Inner product Spaces**	**6 Hours**
Inner product space and Norms, orthogonal vector, the Gram Schamidt orthogonalization Process , orthogonal compliment, Adjoint of Linear operator, Normal and self adjoint operator, Unitary and orthogonal operator, Bilinear and Quadratic form . **Contemporary Issues related to Topic**		
	Total Lecture Hours	**39 Hours**

			July 2022	1.00	Applicable for AY 2022-23 Onwards
Chairperson	Dean (Acad. Matters)	Dean OBE	Date of Release	Version	

Text books	
1	Erwin Kreyzig, Advance Engineering Mathematics, 9th Edition, John Wiley and Sons, INC.
2	Dr. B. S. Grewal, Higher Engineering Mathematics, 40th edition, Khanna Publisher.
3	H.K. Dass, Advanced Engineering Mathematics, 8th revised edition, S. Chand, Delhi.
4	Hoffman and Kunze, Linear Algebra, prentice Hall of India, New Delhi
5	Glbert Strang, Linear Algebra and its Applications, Nelson Engineering (2007)
6	Swapan Kumar Sarkar, A Textbook of Discrete Mathematics, S.Chand Company Limited, Delhi.
7	Seymour Lipschutz, Linear Algebra, Schaum's Solved Problem Series, McGraw-Hill Book Company.
8	Vijay M. Soni, Mathematics, B.Sc. Semester VI, Himalaya Publishing House.

Reference Books	
1	Chandrika Prasad, Mathematics for Engineers (19th edition), , John Wiley & Sons.
2	L.A. Pipes and Harville, Applied Mathematics for Engineers (3rd edition), McGraw Hill.
3	K.B.Datta, Matrix and Linear Algebra, , Prentice Hall of India.
4	N.P. Bali & Manish Goyal, A textbook of Engineering Mathematics (Reprint 2008), Laxmi Prakashan.

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Mathematics%20and%20Humanities/

MOOCs Links and additional reading, learning, video material	
1	https://nptel.ac.in/courses/111106051
2	https://archive.nptel.ac.in/courses/111/104/111104137/
3	https://archive.nptel.ac.in/courses/111/106/111106135/

IV Semester
22AML402 : Operating Systems

Course Outcome
After undergoing this course student will be able to 1. Understand the fundamental concepts in Operating Systems (OS) and understand how various hardware features support OS functionality. 2. Explain various OS mechanisms and policies for managing system resources. 3. Analyse algorithms and techniques for managing various OS resources in a multiprogramming and other environments. 4. Evaluate the performance of algorithms for managing various OS resources.

UNIT I: Introduction to OS	6
Evolution of OS, basic hardware support necessary for modern operating systems, Layered Structural of OS, process concept, process state transitions , Services provided by OS, system calls, privileged instructions, Dual mode of operation, I/O bound and CPU bound processes, concept of multiprogramming and multiprocessing. **Contemporary Issues related to Topic**	
UNIT II: Process management	6
Process control block, process context switch, process versus threads, CPU scheduling, goals of scheduling, CPU scheduling algorithms, Algorithmic evaluation of CPU scheduling algorithms, multi-queue scheduling, multithreading **Contemporary Issues related to Topic**	
UNIT III: Interprocess communication and Synchronization	8
Operations on processes, Interprocess communication, process cooperation and synchronization, race condition, critical region, mutual exclusion and implementation, semaphores, classic problems of Synchronization using semaphores, other synchronization constructs. **Contemporary Issues related to Topic**	
UNIT IV: Memory management techniques	6
Contiguous allocation, static and dynamic partitioning, non-contiguous allocation, paging, translation look aside buffer (TLB) and overheads, segmentation. **Contemporary Issues related to Topic**	
UNIT V: Virtual memory	7
Demand paging, page replacement algorithms, thrashing, and working set model. Deadlocks: necessary conditions, deadlock detection, deadlock avoidance, deadlock prevention, recovery from deadlock. **Contemporary Issues related to Topic**	

UNIT VI: File systems	6
Introduction, Access methods, Directory Structure disk space management and space allocation strategies, disk arm scheduling strategies: FCFS, SSTF, SCAN, CSACN, LOOK, CLOOK, Selecting a disk scheduling algorithm. **Contemporary Issues related to Topic**	
Total Lectures	**39**

Text Books	
1	Operating system Principles, 9th Edition, A. Silberchatz and P.Galvin, John Wiley & Sons Inc.
2	Operating Systems Internals and Design Principles , 2nd Edition ,William Staling, Pearson

Reference Books	
1	Operating Systems: A Design-Oriented Approach , Charles Crowley ,McGraw Hill
2	Operating system concepts and Design, 2nd Edition, Milan MilenKovic , Tata McGraw Hill

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	

MOOCs Links and additional reading, learning, video material	
1.	https://onlinecourses.nptel.ac.in/noc20_cs04/preview
2.	https://onlinecourses.nptel.ac.in/noc21_cs88/preview
3.	https://onlinecourses.nptel.ac.in/noc21_cs72/preview

IV Semester
22AML403 : Lab. Operating Systems

Course Outcome
After undergoing this course student will be able to 1. Understand the fundamental concepts in Operating Systems (OS) and understand how various hardware features support OS functionality. 2. Explain various OS mechanisms and policies for managing system resources. 3. Analyse algorithms and techniques for managing various OS resources in a multiprogramming and other environments. 4. Evaluate the performance of algorithms for managing various OS resources.

List of Experiment

Sr. No.	Experiments Based On
1	Study of Window task manger(Exploring various tabs: application, processes, services, networking, performance)
2	Study of Advanced Linux shell commands (Process management, memory management, networking, etc.)
3	Write a program that illustrates the creation of child process using fork system call. Each child and parent Processes perform different task.
4	Write a multithreaded program to multiply two given matrices.
5	Simulate: a) Any preemptive CPU Scheduling Algorithm b) Any Non-preemptive CPU Scheduling Algorithm
6	Write a program to perform Inter-Process-Communication using shared memory or, pipes or message queues.
7	Write a program that solves two process Producer-Consumer problem with bounded buffer using semaphores. OR Write a program that gives a deadlock and starvation free solution to the Dining Philosohers problem using semaphores.
8	Simulate: a) First Fit(Static Memory allocation algorithm) and b) Worst Fit(Dynamic Memory allocation algorithm)
9	Simulate any one of the following page replacement algorithms: FIFO, LRU, Optimal
10	Write a program to simulate Banker's Deadlock avoidance algorithm.

IV Semester
22AML404 : Foundation of Artificial Intelligence

Course Outcome
At the end of the course, the students will be able to: 1. Apply fundamentals of Artificial Intelligence for given problem statements. 2. Use basic algorithms in various applications of AI and related fields. 3. Assess the applicability, strengths, and weaknesses of the basic knowledge representation, problem solving, and learning methods in solving engineering problems. 4. Solve real world problems using AI techniques

UNIT I: Introduction to AI:	**7**
Definition of AI, early work in AI, the importance of AI, AI and related fields, distributed AI, task domain of AI, Introduction to intelligent agents, generic architecture of intelligent agents. Problems, problem spaces and searches: defining the problem on a state space search, issues in the design of search programs. **Contemporary Issues related to Topic**	
UNIT II: Problem Decomposition and Planning:	**7**
Goal Trees, Rule Based Systems, Rule Based Expert Systems. STRIPS, Forward and Backward State Space Planning, Goal Stack Planning, Plan Space Planning, A Unified Framework For Planning, Heuristic search techniques: generate and test, hill climbing, best first search, problem reduction, constraint satisfaction, means-ends analysis. **Contemporary Issues related to Topic**	
UNIT III: Knowledge Representation:	**7**
issues, representation and mapping approaches, procedural Vs declarative knowledge, introduction to proposition logic, knowledge representation using predicate logic, unification and resolution algorithms. Procedure for knowledge acquisition, Representation of knowledge using rules, logic programming, forward backward reasoning, matching, control knowledge. Knowledge representation using semantics nets **Contemporary Issues related to Topic**	
UNIT IV: Introduction to non-monotonic reasoning, logics for non-monotonic reasoning Statistical reasoning	**6**
Introduction to non-monotonic reasoning, logics for non-monotonic reasoning Statistical reasoning: probability and Bays theorem, certainty factors and rule based system. Learning: Supervised, Unsupervised and Reinforcement learning. **Contemporary Issues related to Topic**	

UNIT V: AI Technologies:	**6**
Natural Language Processing: Introduction, Stages in natural language Processing, Application of NLP in Machine Translation, Information Retrieval and Big Data Information Retrieval. Expert Systems: Design & Development of Expert System, knowledge based Systems, Rule Based Expert System, Expert System Shell, Application Areas of Expert System **Contemporary Issues related to Topic**	
UNIT VI: Neural Networks and applications of AI	**6**
Introduction, Features of Biological neural networks, Learning algorithms, Different network architecture and their applications, Some simple networks-Comparison of neural networks with rule based networks and expert systems, AI Applications: AI in Health, AI in Ecommerce, AI in E-Tourism, AI in Industry, AI in Security **Contemporary Issues related to Topic**	
Total Lectures	**39**

Text Books:	
1.	Artificial Intelligence: A Modern Approach, Stuart Russell, Peter Norvig, Pearson education

Reference Book:	
1.	Introduction to Artificial Intelligence, Rajendra Akerkar, PHI Learning Private Limited
2.	A First Course in Artificial Intelligence, Deepak Khemani
3.	Artificial Intelligence, Elaine Rich, Kevin Knight and Nair, TMH

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://103.152.199.179/YCCE/e-copies%20of%20books/7.Information%20Technology/18..2017_Book_IntroductionToArtificialIntell.pdf

MOOCs Links and additional reading, learning, video material	
1.	https://onlinecourses.nptel.ac.in/noc20_cs42/preview
2.	https://onlinecourses.nptel.ac.in/noc21_ge20/preview

IV Semester
22AML406 : Design & Analysis of Algorithms

Course Outcome
After completion of the course, student will be able to: 1. Remember the concepts of algorithms, 2. Understand time requirements of an algorithm and mathematical techniques used in analysis of algorithms. 3. Analyze the Complexities of different algorithms for a wide variety of foundational problems occurring in computer science applications. 4. Apply the knowledge of different algorithms with discussions on complexity. 5. Evaluate the knowledge of algorithms with Complexity and NP-completeness.

UNIT I:	7
Mathematical foundations, summation of arithmetic and geometric series, Σn, Σn2, bound summations using integration, Analysis of algorithms, analyzing control structures, worst case and average case analysis, Asymptotic notations, Analysis of sorting algorithms such as selection sort, insertion sort, bubble sort, heap sort, external Sorting, lower bound proof. **Contemporary Issues related to Topic**	
UNIT II:	7
Recursive functions and recurrence relations, solutions of recurrence relations using technique of characteristic equation and generating functions, elementary and advanced data structures with operations on them and their time complexity, Amortized analysis. **Contemporary Issues related to Topic**	
UNIT III:	7
Divide and conquer basic strategy, binary search, quick sort, merge sort, Fast Fourier Transform etc. Greedy method –basic strategy, application to job sequencing with deadlines problem, minimum cost spanning trees, single source shortest path etc. **Contemporary Issues related to Topic**	
UNIT IV:	6
Dynamic Programming basic strategy, multistage graphs, all pair shortest path, single source shortest paths, optimal binary search trees, traveling salesman problem, Matrix Chain Multiplication, Longest Common Subsequent. **Contemporary Issues related to Topic**	

UNIT V:	6
Basic Traversal and Search Techniques, breadth first search, connected components, Backtracking basic strategy, 8 – Queen‟s problem, graph colouring, Hamiltonian cycles etc. **Contemporary Issues related to Topic**	
UNIT VI:	6
NP-hard and NP-complete problems basic concepts, non-deterministic algorithms, NP-hard and NP-complete, Cook‟s Theorem, decision and optimization problems, polynomial reduction. **Contemporary Issues related to Topic**	
Total Lectures	**39**

Text Books:	
1.	Computer Algorithms, Horowitz, Sahani, Rajsekharan ,Third Edition, Galgotia Publications Pvt. Ltd.
2.	Introduction to Algorithms, Thomas H. Cormen ,Third Edition, Prentice Hall of India.
3.	Algorithm design ,Klienberg and Tardos, Pearson

YCC Reference Book:	
1	Fundamentals of Algorithms, Brassard and Bratley, second Edition, Prentice Hall

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://link.springer.com/openurl?genre=book&isbn=978-1-4613-6193-0
2	https://onlinelibrary.wiley.com/doi/book/10.1002/9780470168042

MOOCs Links and additional reading, learning, video material	
1.	https://archive.nptel.ac.in/courses/106/101/106101060/
2.	https://nptel.ac.in/courses/106101060

IV Semester
22AML407 : Lab. Design & Analysis of Algorithms

Course Outcome

After completion of the course, student will be able to:

1. Remember the concepts of algorithms,
2. Understand time requirements of an algorithm and mathematical techniques used in analysis of algorithms.
3. Analyze the Complexities of different algorithms for a wide variety of foundational problems occurring in computer science applications.
4. Apply the knowledge of different algorithms with discussions on complexity.
5. Evaluate the knowledge of algorithms with Complexity and NP-completeness.

List of Experiment

Sr. No.	Experiments Based on
1	To Compute and Analyze its time complexity of various sorting algorithm. • Bubble sort • Insertion sort • Selection Sort
2	To implement and compute time complexity of given problem using Divide and Conquer algorithm. • Merge sort • Quick sort • Binary Search
3	To implement and compute time complexity of Job sequencing problem using Greedy Method for different number of inputs.
4	To implement and compute time complexity of Knapsack Problem using Greedy Method for different number of inputs.
5	To implement and compute time complexity of Dijikstra Problem using Greedy programming for different number of inputs.
6	To implement the given problem using minimum cost spanning trees. • Kruskal Algorithm • Prim Algorithm
7	To implement and compute time complexity of All Pair Shortest Path using dynamic programming for different number of inputs.
8	To implement and compute time complexity of Travelling Salesman Problem using dynamic programming for different number of inputs.
9	To implement and compute time complexity of 8 Queens's problem using backtracking for different number of inputs.
10	To implement and compute time complexity of Graph coloring problem using backtracking for different number of inputs.

IV Semester
22AML408 : Database Management Systems

Course Outcome
Upon successful completion of the course, the student will be able to: 1. Understand & compare different levels of abstraction & data independence. 2. Design Entity Relationship Diagram for any scenario & normalize the database 3. Solve queries based on relational algebra & SQL. 4. Analyze transaction management, various concurrency control protocols and crash recovery methods.

UNIT I: Introduction to Database Management System:	6
General File System and Database system Concepts and Architecture, Data Models, Schemas and Instances, Abstraction & Different Levels of Data Abstraction, Data Independence: Logical & Physical Independence. **Contemporary Issues related to Topic**	
UNIT II: SQL:	8
Data definition language (DDL), Data Manipulation Language (DML), Basic structure of SQL Queries, Set operations, Null Values, Nested subqueries, views, Joins,SQL data types & schemas, Integrity Constraints, Domain Constraints, Assertions, triggers, PL/SQL. , jdbc connectivity **No SQL databases**: Features of NoSQL databases, Types of NoSQL databases **Contemporary Issues related to Topic**	
UNIT III: Entity-Relationship Model:	6
Entities and Entity Sets, Relationships and Relationship Sets, Attributes, Mapping Constraints, Keys, Entity Relationship Diagram, Reducing E-R Diagrams to Tables, Generalization, Aggregation, Design of an E-R Database Scheme **Contemporary Issues related to Topic**	
UNIT IV: Relational Database Design	6
Structure of Relational Databases, Pitfalls in Relational Database Design, Functional Dependencies, Normalization using Functional Dependencies, Alternative Approaches to Database design. **Relational Algebra**: Structure of relational databases, Fundamental Relational-Algebra Operations, Additional relational algebra operations. **Contemporary Issues related to Topic**	
UNIT V: Indexing and Hashing	6
Basic of query processing; Indices: Concepts, B+ trees and B -tree index file; Static and dynamic hashing. **Contemporary Issues related to Topic**	

UNIT VI: Transactions & Concurrency control	7
Transactions: basic concepts, States, Concurrent execution, Serializability, Recoverability, isolation; **Concurrency control:** Timestamps and locking protocols, Validation based protocols, deadlock handling; Recovery: Log-based recovery, Shadow-paging. **Contemporary Issues related to Topic**	
Total Lectures	**39**

Text Books	
1.	Database System Concepts, 6th Edition, Korth, Silberschatz, McGraw-Hill publication
2.	Fundamentals of Database Systems, 5th Edition, Elmasri, Navathe & Gupta, Pearson Education.

Reference Books	
1.	SQL & PL / SQL for Oracle 11g Black Book Kindle Edition, 3rd Edition, Dr. P.S. Deshpande, Dreamtech Press
2.	Database Systems, 3rd Edition, Connolly, Pearson Education
3.	Database Systems, 6th Edition, S. K. Singh,Pearson Education

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://103.152.199.179/YCCE/e-copies%20of%20books/7.Information%20Technology/35.Database_Management_Systems__2nd_Ed._.pdf
2	http://103.152.199.179/YCCE/e-copies%20of%20books/7.Information%20Technology/36.dbms%20book%20of%20Raghu%20Ramakrishnan.pdf

MOOCs Links and additional reading, learning, video material	
1.	https://onlinecourses.nptel.ac.in/noc21_cs04/preview
2.	https://nptel.ac.in/courses/106106093

IV Semester
22AML409 : Lab. Database Management Systems

Course Outcome
Upon successful completion of the course, the student will be able to: 1. Understand & compare different levels of abstraction & data independence. 2. Design Entity Relationship Diagram for any scenario & normalize the database 3. Solve queries based on relational algebra & SQL. 4. Analyze transaction management, various concurrency control protocols and crash recovery methods.

List of Experiment

Sr. No.	Experiments Based On
1	To implement different basic Data Definition Language (DDL) & Data Manipulation Language(DML) Commands in SQL , commands that involve constraints for a given schema
2	To implement aggregate function & grouping commands on a given schema
3	To implement basic set operations in SQL on a given schema
4	To apply BETWEEN…AND, NOT BETWEEN, IN, NOT IN, IS NULL, IS NOT NULL clause, single row , mutirow functions on created database tables
5	To implement commands for various joins on a given schema
6	Write SQL queries for given schema using Nested Subqueries and SQL Update on a given schema
7	To create and manipulate various database object of table using views.
8	Select any real time problem for database implementation. Draw an ER diagram for the selected problem in hand. Normalise the database up to appropriate normal form.
9	To display file database connectivity using JDBC
10	Create procedures using PL/SQL for given problem definition

IV SEMESTER

22AML410 : Environmental Sustainability, Pollution and Management

Course Outcomes:

Upon successful completion of the course, the students will be able to

The student will be able to

1. Gain insights into the efforts to safeguard the Earth's environment and resources.
2. Develop a critical understanding of the contemporary environmental issues of concern
3. Have an overview of pollution, climate change and national and global efforts to address adaptation and mitigation to changing environment through environmental management.
4. Learn about the major international treaties and our country's stand on and responses to the major international agreements.

Unit:1	**Environment, Natural Resources and Sustainable Development**	**6 Hours**
The man-environment interaction; Environmental Ethics and emergence of environmentalism; Overview of natural resources: Definition of resource; Classification of natural resources- biotic and abiotic, water, soil and mineral resources, renewable, and non-renewable energy resources; Introduction to sustainable development: Sustainable Development Goals (SDGs)- targets and indicators, challenges and strategies for SDGs		
Unit:2	**Environmental Issues, Conservation of Biodiversity and Ecosystems**	**6 Hours**
Environmental issues and scales: Land use and Land cover change, Global change; Biodiversity and its distribution, Ecosystems and ecosystem services, Threats to biodiversity and ecosystems, National and international policies for conservation.		
Unit:3	**Environmental Pollution and Health**	**7 Hours**
Understanding pollution: Production processes and generation of wastes, Air pollution, Water pollution, Soil pollution and solid waste, Noise pollution, Thermal and Radioactive pollution. Impact on human health		
Unit:4	**Climate Change: Impacts, Adaptation and Mitigation**	**7 Hours**
Understanding climate change, Impacts, vulnerability and adaptation to climate change, Mitigation of climate change		
Unit:5	**Environmental Management**	**7 Hours**
Environmental management system: ISO 14001, Concept of Circular Economy, Life cycle analysis; Cost-benefit analysis, Environmental audit and impact assessment; Waste Management and sustainability; Ecolabeling /Eco mark scheme		
Unit :6	**Environmental Treaties and Legislation**	**6 Hours**
Introduction to environmental laws and regulation, An overview of instruments of international cooperation, Major International Environmental Agreements, Major Indian Environmental Legislations, Major International organizations, and initiatives		
	Total Lecture	**39 Hours**

			July 2022	1.00	Applicable for AY 2022-23 Onwards
Chairperson	Dean (Acad. Matters)	Dean OBE	Date of Release	Version	

Text books	
1	Chiras, D. D and Reganold, J. P. (2010). Natural Resource Conservation: Management for a Sustainable Future.10th edition, Upper Saddle River, N. J. Benjamin/Cummins/Pearson
2	Rajagopalan, R. (2011). Environmental Studies: From Crisis to Cure. India: Oxford University Press
3	Krishnamurthy, K.V. (2003) Textbook of Biodiversity, Science Publishers, Plymouth, UK
4	Jackson, A. R., & Jackson, J. M. (2000). Environmental Science: The Natural Environment and Human Impact. Pearson Education
5	Pittock, Barrie (2009) Climate Change: The Science, Impacts and Solutions. 2nd Edition. Routledge.
6	Theodore, M. K. and Theodore, Louis (2021) Introduction to Environmental Management, 2nd Edition. CRC Press
7	Kanchi Kohli and Manju Menon (2021) Development of Environment Laws in India, Cambridge University Press
Reference Books	
1	Headrick, Daniel R. (2020) Humans versus Nature- A Global Environmental History, Oxford University Press
2	Gilbert M. Masters and W. P. (2008). An Introduction to Environmental Engineering and Science, Ela Publisher (Pearson)
3	William P. Cunningham and Mary A. (2015). Cunningham Environmental Science: A global concern, Publisher (Mc-Graw Hill, USA)
4	Varghese, Anita, Oommen, Meera Anna, Paul, Mridula Mary, Nath, Snehlata (Editors) (2022) Conservation through Sustainable Use: Lessons from India. Routledge.
5	Central Pollution Control Board Web page for various pollution standards. https://cpcb.nic.in/ standards
6	Barnett, J. & S. O'Neill (2010). Maladaptation. Global Environmental Change—Human and Policy Dimensions 20: 211–213
7	Richard A. Marcantonio, Marc Lame (2022). Environmental Management: Concepts and Practical Skills. Cambridge University Press
8	Ministry of Environment, Forest and Climate Change (2019) A Handbook on International Environment Conventions & Programmes. https://moef.gov.in/wp- content/uploads/2020/02/ convention-V-16-CURVE-web.pdf

IV Semester
Department Specific Audit Course
MLC124- Computational Sanskrit

Course Outcome	
1.	To understand the paradigm of programming known as Functional Programming using Haskell language.
2.	To understand the working of Pāṇini's Sanskrit grammar by focusing on the phonetic and morpho-syntactic machinery of the grammar.
3.	To computerize the rules of Pāṇini's Sanskrit grammar using Haskell programming language.
4.	To appreciate how well-defined the grammar is and its similarity to computer programs

UNIT I:	4
Haskell Language: Concepts like types, functions, lists, recursion etc.	
UNIT II:	7
Sanskrit Character Set: Vowels, Consonants, Phonetic Properties Pāṇini's Sanskrit Grammar: Important notions like pratyāhāra, saṃjñā	
UNIT III:	7
Substitutions: ādeśa and ekādeśa Rule Conflict and Resolution: vidhi, niyama and niṣedha rules	
UNIT IV:	6
Specifications: Adapting Pāṇinian Rules for Computation Tips on implementation of the rules	
Total	24

Text Books	
1	Ashtadhyayi of Panini, S. C. Vasu, Motilal Banarsidass
2	The Ashtadhyayi of Panini, Rama Nath Sharma, Munshiram Manoharlal Pub

MOOCs Links and additional reading, learning, video material	
1.	https://nptel.ac.in/courses/106106137

First Year

V&VI-Semester B.E. (Open Elective)

Introduction to German Language

GE-2317/2369	Introduction to German Language			L=3	T=0	P=0	Credits=3
Evaluation Scheme	MSEs	TA	ESE	Total	ESE Duration		
	30	30	40	100	3 Hrs		

Objectives	Course Outcomes : Students will be able to
Learning Basic Vocabulary	Alphabets, Numbers, Days of the Week, Months of the Year, Seasons, Greetings, Professions
Building on Basic Grammar Skills	Gender of the words, Articles, Subject pronouns, Verbs, Sentence building using Verbs and nouns
Learn to build very simple Sentences	Very basic sentences like self-introduction – Name, Age, Profession etc. Ordering food at restaurants.
Describing people, house, places	Learning Adjectives, Demonstrative adjectives to describe people, house and other places.
Write about hobbies, likes and dislikes, daily routine	Learning to write about leisure activities, what are the likes and dislikes and describing daily routine activities.
Speaking, Listening and Practical Exercises	Playing Videos to practice listening skills. Conversation practice and Role play to enhance speaking skills.

Unit-I : Introduction and basic grammar - 6 hours

- Learning about Alphabets, Numbers
- Days of the week, Months of the year, Seasons
- Common expressions, Professions, Colors
- Subject Pronouns, SER verb
- Articles, Adjectives, Demonstrative Adjectives

Unit-II : Learning to build simple sentences- 6 hours

- ESTAR verb to describe placements
- Prepositions of place
- SER ESTAR differences and application
- Using Hay for description
- Build simple sentences about yourself, your friends, classroom objects, household objects

Unit-III : Question words, Plurals, Present Tense and Present Continuous Tense of AR verbs - 7 hours

- Question words of What, who, where, which, why, when, how
- Build conversation skills by answering questions
- Making plurals of sentences
- Learning conjugations of AR verbs in Present Tense
- Learning Present continuous tense of AR Verbs
- Learning to Present oneself

Unit- IV : ER Verbs, Stem Changing Verbs and Tener - 7 hours

- Learning conjugations of ER verbs in Present Tense
- Learning Present continuous tense of ER Verbs
- Learning Food vocabulary
- Learning Basic Conversation at restaurant
- Stem changing Verbs conjugations
- Tener Verb to talk about age, describe family

Unit-V : SaberConocer, Time, IR Verbs, Leisure activities- 7 hours

- Saber Conocer to talk about abilities and personal acquaintance
- Learn to say Time in Spanish and Time related expressions
- Learning conjugations of IR verbs in Present Tense
- Learning Present continuous tense of IR Verbs
- Speak about activities what you do in leisure using all groups of verbs.

Unit-VI : Obligations, Prepositions, Possessive Adjectives, Gustar, Possessive Pronouns and Daily routine with reflexive verbs - 7 hours

- Talk about what has to be or should be done
- Learn prepositions for connecting sentences
- possessive adjectives to learn about my, your, his her, our.
- Learn likes and dislikes with Gustar
- Possessive pronouns to learn about mine, yours, ours.
- Reflexive verbs to Speak about daily routine.

Text Books & Reference Books:
Clan 7, Listos
Aula1, Chicoschicas

V&VI-Semester B.E. (Open Elective)

Introduction to Spanish Language

GE-2319/2369	**Introduction to Spanish Language**			**L=3**	**T=0**	**P=0**	**Credits=3**
Evaluation Scheme	MSEs	TA	ESE	Total	ESE Duration		
	30	30	40	100	3 Hrs		

Objectives	**Course Outcomes : Students will be able to**
Learning Basic Vocabulary	Alphabets, Numbers, Days of the Week, Months of the Year, Seasons, Greetings, Professions
Building on Basic Grammar Skills	Gender of the words, Articles, Subject pronouns, Verbs, Sentence building using Verbs and nouns
Learn to build very simple Sentences	Very basic sentences like self-introduction – Name, Age, Profession etc. Ordering food at restaurants.
Describing people, house, places	Learning Adjectives, Demonstrative adjectives to describe people, house and other places.
Write about hobbies, likes and dislikes, daily routine	Learning to write about leisure activities, what are the likes and dislikes and describing daily routine activities.
Speaking, Listening and Practical Exercises	Playing Videos to practice listening skills. Conversation practice and Role play to enhance speaking skills.

Unit-I : Introduction and basic grammar - 6 hours

- Learning about Alphabets, Numbers
- Days of the week, Months of the year, Seasons
- Common expressions, Professions, Colors
- Subject Pronouns, SER verb
- Articles, Adjectives, Demonstrative Adjectives

Unit-II : Learning to build simple sentences- 6 hours

- ESTAR verb to describe placements
- Prepositions of place
- SER ESTAR differences and application
- Using Hay for description
- Build simple sentences about yourself, your friends, classroom objects, household objects

Unit-III : Question words, Plurals, Present Tense and Present Continuous Tense of AR verbs - 7 hours

- Question words of What, who, where, which, why, when, how
- Build conversation skills by answering questions
- Making plurals of sentences
- Learning conjugations of AR verbs in Present Tense
- Learning Present continuous tense of AR Verbs
- Learning to Present oneself

Unit- IV : ER Verbs, Stem Changing Verbs and Tener - 7 hours

- Learning conjugations of ER verbs in Present Tense
- Learning Present continuous tense of ER Verbs
- Learning Food vocabulary
- Learning Basic Conversation at restaurant
- Stem changing Verbs conjugations
- Tener Verb to talk about age, describe family

Unit-V : SaberConocer, Time, IR Verbs, Leisure activities- 7 hours

- Saber Conocer to talk about abilities and personal acquaintance
- Learn to say Time in Spanish and Time related expressions
- Learning conjugations of IR verbs in Present Tense
- Learning Present continuous tense of IR Verbs
- Speak about activities what you do in leisure using all groups of verbs.

Unit-VI : Obligations, Prepositions, Possessive Adjectives, Gustar, Possessive Pronouns and Daily routine with reflexive verbs - 7 hours

- Talk about what has to be or should be done
- Learn prepositions for connecting sentences
- possessive adjectives to learn about my, your, his her, our.
- Learn likes and dislikes with Gustar
- Possessive pronouns to learn about mine, yours, ours.
- Reflexive verbs to Speak about daily routine.

Text Books & Reference Books:

Clan 7, Listos
Aula1, Chicoschicas

Unit V:

How to make simple enquiries in speaking and writing- I want to catch a train to Bamberg, could you please tell me fastest train to reach Bamberg from Berlin?, Excuse me, I was looking to find a place to eat Pizza. Are you aware of the good restaurants nearby ?,I am looking to find a recent book about…… Could you please tell me in which rack can I find it?, What do you like to eat during lunches?, Do you like playing sports? I play a lot of sports, particularly my fav sports are swimming and walking. **(6 hours)**

Unit VI:

Learn to Write very simple letters

Letter to Your House Owner for fixing water tap, Letter to your neighbor since you won't be coming home late in the evening and your brother will be coming to collect keys from him Small Listening Exercises, Small Practical Exercises - Restaurant, Shopping Market, Bank, University Library.**(6 hours)**

Text Books:

SN	Title	Edition	Authors	Publisher
1	Studio D A1 Deutsch Buch	2014	Funk and Kuhn	Cornelsen Verlag (Goyal Publishers India)
2	Netwerk Deutschals Fremdspache	2015	Stefanie Dengler	Goyal Publishers
3	Tangramaktuell	2004	Hueber	Max HueberVerlag

V&VI-Semester B.E. (Open Elective OE II)

Introduction to French Language

GE-2320/2370	**Introduction to French Language**			**L=3**	**T=0**	**P=0**	**Credits=3**
Evaluation Scheme	MSEs	TA	ESE	Total	ESE Duration		
	30	30	40	100	3 Hrs		

Objectives	**Course Outcome: At the end of the course students will be able to:**
The objective of this course is to impart preliminary knowledge about the French language and civilization and is therefore of an elementary level. At the end of the one year course, the student is expected to acquire the following skills: 1) Elementary communication skills, based on aural and written comprehension of common words and simple sentences in French. 2) Simple oral and written expression.	a) Understand simple words and expressions spoken slowly and distinctly in French and used in day-to-day situations related to the student's immediate environment. b) Read and understand common words and sentences in French. c) Say a few words in French in conversations related to simple day-to-day situations.

Unit-I : Grammar I – 6 hours

- French alphabets
- Pronunciation Guide
- Indefinite and definite articles
- Present tense: -er verbs (regular)

Unit-II : Grammar II – 6 hours

- etre, avoir (irregular verbs)
- Nouns (singular & plural)
- Adjectives
- Pronouns (subject)

Unit-III : Vocabulary – 6 hours

- Numbers (1-100)
- Days of the week
- Months of the year
- Nationalities
- Colours
- Adjectives words for common use used
- Nouns words for common use used

Unit-IV : Communication skills I – 7 hours

- Greetings
- Presentation, introduction

Unit-V : Communication skills II – 7 hours

- Interrogation relating to everyday situations
- Replying to simple questions.

Unit-VI : Civilization – 7 hours

- Day to day Iife, eg.
- Classroom
- Friends
- Family
- School
- Vacations
- Introduction to France: Geography.

Text Books:

1) Ranjit, Mahita& Singh, Monica . `Apprenons le frangais', Part 1. Saraswati House Pvt. Ltd., New Delhi. Second Revised Edition, 2007.

2) Ranjit, Mahitha&Batra, Simran. 'Cahier d'exercices', (Apprenons le francais) 1. Saraswati Book House Pvt. Ltd., New Delhi, 2007.

V&VI-Semester B.E. (Open Elective OE II)

Introduction to Japanese Language

GE2322	**Introduction to Japanese Language**			**L=3**	**T=0**	**P=0**	**Credits =3**
Evaluation Scheme	MSEs	TA	ESE	Total	ESE Duration		
	30	30	40	100	3 Hrs		

Objectives	**Course Outcome: At the end of the course students will be able to:**
The objective of this course is to impart preliminary knowledge about the Japanese language and civilization and is therefore of an elementary level. At the end of the 40 hours course, the student is expected to acquire the following skills: 1) Elementary communication skills, based on oral and written comprehension of common words and simple sentences in Japanese. 2) Simple oral and written expression.	a) Understand simple words and expressions spoken slowly and distinctly in Japanese and used in day-to-day situations related to the student's immediate environment. b) Read and understand common words and sentences in Japanese. c) Say a few words in Japanese in conversations related to simple day-to-day situations.

Unit-I : Grammar I – 10 hours
- Frist Script - Hiragana
- Reading and Writing

Unit-II : Grammar II – 10 hours
- Basic Introduction
- Basic Sentences

Unit-III : Vocabulary – 6 hours
- Numbers (1-10000)
- Days of the week
- Months of the year
- Daily Greeting

Unit-IV : Communication skills I – 6 hours
- Interrogation relating to everyday situations
- Replying to simple questions

Unit-V : Communication skills II – 4 hours

- Day to day Iife, eg.
- Classroom
- Friends
- Family
- School
- Vacations

Unit-VI : Civilization – 4 hours

- History
- Geography

Text book recommended:

1) Minna no Nihongo , by JF .
2) Marugoto by JF
3) Fujichan , By Mandar Sugwekar

III Semester
GE2201 - Engineering Mathematics-III

Objectives	Outcomes
1. Finite Differences for Numerical Differentiation and Integration. 2. Different Transformation for solving difference and differential equation. 3. Partial differential equation with 1st and higher order.	1. Estimate the Calculus of Numerical Function and Solve difference equations. 2. Determine the transforms and inverse transforms of various functions and Apply it to solve Mathematical equations. 3. Discuss the periodicity of functions and express it in terms of Fourier series. 4. Solve partial differential equations.
Mapped Program Outcomes : 2, 3	

UNIT–1 :Finite Differences Difference table; Operators E and Δ, Central differences, Factorials notation, Numerical differentiation and integration, Difference equations with constant coefficients.	**[06 Hrs.]**
UNIT–2 : Laplace Transform Laplace transforms and their simple properties, Unit step function, inverse of Laplace transform, convolution theorem, Applications of Laplace transform to solve ordinary differential equations.	**[07 Hrs.]**
UNIT–3 : Z-transform Z-Transform definition and properties (with proof), inversion by partial fraction decomposition and residue theorem, Applications of Z-transform to solve difference equations with constant co-efficient.	**[06 Hrs.]**
UNIT–4 : Fourier Series Periodic Functions and their Fourier series expansion, Fourier Series for even and odd function, Change of interval, half range expansions	**[07 Hrs.]**
UNIT–5 : Partial Differential Equation **Partial Differential Equation:** Partial Differential Equations of first order first degree i.e. Lagrange"s form, linear homogeneous equations of higher order with constant coefficient. Application of variable separable method to solve first and second order partial differential equations	**[07 Hrs.]**
UNIT–6 : Fourier Transform **Fourier Transform :** Definition: Fourier Integral Theorem, Fourier sine and cosine integrals, Finite Fourier sine & cosine Transform Parseval"s Identity, convolution Theorem	**[06 Hrs.]**

Text Books:

1. Advance Engineering Mathematics, 9th Edition (September 2009), Kreyszig., Wiley
2. Higher Engineering Mathematics, 40th edition, (2010), B.S. Grewal, Khanna Publishers (2006)
3. Advanced Engineering Mathematics, 8th revised edition, 2007, H.K. Dass, Publisher: S.Chand and Company Limited

Reference Books:

1. Mathematics for Engineers, 19th edition, (2007), Chandrika Prasad., John Wiley & Sons.
2. Advanced Mathematics for Engineers, 4th edition, (2006), Chandrika Prasad, John Wiley & Sons.
3. Applied Mathematics for Engineers, 3rd edition, (1970), L.A. Pipes and Harville, McGraw Hill.
4. A text Book of Applied Mathematics, 3rd edition, (2000), P.N. and J.N. Wartikar, Pune Vidyarthi Griha, Prakashan

I SEMESTER

22ADS104: Technical Communications

Course Outcomes :
Upon successful completion of the course the students will be able to
1. Apply different modes for effective communication
2. competently use the phonology of English language
3. Apply nuances of LSRW skills
4. Communicate through different channels

Unit I: Basics of Communication	**(6Hrs.)**
Language as a tool of communication & characteristics of language Process of Communication, Levels of Communication, Flow of Communication, Networks of Communication, Classification of Barriers (Intrapersonal, Interpersonal, Organizational). **(Contemporary issues related to topic)**	
Unit II: English Phonetics	**(6 Hrs.)**
Speech Mechanism, Organs of speech, Consonant and Vowels sounds, Word stress rules. **(Contemporary issues related to topic)**	
Unit III: Interview Skills	**(5 Hrs.)**
Purpose , expectations of employer and preparation for Interview, Types, Types of Questions & Answering Techniques, Telephonic Interviews – preparation and guidelines, Reading Techniques (Exercise based on Complex Unseen passages **(Contemporary issues related to topic)**	
Unit IV: Oral Skills	**(6 Hrs.)**
Group Communication- (Purpose, Different types of Group Communication, Organizational GD, GD as a part of selection process), Meeting (purposes, preparation, procedure and minutes of meeting), Listening Skills - definition types and traits **(Contemporary issues related to topic)**	
Unit V: Presentation & Visual Communication	**(6 Hrs.)**
Presentation and audience analysis, Organizing content, Nuances of presentation, Visual Communication – Introduction & importance, Role & Psychology of color in visual communication. **(Contemporary issues related to topic)**	
Unit VI: Technical Written Communication	**(6 Hrs.)**
Memo, Email, Report -Types, Characteristics, prewriting aspects of report and preparing writing aspects of report), Types of paragraphs.. **(Contemporary issues related to topic)**	
Total Lecture	**35 Hours**

			July 2022	1.00	Applicable for AY 2022-23 Onwards
Chairperson	Dean (Acad. Matters)	Dean OBE	Date of Release	Version	

Textbooks:	
1.	Raman & Sharma, Technical Communication, Oxford University Press.
2.	T. Balasubramaniam, Textbook of English Phonetics for Indian Students, Macmillan India Ltd.

Reference Books:	
1.	Public Speaking, Dale Carnegie, How to Develop Self – Confidence & Influence People.
2.	Asha Kaul, Communication Skills.
3.	Allen Peas, Body Language.
4.	Gerson's Gerson, Technical Communication.

MOOCs Links and additional reading, learning, video material	
1.	https://dl.uswr.ac.ir/bitstream/Hannan/141245/1/9781138219120.pdf
2.	https://www.pdfdrive.com/word-power-made-easy-the-complete-handbook-for-building-a-superior-vocabulary-e157841139.html
3	https://www.pdfdrive.com/improve-your-communication-skills-present-with-confidence-write-with-style-learn-skills-of-persuasion-e156963640.html
4	https://www.pdfdrive.com/21-days-of-effective-communication-everyday-habits-and-exercises-to-improve-your-communication-skills-and-social-intelligence-e158273760.html

I SEMESTER
22CV104: Professional Communication

Course Outcomes :
Upon successful completion of the course the students will be able to 1. Apply different modes for effective communication. 2. Use competently phonology of English language. 3. Apply nuances of LSRW skills. 4. Communicate through different channels.

Unit I: Basics of Communication	**(7 Hrs.)**
Language as a tool of communication & characteristics of language Process of Communication, Levels of Communication, Flow of Communication, Networks of Communication, Classification of Barriers (Intrapersonal, Interpersonal, Organizational). **(Contemporary Issues related to Topic)**	
Unit II: English Phonetics	**(6 Hrs.)**
Speech Mechanism, Organs of speech, Consonant and Vowels sounds, Word stress rules. **(Contemporary Issues related to Topic)**	
Unit III: Presentation & Visual Communication	**(7 Hrs.)**
Presentation and audience analysis, Organizing content, Nuances of presentation, Visual Communication – Introduction & importance, Role & Psychology of color in visual communication. **(Contemporary Issues related to Topic)**	
Unit IV: Verbal Skills	**(7 Hrs.)**
Listening Skills -definition types and traits. Group Communication- (Purpose, Different types of Group Communication, Organizational GD, GD as a part of selection process), Meeting (purposes, preparation, procedure and minutes of meeting). **(Contemporary Issues related to Topic)**	
Unit V: Interview Skills	**(6 Hrs.)**
Purpose, expectations of employer and preparation for Interview, Types, Types of Questions & Answering Techniques, Telephonic Interviews – preparation and guidelines, Reading Techniques (Exercise based on Complex Unseen passages. **(Contemporary Issues related to Topic)**	
Unit VI: Technical Written Communication	**(6 Hrs.)**
Memo, Email, Report -Types, Characteristics, prewriting aspects of report and preparing writing aspects of report), Types of paragraphs. **(Contemporary Issues related to Topic)**	
Total Lecture	**39 Hours**

Textbooks:	
1.	Raman & Sharma, Technical Communication, Oxford University Press.
2.	T. Balasubramaniam, Textbook of English Phonetics for Indian Students, Macmillan India Ltd.

Reference Books:	
1.	Public Speaking, Dale Carnegie, How to Develop Self – Confidence & Influence People.
2.	Asha Kaul, Communication Skills.
3.	Allen Peas, Body Language.
4.	Gerson's Gerson, Technical Communication.

MOOCs Links and additional reading, learning, video material	
1.	https://dl.uswr.ac.ir/bitstream/Hannan/141245/1/9781138219120.pdf
2.	https://www.pdfdrive.com/word-power-made-easy-the-complete-handbook-for-building-a-superior-vocabulary-e157841139.html
3	https://www.pdfdrive.com/improve-your-communication-skills-present-with-confidence-write-with-style-learn-skills-of-persuasion-e156963640.html
4	https://www.pdfdrive.com/21-days-of-effective-communication-everyday-habits-and-exercises-to-improve-your-communication-skills-and-social-intelligence-e158273760.html

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Website : www.ycce.edu , Email : principal@ycce.edu

Declaration by the Head of the Institution

I hereby declare that the data, information and support documents attached herewith are genuine and correct to my knowledge.

Dr. U.P. Waghe
Principal
Principal
Yeshwantrao Chavan
College of Engineering
Wanadongri Hingna Road,
NAGPUR-441110

Y. C. COLLEGE OF ENGINEERING AUTONOMOUS INSTITUTION SEAL NAGPUR

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Summary

1.2.1 Percentage of new courses introduced of the total number of courses across all programs offered during the years

- **Minutes of relevant BOS meetings**
- **Curriculum/ Syllabus of the courses**

Y.C. COLLEGE OF ENGINEERING AUTONOMOUS INSTITUTION SEAL NAGPUR

Principal
Yeshwantrao Chavan
College of Engineering
Wanadongri Hingna Road,
NAGPUR - 441110

INDEX

1.1.3 Details of courses offered by the institution that focus on employability/ entrepreneurship/ skill development during the year.

1.2.1 Details of new courses introduced across all programmes offered during the year

S.N.	Name of the Course	Course Code	Activities/Content with a direct bearing on Employability/ Entrepreneurship/ Skill development	Link to the relevant document
	CE			
1	PE-II : Construction Management And Machinery	CV2363	Project management: Introduction, Types of projects, Various phases of project, Project Proposal, Components of planning, Objectives of planning, Factors affecting planning, Organizational setup, Typical layout of a few major construction projects.Job Planning: Bar diagrams & Bar charts, Application of Network techniques (CPM & PERT) for planning. Estimation of critical path and project duration. Resource planning, Resource Allocation, Resource leveling, Optimization of project cost, Cost slope concept.	
2	PE-II : Construction Management (Coursera Platform)	CV2370	Construction Project Management,Construction Scheduling I,Construction Scheduling II,Construction Cost Estimating and Cost Control I,Construction Cost Estimating and Cost Control II,Construction Finance:	
3	PE-III : Energy Conversion and Management	CV2415	Waste to Energy options: physical, thermochemical and bio chemical processes, Combustion, Gasification, pyrolysis; Fuels Derived anaerobic digestion, Biogas Technology, Future Technologies for Waste to Energy Systems.	
4	PE-V : Structural Engineering Practices	CV2440	Importance, determination & calculation of different loads like Dead load, live load, wall load, seismic load, wind load, finish load, temperature load, vibratory load, etc. Various load combinations,Three dimensional Modeling of the Structure, Boundary Conditions, Section Properties, Applications of Loading, Static & Dynamic Analysis of structure, Design of structure, Understanding & Interpretation of the results, Deformation control, Mode Shapes, Vibrations, Acceptance Criteria's, Tolerances, Reinforcement detailing of Structures as per SP24 and as per exposure conditions, Fire Rating, etc.	
5	PE-I Environmental Management	CV2323	Introduction to Environmental Impact Assessment:, Environmental Impact Statement, Methodologies of EIA. MoEF questionnaire for environmental clearance, Environmental Audit,Resource Management	
	ME			
	NIL			
	EL			
1	PEI: Grid Integration of Renewable Energy	EL2366	National action plan on climate change: National Solar Mission	
2	PEI: Switched Mode Power Supply	EL2367	Resonant Load Converters, SMPS Using Resonant Circuit	
3	PEI: Programming in C for beginners	EL2368	Decision Making and Looping	
4	PEII: Sensors and Actuators	EL2428	Design and fabrication process of Microsensors	
5	PEII: Micro Grid	EL2429	Sizing of Micro Grid	
6	PEIII: Converters and Configurations of Renewable Energ	EL2426	PQ issues in grid interconnections for PV and wind systems	
7	PEIII: Distributed Generation in power System	EL2427	Necessity of energy storage, specifications of energy storage	
8	PEIV: Industrial Safety	EL2436	Various methods for analyzing hazards, Risk assessment analysis	
9	PEIV: Project Planning	EL2437	Documentation required for project handover, Preparing a project report for failure reference.	
	EE			
1	PE-VI:Introduction to remote sensing and image analysis	EE2445	Complete syllabus	
	ETC			
	NIL			
	CT			
	NIL			
	IT			
1	OE I: Introdcution to Data Science	IT2373	Employability & Skill Development-Statistical hypothesis generation and testing, Chi-Square test, t-Test, Analysis of variance, Correlation analysis, Maximum likelihood test,Model Evaluation using Visualization – Residual Plot – Distribution Plot – Polynomial Regression and Pipelines – Measures for In-sample Evaluation – Prediction and Decision Making,Scalable and parallel computing with Hadoop and Map-Reduce	
2	OE II: Concepts of Web Programming	IT2383	Employability & Skill Development-Development Environment, Node.js Basics, Node.js Module, File System,Loading library. Directives: Data Binding, ng-init, ng-repeat, ng-app & ng-model directives, custom directives.2 way binding, Validating User Input, Status, ng-empty, ng-touched, ng-valid, ng-pending. Data Binding: Synchronization between model and view. AngularJS Controllers: ng-controller, Controller Methods, External Files.Scope: $scope, understanding the scope, $rootScope	
	CSE			
1	Fundamentals of Economics	GE2312	Skill Development	
2	Database Management Systems	CSE2301	Skill Development	
3	Design & Analysis of Algorithms	CSE2303	Skill Development	
4	PE I: Business Intelligence	CSE2311	Employability	
5	PE I: Web Technologies	CSE2313	Employability	
6	PE I:Mobile operating System	CSE2317	Employability	
7	OE I: Database System Essentials	CSE2331	Skill Development	
8	OE I: Introduction to Image Processing	CSE2332	Skill Development	
9	OE II: Introduction to Web Technology	CSE2342	Skill Development	
10	OE II: Introduction to Cloud Computing	CSE2343	Skill Development	
11	Fundamentals of Management	GE2311	Skill Development	
12	Computer Networks	CSE2351	Skill Development	
13	Compilers	CSE2353	Skill Development	
14	Software Engineering	CSE2355	Skill Development	
15	PE II: Digital Image Processing	CSE2361	Skill Development	
16	PE II: Internet of Things	CSE2363	Employability	
17	PE II: Neural Network and applications	CSE2365	Skill Development	
18	Discrete Mathematics and Graph theory	AIML2201	Skill Development	
19	Formal Language & Automata Theory	AIML2202	Skill Development	
20	Lab: Formal Language & Automata Theory	AIML2203	Skill Development	
21	Data Structures	AIML2204	Skill Development	
22	Lab: Data Structures	AIML2205	Skill Development	
23	Computer Architecture & Organisation	AIML2206	Skill Development	
24	Lab: Software	AIML2207	Skill Development	
25	Linear Algebra	AIML2251	Skill Development	
26	Operating Systems	AIML2252	Skill Development	
27	Lab: Operating Systems	AIML2253	Skill Development	
28	Software Engineering	AIML2254	Skill Development	
29	Lab: Software Engineering	AIML2255	Skill Development	
30	Design & Analysis of Algorithms	AIML2256	Skill Development	

1.1.3 Details of courses offered by the institution that focus on employability/ entrepreneurship/ skill development during the year.

1.2.1 Details of new courses introduced across all programmes offered during the year

S.N.	Name of the Course	Course Code	Activities/Content with a direct bearing on Employability/ Entrepreneurship/ Skill development	Link to the relevant document
31	Lab: Design & Analysis of Algorithms	AIML2257	Skill Development	
32	Database Management Systems	AIML2258	Skill Development	
33	Lab: Database Management Systems	AIML2259	Skill Development	
	FYC			
1	Introduction to German Language	GE2317/GE2367	Complete Syllabus	
2	Introduction to Spanish Language	GE2319/GE2369	Complete Syllabus	
3	Introduction to French Language	GE2320/GE2370	Complete Syllabus	
4	Introduction to Japnese Language	GE2322/GE2377	Complete Syllabus	
5	Fundamental of Management	GE2311	Functions of Management, HR, Marketing and Finance, Indian Contract Act, Indian Companies Act, Methods of performance appraisal and training, Preparation of project proposal, SWOT Analysis, Project techniques for planning, monitoring and controlling, Market Research, Marketing strategies for pricing and sales promotion, Market segmentation and targeting, Market research, Profit and wealth maximisation, Profit and loss account, balancesheet, Concept of Risk and Return , Break Even Analysis, Budgets & Budgetary Control, Make or Buy Analysis	
6	Technical Communication	22AIDS104/22AML102/22CSD204	Complete Syllabus	
7	Professional Communication Skills	22CV104/22ME104/22IoT204	Complete Syllabus	

Civil Engineering

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DEPARTMENT OF CIVIL ENGINEERING

NOTICE
{BoS}

Date:- 31st January 2023

Meeting No 31 of Board of Studies of Civil Engineering Department is scheduled on **Friday, 3rd , 2023 at 2:00 pm in Departmental Library.**

All staff members are requested to attend the meeting. The agenda of the meeting is mentioned below. All staff members are requested to read the agenda carefully so that they can give fruitful suggestions in the meeting.

Agenda Points

Agenda No. 31.01
Welcome of new members

Agenda No. 31.02
Installation of member Secretary

Agenda No. 31.03
Confirmation of minutes of previous Meeting and action taken report on decisions/suggestions of the previous meeting.

Agenda No. 31.04
To discuss and suggest the action taken on

- Co/Po attainment of subjects taught in previous semester
- Result analysis of subjects taught in previous semester
- Stake holders' feedback on review and design of curriculum
- In Sem, End Sem and Exit feedback on Teaching Lear & curriculum

Agenda No. 31.05
To discuss and suggest the changes in the Scheme of Examination (known as Autonomous 2020 & SoE 2022) of the Undergraduate and Post graduate programs conducted under the Board.

To approve and ratify SoE22 and all syllabi of B.Tech and M.Tech I & II year .

Agenda No. 31.06
To discuss and suggest the minor changes in the syllabi of various courses in B.Tech.2020 Schemes of Undergraduate and Post graduate programs conducted under the Board.

Agenda No. 31.07
To discuss and suggest the changes in the books/Reference Books/Literature Sources published in the syllabi of courses in various Schemes of undergraduate and Postgraduate Programs.

Agenda No. 31.08
To discuss and approve the list of experiments, wherever there is a change, in the laboratory cou rses of Under-Graduate and Post Graduate programs.

Nagar Yuwak Shikshan Sanstha's
Yeshwantrao Chavan College of Engineering
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DEPARTMENT OF CIVIL ENGINEERING

Agenda No. 31.09
To discuss and suggest the changes in the Academic Regulations governing the Undergraduate a nd Post graduate programs conducted under the Board.

Agenda No. 31.10
To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum.

Agenda No. 31.11
To prepare and propose the panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Even Term 2022-23.

Agenda No. 31.12
To prepare and propose the panel of paper setters and Valuers for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Even Term 2022-23.

Agenda No. 31.13
To prepare and propose the panel of internal and external examiners for the various laboratory and other non-theory courses at UG and PG levels that will be examined in End Semester Examination Even 2022-23.

Agenda No. 31.14
Preparation of Electronic question Bank UG courses according to B. Tech. SoE 2020 & 2022. To review solutions to all questions of Electronic Question Banks for all courses

Agenda No. 31.15
To discuss and suggest the changes/additions/deletions/alterations in the existing. Evaluation Process for theory and other courses.

Agenda No. 31.16
To discuss and propose scheme for Minor an Honor course and its syllabus.
To Discuss and propose Certificate courses and value-added courses in Even term 2022-23.

Agenda No. 31.17
Any other matter with the permission of the Chair.

Prof. Ms. Charuta S. Waghmare
BoS Member Secretary
Department of Civil Engineering

Dr.S.P.Raut
Head and Chairman
Department of Civil Engineering

Nagar Yuwak Shikshan Sanstha's
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DEPARTMENT OF CIVIL ENGINEERING

Minutes of 31st BoS Meeting dated on Friday, 3rd,February, 2023

31st Meeting of BoS of Civil Engineering was held on Friday, 3rd, February,2023. It was chaired by Dr.S.P.Raut, Chairman BoS. Following members were present.

S.N.	Name	S.N.	Name
1	Dr.M.V.Madurwar	20	Ms. Amruta Arun Yadav
2	Dr,M.D.Goel	21	Ms. Sangita Shivcharan Meshram
3	Prof.S.N.Harinkhede	22	Dr. Prashant Baban Pande
4	Dr. Udaykumar P. Waghe	23	Mr. Atul Sambhuji Kurzekar
5	Dr. Sudhir Vasantrao Ambekar	24	Mr. Vivek Dnyandeo Jayale
6	Dr. Abhay Vinayakrao Patil	25	Mr. Harshal Madhukar Warade
7	Dr. Ajay Ramdas Gajbhiye	26	Ms. Pallavi Shalikram Chakole
8	Dr. Rajendra Rupraoji Dighade	27	Ms. Snehal Karunkumar Kamble
9	Mr.Devendra Rajram Raut	29	Mr. Sanket Gajanan Kalamkar
10	Mr. Bhupesh Purshottam Nandurkar	29	Mr. Sagar Wasudeo Dhengare
11	Dr. Ms. Madhuri S. Bhagat	30	Mr. Yogesh Prabhakar Kherde
12	Dr. Sanjay Padmakar Raut	31	Ms. Sneha Gowardhan Hirekhan
13	Mrs. Vaishali Nilesh Mendhe	32	Mr. Rajesh Madhukar Bhagat
14	Ms. Charuta Subhash Waghmare	33	Dr. Mrs. Boskey V. Bahoria
15	Mr. Khalid Shamim Ansari	34	Mr. Anukhsh Naresh Asati
16	Mr. Harshal Rameshrao Nikhade	35	Mr. Uday Singh Patil
17	Mr. Jayant Manohar Raut		
18	Mr. Dhiraj Giridharilal Agrawal		
19	Mr. Pawan Keshaorao Hinge		

Following members has been permitted leave of absence

1. Dr.A.D.Ghare
2. Er. Jagdish Lanjewar
3. Dr. Vilas Ganuji Meshram

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DEPARTMENT OF CIVIL ENGINEERING

Minutes of Meetings 31st BoS Meeting

Agenda No. 31.01
Welcome of new members
Dr S. P. Raut welcomed all BoS experts viz., Dr. M. V. Madurwar, Associate Professor, Department of Civil Engineering, VNIT, Nagpur, Dr. M. D. Goel, Associate Professor, Department of Applied Mechanics, VNIT, Nagpur, Prof. S. N. Harinkhede, Alumni and Assistant Professor, GHRIET, Nagpur. Departmental BoS members has also been welcomed by the Chairman.

Agenda No. 31.02
Installation of member Secretary
It has been decided to retain Ms. Charuta S. Waghmare as Member secretary BoS for the session 2022-23.

Agenda No. 31.03
Confirmation of minutes of previous Meeting and action taken report on decisions/suggestions of the previous meeting.
The minutes of previous meeting no.30 held on Thursday 11th August 2022 were already circulated to all members. The ATR of previous meeting have been discussed with BoS members. After confirmation, Chairman asked to accept the minutes of meeting. Dr. Boskey Bahoria accepted the minutes. Prof. Monali Wagh seconded it. The minutes were then accepted.

Agenda No. 31.04
To discuss and suggest the action taken on

- Co/Po attainment of subjects taught in previous semester
  The Co/Po attainment of courses of III,V and VII semester are in process .

- **Result analysis of subjects taught in previous semester**
  The overall and subject wise result analysis of Odd Term 2022-23 (V and VII semester) has been shown to the BoS Experts. Experts appreciated the efforts taken by the faculty for such good results. ESE of III semester have been started from 1st February 2023.

S.N.	Semester	Pass %
1	III	Yet to published
2	V	73.21%
3	VII	84.19%

- Stake holders' feedback on review and design of curriculum

S.N.	Stakeholder	Feedback	Action taken
1	Parent	Subject related to new techniques in construction should be added.	1.Industry aligned courses namely Structural Engineering Practices and Advanced Foundation Engineering was offered for VII semester students. 2.Construction Management and Machinery has been offered as professional elective for VI semester students. 3.Courses such as Project Planning Management, Construction Techniques etc. has been added as core instead of professional electives in SoE 22-

			23.
2	Students	More focus on Hands - on-training on Software .	As per the need of the current scenario, value added courses focussing on software knowledge, viz; STAADPRO, HIT OFFICE Construction management ERP, Primavera was conducted and courses like 3D Max, Revit will be executed for IV,VI semester students .
3	Alumni	Industry oriented software's and electives should be incorporated in the curriculum.	1.Value added courses focussing on the demand of industry has been planned for the current students. 2.In new SoE 22-23 Building Information Modelling has been added as a laboratory course. 3.Industry oriented professional electives has been offered to the students. 4.Industry collaborated Honor program 'Remote Sensing and GIS' has been offered for the V semester students.
4	Faculty	Curriculum is designed considering need of the era.	New SoE has been designed in such a manner so has to have more focus on courses required to make the students industry ready.

- In Sem, End Sem and Exit feedback on Teaching Lear & curriculum

Sem	**No. of faculty with feedback more than 90%**		**No. of faculty with feedback more than 80%**		**No. of faculty with feedback less than 80% and greater than 60%**		**No. of faculty with feedback less than 60%**	
	In Sem	**End Sem**	**In Sem**	**End Sem**	**In Sem**	**End Sem**	**In Sem**	**End Sem**
III	1/10 10.00	1/10 10.00	8/10 80.00	9/10 90.00	1/10 10.00	--	--	--
V	10/15 66.67	12/15 80.00	4/15 26.66	3/15 20.00	1/15 6.67	--	--	--
VII	26/29 89.66	25/29 86.20	3/29 10.34	3/29 10.34	--	1/29 3.45		

Agenda No. 31.05
To discuss and suggest the changes in the Scheme of Examination (known as Autonomous 2020 & SoE 2022) of the Undergraduate and Post graduate programs conducted under the Board.

To approve and ratify SoE22 and all syllabi of B.Tech and M.Tech I & II year .

All members were asked if any further correction or amendment was required to be done in the scheme of examination of the Undergraduate and Post graduate programs.
No corrections and amendments were proposed by any members for SoE Autonomous 2020 & SoE 2022 of the Undergraduate and of Post graduate programs.

DEPARTMENT OF CIVIL ENGINEERING

Agenda No. 31.06

To discuss and suggest the minor changes in the syllabi of various courses in B.Tech.2020 Schemes of Undergraduate and Post graduate programs conducted under the Board.

S.N.	Semester	Course Code and Name	Suggested Modifications	
			Contents Added	**Contents Deleted**
1	VII	CV2401 Estimating & Costing (The sequence of the units in syllabus need to change.)	1.Building estimate should be shifted and added in Unit II from unit V. 2. Unit IV Earthwork should be shifted in unit III. 3.Specifications & rate analysis of Unit II should be added unit IV. 4. Tender Conditions of Contract should be added in Unit V. 5.Valuation from Unit III should be shifted to Unit VI,	-
2	VII	CV2434 PE -V Advanced Steel Design	Gantry Girder should be added in Unit II	Moment resistant Connection should be deleted from unit II

Agenda No. 31.07

To discuss and suggest the changes in the books/Reference Books/Literature Sources published in the syllabi of courses in various Schemes of undergraduate and Postgraduate Programs.

No corrections and amendments were proposed by any members in the laboratory courses of Under-Graduate and Post Graduate programs

Agenda No. 31.08

To discuss and approve the list of experiments, wherever there is a change, in the laborat ory courses of Under-Graduate and Post Graduate programs.

All members were asked if any correction or amendment was required to be done in the list of experiments of Undergraduate and Post graduate programs of Undergraduate and Post graduate programs. No corrections and amendments were proposed by any members in the laboratory courses of Under-Graduate and Post Graduate programs.

Agenda No. 31.09

To discuss and suggest the changes in the Academic Regulations governing the Undergrad uate and Post graduate programs conducted under the Board.

The chairman asked to suggest the changes in the Academic Regulations governing the Undergraduate and Post graduate programs for further submission to Academic Council. No suggestions were proposed by any members. Finally, it was unanimously resolved that the existing Academic Regulations governing the Undergraduate and Post graduate programs be continued without any corrections.

Agenda No. 31.10

To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum.

It has been decided to allot Professional Elective -II offered through Coursera, "Construction Management "conducted by Columbia University, US, to first 20 bright students of VI semester,

Even term 2022-23. It will be offered after considering their consent for the course. The course consists of 4 modules. After successful completion of each module, student will receive certificate which have to submit for the grade allotment

Agenda No. 31.11

To prepare and propose the panel of paper Setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Even Term 2022-23.

The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Even Term 2022-23 will be decided after the notification received from CoE.

Agenda No. 31.12

To prepare and propose the panel of paper setters and Valuers for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Even Term 2022-23.

The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Even Term 2022-23 will be decided after the notification received from CoE.

Agenda No. 31.13

To prepare and propose the panel of internal and external examiners for the various laboratory and other non-theory courses at UG and PG levels that will be examined in End Semester Examination Even 2022-23.

The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Even Term 2022-23 will be decided after the notification received from CoE.

Agenda No. 31.14

Preparation of Electronic question Bank UG courses according to B.Tech. SoE 2020 & 2022. To review solutions to all questions of Electronic Question Banks for all courses.

Sr.No	Semester	Course Code	Title of the course	Type of course PC/PE	Remarks	
					EQB	Solution
1	III Sem.	CV2203	Geotechnical Engineering	PC	Yes	Yes
2	III Sem.	CV2201	Strength of Materials	PC	Yes	Yes
3	III Sem.	CV2205	Fluid Mechanics	PC	Yes	Yes
4	IV Sem.	CV2251	Concrete Technology	PC	Yes	Yes
5	IV Sem.	CV2253	Surveying	PC	Yes	Yes
6	IV Sem.	CV2257	Transportation Engineering	PC	Yes	Yes
7	V Sem.	CV2319	PE-I : Advanced Concrete	PE	Yes	Yes

			Technology			
8	V Sem.	CV2302	Advanced Structural Analysis	PC	Yes	Yes
9	V Sem.	CV2311	PE-I : Advanced Surveying	PE	Yes	Yes
10	V Sem.	CV2313	PE-I : Computer Applications in Civil Engineering	PE	Yes	Yes
11	V Sem. & VI Sem.	CV2333	OE-I : Introduction to Environmental Management	PC	Yes	Yes
12	VI Sem.	CV2351	Steel Structures	PC	Yes	Yes
13	VI Sem.	CV2355	Foundation Engineering	PC	Yes	Yes
14	VII Sem.	CV2401	Estimating & Costing	PC	Yes	Yes
15	VII Sem.	CV2403	Wastewater Engineering	PC	Yes	Yes
16	VII Sem.	CV2404	Hydrology and Water Resources Engineering	PC	Yes	Yes
17	VII Sem.	CV2418	PE-III : Urban Transportation Planning	PE	Yes	Yes
18	VII Sem.	CV2435	PE-V : Design of Bridge Structures	PE	Yes	Yes

Agenda No. 31.15
To discuss and suggest the changes/additions/deletions/alterations in the existing. Evaluation Process for theory and other courses.
No suggestions were proposed by any members. Finally, it was unanimously resolved that the existing Evaluation Process for theory and other courses be continued without any corrections.

Agenda No. 31.16
To discuss and propose scheme for Minor and Honor course and its syllabus.
1.Department have offered B.Tech.Honor Program(Remote sensing and GIS).The course has been in collaboration with Ceinsys Tech.Ltd.Nagpur.Mr.Ranjan Das, Manager GIS division was the key person.Total 19 students opted for this course.

2.BoS Experts suggested to offer Introduction to Non-destructive testing. as Minor Program from Civil Engineering Department.

To Discuss and propose Certificate courses and value-added courses in Even term 2022-23.

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DEPARTMENT OF CIVIL ENGINEERING

Status of certificate & value-added courses conducted by department in Odd AY 22-23

SN	Deptt.	Title of course	Sem	Course Hours	Mode of Training	Dates of conduction & total hours in course	No of Students attended the cert / vac	Remarks
1	Civil Engineering	Value-added course on "Highway Engineering Design by Civil 3D"	V	30	ONLINE	1,2,8,9,15 October 2022, 5 Days (30 Hrs)	90	
2	Civil Engineering	Value-added course on "Seismic Analysis & Design of G+5 RCC Building Using STAADPRO"	VII	30	ONLINE	18 September, 2, 16 October, 6,8 November 2022, 5 days (30 Hrs)	68	
3	Civil Engineering	Value-added course on "Transportation Design by MX Road"	V	30	ONLINE	1,2,8,9,15 October 2022, 5 Days (30 Hrs)	94	
4	Civil Engineering	Value Added Course on "HIT OFFICE Construction management ERP"	VII	30	ONLINE	17 Sept, 1, 8,15,22 October 2022, 5 Days, (30 Hrs)	74	
5	Civil Engineering	Value-added course on Primavera	VII	30	ONLINE	17 September 1 &15 October, 5 & 12 November 2022 (30 Hrs)	69	
6	Civil Engineering	Value Added Course on Principles of Building using Auto-CAD	III	30	ONLINE + OFFLINE	24 December 2022, 7,8,20,21,22 January 2023 (30 Hrs)	85	

Planning of certificate & value added courses conducted by departments

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DEPARTMENT OF CIVIL ENGINEERING

In EVEN AY 22-23

SN	Deptt.	Title Of Course	Sem	Course Hours	Mode Of Training	Proposed Dates Of Conduction & Total Hours In Course	No Of Students Expected To Attend Cert / Vac	Remarks
1	Civil Engineering	Value Added Course on "Building Planning "	IV	30	Online + Offline	March 2023		
2	Civil Engineering	Value Added Course on "3D MAX Structure visualization"	IV	30	Online + Offline	March 2023		
3	Civil Engineering	Value Added Course on "Advanced Survey Road Design by MX Road Software"	VI	30	Online + Offline	February 2023		
4	Civil Engineering	Value Added Course on "Structure Modelling By Revit"	VI	30	Online + Offline	March 2023		
5	Civil Engineering	Value Added Course on "Project Planning and Estimation"	VI	30	Online + Offline	March 2023		
6	Civil Engineering	Value added course on "HIT Office Construction Management ERP"	VI	30	Online + Offline	March 2023		

Agenda No.. 31.17
Any other matter with the permission of the Chair.

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DEPARTMENT OF CIVIL ENGINEERING

All suggestions have been welcomed and forwarded for further submission to Academic Council. The meeting ended with thank to chair.

Prof. Ms. Charuta S. Waghmare
BoS Member Secretary
Department of Civil Engineering

Dr.S.P.Raut
Head and Chairman
Department of Civil Engineering

VI Semester
CV2370 - PE-II : Construction Management

COURSE OBJECTIVES	COURSE OUTCOME
Students will be introduced to 1. Construction project management processes. 2. Principles and Techniques of construction scheduling 3. Overview of construction cost estimating and cost control 4. Financial aspects involved in construction project management	Students will be able to 1. Analyze the construction project management processes. 2. Apply the knowledge of construction scheduling. 3. Apply the knowledge of construction cost estimating and cost control. 4. Explain the financial aspects involved in construction project management..
Mapped Program Outcomes : 1, 6, 7, 8, 9, 10, 11, 12	

UNIT–1 : **Construction Project Management**: Course Overview, Construction Industry Overview, Project Delivery, Lean Project Delivery, Sustainability in the Construction Industry, Environment, Health and Safety of Construction Processes, Building Information Modeling and Technology Trends in Construction, International View of Construction Projects, Role of a Construction Manager, Introduction to Project Planning.	**[06 Hrs.]**
UNIT–2 : **Construction Scheduling I:** Introduction to Construction Scheduling, The Role of the Scheduler in Construction Management, Linear Construction Operations and Line of Balance, Technology Applications for Scheduling, Scheduling for Large Programs, Risk Allocation and Planning, Lean Design in Construction Scheduling.	**[06 Hrs.]**
UNIT–3 : **Construction Scheduling II:** Bar (Gantt) Charts, Activity Precedence Diagrams, Types of Construction Activity Relationships, Forward and Backward Pass Calculations, Critical Path, Activity Floats, Understanding Work Dates and Calendar Dates, Activity on Arrow, Program Evaluation & Review Technique (PERT) and Range Estimating.	**[07 Hrs.]**
UNIT–4 : Construction Cost Estimating and Cost Control I:Construction Cost Estimating and Cost Control Overview, Understanding Design in the Construction Industry, Introduction to the Types of Cost Estimates, Quantity Take-Off and Measurement, Pricing.	**[07 Hrs.]**
UNIT–5 : Construction Cost Estimating and Cost Control II: Building the Estimate Procurement, Post Contract and Cost Estimation within a Project, Construction cost Control methods, Earned Value Method (EVM), Close Out Period, Cost Estimation in Practice, Project Cash Flow, Technology Trends in Cost Estimating and Cost Control, Program Cost Estimating, Lean in Cost Control	**[07 Hrs.]**
UNIT–6 : Construction Finance: Introduction To The Construction Finance Course, The Mathematics of Money, Real Estate Finance for Development Projects, Financial Plans for Development Projects, Project Finance, Risk In Project Finance, Public - Private Partnerships.	**[06 Hrs.]**

VI Semester
CV2370 - PE-II : Construction Management

Text Books :

1. Construction Planning and Management – Purifoy
2. Construction Planning and Management – Dr U K Shrivastava, Galgotia Publ.
3. Project Planning & Management – B C Punmia
4. Laws related to buildings and engineering contracts in India- Gajaria G T, LexisNexis Butterworths India Publisher, 2000.
5. Punmia B.C. & Khandelwal K.K., Project Planning & Control with PERT&CPM, Laxmi Publications, New Delhi,1990.

Reference Books :

1. Construction Contracts- Jimmie Hinze McGraw Hill,
2. Contracts and the legal Environment for Engineers and Architects- Joseph T Bockrath, McGraw Hill,
3. Srinath L, CPM & PERT, Affiliated East-West Press Pvt. Ltd., New Delhi.
4. P.S. Gahlot & B.M. Dhir, Construction Planning and Management, New Age International.
5. Chaudhary Roy, Project Management, Tata McGraw Hill, New Delhi.

Mechanical Engineering

NOTICE
{BoS}

Date:- 10/02/2023

The **thirtieth meeting** of the Board of Studies in **Mechanical Engineering** is scheduled on **Friday 15th Feb 2023 at 11:00AM.**

The agenda for the meeting is as follows:

Item No. 30.01

Welcome of members

Item No. 30. 02

Installation of member

Item No. 30.03

Confirmation of minutes of previous Meeting and action taken report on decisions/suggestions of the previous meeting.

Item No. 30.04

To discuss and suggest the action taken on

i) Co/Po attainment of subjects taught in previous semester
ii) Result analysis of subjects taught in previous semester
iii) Stake holders feedback on review and design of curriculum
iv) In Sem, End Sem and Exit feedback on Teaching Learning & curriculum

Item No. 30.05

To discuss and suggest the changes in the Scheme of Examination (known as Autonomous B.Tech 2020 & SoE 2022) of the Undergraduate and Post graduate programs conducted under the Board. To approve and ratify SoE22 and all syllabi of B.Tech / M.Tech I & II year Nagar Yuwak Shikshan Sanstha'Item

Item No. 30.06

To discuss and suggest the minor changes in the syllabi of various courses in B.Tech 2020 Schemes of Undergraduate and Post graduate programs conducted under the Board.

Item No. 30.07

To discuss and suggest the changes in the books/ Reference Books/ Literature Sources published in the syllabi of courses in various Schemes of Undergraduate and Postgraduate Programs.

Item No. 30.08

To discuss and approve the list of experiments, wherever there is a change, in the laboratory courses of Under-Graduate and Post Graduate programs.

Item No. 30.09

To discuss and suggest the changes in the Academic Regulations governing the Undergraduate and Post graduate programs conducted under the Board.

Item No. 30.10

To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum.

Item No. 30.11

To prepare and propose the panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Odd Term/Even Term 2022-23 .

Item No. 30.12

To prepare and propose the list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Odd/Even Term 2022-23

Item No. 30.13

To prepare and propose the panel of internal and external examiners for the various laboratory and other non-theory courses at UG and PG levels that will be examined in End Semester Examination Odd/Even Term 2022-23.

Item No. 30.14

Preparation of Electronic question Bank UG courses according to B.Tech SoE 2020 & 2022 To review solutions to all questions of Electronic Question Banks for all courses

Item No. 30.15

To discuss and suggest the changes/additions/deletions/alterations in the existing Evaluation Process for theory and other courses.

Item No. 30.16

To discuss and propose scheme for Minor an Honor course and its syllabus. To Discuss and propose Certificate courses and value-added courses in Even Term 2022-23.

Item No. 30.17

Any other matter with the permission of the Chair.

Dr. J.P.Giri	Prof. A.P. Edlabadkar
Chairman	Member Secretary
BoS in Mechanical Engineering	BoS in Mechanical Engineering

NOTICE
{BoS}

Date:- 10/02/2023

30th Meeting of Board of Studies(Wednsday 15/02/2023)

BoS Members

Sr. No.	Name	Designation	Sign	Sr. No.	Name	Designation	Sign
1	Dr. J. P. Giri	Chairman, BOS		**24**	Dr. P. D. Kamble	Member	
2	Dr. Y. M. Puri	University Expert		**25**	Prof. R. V. Adakane	Member	
3	Dr. A. S. Dhobale	External Expert		**26**	Prof. D. N. Kashyap	Member	
4	Mr. Shree Jamdar	Industrial Expert		**27**	Prof. A. R. Narkhede	Member	
5	Mr. Irfan Makki	Meritorious Alumini		**28**	Prof. S. P. Kamble	Member	
6	Prof. V. M. Korde	Advisor, BOS		**29**	Prof. Y. Y. Nandurkar	Member	
7	Prof. A. P. Edlabadkar	Member Secretary		**30**	Prof. M. M. Dakhore	Member	
8	Dr. R. B. Chadge	Member		**31**	Prof. P. S. Barve	Member	
9	Prof. D. I. Sangotra	Member		**32**	Prof. N. D. Gedam	Member	
10	Prof. N. J. Giradkar	Member		**33**	Prof. C. A. Mahatme	Member	
11	Prof. A. S. Bonde	Member		**34**	Prof. G. M. Dhote	Member	
12	Dr. S. T. Bagde	Member		**35**	Dr. V. R. Khawale	Member	
13	Dr. S. S. Chaudhari	Member		**36**	Prof. P. A. Hatwalne	Member	
14	Prof. V. G. Thakre	Member		**37**	Dr. A. P. Kedar	Member	
15	Dr. S. R. Jachak	Member		**38**	Dr. S. V. Prayagi	Member	
16	Prof. M. S. Tufail	Member		**39**	Prof. N. R. Sunehria	Member	
17	Dr. S. P. Ambade	Member		**40**	Prof. P. V. Lande	Member	
18	Prof. P. N. Shende	Member		**41**	Prof. S. S. Nagpure	Member	
19	Prof. A. B. Amale	Member		**42**	Prof. N. P. Mungle	Member	
20	Prof. G. H. Waghmare	Member					
21	Prof. R. G. Bodkhe	Member					
22	Prof. D. Y. Shahare	Member					
23	Dr. S. S. Khedkar	Member					

Minutes of 30th BoS Meeting dated on Wednesday 15th Feb 2023

30th Meeting of BoS of Mechanical Engineering was held on **Wednesday 15th Feb 2023**. It was chaired by Dr. J.P.Giri, Chairman. The following members were present.

S.N.	Name	S.N.	Name
1	Dr. J. P. Giri	23	Dr. P. D. Kamble
2	Dr. Y. M. Puri	24	Prof. R. V. Adakane
3	Dr. A. S. Dhobale	25	Prof. D. N. Kashyap
4	Prof. V. M. Korde	26	Prof. A. R. Narkhede
5	Prof. A. P. Edlabadkar	27	Prof. S. P. Kamble
6	Dr. R. B. Chadge	29	Prof. Y. Y. Nandurkar
7	Prof. D. I. Sangotra	29	Prof. M. M. Dakhore
8	Prof. N. J. Giradkar	30	Prof. P. S. Barve
9	Prof. A. S. Bonde	31	Prof. N. D. Gedam
10	Dr. S. T. Bagde	32	Prof. C. A. Mahatme
11	Dr. S. S. Chaudhari	33	Prof. G. M. Dhote
12	Prof. V. G. Thakre	34	Dr. V. R. Khawale
13	Dr. S. R. Jachak	35	Prof. P. A. Hatwalne
14	Prof. M. S. Tufail	36	Dr. A. P. Kedar
15	Dr. S. P. Ambade	37	Dr. S. V. Prayagi
16	Prof. P. N. Shende	38	Prof. N. R. Sunehria
17	Prof. A. B. Amale	39	Prof. P. V. Lande
18	Prof. G. H. Waghmare	40	Prof. S. S. Nagpure
19	Prof. R. G. Bodkhe	41	Prof. N. P. Mungle
20	Prof. R. G. Bodkhe		
21	Prof. D. Y. Shahare		
22	Dr. S. S. Khedkar		

Following members has been permitted leave of absence

1.Mr. Shree Jamdar

2. Mr. Irfan Makki

Minutes of Meetings 30th BoS Meeting

Agenda No. 30.01
Welcome of new members
Dr J.P.Giri welcomed all BoS experts viz., Dr. Y.M.Puri Associate Professor, Department of Mechanical Engineering, VNIT, Nagpur, Dr. A.S. Dhoble, Associate Professor, Department of Mechanical ; Engineering, VNIT, Nagpur Departmental BoS members has also been welcomed by the Chairman.

Agenda No. 30.02
Installation of Member Secretary
No Change.

Agenda No. 30.03
Confirmation of minutes of previous Meeting and action is taken report on decisions/suggestions of the previous meeting.
The minutes of previous meeting no. 29 held on Saturday 18th August 2022 were already circulated to all members. The ATR of the previous meeting has been discussed with BoS members. (Annexure 1). After confirmation, Chairman asked to accept the minutes of the meeting Dr. S.S. Chaudhari accepted the minutes. Prof. A.S. Bonde seconded it. The minutes were then accepted.

Agenda No. 30.04
To discuss and suggest the action taken on

- **Co/Po attainment of subjects taught in previous semester.** (Annexure 2)
  The complete process of CO/PO attainment is in process

- **Result analysis of subjects taught in the previous semester.** (Annexure 3)
  The overall and subject-wise result analysis of ODD Term 2022-23 has been shown to the BoS Experts. Experts appreciated the efforts taken by the faculty for such good results.

S.N.	Semester	Pass %
1	V	71.00
2	VII	84.00

As the results of all the semesters are above 80%, no action is required to be taken.

- **Stakeholders' feedback on the review and design of the curriculum**
-

S.N.	Stakeholder	Feedback	Action Taken
1.	**Parent**	Subject related to new techniques in construction should be added	In new SoE 21-22, courses such as Surface Engineering, Machine learning in Manufacturing Techniques etc.has been added as core and professional electives.
2	**Alumni**	1. More Site/ industrial visit should be arranged.	1.All semester students will be benefitted with site visits.
		2. Industry based courses should be run.	2.Offered from new session
3	**Student**	1.Courses including current practices and innovative application should be started.	1.Coursera course "Aerial Robotics and mobility" is started in 7th Semester with 3 credits for theory from AY 2022-23.
4	**Faculty**	Changes required in existing syllabus were suggested.	Will be incorporated in the said syllabus.

- **In Sem, End Sem and Exit feedback on Teaching Lear & curriculum.**
  All feedback has been discussed with BoS Experts.

Sem	**No. of faculty with feedback more than 90%**		**No. of faculty with feedback more than 80%**		**No. of faculty with feedback less than 80% and greater than 60%**		**No. of faculty with feedback less than 60%**	
	In Sem	**End Sem**	**In Sem**	**End Sem**	**In Sem**	**End Sem**	**In Sem**	**End Sem**
V	13/15	13/15	02/15	02/15	-	-	-	-
VII	22/26	22/26	04/26	04/26		-	-	-

As feedback on teaching learning is above 60%, BoS experts appreciated and asked to maintain the same.

Agenda No. 30.05

1.To discuss and suggest the changes in the Scheme of Examination (known as Autonomous 2018 & B.Tech 2020) of the Undergraduate and Post graduate programs conducted under the Board.

All members were asked if any further correction or amendment was required to be done in the scheme of examination of the Undergraduate and Post graduate programs.

No corrections and amendments were proposed by any members for SoE Autonomous 2018 of the Undergraduate and of Post graduate programs.

2.To approve and ratify SoE22 and all syllabi of B.Tech and M.Tech I & II year .

10th Curriculum Development workshop was conducted on Tuesday 19th July 2022 for validation of SoE 22 and all syllabi of B.Tech and M.Tech I & II year . Validation of the syllabus was carried out as per thrust area of curriculum by experts of various domain. The SoE and syllabi of all courses has been approved and validated after thorough discussions.

Agenda No. 30.06

To discuss and suggest the minor changes in the syllabi of various courses in Autonomous 2018 & B.Tech.2020 Schemes of Undergraduate and Post graduate programs conducted under the Board.

All members were asked if any further correction or amendment was required to be done in the syllabus of various courses in Autonomous 2018 Schemes of Undergraduate and Post graduate programs.

Agenda No. 30.07

To discuss and suggest the changes in the books/Reference Books/Literature Sources published in the syllabi of courses in various Schemes of undergraduate and Postgraduate Programs.

No corrections and amendments were proposed by any members in the laboratory courses of Under-Graduate and Post Graduate programs

Agenda No. 30.08

To discuss and approve the list of experiments, wherever there is a change, in the laborat ory courses of Under-Graduate and Post Graduate programs.

No corrections and amendments were proposed by any member

Agenda No. 30.09

To discuss and suggest the changes in the Academic Regulations governing the Undergrad uate and Post graduate programs conducted under the Board.

No corrections and amendments were proposed by any member

Agenda No. 30.10

To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum.

No corrections and amendments were proposed by any member

Agenda No. 30.11

To prepare and propose the panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Odd/Even Term 2022-23

The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Odd/Even Term 2022-23 will be decided after the notification received from CoE.

Agenda No. 30.12

To prepare and propose the list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Odd/Even Term 2022-23.

The list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Odd/Even Term 2022-23 will be decided after the notification received from CoE.

Agenda No. 30.13

To prepare and propose the panel of internal and external examiners for the various laboratory and other non-theory courses at UG and PG levels that will be examined in End Semester Examination Odd 2022-23.

The panel of internal and external examiners for the various laboratory and other non-theory courses at UG and PG levels that will be examined in End Semester Examination Odd 2022-23 will be decided after the notification received from CoE.

Agenda No. 30.14

Preparation of Electronic question Bank UG courses according to SoE 2018.
To review solutions to all questions of Electronic Question Banks for all courses.

Following is the account of EQB with solution available and will distributed to students very shortly.

Agenda No. 30.15

To discuss and suggest the changes/additions/deletions/alterations in the existing. Evaluation Process for theory and other courses.

No suggestions were proposed by any members.

Agenda No. 30.16

To discuss and propose a scheme for the Minor and Honor course and its syllabus.

No suggestions were proposed by any members.

Agenda No. 30.17

Any other matter with the permission of the Chair.

1. As per the suggestions given by the external expert Attainment should be carried out on the basis of CGPA, which results in less achievement and helps to show more improvement in the view of the NBA.
2. Question banks should not be circulated among the students with the solution. Ask the students to find out the solutions of the given questions.
3. Question banks should be prepared considering campus interviews.
4. Machining processes of First sem should be replace by Material Science and Metallurgy.

Dr. J.P.Giri	Prof. A.P. Edlabadkar
Chairman	Member Secretary
BoS in Mechanical Engineering	BoS in Mechanical Engineering

Electrical Engineering

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Department of Electrical Engineering

Date: 10/02/23

Minutes of 31st BoS Meeting dated on Saturday 28th January 2023

31st Meeting of BoS of Electrical Engineering was held on Saturday 28th January 2023. It was chaired by Dr.S.G.Kadwane, Chairman BoS. Following members were present.

S.N.	Name	S.N.	Name
1	Dr.S.G.Kadwane	20	Dr.S.R.Gaigowal
2	Dr.R.M.Moharil	21	B.S.Sudame
3	Dr.P.M.Meshram	22	S.L.Tiwari(Tripathi)
4	Dr.S.P.Adhau	23	P.B.Joshi
5	R.N.Nagpure	24	U.V.Waghmare
6	Dr.S.S.Gokhale	25	R.S.Khonde
7	Dr.B.Y.Bagde	26	S.K.Mohod(Bhoyar)
8	Dr.A.P.Munshi	27	Dr.Sarika.D.Patil
9	P.S.Patil	29	Akshay.D.Kadu
10	Dr.S.P.Gawande	29	Nivedita S.Padole
11	S.B.Rewatkar(Kewte)	31	Surabhi L.Kachhawa
12	T.D.Tembhekar(Sakhare)	31	Shweta S.Ghadyalji
13	N.T.Sahu(Shrirao)	32	Anuradha A. Munshi
14	Xma R.Pote	33	Priya Gaikwad
15	A.S.Lilhare	34	Abhishek Joshi
16	V.R .Doifode	35	Priya Jagdale
17	J.M.Kumbhare(Dhakate)		
18	G.C.Gondhalekar		
19	P.S.Shete		

Name	Name
Dr.S.S.Ambekar	Er.Rahul Nagpure
Dr.V.S.Kale	Er.Pravin Palkar
Dr.Ritesh Kesri	

Following members has been permitted leave of absence

1. Dr.V.S.Kale
2. Er.Rahul Nagpure
3. Er.Pravin Palkar

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Department of Electrical Engineering

Minutes of 31st BoS Meeting

Agenda No. 31.01
Welcome of new members

Dr S.G.Kadwane welcomed all BoS experts viz., Dr. S.S.Ambekar Professor, Department of Electrical Engineering, KDKCOE, Nagpur, Dr. Ritesh Keshri, Associate Professor, Department of Electrical Engineering, VNIT, Nagpur. Departmental BoS members have also been welcomed by the Chairman.

Agenda No. 31.02
Installation of member Secretary

It has been decided to retain Mrs. Xma R.Pote as Member Secretary BoS for the session 2022-23.

Agenda No. 31.03
Confirmation of minutes of previous Meeting and action taken report on decisions/suggestions of the previous meeting.

The minutes of previous meeting no. 30 held on Saturday 4th August 2022 were already circulated to all members. The ATR of previous meeting have been discussed with BoS members. (Annexure 31.03). After confirmation, Chairman asked to accept the minutes of meeting. Dr. S. P Adhau accepted the minutes. Ms. S. L. Tiwari seconded it. The minutes were then accepted.

Agenda No. 31.04
To discuss and suggest the action taken on

- **Co/Po attainment of subjects taught in previous semester.** (Annexure 31.04)
  The complete process of CO/PO attainment has been discussed with the BoS Experts. The experts appreciated and approved the process of attainment. Based on direct and indirect assessment, it is observed that all PO's and PSO's almost meet the attainment expectations. However, efforts will be taken to maintain this attainment in future.
  The sample table format is as follows:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Target attainment %	2.64	2.34	2.27	1.49	2.03	1.51	2.02	1.73	2.08	2.02	2.18	2.17	2.18	2.09
Attainment % (Achieved)	2.18	1.88	1.85	1.15	1.77	1.16	1.73	1.55	1.78	1.81	1.87	1.88	1.80	1.68
%	82.69	80.3	81.3	76.8	87.3	76.8	85.4	89.7	85.2	89.26	85.77	86.63	82.54	80.34

- **Result analysis of subjects taught in previous semester.**
  The overall and subject wise result analysis of Odd Term 2022-23 has been shown to the BoS Experts. Experts appreciated the efforts taken by the faculty for such good results.

S.N.	Semester	Pass %
1	V	66.03
2	VII	76.22

- **Stake holders' feedback on review and design of curriculum**

S.N.	Stakeholder	Feedback	Action Taken
1.	Parent	1.Some basic programming language to be taught at Second year level 2.Extra initiatives regarding bright students	1.The subjects will be included in Scheme 2022 for 3rd and 4th Semester students 2. COURSERA has been started from Session Even 21-22.
2	Alumni	1. Course related to recent technology or innovations to be included.	1. The subject of Introduction to Smart Cities will be included for students
		2. Courses which will help the students to work in industry to be offered.	2.The subject Project planning and Industrial safety will be added in Odd Semester Session 23-24
3	Student	Topics related to applications of theory being studied to be covered.	Value added courses are conducted and will be conducted in next semester also.
4	Faculty	New subjects to be added as professional electives	The subjects including contents based on Microgrid and Grid integration will be included

- **In Sem, End Sem and Exit feedback on Teaching Lear & curriculum.**
  All feedback has been discussed with BoS Experts.

Semester	Number of faculty with feedback more than 90%	No. of faculty with feedback more than 80%	No. of faculty with feedback less than 80% and greater than 60%	No. of faculty with feedback less than 60%
	End Sem	**End Sem**	**End Sem**	**End Sem**
V	04/11	07/11	NIL	NIL
VII	11/13	04/13	NIL	NIL

Agenda No. 31.05

1. **To discuss and suggest the changes in the Scheme of Examination (known as Autonomous 2020 & B.Tech 2022) of the Undergraduate and Post graduate programs conducted under the Board.**

All members were asked if any further correction or amendment was required to be done in the scheme of examination of the Undergraduate and Post graduate programs.

- Professional electives to be added in SoE 2020.(Annexure 31.05)
- SoE B.Tech 2022 was presented in the previous meeting and confirmed.

2. **To approve and ratify SoE22 and all syllabi of B.Tech and M.Tech I & II year .**

Curriculum Development workshop was conducted on Wednesday 20th July 2022 for validation of SoE 22 and all syllabi of both B.Tech and M.Tech, I & II year . Validation of the syllabus was carried out as per thrust area of curriculum by experts of various domain. The SoE and syllabi of all courses has been approved and validated after thorough discussions.

Agenda No. 31.06

To discuss and suggest the minor changes in the syllabi of various courses in B.Tech 2020 Schemes of Undergraduate and Post graduate programs conducted under the Board.

All members were asked if any further correction or amendment was required to be done in the syllabus of various courses in B.Tech 2020 Scheme of Undergraduate and Post graduate programs. The following proposal has been forwarded:

1. **New Professional Elective**: It has been decided to offer following professional electives

SN	Semester	Name of Subject
1	6	PEI: Grid Integration of Renewable Energy
2	6	PEI: Switched Mode Power Supply
3	7	PEII: Micro Grid
4	7	PEIII: Converters and Configurations of Renewable Energy Systems
5	7	PEIII: Distributed Generation in power System
6	7	PEIV: Industrial Safety
7	7	PEIV: Project Planning

The BoS experts approved to run the said elective courses from coming odd session 22-23 and asked to incorporate the modification in the syllabus. (Annexure 31.06)

Agenda No. 31.07

To discuss and suggest the changes in the books/Reference Books/Literature Sources published in the syllabi of courses in various Schemes of undergraduate and Postgraduate Programs.

No corrections and amendments were proposed by any members in the books/Reference Books/Literature Sources published in the syllabi of courses in various Schemes of Under-Graduate and Post Graduate programs

Agenda No. 31.08

To discuss and approve the list of experiments, wherever there is a change, in the labora ory courses of Under-Graduate and Post Graduate programs.

All members were asked if any correction or amendment was required to be done in the list of experiments Autonomous 2018 Schemes of Undergraduate and Post graduate programs of Undergraduate and Post graduate programs.

No corrections and amendments were proposed by any members in the laboratory courses of Under-Graduate and Post Graduate programs

Agenda No. 31.09

To discuss and suggest the changes in the Academic Regulations governing the Undergraduate and Post graduate programs conducted under the Board.

The chairman asked to suggest the changes in the Academic Regulations governing the Undergraduate and Post graduate programs for further submission to Academic Council.

No suggestions were proposed by any members.

Finally, it was unanimously resolved that the existing Academic Regulations governing the Undergraduate and Post graduate programs be continued without any corrections.

Agenda No. 31.10

To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum.

Professional Elective I: Programming in C for beginners (6^{th} Semester) to be added was suggested by Mr. B. S. Sudame. It was presented and accepted by BoS members.

(Annexure 31.10)

Agenda No. 31.11

To prepare and propose the panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Odd Term 2022-23

The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Even Term 2022-23 will be decided after the notification received from CoE.

Agenda No. 31.12

To prepare and propose the list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Odd Term 2022-23.

The list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Even Term 2022-23 will be decided after the notification received from CoE.

Agenda No. 31.13

To prepare and propose the panel of internal and external examiners for the various laboratory and other non-theory courses at UG and PG levels that will be examined in End Semester Examination Odd 2022-23.

The panel of internal and external examiners for the various laboratory and other non-theory courses at UG and PG levels that will be examined in End Semester Examination Even 2022-23 will be decided after the notification received from CoE.

Agenda No. 31.14
Preparation of Electronic question Bank UG courses according to SoE 2018.
To review solutions to all questions of Electronic Question Banks for all courses.

Following is the account of EQB with solution available

Status of EQB and Solution

Total Core Courses of Department : 14
Total Professional Elective courses: 04 (PE I -IV)

Sr.No	Semester	Course Code	Title of the course	Type of course PC/PE	Remarks (Ready/Partially complete)	
					EQB	Solution
1	3	EL2201	Analog Electronics	PC	Ready	Ready
2	3	EL2203	Electrical Machines	PC	Ready	Ready
3	3	EL2205	Network Analysis	PC	Ready	Partially complete
4	3	EL2207	Electrical Measurement & Instrumentation	PC	Ready	Ready

Sr.No	Semester	Course Code	Title of the course	Type of course PC/PE	Remarks	
					EQB	Solution
1	4	EL2251	Electrical Machines in Power System	PC	Ready	Ready
2	4	EL2253	Electrical Energy Generation System	PC	Ready	Partially complete
3	4	EL2255	Electric & Magnetic Fields	PC	Ready	Ready
4	4	EL2257	Microprocessor	PC	Ready	Ready
5	5	EL2301	Power Electronics	PC	Ready	Ready
6	5	EL2303	Fundamentals of Power System	PC	Ready	Ready
7	5	EL2304	Electrical Drives	PC	Ready	Ready

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S.N	Semester	Course Code	Title of the course	Type of course PC/PE	Remarks	
					EQB	Solution
1	6	EL2351	Control System	PC	Ready	Ready
2	6	EL2353	Power System Analysis	PC	Ready	Partially complete
3	6	EL2361	PEI:Advanced Power Electronics	PE	Ready	Partially complete
4	6	EL2362	PEI:Electrical Distribution in Power System	PE	Ready	Ready
5	6	EL2363	PEI:Illumination Engineering (MOOC)	PE	Ready	Partially complete
6	6	EL2364	PEI:Electric Vehicles	PE	Ready	Ready
7	6	EL2365	PEI:Electric Power Utilization	PE	Ready	Partially complete

S.N	Semester	Course Code	Title of the course	Type of course PC/PE	Remarks	
					EQB	Solution
1	7	EL2401	Switchgear & Protection	PC	Ready	Ready
2	7	EL2403	High Voltage Engineering	PC	Ready	Ready
3	7	EL2411	PEII: Fundamentals of Power Quality	PE	Ready	Ready
4	7	EL2412	PEII:Electrical Installation Design	PE	Ready	Partially complete
5	7	EL2413	PEII:Electrical Machine Design	PE	Ready	Ready
6	7	EL2421	PEII: Power System Operation and Control	PE	Ready	Ready
7	7	EL2426	PEII: Sensors and Actuators	PE	Ready	Ready
8	7	EL2422	PEIII:FACTS Devices	PE	Ready	Ready
9	7	EL2423	PEIII: Electrical Energy Management and Audit	PE	Ready	Partially complete
10	7	EL2424	PEIII:Advanced Control System	PE	Ready	Ready
11	7	EL2425	PEIII:Artificial Intelligence Based System	PE	Ready	Ready
12	7	EL2431	PEIV:Advanced Electrical Drives	PE	Ready	Partially complete

13	7	EL2432	PEIV:Fundamentals of Smart Grid	PE	Ready	Partially complete
14	7	EL2433	PEIV:Computer Methods in Power System	PE	Ready	Ready
15	7	EL2434	PEIV:EHVAC-HVDC Transmission	PE	Ready	Ready

Agenda No. 31.15
To discuss and suggest the changes/additions/deletions/alterations in the existing Evaluation Process for theory and other courses.
No suggestions were proposed by any members.
Finally, it was unanimously resolved that the existing Evaluation Process for theory and other courses be continued without any corrections.

Agenda No. 31.16
To discuss and propose scheme for Minor and Honor course and its syllabus.
To Discuss and propose Certificate courses and value-added courses in 2022-23.

- Minor changes in syllabus of Honor course of Microgrid Technologies are suggested
- Minor changes in syllabus of Minor course of Electric Vehicles are suggested

STATUS OF CERTIFICATE & VALUE-ADDED COURSES conducted BY DEPARTMENTS in ODD AY 22-23

SN	Dept.	TITLE OF COURSE	Sem	COURSE HOURS	MODE OF TRAINING	DATES OF CONDUCTION & TOTAL HOURS IN COURSE	Number of Students attended the CERT / VAC	Remarks
1	EL	Electrical and Electronic measuring devices	3	35	Offline	4 January -4 February 2023	55	
2	EL	Industrial safety and protective devices	3	35	Offline	2 January -2 February 2023	62	

PLANNING OF CERTIFICATE & VALUE ADDED COURSES Planned BY DEPARTMENTS IN EVEN AY 22-23

SN	Deptt.	TITLE OF COURSE	Sem	COURSE HOURS	MODE OF TRAINING	Proposed DATES OF CONDUCTION & TOTAL HOURS IN COURSE	No of Students Expected to attend CERT / VAC	Remarks
1	EL	Substation design and planning	6	35	Offline	February to March 2023	40	
2	EL	Diesel Generator and Protection	4	35	Offline	May to June 2023	35	
3	EL	Testing and Maintenance of Electrical equipments	4	35	Offline	May to June 2023	35	

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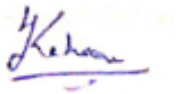
Agenda No. 31.17
Any other matter with the permission of the Chair.

All suggestions have been welcomed and forwarded for further submission to Academic Council. The meeting ended with thanks to Chair.



Mrs. Xma R.Pote
BoS Member Secretary
Dept. of Electrical Engineering

Dr.S.G.Kadwane
Head and Chairman
Dept. of Electrical Engineering

Electroncis Engineering

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Department of Electronics Engineering

Boards of Studies in Electronics Engineering

Minutes of the Meeting No. 32

Meeting No. 32,

Date: 28th January 2022

Meeting no. 32 of the Board of Studies in Electronics Engineering was held on 25th January 2023 at 11.00 A.M. in Electronics Engineering department library.

The meeting was attended by the following members of BoS.

1. **Dr.N.K.Chaudhary**
2. **Mr.Amarendran Akre**
3. **Dr.P.R.Deshmukh**
4. **Dr. R. D. Thakare**
5. **Dr.Pradnya P. Zode**
6. Dr.P.T.Karule
7. Dr. P. P. Zode
8. Dr.A.S.Khobragade
9. Dr.S.V.Rathkanthiwar
10. Mr. A. V. Gokhale
11. Dr.U.S.Ghodeswar
12. Dr.Mrs. P. P. Palsodkar
13. Dr.Mrs.R. S. Balpande
14. Dr.Mrs. M.N. Kalbande
15. Dr.Mr.P.M. Palsodkar
16. Dr.Ms.A.D.Tijare
17. Ms. P.A. Jadhav
18. Mr. K.G.Pande
19. Mr.A.B.Thatere
20. Mr.V.D. Alagdeve
21. Mr. A.A.Peshettiwar
22. Dr.Mrs.Y.A.Gaidhani
23. Ms.P.R.Chaudhari
24. Dr. Mrs.T.G.Panse
25. Dr.P.A.Maturkar
26. P.D.Gawande
27. Prof.M.S.Pawar
28. Dr.Y.A.Suryawanshi

Leave of absence was granted to

1. **Dr.S.B.Badjate**
2. **Mr.R.A.Deshmukh**
3. Mrs.S.A.Dhondse

BoS 32

The following agenda points were deliberated in the meeting

31.01	Welcome of members • **Dr. R.D. Thakare welcomed all the BoS members in the department.**
31.02	Installation of member Secretary • **No Change**
31.03	To confirm the minutes of 31st Meeting of BoS. • **The minutes of the 31st Meeting of BoS in Electronics Engineering held on 30 July 2022 were placed on the table and confirmed unanimously.**
31.04	To discuss and suggest the action taken on i) CO/PO attainment of subjects taught in 5th and 7th semester is as follows The attainment is in process.

			PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8		PO9		PO10		PO11		PO12		PSO1		PSO2	
		CO	Attainment Target	Attainment Achieved	Attainment Target	Attainment Achieved	Attainment Target	Attainment Achieved	Attainment Target	Attainment Achieved	Attainment Target	Attainment Achieved	Attainment Target	Attainment Achieved	Attainment Target	Attainment Achieved	Attainment Target	Attainment Achieved	Attainment Target	Attainment Achieved	Attainment Target	Attainment Achieved	Attainment Target	Attainment Achieved	Attainment Target	Attainment Achieved	Attainment Target	Attainment Achieved	Attainment Target	Attainment Achieved
V Semester	GE 2312 Fundamentals of Economics	1																	2	1.451					2	1.451				
		2																	2	1.733			2	1.733	2	1.733				
		3																					2	2	2	2				
		4																	2	2					2	2				
	EE2301/ EE2302 Digital Signal Processing / Digital Signal Processing Lab	1	3	2.15	1	0.717	2	1.433	1	0.717	3	2.15					1	0.717	2	1.433	1	0.717			3	2.15	2	1.433	1	0.717
		2	3	2.3	3	2.3	2	1.533	2	1.533	3	2.3					1	0.767	2	1.533	1	0.767			3	2.3	2	1.533	1	0.767
		3	3	2.757	3	2.757	3	2.757	3	2.757	3	2.757					1	0.919	2	1.838	1	0.919			3	2.757	2	1.838	1	0.919
		4	3	3	3	3	3	3	3	3	3	3					3	3	3	3	3	3			3	3	3	3	3	3
	EE2303/ EE2304 Analog Integrated Circuits & its Applications /Lab: Analog Integrated Circuits & its Applications	1	3	2.108	3	2.108	3	2.108	3	2.108															3	2.108				
		2	3	2.622	3	2.622	3	2.622	3	2.622															3	2.622				
		3	3	2.1	3	2.1	3	2.1	3	2.1															3	2.1				
		4	3	2.	2	1.	1	0.	1	0.	2	1.																	3	2.

				351		568		784		784		568																		351
		5	3	3	3	3	1	1	2	2	2	2							1	1									3	3
	EE2311/ EE2312 PE I: Computer Communication Network / Lab: PE I: Computer Communication Network	1	3	3	3	3	2	2	2	2	2	2							1	1									3	3
		2	3	2.025	3	2.025	1	0.675	2	1.35	2	1.35							1	0.675									3	2.025
		3									3	2.757	2	1.838					1	0.919	2	1.838							3	2.757
		4	1	0.703	3	2.108			3	2.108	2	1.405																		
		5	2	2	3	3			1	1	1	1																		
	EE2313/ EE2314 PE I: Embedded Systems / Lab: PE I: Embedded Systems	1	2	1.167	3	1.75			3	1.75	2	1.167																		
		2	2	1	3	1.5			3	1.5	2	1																		
		3	1	1	3	3			1	1	1	1																		
		4	2	2	3	3			3	3	3	3																		
		5																			3	2.423	3	2.423						
	EE2315/ EE2316 PE I: Algorithm & Data Structure / Lab: PE I: Algorithm & Data Structure	1	2	1.538	2	1.538	2	1.538	2	1.538	3	2.308	2	1.538	2	1.538	3	2.308					3	2.308	3	2.308	2	1.538	2	1.538
		2	2	1.538															3	2.308	3	2.308	2	1.538	2	1.538				
		3			2	1.538	2	1.538	2	1.538			2	1.538	2	1.538	3	2.308												
		4									3	2.475							3	2.475	2	1.65	3	2.475	3	2.475				
	EE2317/ EE2318 PE I: Applied Machine Learning / Lab: PE I: Applied Machine Learning	1	3	2.625	3	2.625	3	2.625	3	2.625	3	2.625	1	0.875	1	0.875											2	1.75				
		2	3	2.775	3	2.775	3	2.775	3	2.775	3	2.775	1	0.925	1	0.925											2	1.85				
		3	3	3	3	3	3	3	3	3	3	3	1	1	1	1											2	2				
		4	3	1.059	2	0.706	2	0.706	2	0.706	3	1.059	1	0.353	1	0.353											1	0.353				
VII Semester	EE2401/ EE2402 Digital System Design	1	3	3	3	3	2	2											1	1									2	2		
		2	2	2	3	3	2	2											1	1									2	2		
		3	3	3	2	2	2	2											1	1									2	2		
		4	2	1.45	2	1.45	2	1.45											1	0.72									2	1.45		

			1		1		1										5										1		
EE2411PE III: Switching Theory & Finite Automata	1	2	0.941	2	0.941	2	0.941																						
	2	2	1.569	2	1.569	1	0.784																						
	3	3	2.471	2	1.647	1	0.824																						
	4	2	0.7	2	0.7	3	1.05									1	0.35												
EE2412PE III :Power Electronics	1	3	1.059	2	0.706	3	1.059									1	0.353												
	2	2	0.706	2	0.706	2	0.706									1	0.353												
	3	2	0.6	2	0.6	3	0.9									1	0.3												
	4	1	0.3	2	0.6	3	0.9																						
EE2413PE III: Wireless Sensor Network	1	2	0.706	3	1.059	2	0.706									1	0.353							1	0.353				
	2	2	0.706	2	0.706	2	0.706									2	0.706							1	0.353				
	3	3	2.65	2	1.767	3	2.65									2	1.767							1	0.883				
	4	3	3.171	2	2.114	2	2.114									2	2.114							1	1.057				
EE2414PE III: VLSI Signal Processing	1	3	2.486	2	1.657	1	0.829			2	1.657							1	0.829					1	0.829			3	2.486
	2	3	2.943	2	1.962	1	0.981			2	1.962							2	1.962					1	0.981			3	2.943
	3	2	2	2	2	3	3			2	2							1	1					1	1			2	2
	4	2	1.486	2	1.486	3	2.229											2	1.486					2	1.486			2	1.486
EE2421PE IV: Wireless Communication/ EE2422Lab:PE IV: Wireless Communication	1	3	1.95	3	1.95			2	1.3															1	0.65				
	2	3	1.95	3	1.95			3	1.95															1	0.65				
	3	3	2.324	2	1.55			2	1.55															2	1.55				

	4	3	2.108	3	2.108																			2	1.405				
	5									3	1.95					1	0.65							2	1.3				
EE2423PE IV: RF and Microwave/ EE2424Lab:PE IV: RF and Microwave	1	2	1.533	3	2.3			3	2.3							2	1.533	2	1.533	2	1.533								
	2	2	1.529	3	2.294			3	2.294							2	1.529	2	1.529	2	1.529								
	3	1	1	2	2			3	3							2	2	2	2	2	2								
	4	3	2.69	3	2.69			3	2.69							2	1.793	2	1.793	2	1.793								
EE2425/ EE2426 PE IV:Analog VLSI Design/Lab: PE IV: Analog VLSI Design	1	2	1.793	3	2.69	2	1.793	1	0.897	3	2.69					1	0.897	2	1.793	1	0.897			1	0.897	2	1.793	1	0.897
	2	2	1.862	3	2.793	2	1.862	1	0.931	3	2.793					1	0.931	2	1.862	1	0.931			1	0.931	2	1.862	1	0.931
	3	2	2	3	3	2	2	1	1	3	3					1	1	2	2	1	1			1	1	2	2	1	1
	4	2	2	2	2	2	2	1	1	3	3					2	2	2	2	1	1			1	1	2	2	1	1
	5	2	1.267	2	1.267	2	1.267	2	1.267	1	0.633					1	0.633	1	0.633	1	0.633			1	0.633	2	1.267	1	0.633
EE2429PE IV: Operating Systems/ EE2430Lab: PE IV: Operating Systems	1	2	0.6	2	0.6	1	0.3	1	0.3																				
	2	3	2.176	2	1.451	2	1.451	2	1.451																				
	3	2	1.882	2	1.882	2	1.882	2	1.882																				
	4	3	3	2	2	1	1	1	1																				
	5	3	3	3	3	3	3	2	2																	2	2	2	2
EE2432PE V: Nano Electronics	1	2	0.867																					1	0.433				
	2	2	1.067	2	1.067																			2	1.067				
	3	2	1.5	2	1.5																			2	1.5				
	4	1	1																					2	2				
EE2433PE V: Optical Communication	1	2	1.02	3	1.529	2	1.02									2	1.02							1	0.51				
	2	2	2	2	2	2	2									3	3							1	1				
	3	2	1.25	2	1.25	3	1.88									2	1.25							2	1.25				

			5		5		2										5							5							
	4	2	1.367	2	1.367	2	1.367									2	1.367						1	0.683							
EE2435PE V: RF Circuit Design	1	3	2.353	2	1.569	2	1.569											1	0.784												
	2	3	2.176	2	1.451	2	1.451											1	0.725												
	3	3	2.647	2	1.765	2	1.765											1	0.882												
	4	3	3	2	2	2	2											1	1												
PE-V: Industrial Automation	1	2	1.02	2	1.02	2	1.02	2	1.02							2															
	2	3	3	2	2	2	2	2	2							2															
	3	3	1.059	3	1.059	3	1.059	2	0.706							2															
	4	2	1.647	3	2.471	3	2.471	2	1.647							2															
EE2442PE-VI: MEMS	1	2	1.02	2	1.02	3	1.529									2	1.02														
	2	3	2.471	2	1.647	2	1.647									3	2.471														
	3	2	0.706	3	1.059	2	0.706									2	0.706														
	4	2	1.5	2	1.5	2	1.5									2	1.5														
EE2443PE-VI: Biomedical Instrumentation	1	2	2	3	3	3	3	2	2																						
	2	3	1.059	3	1.059	2	0.706	2	0.706																						
	3	2	1.765	2	1.765	1	0.882	3	2.647																						
	4	2	2	1	1	2	2	2	2																						
EE2445PE-VI: Computer Organization	1	2	1.059	2	1.059	1	0.529											2	1.059					3	1.588						
	2	3	3	3	3	3	3	1	1									2	2					3	3						
	3	3	3	3	3	3	3	2	2									2	2					3	3						
	4	3	3	3	3	3	3											2	2					3	3						
PE-VI: IRSIP		3		2							1		1						1												
		3		2							1		1						1												
		2		3		2		1			2		1						1					1							

			2		3		2		1				2		1						1				1						
	EE2410Industrial Training / CRT	1											1	1	1	1	2	2			2	2	1	1	2	2					
		2											1	1	1	1	2	2			2	2	1	1	2	2					
		3											1	1	1	1	2	2			2	2	1	1	2	2					
		4											1	1	1	1	2	2			2	2	1	1	2	2					
	EE2409 Mini Project	1	1	1	1	1															3	3	2	2	1	1					
		2	3	3	3	3	3	3	3	3			3	3	3	3	3	3					3	3	3	3	3	3	3	3	
		3															2	2	2	2	3	3	2	2							
		4	1	1	1	1	1	1	1	1			3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	
		5															3	3	3	3	3	3	3	3							
			2.40	1.86	2.41	1.87	2.17	1.67	2.09	1.73	2.47	2.08	1.53	1.39	1.38	1.35	1.81	1.46	1.84	1.63	1.83	1.80	2.13	1.97	1.86	1.57	2.12	1.92	2.05	1.84	
			77.57 %		77.34 %		76.70 %		82.75 %		84.30 %		90.87 %		98.36 %		80.68 %		88.58 %		98.35 %		92.12 %		84.56 %		90.88 %		89.89%		

Weightage	Attainment Parameters	PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8		PO9		PO10		PO11		PO12		PSO1		PSO2	
		T	A	T	A	T	A	T	A	T	A	T	A	T	A	T	A	T	A	T	A	T	A	T	A	T	A	T	A
80%	TH+PR	2.40	1.86	2.41	1.87	2.17	1.67	2.09	1.73	2.47	2.08	1.53	1.39	1.38	1.35	1.81	1.46	1.84	1.63	1.83	1.80	2.13	1.97	1.86	1.57	2.12	1.92	2.05	1.84
		77.57 %		77.34 %		76.70 %		82.75 %		84.30 %		90.87 %		98.36 %		80.68 %		88.58 %		98.35 %		92.12 %		84.56 %		90.88 %		89.89%	
20%	Indirect (Surveys)	3.00	2.37	3.00	2.37	3.00	2.37	3.00	2.37	3.00	2.26	3.00	2.57	3.00	2.57	3.00	2.46	3.00	2.46	3.00	2.46	3.00	2.36	3.00	2.41				
		79.00 %		79.00 %		79.00 %		79.00 %		75.33 %		85.67 %		85.67 %		82.00 %		82.00 %		82.00 %		78.67 %		80.33 %					
	Total	2.52	1.96	2.53	1.97	2.34	1.81	2.27	1.86	2.57	2.12	1.82	1.63	1.70	1.60	2.05	1.66	2.07	1.79	2.06	1.93	2.31	2.04	2.09	1.74	2.12	1.92	2.05	1.84
		77.91 %		77.73 %		77.29 %		81.76 %		82.21 %		89.16 %		93.88 %		81.07 %		86.68 %		93.60 %		88.62 %		83.35 %		90.88 %		89.89%	

ii) Result analysis of subjects taught in previous semester

Sr.No	Semester	% Result
1	5	78.10
2	7	68.49

- For 5th semester result of all courses is above 75% so no need of any action.
- For 7th semester result of all courses except courses
  - EE2414 PE III: VLSI Signal Processing (Result-48.39%),
  - EE2423 PE IV: RF and Microwave (Result-56.67%) and
  - EE2425: PE IV: Analog VLSI Design (Result-50%) is above 80% so no need of any action.
- For courses EE2414 PE III: VLSI Signal Processing and EE2423 PE IV: RF and Microwave, more number of practice problems on different topics will be taken in class and more assignments will be given.
- For course EE2425: PE IV: Analog VLSI Design, subject expert was appointed, classes were planned and conducted.(Total 18 classes) All 6 units were taught and ESE question paper were solved by the students.

iii) Stake holders feedback on review and design of curriculum

Sr. No.	Stack Holders	Feedback	Action taken
1	**Employers**	Practical knowledge should be high as per industry requirements. Students should have knowledge about work culture in Industry.	• Guest lecture was organized for students by industry person.
2	**Alumni**	The Text Book knowledge that was provided through the curriculum and the technologies we work in our companies are totally different.	• VAC/CC on recent technologies and Hand on sessions in different areas were conducted. • VLSI Design, Bluetooth controlled bot, Python programming, its applications and data science, Graphics programming etc.
3	**Parent**	More awareness should be created about how to apply for internships.	Dr. S.V. Rathkanthiwar. Dean IRO explained the process and assured to create more awareness among students
		More efforts should be taken for placements	The parents were informed about the eligibility criteria of students. Guest lecture on aptitude development was conducted for students
		Industrial visit to more reputed companies should be conducted	The industrial visit in charge was informed about the same and accordingly more visits will be planned ahead.
4	**Students**	More number of Industrial Visit should be planed	4 Industrial visits were organized till date.

iv) In Sem, End Sem and Exit feedback on Teaching Learning & curriculum

Semester	No. of faculty with feedback more than 90%		No. of faculty with feedback more than 80%		No. of faculty with feedback less than 80% and greater than 60%	
	IN SEM	END SEM	IN SEM	END SEM	IN SEM	END SEM
V	2/14	10/14	11/14	4/14	1/14	Nil
	14.28%	71.42%	78.57%	28.57%	7.15%	Nil
VII	16/17	7/9	1/17	2/9	Nil	Nil
	94.11%	77.77%	5.88%	22.22%	Nil	Nil

31.05	To discuss and suggest the changes in the Scheme of Examination (known as Autonomous B.Tech 2020 & SoE 2022) of the Undergraduate under the Board. To approve and ratify SoE22 and all syllabi of B.Tech I & II year • **SoE22 for Electronics Engineering and CSE (IoT) was presented and approved.** **As per the suggestions by the experts in the SoE of CSE(IoT) involvement of courses from electrical and mechanical department in professional elective should be less.**
31.06	To discuss and suggest the minor changes in the syllabi of various courses in B.Tech 2020 Schemes of Undergraduate and Post graduate programs conducted under the Board. • **No Change**
31.07	To discuss and suggest the changes in the books/ Reference Books/ Literature Sources published in the syllabi of courses in various Schemes of Undergraduate and Postgraduate Programs. • **No change**
31.08	To discuss and approve the list of experiments, wherever there is a change, in the laboratory courses of Under-Graduate and Post Graduate programs. • **One new experiment is added in the course EE2402 Digital system design lab.**
31.09	To discuss and suggest the changes in the Academic Regulations governing the Undergraduate and Post graduate programs conducted under the Board. • **No change**

31.10	To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum. • **No change**
31.11	To prepare and propose the panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Even Term 2022□23. • **The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs for End Semester Examination of EVEN Term 2022-23 was constituted.**
31.12	To prepare and propose the list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Even Term 2022□23. • **There are no Postgraduate courses under the Board.**
31.13	To prepare and propose the panel of internal and external examiners for the various laboratory and other non□theory courses at UG and PG levels that will be examined in End Semester Examination Even Term 2022□23. • **The panel of internal and external examiners for the various laboratory courses at UG levels for End Semester Examination of EVEN Term 2022-23 was constituted.**
31.14	Preparation of Electronic question Bank UG courses according to SoE 2020 & 2022. To review solutions to all questions of Electronic Question Banks for all courses • **Electronic Question Banks for all courses are ready.**
31.15	To discuss and suggest the changes/additions/deletions/alterations in the existing Evaluation Process for theory and other courses. • **No change.**
31.16	To discuss and propose scheme for Minor an Honor course and its syllabus. To Discuss and propose Certificate courses and value□added courses in 2022□23. • **NPTEL based Honor courses for CRYPTOGRAPHY are** 5 Semester: 1. Discrete Mathematics 2. Introduction to Machine Learning 6 Semester: 1. Computer Networks and Internet Protocol 2. Data Analytics with Python Certificate courses and value-added courses to be conducted in even 2022-23. • Professional PCB design • Course on IoT
31.17	Any other matter with the permission of the Chair.

The meeting was concluded with thanks to the Chair. BoS Chairman has the authority to final the Scheme of Examination.

Dr.R.D.Thakare
Chairman
BoS in Electronics Engineering
Date: 28 January 2023

Dr.Pradnya Zode
Member Secretary
BoS in Electronics Engineering

Composition of Board of Studies in Electronics Engineering

Sr. No.	Provision	Name of Member	Membership
1	Head of the department	**Dr. R. D. Thakare**	Chairman
2	Faculty Member	**Dr. Pradnya Zode**	Member Secretary
3	Faculty Member	Dr. P. T. Karule	Member
4	Faculty Member	Dr.A.S.Khobragade	Member
5	Faculty Member	Dr. P. K. Dakhole	Member
6	Faculty Member	Dr.S.V.Rathkanthiwar	Member
7	Faculty Member	Mr. M.S.Pawar	Member
8	Faculty Member	Mr. A. V. Gokhale	Member
9	Faculty Member	Mr. A. B. Thatere	Member
10	Faculty Member	Dr. U. S. Ghodeswar	Member
11	Faculty Member	Dr. P. P. Zode	Member
12	Faculty Member	Dr. P. P. Palsodkar	Member
13	Faculty Member	Dr. Ms. T. G. Panse	Member
14	Faculty Member	Dr. Ms. M. N. Kalbande	Member
15	Faculty Member	Dr. Ms. Y. A. Gaidhani	Member
16	Faculty Member	Ms. R. S. Balpande	Member
17	Faculty Member	Dr. Mr.P. M. Palsodkar	Member
18	Faculty Member	Dr.Y.A.Suryavanshi	Member
19	Faculty Member	Ms. A. D. Tijare	Member
20	Faculty Member	Mr. V. D. Alagdeve	Member
21	Faculty Member	Ms. P.A.Jadhav	Member
22	Faculty Member	Ms. S. A. Dhondse	Member
23	Faculty Member	Mr. A. A. Peshattiwar	Member
24	Faculty Member	Mr. Kuldeep Pande	Member
25	Faculty Member	P.R.Choudhary	Member
26	Faculty Member	Dr.P.A.Maturkar	Member
27	Faculty Member	P.D.Gawande	Member
28	Subject expert from outside the college to be nominated by the Academic Council.	**Dr.S.B.Badjate**	Member
29	Subject expert from outside the college to be nominated by the Academic Council.	**Dr.N.K.Chaudhary**	Member
30	Expert nominated by the vice-chancellor	**Dr.P.R.Deshmukh**	Member
31	Representative from industry/corporate sector/allied area relating to placement.	**Mr. Amarendra G. Akre**	Member
32	Postgraduate meritorious alumnus nominated by the Principal	**Mr.R.A.Deshmukh**	Member

Yeshwantrao Chavan College of Engineering, Nagpur

Department of Electronics Engineering

Session 2022-23 (Odd Term)

Name of Laboratory : Digital System Design Lab	
Course : EE 2402 Digital System Design Lab	Sem/ Branch : VI Sem / Electronic Engg.

List of Experiments

Expt No.	Experiment Name	CO
1	Write data flow Verilog Codes of basic gates	CO1,CO2,CO4
2	Write data flow Verilog Codes of combinational circuits	CO1,CO2,CO4
3	Write Test bench for combinational circuits	CO1,CO2,CO3,CO4
4	Write switch level Verilog Codes for CMOS circuits	CO1,CO2,CO4
5	Write behavioural Verilog code of digital circuits using if-else statement.	CO1,CO2,CO4
6	Write behavioural Verilog code of digital circuits using case statement..	CO1,CO2,CO4
7	Write a behavioural Verilog code of Flip Flops	CO1,CO2,CO4
8	Write a Structural Verilog code of adders	CO1,CO4
9	Write a Structural Verilog code of shift registers	CO1,CO4
10	Write Verilog code for Mealy and Moore sequence detector	CO1,CO2,CO3,CO4
11	FPGA implementation of combinational circuits	CO1,CO4

Session 2021-22

NPTEL based Honor courses-CRYPTOGRAPHY

5 Semester:

1. Discrete Mathematics
2. Introduction to Machine Learning

6 Semester:

1. Computer Networks and Internet Protocol
2. Data Analytics with Python

Session 2022-23

SN	Sem	Type	Sub. Code	Subject	T/P	Contact Hours				Credits	% Weightage			ESE Duration Hours
						L	T	P	Hrs		MSEs*	TA**	ESE	
1	5	PC	EE	Computer Networks and Internet Protocol	T	3	0	0	3	3	30	30	40	3 Hours
2	5	PC	EE	Discrete Mathematics	T	3	0	0	3	3	30	30	40	3 Hours
3	6	PC	EE	Data Analytics	T	3	0	0	3	3	30	30	40	3 Hours
4	6	PC	EE	Machine Learning	T	3	0	0	3	3	30	30	40	3 Hours
5	7	PC	EE	Cryptography and Network Security	T	3	0	0	3	3	30	30	40	3 Hours
6	7	PC	EE	Social Networks Analysis	T	3	0	0	3	3	30	30	40	3 Hours

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Department of Electronics Engineering

Boards of Studies in Electronics Engineering

Minutes of the Meeting No. 31

Meeting No. 31,

Date: 2nd August 2022

Meeting no. 31 of the Board of Studies in Electronics Engineering was held online on 30th July 2022 at 10.00A.M.in Electronics Engineering department library.

The meeting was attended by the following members of BoS.

1. **Dr.S.B.Badjate**
2. **Dr.N.K.Chaudhary**
3. **Dr.P.R.Deshmukh**
4. **Dr. R. D. Thakare**
5. **Dr.Pradnya P. Zode**
6. Dr. P. P. Zode
7. Dr.A.S.Khobragade
8. Dr.S.V.Rathkanthiwar
9. Mr. A. V. Gokhale
10. Dr.U.S.Ghodeswar
11. Dr.Mrs. P. P. Palsodkar
12. Dr.Mrs.R. S. Balpande
13. Dr.Mr.P.M. Palsodkar
14. Dr.Ms.A.D.Tijare
15. Ms. P.A. Jadhav
16. Mr. K.G.Pande
17. Mr.A.B.Thatere
18. Mr.V.D. Alagdeve
19. Mr. A.A.Peshettiwar
20. Dr.Mrs.Y.A.Gaidhani
21. Ms.P.R.Chaudhari
22. Dr. Mrs.T.G.Panse
23. Mrs.S.A.Dhondse
24. Dr.P.A.Maturkar
25. P.D.Gawande
26. Prof.M.S.Pawar
27. Dr.Y.A.Suryawanshi

Leave of absence was granted to

1. **Mr.Amarendran Akre**
2. **Mr.R.A.Deshmukh**
3. Dr.P.K.Dakhole
4. Dr.P.T.Karule
5. Dr.Mrs.M.N.Kalbande

BoS 31

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The following agenda points were deliberated in the meeting

31.01	Welcome of new members • **Dr. R.D. Thakare welcomed all the BoS members in the department.**
31.02	Installation of member Secretary • **Chairman declared new member Secretary as Dr. Pradnya Zode**
31.03	To confirm the minutes of 30th Meeting of BoS. • **The minutes of the 30th Meeting of BoS in Electronics Engineering held on 13 January 2022 were placed on the table and confirmed unanimously.**
31.04	To discuss and suggest the action taken on i) Co/Po attainment of subjects taught in previous semester **•The overall attainment of all POs for the program has been carried and all PO's are achieved. The details are as follows**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EE2201 Basic Electronics	3	3												
GE2201 Engineering Mathematics III	2	2	1	1				1				1		
EE2201 Electronic Devices EE2202 Electronic Devices Lab	3	2	2	3	3	2		2	2	2	1	1	2	1
EE2203 Signals & Systems	1	1	1					1				1		1
EE2204 Lab : Programming Language	3	2	3	1				1				3		
EE2205/ EE2206 Digital Logic Design/ Lab : Digital Logic Design	3	3			1			1	1	1		1	1	
EE2207/ EE2208 Network Analysis/ Lab : Network Analysis	2	2	2	2	3	2		1	2	1	1	2	2	1
GE2204 Advanced Mathematical Techniques	2	2												
EE2251 / EE2252 Electronic Circuits /Lab : Electronic Circuits	3	3	2	3	3	2		2	2	2	1	1	1	1
EE2253/ EE2254 Microcontroller & its Applications / Lab. Microcontroller & its Applications	3	3	2	2	3	1	1	2	2	2	1	3	3	
EE2255/ EE2256 Analog Communication /Lab : Analog Communication	2	2	2										1	1
EE2257	2	3												

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Electromagnetic Fields														
EE2258 Lab: Electronics Workshop	3	3	2		2	2	2	3	3	3	2	2	2	
EE2301/ EE2302 Digital Signal Processing / Digital Signal Processing Lab	3	3	3	3	2							3		
EE2303/ EE2304 Analog Integrated Circuits & Its Applications /Lab: Analog Integrated Circuits & Its Applications	3	3	2	2	2				1			3		3
EE2311/ EE2312 PE I: Computer Communication Network / Lab: PE I: Computer Communication Network	2	3	2	2	2	2			1	2				3
EE2313/ EE2314 PE I: Embedded Systems / Lab: PE I: Embedded Systems	2	3		3	2					3	3			
EE2315/ EE2316 PE I: Algorithm & Data Structure / Lab: PE I: Algorithm & Data Structure	2	2	2	2	3	2	2	3	3	3	3	3	2	2
EE2317/ EE2318 PE I: Applied Machine Learning/ Lab: PE I: Applied Machine Learning	3	3	3	3	3	1	1					2		
EE 2351 Control System Engineering	2	3	2	2										
EE2352 Transmission Lines and Wave Guides	2	3	2	2	3				3					2
EE2353/EE2354 Digital Communication/Lab: Digital Communication	3	3	1	2	2	2			1	2				3
EE2361 PE II: Internet of Things EE2362- Lab: PE II: Internet of Things	3	3	2		3									3
EE2363/ EE2364 PE II: Digital CMOS Circuits / Lab: PE II: Digital CMOS Circuits	2	3	3											3
EE2365/ EE2366 PE II: Digital Image	2	3	2	2	2				2	2				3

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Processing / Lab:PE II: Digital Image Processing														
EE2367 PE II: Object Oriented Programming	3	2	3	2	3	3			2		1	1	1	1
EE2368 Lab: PE II: Object Oriented Programming	3	2	3	2	3	3			2		1	1	1	1
EE2381 OE III : Fuzzy Logic & Neural Network	3	3	3	3	2	2	1	2	2	2	2	2	3	
EE2382 OE III : Basics of Analog and Digital Communication Systems	2	2	2					2				2		
EE2383 OE III: Biomedical Instrumentation	2	2	2					2				2		
EE2401/EE2402 Digital System Design	3	3	2						2	2		2	2	
EE2411PE III: Switching Theory & Finite Automata	2	2	2					1						
EE2412PE III :Power Electronics	2	2	3					1						
EE2413PE III: Wireless Sensor Network	3	2	2					2				1		
EE2414PE III: VLSI Signal Processing	3	2	2		2				2			1		3
EE2421PE IV: Wireless Communication/ EE2422Lab:PE IV: Wireless Communication	3	3		2	3			1				2		
EE2423PE IV: RF and Microwave/ EE2424Lab:PE IV: RF and Microwave	2	3		3				2	2	2				
EE2425PE IV: Analog VLSI Design	3	3	2	2					2			2	1	
EE2429PE IV: Operating Systems/ EE2430Lab: PE IV: Operating Systems	3	2	2	2										
EE2432PE V: Nano Electronics	2	2										2		
EE2433PE V: Optical Communication	2	2	2					2				1		
EE2435PE V: RF Circuit Design	3	2	2						1					
EE2442PE-VI: MEMS	2	2	2					2						

EE2443PE-VI: Biomedical Instrumentation	2	2	2	2										
EE2445PE-VI:Computer Organization	3	3	3	2					2			3		
EE2410Industrial Training / CRT						1	1	2		2	1	2		
EE2409Mini Project	2	2	2	2		3	3	3	3	3	3	2	3	3
Major Project	2	2	2	2		3	3	3	3	3	3	2	3	3
Average Direct Attainment Target	2.44	2.42	2.08	2.18	2.43	1.96	1.57	1.76	1.88	2.08	1.56	1.82	1.72	1.95
Indirect Attainment Target	3	3	3	3	3	3	3	3	3	3	3	3		
(80 % Direct + 20% Indirect) Total Attainment Target	2.56	2.45	2.28	2.26	2.52	1.91	1.87	1.90	2.12	2.35	2.32	2.04	1.94	1.90
	3	3	3	3	3	2	2	2	3	3	3	3	2	2

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO-1	PSO-2
Direct Attainment	2.21	2.11	1.88	1.91	2.14	1.54	1.47	1.59	1.83	2.15	2.12	2.69	1.92	1.88
In Direct Attainment	2.79	2.79	2.79	2.79	2.79	2.89	2.84	2.84	2.91	2.82	2.82	2.73		
(80 % Direct + 20% Indirect) Total Attainment	2.33	2.25	2.06	2.09	2.27	1.81	1.74	1.84	2.05	2.29	2.26	1.90	1.92	1.88
	3	**3**	**3**	**3**	**3**	**2**	**2**	**2**	**3**	**3**	**3**	**2**	**2**	**2**

Semester	Course	CO Attainment	Action To Be Taken	Contribution to PO
IV	EE2253/ Microcontroller & its Applications	CO-3,4	Extra Assembly Language Programs will be practiced in the class, Also Assignment will be given	PO-1,2,3
IV	EE2257 Electromagnetic Fields	CO-1,2,3,4	More Numerical will be taught in the class & assignment will be given	PO-1,2
VI	EE 2351 Control System Engineering	CO-1,2,3,4	Further Numerical will be taught in the class & assignment will be given	PO-1,2,3
VI	EE2352 Transmission Lines and Wave Guides	CO-1,2,3,4	Additional emphasis will be given on derivations and assignment will be given	PO-1,2,3

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ii) Result analysis of subjects taught in previous semester

Sr.No	Semester	% Result
1	4	81.56
2	6	78.95
3	8	100

- For IV semester result of all courses is above 80% so no need of any action.
- For VI semester result of all courses except courses EE2363 PE II:Digital CMOS circuits (Result-72.97%) and EE2367 PE II:Object oriented programming (Result-74.36%) is above 80% so no need of any action.
- For EE2363 PE II:Digital CMOS circuits and EE2367 PE II:Object oriented programming more number of practice problems on different topics will be taken in class and more assignments will be given.

iii) Stake holders feedback on review and design of curriculum

•Stake holders feedback on review and design of curriculum was shown.

Sr.No.	Stack Holders	Feedback	Action taken
1	Employers	Industry require more practical Knowledge on latest software tools	As per Suggestion standard EDA tools as CADENCE, Keil, Multisim, PSPICE (ORCAD), Quartus II, Arduino for IOT is introduced.
		Students should have field knowledge which will be use full at the onset in their job.	• In the SoE semester long Internship for UG Students in 8th semester is included. • Students have done Industry based certification courses and NPTEL courses.
2	Alumni	For Core placement more hand on VLSI	• Value added course on VLSI Design and EDA tools for more Hand on exposure in VLSI was conducted. • In new SoE22 digital VLSI design course is made core and more electives are added on VLSI.
3	Parent	Parents enquired about mock interview/ campus training for students.	Information about CRT, YCAP and T&P activities to be conducted by the department was given.
		Parents enquired about the changes in exam pattern from online to offline	Parents were made aware about changes in the exam pattern in offline mode.
4	Students	Courses based on IoT should be introduced.	In SoE 22 IoT course is made core from elective in SoE 18-19
		Options in questions should be given in ESE	To follow the OBE, no options is given the ESE paper.

iv) In Sem, End Sem and Exit feedback on Teaching Lear & curriculum

Semester	No. of faculty with feedback more than 90%		No. of faculty with feedback more than 80%		No. of faculty with feedback less than 80% and greater than 60%	
	IN SEM	END SEM	IN SEM	END SEM	IN SEM	END SEM
IV	8/19	7/8	10/19	1/8	1/19	NIL
	42.11%	87.5%	52.63%	12.5%	5.2%	--
VI	14/26	19/23	12/26	4/23	NIL	NIL
	53.85%	82.61%	46.15%	17.39%	--	--

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		Students should have field knowledge which will be use full at the onset in their job.	• In the SoE semester long Internship for UG Students in 8th semester is included. • Students have done Industry based certification courses and NPTEL courses.
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iv) In Sem, End Sem and Exit feedback on Teaching Lear & curriculum

Semester	No. of faculty with feedback more than 90%		No. of faculty with feedback more than 80%		No. of faculty with feedback less than 80% and greater than 60%	
	IN SEM	END SEM	IN SEM	END SEM	IN SEM	END SEM
IV	8/19	7/8	10/19	1/8	1/19	NIL
	42.11%	87.5%	52.63%	12.5%	5.2%	--
VI	14/26	19/23	12/26	4/23	NIL	NIL
	53.85%	82.61%	46.15%	17.39%	--	--

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31.05	To discuss and suggest the changes in the Scheme of Examination (known as Autonomous 2018 &B.Tech 2020) of the Undergraduate and Post graduate programs conducted under the Board. To approve and ratify SoE22 and all syllabi of B.Tech and M.Tech I & II year. • **1 new industry aligned Professional elective subject in association with MRSAC, Nagpur as "Introduction to Remote Sensing and Image Analysis"is added in the 7thsem as PE 6 of Autonomous 2018 SoE.** • **SoE22 for Electronics Engineering was presented and approved.** • **SoE22 for CSE(IoT)was presented and approved.** • **Syllabus of 5th to 8th Semester for IIoT Branch was presented and approved.**
31.06	To discuss and suggest the minor changes in the syllabi of various courses in Autonomous 2018 &B.Tech 2020 Schemes of Undergraduate and Post graduate programs conducted under the Board. • **Minor changes in the syllabi of 7th Semester EE2434 PE V: RF Circuit Design is proposed.** • **Minor changes in the syllabi of 7th Semester EE2431 PE V: Industrial Automationis proposed.** • **Minor changes in the syllabi of 7th Semester EE2412 PE III: Power Electronics is proposed.**
07	To discuss and suggest the changes in the books/ Reference Books/ Literature Sources published in the syllabi of courses in various Schemes of Undergraduate and Postgraduate Programs. • **No change**
31.08	To discuss and approve the list of experiments, wherever there is a change, in the laboratory courses of Under□Graduate and Post Graduate programs. (Comment: The laboratory courses may be described in greater details for easy understanding by students.) • **No change**
31.09	To discuss and suggest the changes in the Academic Regulations governing the Undergraduate and Post graduate programs conducted under the Board. • **No change**
31.10	To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum. • **No change**
31.11	To prepare and propose the panel of paper setters, Moderators and Valuers for the various theorycourses at Undergraduate programs that will be examined in End Semester Examination of Odd Term/Even Term 2022□23. • **The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs for End Semester Examination of Odd Term 2022-23 was constituted.**
31.12	To prepare and propose the list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Odd/Even Term 2022□23. (Comment: Question papers of all the courses of PG programs are set and evaluated by the course instructor from Odd Term 2021□22. The grades of the students will also be decided by the Course Instructors.) • **There are no Postgraduate courses under the Board.**
31.13	To prepare and propose the panel of internal and external examiners for the various laboratory and other non□theory courses at UG and PG levels that will be examined in End Semester Examination Odd/Even Term 2022□23. • **The panel of internal and external examiners for the various laboratory courses at UG levels for End Semester Examination of ODDTerm 2022-23was constituted.**
31.14	Preparation of Electronic question Bank UG courses according to SoE 2018. To review solutions to all questions of Electronic Question Banks for all courses • **Electronic Question Banks for all courses are ready.**
31.15	To discuss and suggest the changes/additions/deletions/alterations in the existing Evaluation Process for theory and other courses.

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	• **No change.**
31.16	To discuss and propose scheme for Minor an Honor course and its syllabus. **NPTEL based Honor courses in CRYPTOGRAPHY for 7 Semester, 2 courses are** **1. Cryptography and Network Security** **2. Social Network** • **Approval for above NPTEL courses for Honor course Cryptography was put up for approvals and it was approved.** **NPTEL based Honor courses in CRYPTOGRAPHY for 5 Semester, 2 courses are** **1. Introduction to Machine Learning** **2. Discrete Mathematics** • **Approval for above NPTEL courses for Honor course Cryptography was put up for approvals and it was approved.** To Discuss and propose Certificate courses and value□added courses in 2022□23. **Two Certificate courses to be conducted in ODD 2022-23 as** • **Capacity Building on Machine Learning.** • **Graphics programming in "C".** **Two VACs to be conducted in ODD 2022-23 as** • **VLSI Design.** • **Python Programming, its application & Data Science.**
31.17	Any other matter with the permission of the Chair.

The meeting was concluded with thanks to the Chair.BoS Chairman has the authority to final the Schemeof Examination.

Dr.R.D.Thakare
Chairman
BoS in Electronics Engineering

Dr.Pradnya Zode
Member Secretary
BoS in Electronics Engineering

Date: 2nd August 2022

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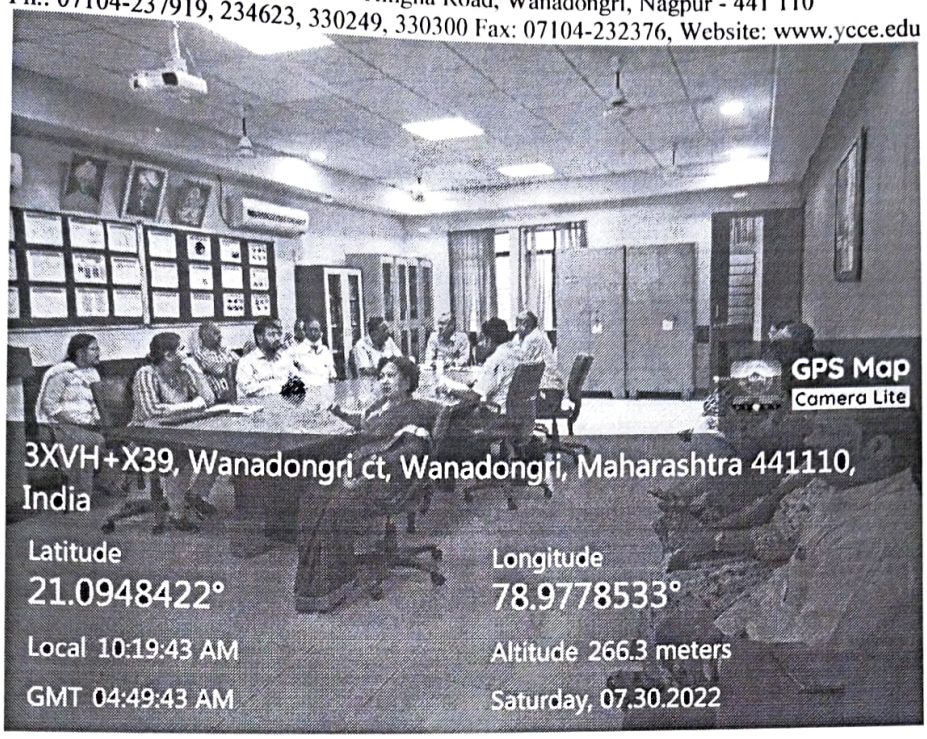

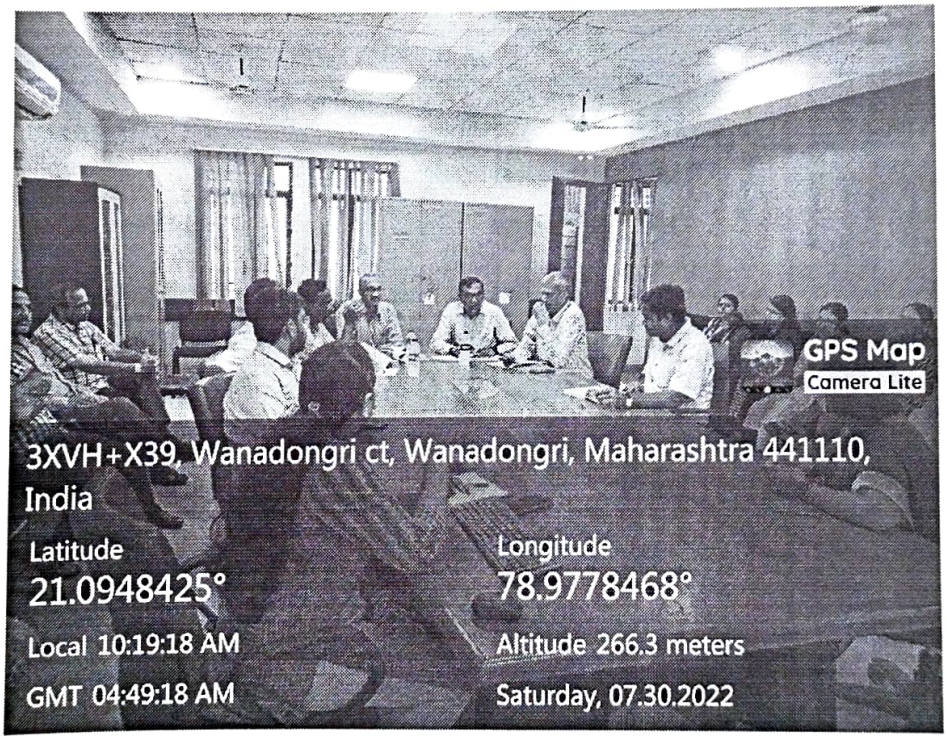

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Composition of Board of Studies in Electronics Engineering

Sr. No.	Provision	Name of Member	Membership
1	Head of the department	**Dr. R. D. Thakare**	Chairman
2	Faculty Member	**Dr. Pradnya Zode**	Member Secretary
3	Faculty Member	Dr. P. T. Karule	Member
4	Faculty Member	Dr.A.S.Khobragade	Member
5	Faculty Member	Dr. P. K. Dakhole	Member
6	Faculty Member	Dr.S.V.Rathkanthiwar	Member
7	Faculty Member	Mr. M.S.Pawar	Member
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19	Faculty Member	Ms. A. D. Tijare	Member
20	Faculty Member	Mr. V. D. Alagdeve	Member
21	Faculty Member	Ms. P.A.Jadhav	Member
22	Faculty Member	Ms. S. A. Dhondse	Member
23	Faculty Member	Mr. A. A. Peshattiwar	Member
24	Faculty Member	Mr. KuldeepPande	Member
25	Faculty Member	P.R.Choudhary	Member
26	Faculty Member	Dr.P.A.Maturkar	Member
27	Faculty Member	P.D.Gawande	Member
28	Subject expert from outside the college to be nominated by the Academic Council.	**Dr.S.B.Badjate**	Member
29	Subject expert from outside the college to be nominated by the Academic Council.	**Dr.N.K.Chaudhary**	Member
30	Expert nominated by the vice-chancellor	**Dr.P.R.Deshmukh**	Member
31	Representative from industry/corporate sector/allied area relating to placement.	**Mr. Amarendra G. Akre**	Member
32	Postgraduate meritorious alumnus nominated by the Principal	**Mr.R.A.Deshmukh**	Member

Session 2021-22

NPTEL based Honor courses-CRYPTOGRAPHY

7 Semester:

1. Cryptography and Network Security
2. Social Network

Session 2022-23

SN	Sem	Type	Sub. Code	Subject	T/P	Contact Hours				Credits	% Weightage			ESE Duration Hours
						L	T	P	Hrs		MSEs*	TA**	ESE	
1	5	PC	EE	Computer Networks and Internet Protocol	T	3	0	0	3	3	30	30	40	3 Hours
2	5	PC	EE	Discrete Mathematics	T	3	0	0	3	3	30	30	40	3 Hours
3	6	PC	EE	Data Analytics	T	3	0	0	3	3	30	30	40	3 Hours
4	6	PC	EE	Machine Learning	T	3	0	0	3	3	30	30	40	3 Hours
5	7	PC	EE	Cryptography and Network Security	T	3	0	0	3	3	30	30	40	3 Hours
6	7	PC	EE	Social Networks Analysis	T	3	0	0	3	3	30	30	40	3 Hours

Electronics Telecommunication Engineering

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Department of Electronics & Telecommunication Engineering

Minutes of the 26th BOS Meeting

Date: 3rd August 2022

The 26th meeting of the Board of Studies in Electronics & Telecommunication Engineering was held on Wednesday, 3rd August 2022 at 10:00 am in the departmental Library ET, YCCE, Nagpur

The meeting was attended by the following members of Board of Studies.

Sr. No.	Name	Signature
01	Dr.A.G.Keskar, Expert,VNIT, Nagpur	
02	Dr. R. B. Deshmukh, Expert,VNIT, Nagpur	
03	Dr.S.L.Badjate ,VC Nominee, Principal S. B .Jain, Nagpur	
04	Mr. Ranjit Singh, Industry person, M.D. & CEO, Syslogix systems Pvt. Ltd, Nagpur	
05	Mr. Sagar Ghormade, PG Alumni	Absent

S. No.	Name	Signature	S No.	Name	Signature
1	Dr. M. M. Mushrif		15	Dr.M.L.Keote	
2	Dr.M.D. Chawhan		16	Dr. P. D. Dorge	
3	R.P.Deshmukh		17	S.A.Desai	
4	Dr. P.W. Raut		18	Dr.V.D. Bondre	
5	Dr. D.B.Bhoyar		19	Dr.B.Y. Masram	
6	K.P.Kamble		20	Y. S. Kale	
7	Dr. Y.U.Chitriv		21	V.B.Niranjane	
8	Dr. A.D.Belsare		22	A.A.Madankar	
9	Dr. N.D.Rehpade		23	R.P.Kamdi	
10	A.V.Choudhari		24	D.K.Thote	
11	N.A.Pande		25	M.S.Patil	
12	Dr. S.S.Khade		26	Dr. R.S.Keote	
13	Dr.C.S.Gode		27	S.R.Nitnaware	
14	S.S.Chiwande		28	M. S. Ghute	

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Sr. No.	Name	Signature
01	Dr.A.G.Keskar, Expert,VNIT, Nagpur	Present
02	Dr. R. B. Deshmukh, Expert,VNIT, Nagpur	Present
03	Dr.S.L.Badjate ,VC Nominee, Principal S. B .Jain, Nagpur	Present
04	Mr. Ranjit Singh, Industry person, M.D. & CEO, Syslogix systems Pvt. Ltd, Nagpur	Present
05	Mr. Sagar Ghormade, PG Alumni	Absent

S. No.	Name	Signature	S No.	Name	Signature
1	Dr. M. M. Mushrif	Present	15	Dr.M.L.Keote	Present
2	Dr.M.D. Chawhan	Present	16	Dr. P. D. Dorge	Present
3	R.P.Deshmukh	Present	17	S.A.Desai	Present
4	Dr. P.W. Raut	Present	18	Dr.V.D. Bondre	Present
5	Dr. D.B.Bhoyar	Present	19	Dr.B.Y. Masram	Present
6	K.P.Kamble	Present	20	Y. S. Kale	Present
7	Dr. Y.U.Chitriv	Present	21	V.B.Niranjane	Present
8	Dr. A.D.Belsare	Present	22	A.A.Madankar	Present
9	Dr. N.D.Rehpade	Present	23	R.P.Kamdi	Present
10	A.V.Choudhari	Present	24	D.K.Thote	Present
11	N.A.Pande	Present	25	M.S.Patil	Present
12	Dr. S.S.Khade	Present	26	Dr. R.S.Keote	Present
13	Dr.C.S.Gode	Present	27	S.R.Nitnaware	Present
14	S.S.Chiwande	Present			

Leave of absence was granted to –

Sr. No.	Name
1	Mr. Sagar Ghormade, PG Alumni

The following agenda points were discussed and deliberated in the meeting.

26.01 Welcome of new members.

BoS members have been welcomed by the Chairman.

26.02 Installation of member Secretary.

No changes

26.03 Confirmation of minutes of previous Meeting and action taken report on decisions/suggestions of the previous meeting.

The minutes of the 25th BOS meeting held on, **10th January 2022** in Electronics and Telecommunication Engineering Department were placed on the table and were confirmed unanimously.

26.04 To discuss and suggest the action taken on

i) Co/Po attainment of subjects taught in previous semester
ii) Result analysis of subjects taught in previous semester
iii) Stake holders feedback on review and design of curriculum
iv) In Sem, End Sem and Exit feedback on Teaching Learning & curriculum

i) Co/Po attainment of subjects taught in previous semester

- The complete process of CO/PO attainment has been discussed with the BoS Experts. The experts appreciated and approved the process of attainment. The overall attainment of all POs for the program has been carried and all PO's are achieved except PO2 and PO3.
- PO2 and PO3 are marginally achieved due to courses in odd semester (Wireless Sensor Network, Multimedia Communication, Embedded System and Network Analysis) and in even semester, extra-curricular activities.
- The more emphasis would be given on problem analysis through practice assignments on courses like WSN, NA, Embedded System, and Multimedia Communication.
- It is planned that awareness on participation in technical event and publications amongst students would be carried.

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PO	Target Level	PO Benchmark in %	PO Benchmark inlevel	Attainment Level	Observations
PO1	2.99	75	2.24	2.25	Attained
PO2	2.89	75	2.17	2.15	Marginally Attained
PO3	2.64	75	1.98	1.96	Marginally Attained
PO4	2.09	70	1.46	1.58	Attained
PO5	2.75	75	2.06	2.10	Attained
PO6	2.37	70	1.66	1.78	Attained
PO7	2.49	70	1.74	2.11	Attained
PO8	2.93	70	2.05	2.36	Attained
PO9	2.51	75	1.88	1.97	Attained
PO10	2.58	70	1.81	2.00	Attained
PO11	2.23	70	1.56	1.69	Attained
PO12	2.60	70	1.82	2.03	Attained
PSO1	2.62	75	1.97	2.01	Attained
PSO2	2.74	75	2.06	2.10	Attained

Program level Course-PO matrix of all courses including first year courses

Semester	Course Code/Name	% AVG (A+B+C)	attainment													
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
III	ET2201 - Electronic Devices and Circuits/ ET2202 - Lab: Electronic Devices and Circuits	**82.76**	2.48	2.31	2.45		2.48				2.48	2.48	1.66	2.48	2.48	2.48
III	ET2203 - Digital Circuits and Fundamentals of Microprocessor / ET2204 - Lab: Digital Circuits and Fundamentals of Microprocessor	**83.62**	2.34	2.14	2.62		2.50				2.17	2.17	1.67	2.50	2.50	2.50
III	ET2205 - Electronic Measurement & Instrumentation / ET2206 - Lab: Electronic Measurement & Instrumentation	**85.56**	2.14	2.14			2.53				2.12	2.36		1.73	1.28	
III	ET2207 - Network Analysis	**52.23**	1.57	1.57			1.04				1.04	1.04		1.04	1.57	1.04
IV	ET2251 - Electromagnetic Fields	**64.53**	1.94	1.94							1.29	1.29		1.29	1.29	
IV	ET2252 - Microcontroller and Interfacing / ET2253 - Lab: Microcontroller and Interfacing	**69.84**	2.10	2.07	1.61	0.69	2.07	1.38			1.92	1.92	1.38	2.10	2.10	2.07
IV	ET2254 - Analog Communication / ET2255 - Lab: Analog Communication	**69.72**	2.09	1.97		0.66	1.33	1.32			1.99	1.39	1.32	1.39	2.09	1.33
IV	ET2256 - Control Systems / ET2257 - Lab: Control	**71.18**	2.14	2.14			2.14				2.14	2.14		1.42	1.42	2.14

	Systems															
V	ET 2301 - ANALOG INTEGRATED CIRCUITS / ET 2302 – LAB: ANALOG INTEGRATED CIRCUITS	**90.37**	2.71	2.48	2.29		2.71				2.71	2.71	1.81	2.71	2.71	2.71
V	ET 2303 – FIELDS & RADIATING SYSTEMS	**76.02**	2.28	2.28	1.54		1.38				0.76	1.52		1.52	1.52	1.38
V	ET 2304 – SIGNALS & SYSTEMS /ET 2305– LAB: SIGNALS & SYSTEMS	**86.39**	2.59	2.59	0.88	1.75	2.59				2.59	2.59		2.59	2.59	2.59
V	ET 2306– LAB: ELECTRONICS WORKSHOP	**88.10**	2.64	2.64	2.56		2.05	1.76			2.64	2.64	1.76	2.64	2.64	2.05
VI	ET2351 - Digital Signal Processing / ET2352 - Lab: Digital Signal Processing	**64.37**	1.93	1.93	1.62		1.80				1.93	1.93	1.29	1.93	1.93	1.80
VI	ET2361 - PE I : Object Oriented Programming / ET2362 - Lab.: PE I: Object Oriented Programming	**70.39**	2.11	2.11	1.81		1.97				2.11	2.11	1.41	2.11	2.11	1.97
VI	ET2363 - PE I : Discrete Structures / ET2364 - Lab. : PE I : Discrete Structures	**71.90**	2.16	2.16	1.48		2.16				2.16	2.16	1.44	2.16	1.44	2.16
VI	ET2365 - PE I : Microprocessors and Peripherals / ET2366 - PE I : Lab. Microprocessors and Peripherals	**60.58**	1.82	1.87	1.92		1.59				1.59	1.59	1.21	1.82	1.82	1.87
VI	ET2367 - PE I : Electronic Instrumentation / ET2368 - PE I : Lab Electronic Instrumentation	**68.88**	2.07	1.88	1.41		1.41				1.75	1.91		2.07	1.38	1.41
VI	ET2371 - PE I : Fundamentals of Computing / ET2372 - Lab: PE I -Fundamentals of Computing	**84.08**	2.52	2.51	1.65		2.52				2.52	2.52	1.68	2.52	1.68	2.52
VI	ET2377 - PE II : Antenna Theory & Design / ET2378 - PE II : Lab. Antenna Theory & Design	**66.37**	1.99	1.99	1.97		2.01				1.83	1.83	1.33	1.99	1.99	1.98
VI	ET2379 - PE II : Digital System Design / ET2380- PE II : Lab. Digital system Design	**66.26**	1.99	1.99	2.11		2.11				1.85	1.85	1.25	1.99	1.99	2.11
VI	ET2381- PE II : Internet of Things (IoT) / ET2382- PE II : Lab. Internet of Things (IoT)	**75.38**	2.26	2.26	2.30		2.23				2.07	2.07	1.49	2.26	1.51	2.23
VI	ET2383- PE II : Optical Communication / ET2384- PE II : Lab. Optical	**78.08**	2.34	2.12			2.34				2.34	2.34		2.34	2.34	

	Communication															
VI	ET2385- PE II: Principles of image processing / ET2386- PE II: Lab. Principles of image processing	**70.19**	2.11	2.11			2.11				2.11	2.11	1.40	2.11	2.11	2.11
VII	ET 2401–RF & Microwave / ET 2402 – Lab: RF & Microwave	**84.14**	2.52	2.55			2.36				2.52	2.52		2.52	2.52	
VII	ET2403 – Digital Communication / ET2404 – Lab: Digital Communication	**82.77**	2.48	2.26			2.52				2.52	2.33	1.68	2.52	2.48	2.52
VII	ET 2411 – PEIII:Power Electronics	**83.22**	2.50	2.50	2.48						1.66	1.66		2.50	1.66	
VII	ET2412 – PE III: Data compression and encryption	**67.84**	2.04	1.33			1.36				0.68	1.36		1.36	0.68	1.36
VII	ET 2413 –PE III :Analog VLSI Design	**83.76**	2.51	2.51	2.57						0.84	1.68		1.68	1.68	
VII	ET 2414 – PE III: Error Correcting Code	**80.46**	2.41	2.38							1.61	1.61		2.41	2.41	
VII	ET2415– PE III: Wireless Mobile Communication Systems	**73.23**	2.20	1.67							0.73	1.46		1.46	2.20	
VII	ET2421 – PE IV: Satellite Communication & Radar Engineering	**89.07**	2.67	2.26							1.78	1.78		1.78	2.67	
VII	ET2422- PE IV: Embedded System	**54.92**	1.65	1.28	1.36		0.90				1.10	1.10		1.10	1.65	0.90
VII	ET 2423 – PE IV: Switching Theory	**66.87**	2.01	2.01	1.95						1.34	1.34		1.34	1.34	
VII	ET 2424 – PE IV: Topics in Machine Learning	**80.16**	2.40	2.40			2.40				2.40	2.40	1.60	2.40	0.80	2.40
VII	ET 2425 – PE IV:Multimedia Communications	**64.84**	1.95	1.49	0.73		1.30				1.30	1.30		1.30	1.95	1.30
VII	ET2431-PE V: Display Technology	**86.65**	2.60	2.37	1.55							1.73		1.73	1.73	
VII	ET2432-PE V:Biomedical Instrumentation	**86.68**	2.60								1.73	1.73		1.73	1.73	
VII	ET 2433 – PE V: Fuzzy Logic & Neural Network	**75.00**	2.25	2.25	1.61		1.50				1.50	1.50		1.50	0.75	1.50
VII	ET 2434 -PE V: Wireless Sensor Networks	**76.45**	2.29	1.35	1.10						1.53	1.53		1.50	1.53	
VII	ET2435 – PE V : RF Circuit Design	**86.58**	2.60	2.32	2.77						1.73	1.73		1.73	1.73	
VII	ET2441-PE VI : CMOS VLSI Design	**76.31**	2.29	2.08	2.07		1.53				1.53	1.53		1.53	2.29	1.53
VII	ET2442– PE VI: Digital Image Analysis for Remote Sensing	**68.99**	2.07	1.93			1.38				1.38	1.38		1.38		1.38
VII	ET 2443- PE VI : Microwave Integrated circuits	**85.14**	2.55	2.52	2.52		1.68				0.85	1.70		1.70	1.70	1.68
VII	ET2444 – PE VI: Communication Networks	**70.88**	2.13	2.13	1.77						1.42	1.42		1.42	2.13	
VII	ET2446 – PE VI:PLCs& SCADA	**90.37**	2.71	2.79	1.86						1.81	1.81		1.81	1.81	
VII	ET2409: Mini Project	**75.82**	2.27	2.27	1.52	1.52	2.27	1.89	1.89	2.27	2.27	2.27	1.52	2.27	2.27	2.27

VII	ET2410: Campus Recrutment Training (CRT)	**91.41**	2.74	2.74			2.74		1.83	2.74	2.74	2.74		2.74	2.74	2.74
VIII	ET2452: Extra curricular Activity Evaluation / Internship	**67.10**	2.01	2.01	1.58	1.58	2.01	1.05	1.05	1.05	2.01	2.01	1.34	2.01	2.01	2.01
VII	ET2451 : Major Project	**84.29**	2.53	2.48	2.33	2.33	2.53	2.15	2.29	2.29	2.53	2.53	2.36	2.53	2.53	2.53

Evaluation of each PO & PSO

Weightage		PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8		PO9		PO10		PO11		PO12		PSO1		PSO2	
		T	A	T	A	T	A	T	A	T	A	T	A	T	A	T	A	T	A	T	A	T	A	T	A	T	A	T	A
80%	TH+PR	2.99	2.21	2.86	2.12	2.55	1.87	1.86	1.36	2.69	1.99	2.21	1.61	2.36	2.03	2.92	2.35	2.39	1.83	2.47	1.88	2.04	1.49	2.49	1.91	2.52	1.88	2.67	1.98
		74.03 %		**74.13 %**		**73.23 %**		**73.23 %**		**74.06 %**		**72.71 %**		**85.88 %**		**80.57 %**		**76.67 %**		**76.09 %**		**73.06 %**		**76.56 %**		**74.53 %**		**74.17 %**	
20%	Survey	3.00	2.41	3.00	2.26	3.00	2.30	3.00	2.44	3.00	2.53	3.00	2.47	3.00	2.45	3.00	2.39	3.00	2.54	3.00	2.47	3.00	2.49	3.00	2.49	3.00	2.52	3.00	2.57
		80.28 %		**75.41 %**		**76.73 %**		**81.46 %**		**84.22 %**		**82.30 %**		**81.81 %**		**79.67 %**		**84.59 %**		**82.47 %**		**83.07 %**		**83.02 %**		**83.85 %**		**85.55 %**	
Total		2.99	2.25	2.89	2.15	2.64	1.96	2.09	1.58	2.75	2.10	2.37	1.78	2.49	2.11	2.93	2.36	2.51	1.97	2.58	2.00	2.23	1.69	2.60	2.03	2.62	2.01	2.74	2.10
		75.28 %		**74.40 %**		**74.02 %**		**75.60 %**		**76.28 %**		**75.14 %**		**84.90 %**		**80.39 %**		**78.56 %**		**77.57 %**		**75.75 %**		**78.05 %**		**76.66 %**		**76.66 %**	

ii) Result analysis of subjects taught in previous semester

The overall and subject wise result analysis of Even Term 2021-22 has been shown to the BoS Experts.

S.N.	Semester	Pass %
1	IV	86.534
2	VI	90.526
3	VIII	100.00

As the results of all the semesters are above 80%, no action is requiring to be taken.

iii) Stake holders feedback on review and design of curriculum

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S.N.	Stakeholder	Feedback	Action Taken
1.	**Parents**	1. Update curriculum to cater to the needs of the future of the industry. Faculty must be empathetic towards students and provide an education instead of reading from PPT.	1. For catering future needs of industries specialized courses are included in the new SoE 22.Also judicious combination of PPT and Chalk and Duster is suggested to the faculty as per the requirement of the subject.
		2. Exam pattern should be changed, options in question papers required.	2. Sentiments of parents and students regarding options in question paper is communicated to DAM office.
		3. Improve library facility.	3. Information of online library and facilities available in the library are communicated to students. Reference material for GATE is purchased and made available in Departmental library
2	**Alumni**	1. Industry institution interaction should be strengthened	1. For strengthening ,Industry institution interaction , MoU are signed with 20 + Industries , industrial visits are organized, more than 25 technical activities including guest lectures, workshops, seminars, etc. are taken. In addition industry expert is member of BoS and industry; research centre electives are included in the SoE
		2. Compulsory seminar should be taken for developing self confidence	2. For overall personality, soft skills & self-confidence development of students YCAP Audit course is specially started from III semester itself.
		3. Core Companies should be visited to college for placements	3. Core companies like Cerium Systems, L&T Technologies Services and Blue berry semiconductor visited last year for campus placement. Efforts are also being taken by T & P office for campus placement of few more core companies
		4. Courses on currents trends in technical employability must be increased	4. The courses like Machine learning, IoT, PLCs and SCADA etc are introduced to improve technical employability of students.
3	**Employers**	1. Some Skill based content in curriculum to solve local and global problems must be added	1. To develop analytical and practical skills and solve local and global problems, activities like Mini Projects in all hardware labs, Industry based major projects and project based learning are added.

		2. Current syllabus must be updated with current trends in industry	2. For updating syllabus as per industry requirement, SoE is modified after every 04 years in consultation with Experts from Industries as well as inputs received from Employers, Alumni etc.
4	**Faculty** (points discussed in 25 BoS meeting)	**ET2385- PE II**: Principles of image processing: Following topics need to add in syllabus Unit 3: Filtering in spatial and frequency domain, Unit 5: Clustering Unit 6: Feature Extraction **ET2444 – PE VI**: Communication Networks: Following topics need to add in syllabus Unit 3: Congestion and Congestion Control Mechanism, Unit 4: Introduction, virtual circuit and datagram networks, internet protocol, routing algorithm, routing in the internet, broadcast and multicast routing **ET 2434 -PE V**: Wireless Sensor Networks: Unitization of syllabus is needed to revise. **ET2446 PE VI:** PLCs and SCADA : Unitization of syllabus is needed to revise.	Incorporated in the said syllabus.

iv) In Sem, End Sem and Exit feedback on Teaching Learning & curriculum

All feedback has been discussed with BoS Experts.

Semester	No. of faculty with feedback more than 90%		No. of faculty with feedback more than 80%		No. of faculty with feedback less than 80% and greater than 60%	
	In-sem	End-sem	In-sem	End-sem	In-sem	End-sem
IV	06/15	13/15	07/15	02/15	02/15	-
	40%	86.66%	46.66%	13.33%	13.33%	-
VI	07/13	03/09	06/13	06/09	-	-
	53.46%	33.33%	46.15%	66.66%	-	-

Since the feedback is more than 60% for all faculty members, no action is required to be taken.

26.05 To discuss and suggest the changes in the Scheme of Examination (known as Autonomous 2018 & B.Tech 2020) of the Undergraduate and Post graduate programs conducted under the Board. To approve and ratify SoE22 and all syllabi of B.Tech and M.Tech I & II year

- No Changes have been proposed in the Scheme of Examination 2018 of Undergraduate and Post graduate programs.
- The course Fundamentals of Internet of Things to be included as Open Elective I and Open Elective II in V semester and VI semester respectively of B.Tech 2020 has been proposed and approved by experts.
- The Experts approved and confirmed SoE 22 and II, III, IV semester syllabi of B.Tech and M.Tech I & II year.
- The Expert suggested following minor changes in syllabi of SoE22 B.Tech
  In the course Digital Logic Design Remove the topic Excess 3 code; modify the syllabus as per the Switching & Finite Automata Theory by Zvi Kohavi, Niraj K. Jha book.
- In the course Passive RF Circuit (M.Tech I sem course) experts suggested to swap unit 5 with Unit 6.

26.06 To discuss and suggest the minor changes in the syllabi of various courses in Autonomous 2018 & B.Tech 2020 Schemes of Undergraduate and Post graduate programs conducted under the Board.

No Changes have been proposed

26.07 To discuss and suggest the changes in the books/ Reference Books/ Literature Sources published in the syllabi of courses in various Schemes of Undergraduate and

Experts suggested changes in the books for the following courses

ET2201 Electronics devices and circuits :
The reference book Electronic Devices and Theory, BoyleStad, Nashelsky, 9th. Edition May 2010, PHI shifts to text book.

ET2252 Microcontroller & Interfacing:
To add The book Fundamentals of microcontrollers & applications in Embedded systems by Ramesh Gaonkar in the syllabus

Postgraduate Programs.

26.08 To discuss and approve the list of experiments, wherever there is a change, in the laboratory courses of Under-Graduate and Post Graduate programs.

Experts suggested modifying the experiment list for all lab courses of Under-Graduate and Post Graduate programs

26.09 To discuss and suggest the changes in the Academic Regulations governing the Undergraduate and Post graduate programs conducted under the Board.

No changes have been suggested

26.10 To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum.

26.11 To prepare and propose the panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Odd Term 2022-23

The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Odd Term 2022-23 have been prepared and proposed.

26.12 To prepare and propose the list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Odd Term 2022-23

The list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Odd Term 2022-23 have been prepared and proposed.

26.13 To prepare and propose the panel of internal and external examiners for the various laboratory and other non-theory courses at UG and PG levels that will be examined in End Semester Examination Odd Term 2022-23

The panel of internal and external examiners for the various laboratory and other non-theory courses at UG and PG levels that will be examined in End Semester Examination Odd Term 2022-23 have been prepared and proposed.

26.14 Preparation of Electronic question Bank UG courses according to SoE 2018.To review solutions to all questions of Electronic Question Banks for all courses.

Electronic question bank UG courses according to SoE 2018 are prepared/ updated. Solutions to all questions of Electronic Question Banks for all courses are reviewed.

26.15 To discuss and suggest the changes/additions/deletions/alterations in the existing Evaluation Process for theory and other courses.

No changes have been suggested

26.16 To discuss and propose scheme for Minor an Honor course and its syllabus. Discussed and proposed Certificate courses and value added courses in 2022-23.

Scheme for Honor course and its syllabus is proposed and discussed; minor Changes have been suggested by experts and were incorporated in Honors in Computer Vision & Automation.

In the course ETH 132 Industrial Automation and Robotics

- Changes in syllabus is below 20%
- Unitization of syllabus is revised

Following Certification courses and Value added courses were proposed and approved by experts.

- Image processing and Computer Vision Applications of duration 30 Hrs
- Advances in Embedded system and IoT of duration 30 Hrs
- Advanced CMOS VLSI Design of duration 30 Hrs

26.17 Any other matter with the permission of the Chair.

- It is suggested by the experts that every undergraduate course unit will not reflect Contemporary issues. hence it should be remove from each unit and "recent trend /topic related to course" should be added at the end of sixth unit.
- Through the observations on post graduate curriculum design, experts have recommended reconciled course curriculum as paragraph instead of unitized one.

Chairman was authorized to finalize the SOE.

The meeting concluded with thanks to the Experts.

Dr. M.S. Dorle
Member Secretary
BoS, ET

Dr. M.S. Narlawar
Chairman & HoD, ET

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Department of Electronics & Telecommunication Engineering

YCCE/ET/FORMAT/BOS/MOM/28

Minutes of the 28th BOS Meeting

Date: 22nd July 2023

The 28th meeting of the Board of Studies in Electronics & Telecommunication Engineering was held on Saturday, 22nd July 2023 at 10:00 am in the departmental Library ET, YCCE, Nagpur.

The meeting was attended by the following members of Board of Studies.

Sr. No.	Name	Signature
01	Dr.A.G.Keskar, Expert,VNIT, Nagpur	Absent
02	Dr. R. B. Deshmukh, Expert,VNIT, Nagpur	Present
03	Dr.S.L.Badjate ,VC Nominee, Principal S. B .Jain college of Engineering, Nagpur	Present
04	Mr. Ranjit Singh, Industry person, M.D. & CEO, Syslogix systems Pvt. Ltd, Nagpur	Present
05	Mr. Aniruddha Kalbande, Alumni	Present

S. No.	Name	Signature	S No.	Name	Signature
1	Dr. M. M. Mushrif	Present	15	M.S.Ghute	Absent
2	Dr.P.L.Zade	Present	16	S.S.Chiwande	Present
3	Dr.M.D. Chawhan	Absent	17	Dr.M.L.Keote	Present
4	R.P.Deshmukh	Present	18	Dr. P. D. Dorge	Present
5	Dr. P.W. Raut	Present	19	S.A.Desai	Present
6	Dr. D.B.Bhoyar	Present	20	Dr.V.D. Bondre	Present
7	K.P.Kamble	Present	21	Dr.B.Y. Masram	Present
8	Dr. Y.U.Chitriv	Present	22	Y. S. Kale	Absent
9	Dr. A.D.Belsare	Absent	23	V.B.Niranjane	Present
10	Dr. N.D.Rehpade	Present	24	A.A.Madankar	Absent
11	A.V.Choudhari	Present	25	D.K.Thote	Present
12	N.A.Pande	Present	26	M.S.Patil	Present
13	Dr. S.S.Khade	Present	27	Dr. R.S.Keote	Present
14	Dr.C.S.Gode	Present			

Approved By: BoS Electronics & Telecommunication Engg.

Leave of absence was granted to –

Sr. No.	Name
1	Dr.A.G.Keskar, Expert,VNIT, Nagpur
2	Dr.M.D. Chawhan ET,YCCE
3	M.S.Ghute ,ET,YCCE
4	Y. S. Kale ,ET,YCCE
5	A.A.Madankar, ET,YCCE

The following agenda points were discussed and deliberated in the meeting.

28.01 Welcome of new members.
BoS Chairman Dr. M. S. Narlawar welcomed all BoS members. The chairman also welcomed new members Dr. P.L. Zade and Mr. Anirudhha Kalbande Alumnus.

28.02 Installation of member Secretary.
No changes

28.03 Confirmation of minutes of previous Meeting and action taken report on decisions/suggestions of the previous meeting.
The minutes of the 27th BOS meeting held on, **23rd January 2023** in Electronics and Telecommunication Engineering Department were placed on the table and were confirmed unanimously.

28.04 To discuss and finalize the Scheme of Examination SoE 2023 of Electronics & Telecommunication Engineering Undergraduate programmes, framed as per NEP 20 Guidelines, issued by Government of Maharashtra through GR No: NEP-2022/(67/23) / DTE-2 dated 04.07.2023. To approve SoE23 and all syllabi of B.Tech I Year.

The Scheme of Examination SoE 2023 of Electronics & Telecommunication Engineering Undergraduate programme, framed as per NEP 20 Guidelines, issued by Government of Maharashtra through GR No: NEP-2022/(67/23) / DTE-2 dated 04.07.2023, has been discussed with BoS experts.

The guidelines created by the Dean (Academic Matters) in accordance with the GR and the key elements of the GR have been thoroughly examined. 176 credits in total have been allocated among the different course categories.

BoS experts appreciated the efforts taken by the department to formulate the SoE as per the NEP 2020 guidelines defined by GoM.

As per the suggestions of BoS experts, complete VIII semester must be provided with Internship as the students are busy as intern in the respective assigned firm and practically, it's become difficult for them to cope with both college and industry timings.

The suggestions of BoS experts have been forwarded to Dean Academic Matters for further approval.

Approved By: BoS Electronics & Telecommunication Engg.

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Department of Electronics & Telecommunication Engineering

28.05 To discuss and suggest the action taken on
i) Co/Po attainment of subjects taught in previous semester
ii) Result analysis of subjects taught in previous semester
iii) Stake holders feedback on review and design of curriculum
iv) In Sem, End Sem and Exit feedback on Teaching Learning & curriculum

i) Co/Po attainment of subjects taught in previous semester

Co/Po attainment of subjects taught in previous semester is in Progress.

ii) Result analysis of subjects taught in previous semester

The overall and subject wise result analysis of EVEN Term 2022-23 has been shown to the BoS Experts.

S.N.	Semester	Pass %
1	IV	**69.72**
2	VI	**79.07**
3	VIII	**100**

Course result with less than 75%

SN	SEM	Courses Name	Results (%)
1.	VI	ET 2363 PE I : Discrete Structure	70.27%

Action Taken:

1. Revision classes before MSEs will be taken for all the students.
2. Solving old MSE & ESE Question papers from students.

IV sem Result		
Range	**Name of Subject**	**Result**
Result between 75 to 80%	Microcontroller and Interfacing	79.05%
Result between 80 to 90 %	1.Advance Mathematical Technique 2. Electromagnetic Fields 3.Control system 4.Analog Communication	88.73% 87.56% 88.52% 84.13%

Approved By: BoS Electronics & Telecommunication Engg.

VI sem Result		
Range	**Name of Subject**	**Result**
Result between 80 to 90 %	Digital Signal Processing PE II : Antenna Theory & Design	84.31% 80.95%
Result above 90%	1.Fundamental of management 2. PE I : Microprocessor and Peripherals 3. PE I : Electronic Instrumentation 4. PE I : Object oriented programming 5. PE I : Fundamentals of Computing 6. PE II : Digital system Design 7. PE II : Internet of Things (IoT) 8.PE II : Optical Communication 9. PE II :Principles of image processing	94.88% 92.50% 95.35% 100% 100% 100% 100% 100% 95.35%

iii) Stake holders feedback on review and design of curriculum

S.N.	Stakeholder	Feedback	Action Taken
1	**Parents**	Provide internship to all students even if placed or not placed	Internship for non-placed students through MoUs signed industries, Internshala and AICTE internship portal is a done.
		College should conduct additional software courses required in industry	• Many value added courses are conducted in different departments which students can attend. • Many software courses such as OOPS, Machine learning, Fundamentals of computing are in the SoE.
2	**Alumni**	Focus on practical implementation to develop students skills	• Project Based Learning activity already taken for one course each in 4th and 6th semester • Mini projects are taken in hardware related laboratory
		Focus on programming languages & Include industry level topics on syllabus	• More professional elective courses aligned with industry are added in SoE through which industry based and programming skills will be enhanced. • In addition through Value Added Courses engaged by industry persons the students are made industry ready

		Must include proper training in MATLAB & Simulink	Through Value added and Certification course initiated for the students from 3rd sem itself they get appropriate training on MATLAB & Simulink
		Provide the software classes	YCAP is initiated from 3rd sem to groom software competencies of student
		Updation in certain course syllabi required	Not only every year syllabus is revised but also new courses are introduced to suit the current trends of industry
3	**Employers**	Current syllabus must be updated with current trends in industry	For updating syllabus as per industry requirement, SoE is modified after every 04 years in consultation with Experts from Industries as well as inputs received from Employers, Alumni etc.
4	**Faculty**	1) ET2254-Analog Communication The topic TV Fundamentals and digital satellite television needs to remove from syllabus. 2) ET 2443- PE VI: Microwave Integrated circuits Unit 2 need to split in two units and merge unit 5 and unit 6 to make one unit.	Incorporated in the said syllabus.
5	**Students**	Programming languages, Entrepreneurship related subjects should be added.	• Subject like Object Oriented Programming ,Algorithm and data structure, Python etc. were included in curriculum • Already department conducted many workshops through enterpreneurship cell for students. Also we have facility of Enterprenurship cell for students including management subjects.
		Lab classes should be given more importance so that we learn practical knowledge and projects development.	• In every lab course we have mini project and most of the Major Projects are Industry aligned to improve practical knowledge of the students

iv) In Sem, End Sem and Exit feedback on Teaching Learning & curriculum
All feedbacks have been discussed with BoS Experts.

Semester	No. of faculty with feedback more than 80%		No. of faculty with feedback less than 80% and greater than 60%		No. of faculty with feedback less than 60%	
	In-sem	End-sem	In-sem	End-sem	In-sem	End-sem
IV	13/13	13/13	NIL	NIL	NIL	NIL
	100%	100%	-	-	-	-
VI	14/14	14/14	NIL	NIL	NIL	NIL
	100%	100%	-	-	-	-

28.06 To discuss and suggest the minor changes in the syllabi of various courses in B.Tech 2020 & B.Tech 2022 Schemes of Undergraduate and Post graduate programs conducted under the Board.

No changes were proposed by any members in syllabi of various courses in B.Tech 2020 & B.Tech 2022 Schemes of the Undergraduate and Post graduate programs conducted under the Board.

28.07 To discuss and suggest the changes in the books/ Reference Books/ Literature Sources Published in the syllabi of courses in various Schemes of Undergraduate and Postgraduate Programs.

No Changes were proposed by any members in the books/ Reference Books/ Literature Sources Published in the syllabi of courses in various Schemes of Undergraduate and Postgraduate Programs.

28.08 To discuss and approve the list of experiments, wherever there is a change, in the laboratory courses of Under-Graduate and Post Graduate programs.

No Changes were proposed by any members in the laboratory courses of Under-Graduate and Post Graduate programs.

28.09 To discuss and suggest the changes in the Academic Regulations governing the Undergraduate and Post graduate programs conducted under the Board.

No suggestions were proposed by any members. Finally, it was unanimously resolved that the existing Academic Regulations governing the Undergraduate and Post graduate programs be continued without any corrections.

28.10 To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum.

28.11 To prepare and propose the panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Odd Term 2022-23

The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Odd Term 2023-24 will be decided after the notification received from CoE.

28.12 To prepare and propose the list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Odd Term 2022-23

The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Odd Term 2023-24 will be decided after the notification received from CoE.

28.13 To prepare and propose the panel of internal and external examiners for the various laboratory and other non-theory courses at UG and PG levels that will be examined in End Semester Examination Odd Term 2022-23

The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Odd Term 2023-24 will be decided after the notification received from CoE.

28.14 Preparation of Electronic question Bank UG courses according to B.Tech SoE 2020 & 2022 To review solutions to all questions of Electronic Question Banks for all courses

Electronic question bank UG courses according to B.Tech SoE 2020 are prepared/ updated. Solutions to all questions of Electronic Question Banks for all courses are reviewed.
Preparation of Electronic question Bank UG courses according to B.Tech. SoE 2022 is in process.

28.15 To discuss and suggest the changes/additions/deletions/alterations in the existing Evaluation Process for theory and other courses.

No changes have been suggested.

28.16 To discuss and propose scheme for Minor and Honor course and its syllabus. To Discuss and propose Certificate courses and value-added courses in odd term 2023-24.

The Department Honor program titled **Computer Vision and Automation** is renamed as **Computational Intelligence for Automation** from the session 2023-24
The course has been in collaboration with Fireblaze Technologies Private Ltd. Nagpur
No changes were proposed for Honor course syllabi.

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Department of Electronics & Telecommunication Engineering

Following Certification courses and Value added courses were proposed and approved by experts.

SN	Title of Course	Sem	Course Hours	Mode Of Training	Proposed Dates of Conduction & Total Hours In Course	No Of Students Expected To Attend Cert / Vac
1	Hands on training on tools used for mixed signal design and it's application	V & VII	30 Hrs	Offline	24-28 July 2023	40
2	Machine Learning with practical application using Python	V & VII	30 Hrs	Offline	14-19 July 2023	50
3	Wireless Mobile Communication & Cyber Security	V & VII	30 Hrs	Offline	2-6 August 2023	30

28.17 Any other matter with the permission of the Chair.
All suggestions have been accepted and are being forwarded to the Academic Council for consideration.
The meeting concluded with thanks to the Experts.

Dr. M.S. Dorle
Member Secretary
BoS, ET

Dr. M.S. Narlawar
Chairman & HoD, ET

Approved By: BoS Electronics & Telecommunication Engg.

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Department of Electronics & Telecommunication Engineering

YCCE/ET/FORMAT/BOS/MOM/27

Minutes of the 27th BOS Meeting

Date: 23rd January 2023

The 27th meeting of the Board of Studies in Electronics & Telecommunication Engineering was held on Monday, 23rd January 2023 at 3:00 pm in the departmental Library ET, YCCE, Nagpur.

The meeting was attended by the following members of Board of Studies.

Sr. No.	Name	Signature
01	Dr.A.G.Keskar, Expert,VNIT, Nagpur	Present
02	Dr. R. B. Deshmukh, Expert,VNIT, Nagpur	Present
03	Dr.S.L.Badjate ,VC Nominee, Principal S. B .Jain, Nagpur	Absent
04	Mr. Ranjit Singh, Industry person, M.D. & CEO, Syslogix systems Pvt. Ltd, Nagpur	Absent
05	Mr. Sagar Ghormade, PG Alumni	Absent

S. No.	Name	Signature	S No.	Name	Signature
1	Dr. M. M. Mushrif	Present	15	S.S.Chiwande	Present
2	Dr.M.D. Chawhan	Present	16	Dr.M.L.Keote	Present
3	R.P.Deshmukh	Present	17	Dr. P. D. Dorge	Present
4	Dr. P.W. Raut	Present	18	S.A.Desai	Present
5	Dr. D.B.Bhoyar	Present	19	Dr.V.D. Bondre	Present
6	K.P.Kamble	Present	20	Dr.B.Y. Masram	Present
7	Dr. Y.U.Chitriv	Absent	21	Y. S. Kale	Present
8	Dr. A.D.Belsare	Present	22	V.B.Niranjane	Present
9	Dr. N.D.Rehpade	Present	23	A.A.Madankar	Present
10	A.V.Choudhari	Present	24	R.P.Kamdi	Present
11	N.A.Pande	Present	25	D.K.Thote	Present
12	Dr. S.S.Khade	Present	26	M.S.Patil	Present
13	Dr.C.S.Gode	Present	27	Dr. R.S.Keote	Present
14	M.S.Ghute	Present	28	S.R.Nitnaware	Present

Approved By: BoS Electronics & Telecommunication Engg.

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Department of Electronics & Telecommunication Engineering

Leave of absence was granted to –

Sr. No.	Name
1	Dr.S.L.Badjate ,VC Nominee, Principal S. B .Jain, Nagpur
2	Mr. Ranjit Singh, Industry person, M.D. & CEO, Syslogix systems Pvt. Ltd, Nagpur
3	Mr. Sagar Ghormade, PG Alumni
4	Dr. Y.U.Chitriv, ET,YCCE

The following agenda points were discussed and deliberated in the meeting.

27.01 Welcome of new members.

BoS members have been welcomed by the Chairman.

27.02 Installation of member Secretary.

No changes

27.03 Confirmation of minutes of previous Meeting and action taken report on decisions/suggestions of the previous meeting.

The minutes of the 26th BOS meeting held on, **3rd August 2022** in Electronics and Telecommunication Engineering Department were placed on the table and were confirmed unanimously.

27.04 To discuss and suggest the action taken on

i) Co/Po attainment of subjects taught in previous semester
ii) Result analysis of subjects taught in previous semester
iii) Stake holders feedback on review and design of curriculum
iv) In Sem, End Sem and Exit feedback on Teaching Learning & curriculum

i) Co/Po attainment of subjects taught in previous semester

Co/Po attainment of subjects taught in previous semester is in Progress.

ii) Result analysis of subjects taught in previous semester

The overall and subject wise result analysis of ODD Term 2022-23 has been shown to the BoS Experts.

S.N.	Semester	Pass %
1	VII	70.20
2	V	54.79

Approved By: BoS Electronics & Telecommunication Engg.

Courses results with less than 75%

SN	SEM	Courses Name	Results (%)
1.	V	ET 2301 AIC	70.18
2.		ET 2304 S&S	60.27
3.	VII	ET2434 WSN	57.45
4.		ET 2441 CMOS VLSI DESIGN	68
5.		WT 2442 DIARS	60

Action Taken:
1. Remedial classes were taken in all the courses for students with less than 40% marks.
2. Revision classes before MSEs will be taken for all the students from EVEN 2022-23.
3. Solving old MSE & ESE Question papers from students

iii) Stake holders feedback on review and design of curriculum

S.N.	Stakeholder	Feedback	Action Taken
1.	**Parents**	Provide internship to all students even if placed or not placed	Internship for non-placed students through MoUs signed industries, Internshala and AICTE internship portal.
		College should conduct additional software courses required in industry	• Many value added courses are conducted in different departments which students can attend. • Many software courses such as OOPS, Machine learning, Fundamentals of computing are in the SoE.
		Students should be encouraged for languages like C++, Java, Python and how to work in IT companies	Courses based on C++ and Python included in SoE
2	**Alumni**	Focus on practical implementation to develop students skills	• Project Based Learning activity already taken for one course each in 4th and 6th semester • Mini projects are taken in hardware related laboratory
		Focus on programming languages & Include industry level topics on syllabus	• More professional elective courses aligned with industry are added in SoE through which industry based and programming skills will be enhanced.

			• In addition through Value Added Courses engaged by industry persons the students are made industry ready
		Must include proper training in MATLAB & Simulink	Through Value added and Certification course initiated for the students from 3rd sem itself they get appropriate training on MATLAB & Simulink
		Provide the software classes	YCAP is initiated from 3rd sem to groom software competencies of student
		Updation in certain course syllabi required	Not only every year syllabus is revised but also new courses are introduced to suit the current trends of industry
3	**Employers**	Current syllabus must be updated with current trends in industry	For updating syllabus as per industry requirement, SoE is modified after every 04 years in consultation with Experts from Industries as well as inputs received from Employers, Alumni etc.
4	**Faculty**	The course Fundamentals of Internet of Things to be included as Open Elective I and Open Elective II in V semester and VI semester respectively of B.Tech 2020 has been proposed and approved by experts.	Incorporated in the said B.Tech SoE 2020.
5	**Students**	• Programming languages, Entrepreneurship related subjects should be added. • Lab classes should be given more importance so that we learn practical knowledge and projects development.	• Subject like Object Oriented Programming ,Algorithm and data structure, Python etc. were included in curriculum • Already department conducted many workshops through enterpreneurship cell for students. Also we have facility of Enterprenurship cell for students including management subjects. • In every lab course we have mini project and most of the Major Projects are Industry aligned to improve practical knowledge of the students

iv) In Sem, End Sem and Exit feedback on Teaching Learning & curriculum

All feedbacks have been discussed with BoS Experts.

Semester	No. of faculty with feedback more than 80%		No. of faculty with feedback less than 80% and greater than 60%		No. of faculty with feedback less than 60%	
	In-sem	End-sem	In-sem	End-sem	In-sem	End-sem
V	11/12	11/12	1/12	1/12	NIL	NIL
	91.66%	91.66%	8%	8%	-	-
VII	28/31	26/31	3/31	5/31	NIL	NIL
	90.32%	83.87%	9%	16.2%	-	-

No Faculty was having feedback less than 60%.

27.05 To discuss and suggest the changes in the Scheme of Examination (known as Autonomous B.Tech 2020 & SoE 2022) of the Undergraduate and Post graduate programs conducted under the Board. To approve and ratify SoE22 and all syllabi of B.Tech and M.Tech I & II year

- No Changes have been suggested in the Scheme of Examination (known as Autonomous B.Tech 2020 & SoE 2022) of the Undergraduate and Post graduate programs.
- The Experts approved and confirmed SoE 22 and II, III, IV semester syllabi of B.Tech and M.Tech I & II year.

27.06 To discuss and suggest the minor changes in the syllabi of various courses in B.Tech 2020 Schemes of Undergraduate and Post graduate programs conducted under the Board.

The Expert suggested and approved following minor changes in syllabi of B.Tech 2020

1) In the course ET2254 - Analog Communication
   Remove the topics TV Fundamentals and digital satellite television.
2) In the course ET 2443- PE VI: Microwave Integrated circuits
   Split unit 2 in two units and merge unit 5 and unit 6 to make one unit.

27.07 To discuss and suggest the changes in the books/ Reference Books/ Literature Sources Published in the syllabi of courses in various Schemes of Undergraduate and Postgraduate Programs.

No Changes have been suggested

27.08 To discuss and approve the list of experiments, wherever there is a change, in the

laboratory courses of Under-Graduate and Post Graduate programs.

Experts suggested modifying the experiment list for ET 2255- lab Analog Communication

27.09 To discuss and suggest the changes in the Academic Regulations governing the Undergraduate and Post graduate programs conducted under the Board.

No changes have been suggested

27.10 To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum.

27.11 To prepare and propose the panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Even Term 2022-23

The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Even Term 2022-23 have been prepared and proposed.

27.12 To prepare and propose the list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Even Term 2022-23

The list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Even Term 2022-23 have been prepared and proposed.

27.13 To prepare and propose the panel of internal and external examiners for the various laboratory and other non-theory courses at UG and PG levels that will be examined in End Semester Examination Even Term 2022-23

The panel of internal and external examiners for the various laboratory and other non-theory courses at UG and PG levels that will be examined in End Semester Examination Even Term 2022-23 have been prepared and proposed.

27.14 Preparation of Electronic question Bank UG courses according to B.Tech SoE 2020 & 2022.To review solutions to all questions of Electronic Question Banks for all courses.

Electronic question bank UG courses according to B.Tech SoE 2020 are prepared/ updated. Solutions to all questions of Electronic Question Banks for all courses are reviewed.

27.15 To discuss and suggest the changes/additions/deletions/alterations in the existing

Evaluation Process for theory and other courses.

No changes have been suggested.

27.16 To discuss and propose scheme for Minor and Honor course and its syllabus. Discussed and proposed Certificate courses and value added courses in 2022-23.

No changes have been proposed for Honor course and its syllabi.

Following Certification courses and Value added courses were proposed and approved by experts.

- VLSI front end and back end design for Industry of duration 30 Hrs
- Machine Learning with practical application using Python of duration 30 Hrs
- Advanced CMOS VLSI Design of duration 30 Hrs

27.17 Any other matter with the permission of the Chair.

Chairman was authorized to finalize the SOE.

The meeting concluded with thanks to the Experts.

Dr. M.S. Dorle
Member Secretary
BoS, ET

Dr. M.S. Narlawar
Chairman & HoD, ET

Approved By: BoS Electronics & Telecommunication Engg.

Computer Technology

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Department of Computer Technology

Boards of Studies in Computer Technology

Minutes of the Meeting No. 29

Date: 17th Aug 2022

Meeting no. 29 of the Board of Studies was held on 17th Aug. 2022 at 10.30 A.M. in the Department Library of Computer Technology Department.

The meeting was attended by the following expert members of BoS.

External Members:

S. N.	Name of Honorable External Member	Expert From	Signature
1.	Prof. (Dr.) U. A. Deshpande, Professor, CSE, VNIT, Nagpur	Academia	
2.	Mr. Ajit Dharmik, Director, 6 Simplex Software Solutions Pvt. Ltd., Nagpur	Industry	
3.	Mr. Vaibhav Deshpande, Assistant Professor, CE Dept. SVPCET, Nagpur	PG Alumni	Leave of absence granted

BoS Members:

Sr. No.	Name of Member	Sr. No.	Name of Member
1.	Dr. R. D. Wajgi	2.	Prof. (Dr.) Manali Kshirsagar *
3.	Dr. N. V. Thakur	4.	Dr. Arvind Bhagat Patil *
5.	Dr. Kavita Singh *	6.	Dr.S.J.Karale
7.	Dr.Gauri Dhopavakar	8.	Dr. P. Deshkar
9.	Gauri Chaudhary *	10.	Mrs. Smita R.Kapse
11.	Ms.R.S.Khedgaonkar	12.	Mr. P.V. Barekar
13.	Mr. Ganesh Yenurkar	14.	Mr.Nilesh Sambhe
15.	Mrs. S. S. Thombre	16.	Mr. N.S. Mangrulkar
17.	Mr. R. S. Bhanuse	18.	Mr. G. Vaidya
19.	Mrs. Neha Kadu	20.	Mr.Sanjay Pande
21.	Mrs.P.Moon	22.	Ms. Charvi Suri
23.	Mrs.S.Gabhane	24.	Ms.A.Pimpalkar
25.	Mrs.S.Jain	26.	Mrs.A. Shahakar
27.	Ms.Oshin Shende	28.	Mrs.L.R.Tembhare
29.	Mrs.S.Kawale	30.	Ms.S.Sarwate
31.	Ms.S.Roakde	*Leave of absence granted	

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Department of Computer Technology

The following agenda points were deliberated in the meeting

29.01	Welcome of new members **Dr. R. D. Wajgi welcome all New Members**
29.02	Installation of member Secretary **Dr. R. D. Wajgi welcome new member secretary Prof. (Dr.) N. V. Thakur**
29.03	To confirm the minutes of 28th Meeting of BoS. **The minutes of the 28th Meeting of BoS in Computer Technology were placed on the table by Chairman Dr. R. D. Wajgi were confirmed unanimously.**
29.04	To discuss and suggest the action taken on **i) Co/Po attainment of subjects taught in previous semester**

Type		Direct		Indirect		Total	
Weightage		**80%**		**20%**			
Attainment Parameters		**TH+PR**		**Survey**			
PO1	**T**	2.64	90.25%	3.00	100.00%	2.82	**88.76 %**
	A	2.38		**3.00**		**2.51**	
PO2	**T**	2.54	87.60%	3.00	80.00%	2.77	**81.55 %**
	A	2.22		**2.40**		**2.26**	
PO3	**T**	2.54	84.57%	3.00	83.33%	2.77	**80.06 %**
	A	2.15		**2.50**		**2.22**	
PO4	**T**	2.38	84.16%	3.00	86.67%	2.69	**78.85 %**
	A	2.00		**2.60**		**2.12**	
PO5	**T**	2.71	84.64%	3.00	83.33%	2.86	**81.81 %**
	A	2.30		**2.50**		**2.34**	
PO6	**T**	1.97	79.67%	3.00	86.67%	2.48	**71.41 %**
	A	1.57		**2.60**		**1.77**	
PO7	**T**	1.88	115.73%	3.00	91.67%	2.44	**93.78 %**
	A	2.17		**2.75**		**2.29**	
PO8	**T**	1.92	92.89%	3.00	91.67%	2.46	**80.31 %**
	A	1.78		**2.75**		**1.97**	
PO9	**T**	2.31	94.95%	3.00	93.33%	2.66	**87.21 %**
	A	2.20		**2.80**		**2.32**	

PO10	**T**	1.72	93.84%	3.00	91.67%	2.36	**78.05 %**
	A	1.62		**2.75**		**1.84**	
PO11	**T**	2.39	105.31%	3.00	93.33%	2.69	**95.48 %**
	A	2.52		**2.80**		**2.57**	
PO12	**T**	2.46	90.88%	3.00	91.67%	2.73	**85.65 %**
	A	2.23		**2.75**		**2.34**	
PSO1	**T**	2.64	87.69%	3.00	93.33%	2.82	**85.49 %**
	A	2.31		**2.80**		**2.41**	
PSO2	**T**	2.37	86.08%	3.00	91.11%	2.69	**81.18 %**
	A	2.04		**2.73**		**2.18**	

Improvement needed for PO6, PO9, PO10

ii) Result analysis of subjects taught in previous semester

Sr. No.	Semester	Total Appeared	Total Passed	Pass %
1.	IV	151	122	80.75
2.	VI	158	141	89.24
3.	VII	154	154	100

iii) Stake holder's feedback on review and design of curriculum

Stakeholder	Suggestions given	Action taken
Alumni Feedback	Courses can be added : • Big Data • Java • Cloud Computing • AIML • Sales force • Crypto chain/Blok chain • New Technologies (SAP) • Data Science **More focus Practical**	• Cloud Computing is already included in SoE 2018 • Salesforce is already included in SoE 2018 • Student Development Program on Blockchain technology is conducted • Value Added Course is planned for 2022-23 session on SAP **(Systems Applications and Products in data processing)** • Data Science related courses like MFDA, BI, ML, Elements of AIML etc. are included in SoE22 •
Employer Feedback	Courses can be added: • Cyber Security specialization course	• Communication related to syllabus of Cyber Security aligned with industry is ongoing • Cyber Physical Systems course is included in SoE22 as PE

	Faculty Feedback	Courses Need Modification • Python Programming Lab : need more hours • Essentials of IT • Data Mining • Computer Architecture And Organization • Introduction to Salesforce • Design Patterns	• Incorporated in SoE22 • Modifications/revisions are done in association with concerned course teachers

iv) In Sem, End Sem and Exit feedback on Teaching Learning & curriculum

Sr. No.	In Sem (No. of Faculty)	End Sem (No. of Faculty)
>=80 %	21	22
<=60%	01	NIL

29.05 To discuss and suggest the changes in the Scheme of Examination (known as Autonomous 2018 and Autonomous 2020 of the Undergraduate and Post graduate programs conducted under the Board . To approve and ratify SoE22 and all syllabi of B.Tech and M.Tech.

Suggestions for SoE Autonomous 2018 UG :

- **Syllabus of Web Technology, DBMS, Cloud Computing should be revised**
- **UI/UX design to be introduced as PE**

Suggestions for SoE 2022 UG :

- **Tutorial to be added**
- **Syllabus of Elements of AIML, Web Technology Lab, DMPT, MFDA, DBMS, Cloud Computing , AWT Lab should be revised**
- **Distributed System content should be added in Cloud Computing Course**
- **Software Testing Course should be added in SoE 2022**
- **Remove Linear Programming and Operation Research Courses and make it as the part of Optimization and rename the Course as Operations Research and Optimization**
- **Balancing and distribution of credits should be done properly**

No Change in SoE of PG

29.06 To discuss and suggest the minor changes in the syllabi of various courses in Autonomous Autonomous 2018 Schemes of undergraduate and post graduate programs conducted under the Board.

	• **Update the syllabus content of DBMS with advanced SQL with cloud instances, Postgresql to be included in DBMS Lab** • **Add distributed system concepts in Cloud Computing Course, and Jio cloud, Open stack to be explored in lab** • **Update the content of Web Technology Lab: Remove asp.net and add javascript, typescript along with existing HTML and CSS in Web Technology Lab** • **Nodejs to be introduced in AWT course**
29.07	To discuss and suggest the changes in the books/ Reference Books/ Literature Sources published in the syllabi of courses in various Schemes of Undergraduate and Postgraduate Programs. **Following Books should be added as the Text and Reference Books for the concerned Courses:** • **Mathematics for Computer Science by Albert Mayer** • **Introduction to Linear Algebra by Gilbert Strang** • **Deep Learning using Python by François Chollet** • **Symbolic Logic and Mechanical Theorem Proving by Chin-Liang Chang, Richard Lee**
29.08	To discuss and approve the list of experiments, wherever there is a change, in the laboratory courses of Under and Post Graduate programs. • **Lab designing in collaboration with industry experts** • **Application-based practical list to be prepared for all courses**
29.09	To discuss and suggest the changes in the Academic Regulations governing the Undergraduate and Post graduate programs conducted under the Board. • **50:50 for Theory evaluation and 60:40 for Lab evaluation** • **Industry experts can be invited for External evaluation during ESE practical examination** • **Per course one external paper setter is required**
29.10	To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum. **Suggested new courses are:** • **Technical Writing** • **Ethics in Engineering Practice /Professional Ethics**
29.11	To prepare and propose the panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester

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	Examination of Odd Term 2022-23. **The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs for End Semester Examination of Odd Term 2022-23 was constituted.**
29.12	To prepare and propose the list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Odd Term 2022-23. **The panel of paper setters, Moderators and Valuers for the various theory courses at Postgraduate programs for End Semester Examination of Odd Term 2022-23 was constituted.**
29.13	To prepare and propose the panel of internal and external examiners for the various laboratory and other non-theory courses at UG and PG levels that will be examined in End Semester Examination Odd Term 2022-23. **The panel of internal and external examiners for the various laboratory courses at UG and PG levels for End Semester Examination of Odd Term 2022-23 is ongoing.**
29.14	Preparation of Electronic question Bank UG courses according to SoE 2018 To review solutions to all questions of Electronic Question Banks for all courses **Preparation of Electronic question Bank for all semesters is ready** **Solutions of few courses is ready and few courses partially ready**
29.15	To discuss and suggest the changes/additions/deletions/alterations in the existing Evaluation Process for theory and other courses. • **50:50 for Theory evaluation and 60:40 for Lab evaluation** • **For lab it can be 80: 20 or 100 marks based on continuous assessment** • **External evaluation of lab can be done by industry experts** • **Lab designing can be done in collaboration with industry experts**
29.16	To discuss and propose scheme for Minor an Honor course and its syllabus. Discussed and proposed Certificate courses and value added courses in 2022-23. **Suggestions for Minor in CSE** • **In place of Operating System, Object Oriented Programming is added in the Minor scheme for 5th semester.** **Names of the Honor Programs are changed, and its syllabus is modified accordingly.** **New proposed names of the Honor Program are** • **Honors in Machine Learning Specialization**

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	• **Honors in Data Science** • **Honors in AI (NPTEL)** **Proposed list of Value-added courses:** • **Advancement in Image and Video Processing** • **Advancement in AI technologies** • **SAP (Systems Applications and Products in data processing)** • **Data Analytics and Visualization**
29.17	Any other matter with the permission of the Chair **Formal Thanks to External Experts on behalf of the BoS Chairman, BoS Members, and member secretary.**

The meeting concluded by vote of thanks by chairperson, BoS of Computer Technology

Prof. N.V.Thakur
Member Secretary
BoS Computer Technology

Dr. R. D. Wajgi
Chairperson
BoS Computer Technology

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Department of Computer Technology

Boards of Studies in Computer Technology

Minutes of the Meeting No. 30

Date: 4th Feb 2023

Meeting no. 30 of the Board of Studies was held on 4th Feb 2023 at 10.00 A.M. in the Department Library of Computer Technology Department.

The meeting was attended by the following expert members of BoS.

External Members:

S. N.	Name of Honorable External Member	Expert From	Signature
1.	Prof. Dr. U. A. Deshpande, Professor, CSE, VNIT, Nagpur	Academia	Leave of absence granted
2.	Prof. Dr. D. S. Adane, Professor, RKNECE,Nagpur	VC Nominee	
2.	Mr. Ajit Dharmik, Director, 6 Simplex Software Solutions Pvt. Ltd., Nagpur	Industry	
3.	Mr. Vaibhav Deshpande, Assistant Professor, CE Dept. SVPCET, Nagpur	PG Alumni	

BoS Members:

Sr. No.	Name of Member	Sr. No.	Name of Member
1.	Dr. R. D. Wajgi	2.	Prof. (Dr.) Manali Kshirsagar *
3.	Dr. N. V. Thakur	4.	Dr. Arvind Bhagat Patil
5.	Dr. Kavita Singh	6.	Dr.S.J.Karale*
7.	Dr.Gauri Dhopavakar	8.	Dr. P. Deshkar
9.	Gauri Chaudhary *	10.	Mrs. Smita R.Kapse
11.	Ms.R.S.Khedgaonkar	12.	Mr. P.V. Barekar*
13.	Mr. Ganesh Yenurkar*	14.	Mr.Nilesh Sambhe*
15.	Mrs. S. S. Thombre	16.	Mr. N.S. Mangrulkar
17.	Mr. R. S. Bhanuse	18.	Mr. G. Vaidya
19.	Mrs. Neha Kadu	20.	Mr.Sanjay Pande
21	Mrs.P.Moon	22.	Ms. Charvi Suri
23.	Mrs.S.Gabhane	24.	Ms.A.Pimpalkar
25.	Mrs.S.Jain	26.	Mr.A.Arjunkar
27.	Mrs.S.Kawale	28.	Mrs.L.R.Tembhare
29.	Mrs.S.Sahare	30.	Ms.S.Sarwate
31.	Mrs.P.Bainalwar	32	Ms.S.Borkar
		*Leave of absence granted	

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Department of Computer Technology

The following agenda points were deliberated in the meeting

30.01	Welcome of new members **Dr. R. D. Wajgi welcome all New Members**
30.02	Installation of member Secretary
30.03	To confirm the minutes of 29th Meeting of BoS. **The minutes of the 29th Meeting of BoS in Computer Technology were placed on the table by Chairman Dr. R. D. Wajgi were confirmed unanimously.**
30.04	To discuss and suggest the action taken on i. **To discuss and suggest the action taken on PO-CO Analysis and attainment** **Ongoing** ii. **Stake holder's feedback on review and design of curriculum**

Stakeholder	Suggestions given	Action taken
Alumni Feedback	Contents can be added : • React JS, Node JS • Data Security • Angular JS • Java • MongoDB	• VAC conducted on Angular 12 • 2 Days SDP on Java conducted • Case study on no SQL database added in DBMS
Faculty Feedback	Courses Need Modification • Web Technology • DBMS • CAO • CN	• Incorporated in SoE22 • Modifications/revisions are done in association with concerned course teachers

iii. **In Sem, End Sem and Exit feedback on Teaching Learning & curriculum**

Sr. No.	In Sem (No. of Faculty)	End Sem (No. of Faculty)
>=80 %	29	30
<=60%	01	NIL

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	iv. Result analysis of subjects taught in previous semester.

Sr. No.	Semester	Total Appeared	Total Passed	Pass %
1.	V	148	121	81.76
2.	VII	156	144	92.31

30.05	To discuss and suggest the changes in the Scheme of Examination (known as Autonomous B.Tech 2020 & SoE 2022) of the Undergraduate and Post graduate programs conducted under the Board. To approve and ratify SoE22 and all syllabi of B.Tech / M.Tech I & II year **Suggestions for SoE Autonomous 2020 UG :** • **Syllabus of Advanced Data Structures, DBMS, Web Technology, Computer Architecture and Organization, Computer Network should be revised,.** **Suggestions for SoE 2022 UG : Final Audit course for SoE 2022** **III rd Sem Audit course on Document Presentation and Computation.** **IV th Sem Audit Course on Data Visualization** **No Change in SoE of PG**
30.06	To discuss and suggest the minor changes in the syllabi of various courses in BTech SoE 2020 Schemes of undergraduate and post graduate programs conducted under the Board. • **Syllabus of Advanced Data Structures, DBMS, Web Technology, Computer Architecture and Organization, Computer Network should be revised.**
30.07	To discuss and suggest the changes in the books/ Reference Books/ Literature Sources published in the syllabi of courses in various Schemes of Undergraduate and Postgraduate Programs. **No change**
30.08	To discuss and approve the list of experiments, wherever there is a change, in the laboratory courses of Under and Post Graduate programs. • **Add one Practical on Protocol Design (SNMP) in Computer Network**
30.09	To discuss and suggest the changes in the Academic Regulations governing the Undergraduate and Post graduate programs conducted under the Board. **No Change**
30.10	To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum.

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	No Change
30.11	To prepare and propose the panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Odd/Even Term 2022-23. **The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs for End Semester Examination of Odd Term First Year and III Sem 2022-23 was constituted and Even Term 2022-23 is ongoing.**
30.12	To prepare and propose the list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Odd/Even Term 2022-23. **The panel of paper setters, Moderators and Valuers for the various theory courses at Postgraduate programs for End Semester Examination of Odd Term First Year and III Sem 2022-23 was constituted and Even Term 2022-23 is ongoing.**
30.13	To prepare and propose the panel of internal and external examiners for the various laboratory and other non-theory courses at UG and PG levels that will be examined in End Semester Examination Odd/Even Term 2022-23. **The panel of internal and external examiners for the various laboratory courses at UG and PG levels for End Semester Examination of Odd Term First Year 2022-23 is ongoing.**
30.14	Preparation of Electronic question Bank UG courses according to SoE 2020 and SoE2022 To review solutions to all questions of Electronic Question Banks for all courses **Preparation of Electronic question Bank for all semesters is ready** **Solutions of few courses is ready and few courses partially ready** **EQB with Solution of newly introduced courses and PE is ongoing** **Total Core Courses of Department : 17** **Total Professional Elective courses : 09**

Sr.No	Semester	Course Code	Title of the course	Type of course PC/PE	Remarks	
					EQB	Solution
1.	3rd Sem	CT2201	CAO	PC	Available	Available
2.	3rd Sem	CT2202	DS	PC	Available	Available
3.	3rd Sem	CT2204	OOP	PC	-	Available
4.	4th Sem	CT2251	OS	PC	Available	Available
5.	4th Sem	CT2253	ADS	PC	Available	Available
6.	4th Sem	CT2255	MFDA	PC	-	-

7.	4th Sem	CT2257	DBMS	PC	Available	Available
8.	5th Sem	CT2301	CN	PC	Available	Available
9.	5th Sem	CT2303	TFCS	PC	Available	Available
10.	6th Sem	CT2351	DAA	PC	Available	Available
11.	6th Sem	CT2353	LP	PC	Available	Available
12.	6th Sem	CT2355	SE	PC	Available	Available
13.	7th Sem	CT2401	AI	PC	Available	Available
14.	7th Sem	CT2403	NS	PC	Available	Available

Sr.No	Semester	Course Code	Title of the course	Type of course PC/PE	Remarks	
					EQB	Solution
1.	5th Sem	CT2313	MOS	PE	Available	-
2.	6th Sem	CT2361	DIP	PE	Available	Available
3.	6th Sem	CT2365	BI	PE	Available	-
4.	6th Sem	CT2364	IoT	PE	Available	Available
5.	7th Sem	CT2411	NNFL	PE	Available	Available
6.	7th Sem	CT2415	BI	PE	Available	-
7.	7th Sem	CT2425	ML	PE	Available	Available
8.	7th Sem	CT2435	CC	PE	Available	Available
9.	7th Sem	CT2412	AWN	PE	Available	Available

30.15 To discuss and suggest the changes/additions/deletions/alterations in the existing Evaluation Process for theory and other courses.

- **No Change**

30.16 To discuss and propose scheme for Minor an Honor course and its syllabus. Discussed and proposed Certificate courses and value added courses in Even Term 2022-23.

Change the Name of Course Database modeling as Data Modeling

NPTEL course can be added for Honors Program

Seminar-Workshop-Training programming conducted from July 2022 to January 2023

SN	Title	Type	Date	Beneficiary
1.	Guest Lecture on Engineering Mathematics	**Guest Lecture (GATE)**	31/01/2022	32
2.	Coding Olympiad	**Coding Contest**	24/01/2023	277
3.	Guest Lecture on Algorithms	**Guest Lecture (GATE)**	20/01/2022	32
4.	Guest Lecture on Programming and Data Structure	**Guest Lecture (GATE)**	20/01/2022	32
5.	Guest Lecture on Computer Networks	**Guest Lecture (GATE)**	19/01/2022	32

	6.	Guest Lecture on Operating System	**Guest Lecture (GATE)**	18/01/2022	32
	7.	Guest Lecture on Databases	**Guest Lecture (GATE)**	17/01/2022	32
	8.	Python for Data Science	**SDP**	21/1/2023 to 22/1/2023	81
	9.	SDP on Salesforce Technology	**SDP**	24/12/2022	50
	10.	Seminar on Cloud Technology and Information Security and its Future Opportunities	**Seminar**	23/11/2022	34
	11.	Workshop on Computer programming and IoT for Sai Ashram Students	**Workshop**	31/10/2022	18
	12.	Guest Lecture on GIS	**Guest Lecture**	10/12/2022	39
	13.	Seminar on Higher Studies	**Seminar**	12/10/2022	76
	14.	Certification Program on Advancement in Techniques used for Data Science.	**30Hrs Certification Course**	10/9/2022 to 12/11/2022	156
	15.	Intellectual Property Rights in Digital Words	**Seminar**	22/8/2022	60
	16.	Carrier Guidance Seminar	**Seminar**	22/8/2022	58
30.17	Any other matter with the permission of the Chair **Formal Thanks to External Experts on behalf of the BoS Chairman, BoS Members, and member secretary.**				

The meeting concluded by vote of thanks by chairperson, BoS of Computer Technology

Prof. N.V.Thakur
Member Secretary
BoS Computer Technology

Dr. R. D. Wajgi
Chairperson
BoS Computer Technology

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Department of Computer Technology

List of Faculty

Sr. No.	Name	Signature
1.	Dr. Rakhi D. Wajgi	
2.	Dr. Manali M. Kshirsagar	
3.	Dr. NileshSingh V. Thakur	
4.	Dr. Arvind R.Bhagat Patil	
5.	Dr. Kavita R Singh	
6.	Dr. Shivkumar J.Karale	
7.	Dr. Gauri M. Dhopavkar	
8.	Smita R. Kapse	
9.	Roshni S. Khedgaonkar	
10.	Gauri A. Chaudhary	
11.	Nilesh U. Sambhe	
12.	Dr. Prarthana A. Deshkar	
13.	Supriya Thombre	
14.	Praful V. Barekar	
15.	Nikhil Mangrulkar	
16.	Roshan S. Bhanuse	
17.	Ganesh K.Yenurkar	
18.	Sanjay P. Pande	
19.	Gendlal M.Vaidya	
20.	Charvi S. Suri	
21.	Pradnya S. Moon	
22.	Archana S. Pimpalkar	
23.	Shweta N. Jain	
24.	Lata R. Tembhare	
25.	Shubhangi Shambharkar	
26.	Shruti G. Sarwate	
27.	Sharayu R. Kawale	
28.	Shubhangi M. Borkar	

Information Technology

Nagar Yuwak Shikshan Sanstha's
Yeshwantrao Chavan College of Engineering
(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)
Hingna Road, Wanadongri, Nagpur - 441 110
Ph.: 07104-237919, 234623, 329259, 329250 Fax: 07104-232376, Website: www.ycce.edu

Department of Information Technology

YCCE/IT/FORMAT/BOS/MOM/30 04/02/2023

Minutes of BOS Meeting

The **thirtieth meeting** of the Board of Studies in **Information Technology** was held on Saturday**, 04th Feb 2023 in online mode** on Google Meet Platform **(link:**) at 11.00 a.m. onwards

The meeting was attended by the following members of BoS.

External Members

Sr. No.	Name of Honorable External Member	Position held in BoS
1	Dr. U. A. Deshpande Prof. CSE VNIT, Nagpur	External Expert
2	Mr. Abhishek Nachankar, Member PG Alumni	External Expert

BoS Members

Sr. No.	Name
1.	Dr. R. C. Dharmik, Chairman
2.	Dr. U. H. Gawande
3.	Dr. N. R. Wankhade , Member Secretary
4.	Dr. Swati G. Kale
5.	Mr. M. K. Hadap
6.	Mr. B. U. Bawankar
7.	Mr. A. D. Gaikwad
8.	Ms. P. G. Jaiswal
9.	Mrs. S. S. Gugulothu
10.	Mr. S. S. Chavhan
11.	Dr. Bhushan M. Manjre
12.	Ms. Kavita H. Gudadhe
13.	Ms. Warsha P. Sirskar
14.	Ms. Swapna M. Kamble
15.	Ms. ApurvaA. Bodkhe
16.	Ms. Rutuja B. Chirwatkar
17.	Ms. DivyaM. Kantode
18.	Ms. Vishakha D. Akhare
19.	Ms. Prerna C. Jawdand

20.	Ms. Chandrayani N. Rokde
21.	Ms. Shweta M. Bokade
22.	Mr. Piyush G. Dhule
23.	Ms. Swapna D. Lokhande
24.	Ms. Pooja G. Dhawane
25.	Ms. Priti V. Matre
26.	Ms. Rita R. Bhawalkar
27.	Mr. Jagdish Yadav
28.	Ms. Payal D. Thakare
29.	Ms. Rakhi G. Doijad
30.	Ms. Kiran Gavhale

Leave of Absence is granted to the following Members:

1	Dr. P. S. Deshpande, Professor & Head, Deptt. of CSE, VNIT Nagpur
2	Mr. Sandesh Supekar, Manager, TCS Pune
3	Dr. Latesh Malik, Prof. CSE GCOE, Nagpur
4	Ms. Diksha D. Gabhane

Following are the minutes of the meeting:

Item No. 30.01

Welcome of new members

BoS Chairman Welcome the following external and internal members:
Mr. Jagdish Yadav

Item No. 30.02

Installation of member Secretary

NIL

Item No. 30.03

Confirmation of minutes of previous Meeting and action taken report on decisions/suggestions of the previous meeting.

Minutes of 29th BoS meeting were read by Member secretary and approved by the BoS unanimously.

Item No. 30.04

To discuss and suggest the action taken on

i. Co/Po attainment of subjects taught in previous semester

The complete process of CO/PO attainment has been discussed with the BoS Experts. The experts appreciated and approved the process of attainment. On the basis of direct and indirect assessment, it is observed that all PO's and PSO's meet the attainment expectations. Therefore, no action is requiring to be taken. However, efforts will be taken to maintain this attainment in future.

POs, PSOs Attainment for Session 2022-2023(ODD) is in process

ii. Result analysis of subjects taught in previous semester – Exam is going on

iii. Stakeholders feedback on review and design of curriculum

S.N.	Stakeholder	Feedback	Action Taken
1.	Parent	Give pointers to students to extent their course knowledge	Student development programs are scheduled on Virtualization on cloud computing, Reinforcement learning, Introduction to NLTK
2	Industry	Include research oriented studies	Implement through case studies in the course like Machine Learning, Web Technology, Deep Learning.
3	Alumni	add the courses in view of current demand of industry	Planned VAC on self-service BI
		Students must have awareness about ethical hacking	Planned VAC on Ethical Hacking
4	Faculty	Improve analytical and practical skill	Added project-based learning in OOP, IOT, DBMS, BI, HCI and ML.

iv. In-Sem, End-Sem and Exit feedback on Teaching Learning &curriculum

All feedback has been discussed with BoS Experts.

Semester	No. of faculty with feedback more than 90%	No. of faculty with feedback more than 80%	No. of faculty with feedback less than 80% and greater than 60%	No. of faculty with feedback less than 60%

	In-sem	End-sem	In-sem	End-sem	In-sem	End-sem	In-sem	End-sem
III	02/10	-	05/10	-	03/10	-	-	-
V	02/08	03/08	06/08	05/08	-	-	-	-
VII	09/11	07/11	02/11	03/11	-	01/11	-	-

As feedback on teaching learning is above 60%, BoS experts appreciated and asked to maintain the same.

Item No. 30.05

To discuss and suggest the changes in the Scheme of Examination (known as Autonomous - B.Tech. 2020 & SoE 2022) of the Undergraduate program conducted under the Board and to approve and ratify SoE22 and all syllabi of B.Tech / M.Tech I & II year

Scheme of Examination (known as Autonomous -2018 & B.Tech. 2020-21) of the Undergraduate program discussed and approved.

Following changes was suggested in the scheme of 2022

- Machine Learning course shift to 6th semester
- Artificial Intelligence course shift to 7th semester.

Item No. 30.06

To discuss and suggest the minor changes in the syllabi of various courses in B.Tech 2020 Schemes of Undergraduate and Post graduate programs conducted under the Board.

Minor changes in the syllabus of following courses are accepted by the expert members:

SEM	Course	Suggestions
3	**Introduction to Data Science**	Add topics on Analysis of Variance (ANOVA) Explanation, Formula, and Application. Case Study based on Exploratory Data Analytics

Item No. 30.07

To discuss and suggest the changes in the books/ Reference Books/ Literature Sources published in the syllabi of courses in various Schemes of Undergraduate and Postgraduate Programs.

Books/ Reference Books/ Literature Sources published in the syllabi of courses is reviewed and approved.

Item No.30.08

To discuss and approve the list of experiments, wherever there is a change, in the laboratory courses of Under-Graduate programs. NIL

Item No. 30.09

To discuss and suggest the changes in the Academic Regulations governing the Undergraduate programs conducted under the Board.- NA

Item No. 30.10

To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum. – NA

Item No. 30.11

To prepare and propose the panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of EVEN Term 2022-23.

The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs for End Semester Examination of EVEN Term 2022-23 was constituted.

Item No. 30.12

To prepare and propose the list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of EVEN Term 2022-23 - NA

Item No. 30.13

To prepare and propose the panel of internal and external examiners for the various laboratory and other non-theory courses at UG level that will be examined in End Semester Examination EVEN Term 2022-23.

The panel of internal and external examiners for the various laboratory courses at UG level for End Semester Examination of EVEN Term 2022-23 was constituted.

Item No. 30.14

Preparation of Electronic question Bank for core UG courses.

STATUS OF QUESTION BANKS WITH SOLUTION SET AVAILABLE FOR SESSION 2022-23 ARE AS UNDER:

Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

Hingna Road, Wanadongri, Nagpur - 441 110

Ph.: 07104-237919, 234623, 329259, 329250 Fax: 07104-232376, Website: www.ycce.edu

Department of Information Technology

SR. NO.	Semester	Sub_code	Subject name	Name of Faculty	E-Question Bank status [completed/not completed]	Solution set status
1	1 st/2nd	IT2101	Introduction to Computer Programming	Prof.B.U.Bawankar	Completed	In-process
2	3rd	IT2201	Digital Circuits & Microprocessors	Prof. S.S.Goguluthu/ Kavita Gudadhe	In-process	-
3		IT2203	Object Oriented Programming	Prof. N.R.Wankhade	Completed	In-process
3		IT2205	Data Structures and Program Design-I	Prof.B.U.Bawankar/ Prof.S.S.Chavhan	Completed	In-process
4		IT2207	Computer Architecture & Organization (Self -Learning-Online)	Prof. S.G.Kale/ K.R. Gavhale	Completed	In-process
5	4th	IT2251	Data Structures and Program Design-II	Prof.S.W.Shende/Prof.S.S.Chavhan	Completed	In-process
6		IT2253	Computer Networks	PROF.A.D. GAIKWAD	Completed	In-process
7		IT2255	Operating Systems	K.R. Gavhale, Rutuja Chirwatkar	Completed	In-process
8		IT2257	Theory of Computation	Prof.B.U.Bawankar	Completed	In-process
9	5th	IT2301	Data Base Management Systems	Prof. P. G. Jaiswal	Completed	In-process
10		IT2303	Software Engineering (Self - LearningOnline)	PROF.A.D.GAIKWAD	Incomplete	-
11		IT2311	PE I: Web Programming	Prof. S.G.Kale	Completed	-
12		IT2313	PE I: Data Analysis and Statistics	-	-	-
13		IT2315	PE I: Customer Relationship Management	PROF.A.D.GAIKWAD	Incomplete	-
14		IT2321	OE I: Industry 4.0	Prof. S.S.Goguluthu	-	-
15		IT2322	OE I: Core JAVA	Prof. N.R.Wankhade	Completed	In-process
16		IT2331	OE II: Introduction to Machine Learning	Prof.S.S.Chavhan/Dr.U.H.Gawande	Completed	Completed
17		IT2332	OE II: Information Security	Prof. S.G.Kale/Prof. P. G. Jaiswal	-	-
18	6th	IT2351	Design & Analysis of Algorithms	Prof. N.R.Wankhade	Completed	In-process
19		IT2353	Principles of Compiler Design	Dr. R. C. Dharmik	Completed	Completed
20		IT2361	PE II::Machine Learning	Dr.U.H.Gawande	Completed	Completed
21		IT2363	PE II: Business Intelligence	Prof. P. G. Jaiswal	-	-
22		IT2365	PE II: Internet of Things	Prof. S.S.Goguluthu/ Divya Kantode	-	-
23		IT2371	OE-III: Industry 4.0	Prof. S.S.Goguluthu	-	-
24		IT2372	OE-III : Core JAVA	Prof. N.R.Wankhade	Completed	In-process
25		IT2381	OE-IV : Introduction to Machine Learning	Prof.S.S.Chavhan/Dr.U.H.Gawande	Completed	Completed
26		IT2382	OE-IV : Information Security	Prof. S.G.Kale	-	-
27	7th	IT2401	Data Mining	Prof. P. G. Jaiswal	Completed	In-process
28		IT2403	Principles of Artificial Intelligence	Prof. S.G.Kale	In-process	-
29		IT2411	PE III: Cloud Computing	Dr. R. C. Dharmik	Completed	In-process
30		IT2412	PE III:Real Time Systems	Prof.S.W.Shende	Completed	In-process
31		IT2413	PE III: Network Security	Prof. S.G.Kale	Completed	-
32		IT2414	PE III: Information Retrieval	-		

33		IT2421	PE IV: Neural Network and Fuzzy Logic	Dr.U.H.Gawande	Completed	In-process
34		IT2423	PE IV: Ethical Hacking and Cyber Forensics	-	-	-
35		IT2425	PE IV: Human Computer Interaction	-		
36		IT2427	PE IV: Parallel Computing	Prof.S.W.Shende	In-process (First Time Offered)	In-process
37		IT2431	PE V: Digital Image Processing	Dr.U.H.Gawande	Completed	In-process
38		IT2432	PE V: Distributed Systems	ADG/SSC/PGJ		
39		IT2433	PE V: Coding Standardand and Technical Documentation	Not Offered	-	-
40		IT2441	PE VI: Advanced Computer Architecture	Not Offered	-	-
41		IT2442	PE VI: Mobile Communication	Prof. Hadap sir	Completed	Completed
42		IT2443	PE VI: E-commerce	Not Offered-	-	-
43		IT2444	PE VI: Natural Language Processing	Prof. S.G.Kale	Completed	-

Item No. 30.15

To discuss and suggest the changes/additions/deletions/alterations in the existing Evaluation Process for theory and other courses- NIL

Item No. 30.16

To discuss and propose scheme for Minor an Honor course and its syllabus.
Discussed and proposed Certificate courses and value added courses in 2022-23. –
Two VAC coursed proposed 1. Self-service BI and Ethical Hacking

Item No. 30.17

Any other matter with the permission of the Chair- NIL

The meeting concluded by vote of thanks by chairperson, BoS of Information Technology.

Prof. Nisha R. Wankhade
Member Secretary,
Bos in Information Technology

DR. R. C. Dharmik
Chairman,
BoS in Information Technology

V SEMESTER

Subject Name(2393) : PE-I . Net Development Part-1

Course Outcomes
Upon successful completion of the course the students will be able to 1. Understand the concept of .NET full stack development using C# ,Asp, MVC Controller 2. Apply the concept in .NET Full stack development. 3. Design various application using .NET framework

Unit I	**(6 Hrs.)**
Visual Studio and .NET SDK setup, Overview of .NET framework components and Visual Studio - CLR, CLS, Base class libraries, application types, classes and methods	
Unit II	**(6 Hrs.)**
Introduction .NET, application and structure of application, Windows, web and console application and its purpose, .NET assemblies and executables, Assembly structure	
Unit III	**(6 Hrs.)**
Object Oriented Programming Concept in C#,Classes, Objects, Encapsulation, Polymorphism, Inheritance and Data abstraction	
Unit IV	(6 **Hrs.)**
LINQ, why LINQ, purpose, how to filter, iterate, sorting using LINQ ,LINQ keywords, querying techniques and practice	
Unit V	**(6 Hrs.)**
SQL Sever, DataBase Object introduction, Sql, TriggersQuery concepts - SELECT, WHERE, ORDER BY, JOINS, GROUP BY, Having clauses, TOP, sample queries and knowledge test	
Unit VI	**(6 Hrs.)**
ADO.NET Connection Strings, SqlConnection Class, SqlCommand Class, SqlDataReader Class, SqlDataAdapter Class, DataSet Class, DataReader Class, Transactions, Stored Procedures, Data Binding, LINQ to SQL, Entity Framework	
Total Lecture	**36 Hours**

Textbooks:	
1.	Introducing MICROSOT .NET by David S. Platt

Reference Books:	
1.	C# 6.0 and the .NET 4.6 Frameworkby Andrew Troelsen and Philip Japikse

V SEMESTER

Code (IT-2394) Subject Name: Lab. : Dot Net Full Stack Development

Course Outcomes
Upon successful completion of the course the students will be able to 1. To obtain sound knowledge in the theory, object oriented programming using c# 2. Apply the concept in .NET Full stack development. 3. To Analyze the given problem statement and give cost effective solution. 4. To design and build a web form application.

Minimum Eight Practical's to be performed from the list as below

SN	**Experiments based on**
1	Program Based on object oriented programming concepts in C#
2	Program Based on Exceptional Handling
3	Program Based on Delegates and Events
4	Program Based on LINQ
5	Program Based on SQL Server database objects
6	Program Based on SQL Triggers
7	Program Based on ADO.Net for connectivity with database
8	Program Based on MVC Validations
9	Mini Project

VII SEMESTER

Subject Name(2491) : PE Java Full Stack Development Part-2

Course Outcomes
Upon successful completion of the course the students will be able to
CO 1: Understand the core, advance java, cloud and virtualization concepts. CO 2: Apply the concepts for full stack development. CO 3: Design different web applications using UI components and Spring framework. CO 4: Develop fully functional web applications using different frameworks and tools. CO 5: Implementation of web application using different tools.

Unit I	**(7 Hrs.)**
Java Basics: OOP Concepts, Data Structures, Collection Framework, File handling, JDBC, Introduction to JUnit	
Unit II	**(7 Hrs.)**
Advance Java Features: Introduction to Java 8 Features, Interface Enhancements, Functional Interfaces, Lambda Expression, ForEach , Method References, Streams API, JavaDocs	
Unit III	**(6 Hrs.)**
User Interface Design: Building Responsive Web Pages HTML5, CSS3 and JavaScript, Basic Single Page Applications Using Angular OR React	
Unit IV	**(8 Hrs.)**
Spring Framework: Working with Spring Core, Dependency Injection, Spring MVC,Spring Boot, Introduction to Hibernate and Spring Microservices.	
Unit V	**(7 Hrs.)**
Cloud and Virtualization: Virtualization Basics, Introduction to Cloud, RDB Cloud Fundamentals (SaaS, Paas, IaaS), Introduction to AWS (S3 Buckets, RDS), AWS Cloudfront	
Unit VI	**(7 Hrs.)**
Full Stack Development Tools: Introduction to Maven, Jacoco, SonarLint, Jira, Swagger,Mockito, Docker, Gitrunner	
Total Lecture	**42 Hours**

Textbooks:	
1.	Matthew Leonard for Advanced Learners: Full Stack Web Development Kindle Edition

Reference Books:	
1.	Java2CompleteReference Herbert Schildt Mc Graw-Hill

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VII SEMESTER
Subject Name(IT2492): Lab. : PE-4:JAVA FULL STACK DEVELOUPMENT LAB

Course Outcomes
Upon successful completion of the course the students will be able to 1: Understand the core, advance java, cloud and virtualization concepts. 2: Apply the concepts for full stack development. 3: Design different web applications using UI components and Spring framework. 4: Develop fully functional web applications using different frameworks and tools. 5: Implementation of web application using different tools.

Minimum Eight Practical's to be performed from the list as below

SN	**Experiments based on**
1	1a.Write a Java program to iterate a linked list in reverse order. 1b.Write a Java program to get the first and last occurrence of the specified elements in a linked list. 1c.Write a Java program to convert a hash set to a tree set.
2	2a. Write a Java program to get a list of all file/directory names in the given directory. 2b.Write a Java program to check if a file or directory specified by pathname exists or not. 2c. Write a Java program to read file content line by line.
3	3a. Write a Java program to implement a lambda expression to find the sum of two integers. 3b. Write a lambda expression to implement a lambda expression to calculate the factorial of a given number.
4	Design a class using Stream API to take a Details of Employee like Id, Name and Salary. If Salary is greater than 1500/- and Less than 50000 Display the Employee Name.
5	Write a Java program using JDBC to Connect with database and fetch employee record and insert records in employee table.
6	Mini Project –Build a Responsive Web Pages Using HTML5, CSS3 and JavaScrip
7	Mini Project- Design the Basic Single Page Applications Using Angular or react for any Business
8	Design class Student with fields like id, Name and Email and generate table with this fields in database using hibernate framework.
9	To study Virtualization and AWS Cloud.
10	To study Maven, , Jira, Mockito and Docker

VII SEMESTER

Code (2494) Subject Name: Lab. : Dot Net Full Stack Development

Course Outcomes
Upon successful completion of the course the students will be able to 1. To obtain sound knowledge in the theory, object oriented programming using c# 2. Apply the concept in .NET Full stack development. 3. To Analyze the given problem statement and give cost effective solution. 4. To design and build a web form application.

Minimum Eight Practical's to be performed from the list as below

SN	**Experiments based on**
1	Program Based on object oriented programming concepts in C#
2	Program Based on Exceptional Handling
3	Program Based on Delegates and Events
4	Program Based on LINQ
5	Program Based on SQL Server database objects
6	Program Based on SQL Triggers
7	Program Based on ADO.Net for connectivity with database
8	Program Based on MVC Validations and Exception Handling
9	Web Application project

V SEMESTER

Subject Name(IT2391) : PE-I Java Full Stack Development Part-1

Course Outcomes
Upon successful completion of the course the students will be able to CO 1: Understand the core, advance java, cloud and virtualization concepts. CO 2: Apply the concepts for full stack development. CO 3: Design different web applications using UI components and Spring framework. CO 4: Develop fully functional web applications using different frameworks and tools. CO 5: Implementation of web application using different tools.

Unit I	**(7 Hrs.)**
Java Basics:OOP Concepts, Data Structures, Collection Framework, File handling	
Unit II	**(7 Hrs.)**
RDBMS Fundamentals:Introduction – RDBMS Fundamentals , JDBC, JDBC API, DML (CRUD)	
Unit III	**(6 Hrs.)**
Advance Java Features:Introduction to Java 8 Features, Interface Enhancements, Functional Interfaces, Lambda Expression, ForEach , Method References, Streams API, JavaDocs	
Unit IV	**(8 Hrs.)**
User Interface Design:Building Responsive Web Pages HTML5, Basic Single Page Applications Using Angular OR React	
Unit V	**(7 Hrs.)**
Spring Framework:Working with Spring Core, Dependency Injection, Spring MVC,Spring Boot, Introduction to Hibernate and Spring Microservices	
Unit VI	**(7 Hrs.)**
Cloud and Virtualization:Virtualization Basics, Introduction to Cloud, RDB Cloud Fundamentals (SaaS, Paas, IaaS), Introduction to AWS (S3 Buckets, RDS), AWS Cloudfront	
Total Lecture	**42 Hours**

Textbooks:	
1.	Matthew Leonard for Advanced Learners: Full Stack Web Development Kindle Edition

Reference Books:	
1.	Java2CompleteReference Herbert Schildt Mc Graw-Hill

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V SEMESTER

(IT 2392)PE-1:JAVA FULL STACK DEVELOUPMENT LAB

SN	**Experiments based on**
1	1a.Write a Java program to iterate a linked list in reverse order. 1b.Write a Java program to get the first and last occurrence of the specified elements in a linked list. 1c.Write a Java program to convert a hash set to a tree set.
2	2a. Write a Java program to get a list of all file/directory names in the given directory. 2b.Write a Java program to check if a file or directory specified by pathname exists or not. 2c. Write a Java program to read file content line by line.
3	3a. Write a Java program to implement a lambda expression to find the sum of two integers. 3b. Write a lambda expression to implement a lambda expression to calculate the factorial of a given number.
4	Design a class using Stream API to take a Details of Employee like Id, Name and Salary. If Salary is greater than 1500/- and Less than 50000 Display the Employee Name.
5	Write a Java program using JDBC to Connect with database and fetch employee record and insert records in employee table.
6	Mini Project –Build a Responsive Web Pages Using HTML5, CSS3 and JavaScrip
7	Mini Project- Design the Basic Single Page Applications Using Angular or react for any Business
8	Design class Student with fields like id, Name and Email and generate table with this fields in database using hibernate framework.
9	To study Spring Framework
10	To study Virtualization and AWS Cloud.

VII SEMESTER

Subject Name : PE4:(2493) . Net Full Stack Development

Course Outcomes
Upon successful completion of the course the students will be able to 1. Understand the concept of .NET full stack development using C# ,Asp, MVC Controller 2. Apply the concept in .NET Full stack development. 3. Design various application using .NET framework.

Unit I :Introduction .Net	**(6 Hrs.)**
Introduction .NET, application and structure of application, Object Oriented Programming Concept in C#, Exceptional Handling, Delegates and Events	
Unit II: Itroduction to DataBase	**(6 Hrs.)**
LINQ, SQL Sever, DataBase Object introduction, Sql, Triggers	
Unit III: Introduction to Front End	**(6 Hrs.)**
ADO.NET, HTML, CSS, UI and Front End, Java Script	
Unit IV:MVC	**(6 Hrs.)**
What is MVC, components, Interaction among components, Program.cs and StartUp.cs file, Configure Services and Configure Methods, Middleware components, Model View Controllers, Creating first app in MVC	
Unit V:API	**(6 Hrs.)**
Implementing data validation, annontations and Validation Summary and Exception handling mechanims in MVC, what is API, create project, test API, API Controllers, configure Web API,routing, parameter binding,	
Unit VI:Introduction to DevOps	**(6 Hrs.)**
Introduction to Coding Principle, DevOps, Docker	
Total Lecture	**36Hours**

Textbooks:	
1.	Introducing MICROSOT .NET by David S. Platt

Reference Books:	
1.	C# 6.0 and the .NET 4.6 Frameworkby Andrew Troelsen and Philip Japikse

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Computer Science and Engineering

Nagar Yuwak Shikshan Sanstha's
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Department of Computer Science & Engineering

YCCE/CSE/FORMAT/BOS/MOM/4 30/01/2023

Minutes of BOS Meeting

Fourth Meeting of the Board of Studies in **Computer Science & Engineering** was held on Monday, 30/01/2023 at 10.30 am. in offline mode at Board room Information Technology department.

The meeting was attended by the following members of BoS.

External Members

Sr. No.	Name of Honorable External Member	Position held in BoS	Sign
1.	Dr. P.S.Deshpande	External Expert	

BoS Members

Sr. No.	Name of Member	Sign
1	Dr. Lalit Damahe	
2	Dr. K.K.Bhoyar	
3	Mrs. R.A.Fadnavis	
4	Mr. Fazil Sheikh	
5	Mrs. P.P. Wagale	
6	Mr. Jiven N. Dehankar	
7	Mrs. Punam S. Mahakalkar	
8	Mr. Rushikesh M. Shete	
9	Mrs Bharati Karare	
10	Mrs. V.N. Bagade	
11	Mrs. C.A.Tripathi	
12	Mrs. A.T. Paul	
13	Ms. R.P. Suryavanshi	
14	Mrs. Kavita A. Kathane	
15	Ms. Renuka Kadu	
16	Mrs. S. B. Meshram	
17	Mrs. N.P. Giradkar	
18	Ms. Roshni Bhave	
19	Mrs. Shraddha G.Vaidya	
20	Mr. Sachin Janbandhu	
21	Ms. Kalyani Karule	
22	Ms. Ashwini Nagpure	
23	Ms. Sharayu Sangekar	
24	Ms. Gayatri Bhoyar	

Leave of Absence was granted to following members:

Sr. No.	Name of Member
1.	Dr. U. A. Deshpande, External Expert
2.	Dr. D.A Adane,RTMNU nominee
3.	Mr.Swapnil Deshmukh, External Expert

Following are the minutes of the meeting:

Item No. 4.01

Welcome of new members

BoS Chairman Dr. Lalit Damahe welcome all the external and internal members.

Item No. 4.02

Installation of member Secretary

- no change

Item No. 4.03

Confirmation of minutes of previous Meeting and action taken report on decisions/suggestions of the previous meeting:

ATR available in Annexure -I

Item No. 4.04

To discuss and suggest theaction taken on

i.Co/Po attainment of subjects taught in previous semester
ii.Result analysis of subjects taught in previous semester
iii.Stakeholders feedback on review and design of curriculum
iv.In Sem,EndSem and Exitfeedback on Teaching Learning &curriculum

i) **CO/PO attainment** for odd semester 2022-23- V semester CSE semester was shown to BOS expert members . CO/PO attainment of III semester CSE and CSE- AIML is in progress since ESE is to be over .

ii) Result analysis of subjects taught in previous semester.

The overall and subject wise result analysis of ODD Term 2022-23 has been shown to the BoS Experts. Experts appreciated the efforts taken by the faculty for good results.

S.N	Semester	Pass %
1	IV	89.54
2	V	96.26

As the results of Vsemester are above 80%, No action required to be taken

iii) Stake holders feedback on review and design of curriculum –

S.N.	Stakeholder	Feedback	Action Taken
1.	Parent	Require Common Room for girls	Discussed with higher Authority
		Conduct Sports Activites	Annual calender of RTMNU sports is circulated to students
		Overall Curriculum is appreciated by parents	-
2	Faculty	Database Management System-Indexing and Hashing should include in Syllabus	Proposed in BoS meeting and Approved

iv) **In Sem, End Sem and Exit feedback on Teaching Learning & curriculum.**
All feedback of ODD semester- 2022-23- V semester CSE and III semester CSE and CSE-AIML has been discussed with BoS Experts.

Sem	No. of faculty with feedback more than 90%		No. of faculty with feedback more than 80%		No. of faculty with feedback less than 80% and greater than 60%		No. of faculty with feedback less than 60%	
	In Sem	End Sem	In Sem	End Sem	In Sem	End Sem	In Sem	End Sem
IV	6/7	7/7	01/7	-	-	-	-	-
V	7/7	5/7	-	2/7	-	-	-	-
III	1/6	-	5/6	-	-	-	-	-
III (AIML)	1/3	-	1/3	-	1/3			

As feedback on teaching learning is above 60%, BoS experts appreciated and asked to maintain the same.

Item No. 4.05

To discuss and suggest the changes in the Scheme of Examination (known as Autonomous 2018 & B.Tech 202021) of the Undergraduate programs conducted under the Board. To approve and ratify SoE22 and all syllabi of B. Tech.

SoE B.Tech 2020 :

IV	AIML2256– Design Analysis and Algorithms	4 Credits can be given

semster	Course	Suggestions
VI	CSE2553: Compiler	4 credits can be given

SoE22 :

NEP CSE(AIML)SoE22-23 was verified by experts . Following suggestions were given :

1. Audit course –Add Courses as Yoga, meditation in SoE- CSE and CSE-AIML

Item No. 4.06

To discuss and suggest the minor changes in the syllabi of various courses in Aut onomous 2018 & B.Tech 2020 Schemes of Undergraduate and Post graduate pr ograms conducted under the Board.

Minor changes in the syllabus of following B.Tech SoE2020 -VI Semester subject are suggested by the expert members:

1. Make Internet of things and Web Technology Courses to be Industry Aligned.
2. Take Offline Classes/ labs for Industry aligned course -Mobile Operating system

No changes suggested in the syllabus of IV Semester CSE (AIML)SOE2021- by the expert members

Item No. 4.07

To discuss and suggest the changes in the books/ Reference Books/ Literature Sources published in the syllabi of courses in various Schemes of Undergraduate and Postgraduate Programs.

Minor changes in the books of following subject are suggested by the expert members:

semster	Course
V CSE & IV CSE(AIML)	CSE2302/AIML2259- Lab: Database Management System (''SQL & PL / SQL for Oracle 11g Black Book'' as a Reference book)
VI	CSE2365-Lab:Neural Network and Application -Add Refence book for Practical- "Deep learning with python" by Francois Chollet

Item No. 4.08

To discuss and approve the list of experiments, wherever there is a change, in the laboratory courses of Under-Graduate programs.

SoE B.Tech- 2020-21 scheme:

semster	Course	Suggestions
V	CSE2302– Lab: Database Management Systems	• Add Practicals based on Multiple Queries
IV	AIML2259- Database Management System	
VI	CSE2551:Computer Network	• Minor Changes in Practical List
VI	CSE2361-Lab: PE-II Digital Image Processing	• Implement 1-2 Practicals in Python • Add practicals based on applications on CCTV data
VI	CSE2363-Lab: Internet Of Things	• Add practicals on creating Sensors based applications like gas sensors, ph sensors ,etc.

Item No. 4.09

To discuss and suggest the changes in the Academic Regulations governing the Undergraduate programs conducted under the Board.- No suggestions

Item No. 4.10

To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum. – As per Expert Suggestions no Requirment of MOOCS

Item No. 4.11

To prepare and propose the panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will be examined in End Semester Examination of Even Term 2022-23.

The panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs for End Semester Examination (Y11)of Even Term 2022-23 was constituted.

Item No. 4.12

To prepare and propose the list of question paper setters and evaluators for all the Postgraduate courses under the Board that will be examined in End Semester Examination of Even Term 2022-23 - NA

Item No. 4.13

To prepare and propose the panel of internal and external examiners for the various laboratory and other non-theory courses at UG level that will be examined in End Semester Examination ODD Term 2022-23.

The panel of internal and external examiners for the various laboratory courses at UG level for End Semester Examination (Y12) of Even Term 2022-23 was constituted.

Item No. 4.14

Preparation of Electronic question Bank for core UG courses.

List of Courses for which EQB is prepared :

SN	Semester	Course Name
1.	III	CSE2201: Computer Architecture and Organization
2.		CSE2202: Object Oriented Programming
3.		CSE2204: Data structure –I
4.	IV	CSE2255:Introduction to Data Analysis
5.		CSE2251: Operating System
6.		CSE2257: Theory Of Computation
7.	V	CSE2301:Database Management Systems
8.		CSE2303:Design & Analysis of Algorithms
9.		CSE2311:Business Intelligence
10.		CSE2313:Web Technologies
11.		CSE2317:Mobile operating System
12.	III (CSE AIML)	AIML2202:Formal Language & Automata Theory
13.		AIML2204:Data Structures
14.		AIML2206:Computer Architecture & Organisation

List of Courses for which EQB is to be prepared-

SN	Semester	Course Name
1.	CSE- IV	CSE2253: DataStructure 2
2.	CSE-VI	CSE2351:Computer Networks
3.		CSE2353:Compilers
4.		CSE2355:Software Engineering
5.		CSE2361:Digital Image Processing
6.		CSE2363:Internet of Things
7.		CSE2365:Neural Network and applications
8.	CSE-AIML-4	AIML2202: Formal Language & Automata Theory
9.		AIML2204: Data Structures
10.		AIML2206:Computer Architecture & Organisation

Item No. 4.15

To discuss and suggest the changes/additions/deletions/alterations in the existing Evaluation Process for theory and other courses- No suggestions

Item No. 4.16

To discuss and propose scheme for Minor and Honor course and its syllabus. To Discuss and propose Certificate courses and value-added courses in 2022-23.

- Discussed about value added courses in 2022-23. No suggestions from expert .
- Expertise can be developed initially in department by collaborating with industry for Full stack developer and then can propose certificate course on it .

List of Value Added Courses

Sr. No.	Name of the VAC	Date	Duration of course	Number of students enrolled	Resource Person
1.	VAC on Python Programming for Data Science and ML	4th Dec.- 19th Dec., 2021	30 hours	275	Mr. Parag Dhawan, Mr. Rohit Joshi Mastersoft ERP Solution Pvt. Ltd.
2.	VAC on Data Analytics using Excel	16th April – 1st May 2022	30 hours	72	Mr. Sathyanarayana, Quality Theorem, Bangalore
3	VAC on Salesforce Administration	1st Oct.- 5th Nov. 2022	30 hours	93	Prof. J.N. Dehankar, YCCE, Nagpur
4	VAC on Data Analytics using Microsoft Excel	(24th Dec 2022 to 22nd Jan 2023- every weekend 6hours/day) 24/12,25/12,31/12, 7/01,22/1	30 hours	138	Mr. Sathyanarayana, Quality Theorem, Bangalore

VAC Planned

Sr. No.	Name of the VAC	Date	Duration of course	Number of students enrolled	Resource Person
1.	VAC on Salesforce Development	Even Sem 2023	30 hours	-	Prof. J.N. Dehankar, YCCE, Nagpur
2.	VAC on Hands-on Animation using Adobe Flash	Odd Sem 2023	30 hours	-	Disscussion is going on with Indusrty

Item No. 4.17
Any other matter with the permission of the Chair- Nil

Formal Thanks were given to External Experts on behalf of the BoS Chairman, BoS members and Member Secretary. The meeting concluded by vote of thanks by chairperson, BoS of Computer Science and Engineering

Prof. Rupa Fadnavis
Member Secretary
BoS in CSE

Dr. L.B. Damahe
Chairman
BoS in CSE

First Year

Nagar Yuwak Shikshan Sanstha's
Yeshwantrao Chavan College of Engineering Nagpur
(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)
Hingna Road, Wanadongri, Nagpur-441 110
NAAC Accredited with 'A++' Grade

OFFICE OF FIRST YEAR COORDINATOR

Date: 9.02.2023

NOTICE

A meeting of Board of Studies (General Engineering) is scheduled on 4th February 2023 at 11.00 am. All Experts and faculty members are requested to attend this meeting. The agenda of meeting is mentioned as below.

Agenda Points are

Agenda No. 26.01

Welcome of new members

Agenda No. 26.02

Confirmation of minutes of previous Meeting and action taken report on decisions/suggestions of the previous meeting.

Agenda No. 26.03

To discuss and suggest the action taken on
i) CO/PO attainment of subjects taught in previous semester.
ii) Result analysis of subjects taught in previous semester.
iii) Stake holder's feedback on review and design of curriculum.
iv) In Sem, End Sem and Exit feedback on Teaching Learning & curriculum.

Agenda No. 26.04

To discuss and suggest the changes in the Scheme of Examination (known as Autonomous 2018 & B.Tech 2022) of the Undergraduate programs conducted under the Board. To approve and ratify SoE22 and all syllabi of B.Tech I & II year.

Agenda No. 26.05

To discuss and suggest the minor changes in the syllabi of various courses in Autonomous 2018 & B.Tech 2022 Schemes of Undergraduate conducted under the Board.

Agenda No. 26.06

To discuss and suggest the changes in the books/ Reference Books/ Literature Sources published in the syllabi of courses in various Schemes of Undergraduate Programs.

Agenda No. 26.07

To discuss and approve the list of experiments, wherever there is a change, in the laboratory courses of Under-Graduate programs.

Agenda No. 26.08

To discuss and suggest the changes in the Academic Regulations governing the ndergraduate programs conducted under the Board.

Agenda No. 26.09

To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum.

Agenda No.26.10

To prepare and propose the panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will examine in End Semester Examination of Odd Term/Even Term 2022-23.

Agenda No. 26.11

To prepare and propose the panel of internal and external examiners for the various laboratory and other non-theory courses at UG levels that will examine in End Semester Examination Odd/Even Term 2022-23.

Agenda No. 26.12

Preparation of Electronic question Bank UG courses according to B.Tech SoE 2020 & 2022
To review solutions to all questions of Electronic Question Banks for all courses

Agenda No. 26.13

To discuss and suggest the changes/additions/deletions/alterations in the existing Evaluation Process for theory and other courses.

Agenda No. 26.14

To discuss and propose scheme for Minor an Honor course and its syllabus. To Discuss and propose Certificate courses and value-added courses in Even Term 2022-23.

Agenda No. 26.15

Any other matter with the permission of the Chair.

Dr. Anushree Aserkar
Member Secretary- Bard of Studies
(General Engineering)
Department of Applied Mathematics and Humanities

Dr. Manjusha P. Gandhi
Chairman-Bard of Studies
(General Engineering), First Year Coordinator
Department of Applied Mathematics and Humanities

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Board of Studies: General Engineering

Minutes of 26th Board of Studies Meeting in General Engineering: 4th February 2023

The 26th BoS meeting of General Engineering Board was held on 4th February 2023, Saturday at 11.00 a.m. The meeting was organized offline. Total 42 members were present for the meeting. All the external experts: Dr. G.P. Singh-Head, Department of Mathematics, VNIT, Nagpur, Dr. Anupama Kumar--Head, Department of, Chemistry, VNIT, Nagpur, University nominee-Dr. Vijay Tangde, Dept of Chemistry, RTM Nagpur University, Nagpur, Industry expert-Dr. S.S. Bagchi, Dy. General Manager, Reliance Power, Butibori, Nagpur, were attended the meeting.

The following members were present during the meeting:

1	Dr.Manjusha P.Gandhi	20	Dr. Anushree Aserkar
2	Prof.(Mrs.) M.S.Dani	21	Prof. Rahul Tiwari
3	Dr. Arti Ghogre	22	Dr.Mrs.H.V. Ganvir
4	Dr.Malabika Adak	23	Dr. Vikrant Ganvir
5	Dr.A.J.Meshram	24	Dr.Arsala Khan
6	Prof.Asfar Siddiqui	25	Dr. Swati A. Fartode
7	Prof. Monali G.Dhote	26	Dr. Bharati Patil
8	Dr.Nitin Wange	27	Dr. Manisha Upasani
9	Prof.D.P.Bawane	28	Tejaswini M. Jaulkar
10	Prof.M.N.Dandale	29	Dr. P. U. Waghe
11	Prof.N.A.Bhosale	30	Prof. Shruti Gomkale
12	Prof. Purva Khot	31	Prof.S.S.Panditkar
13	Prof.Arvinder Kour Mehta	32	Dr.Ramesh Surose
14	Dr.A.D.Gedam	33	Ms.Megha Mediretta
15	Prof. Nanada Thakre	34	Prof. Y A. Pourkar

16	Prof. P.Dhenge	35	Dr. M. S. Sawangikar
17	Prof. Madhumita Dhote	36	Prof. Pournima Pande
18	Prof.Swati Ingole	37	Dr. G.S. Deshmukh
19	Prof. Monali Dubey	38	Prof. Pragati Asawale

Following members are permitted for leave of absence

1) Dr.Meenal Kale
2) Prof. Vishakha Bhandarkar.
3) Dr.Deepti Jamkar
4) Prof.Sheela Bhivgade

Agenda No. 26.01

Welcome of new members

The meeting began with the welcome of new members Prof. Madhumita Dhote(Humanities), Prof.Swati Ingole(Humanities), Prof.Sheela Bhivgade(Humanities), Prof. Monali Dubey(Humanities), Prof. Rahul Tiwari(humanities), Prof. Pragati Asawale(Chemistry).

Agenda No. 26.02

Confirmation of minutes of previous Meeting and action taken report on decisions/suggestions of the previous meeting.

The minutes of previous meeting no. 25th held on Saturday 30th July 2022 were already circulated to all members. The ATR of previous meeting have been discussed with BoS members. Minutes of previous meeting were confirmed.

Agenda No. 26.03

To discuss and suggest the action taken on

i) CO/PO attainment of subjects taught in previous semester is in progress.

ii) Result analysis of subjects taught in previous semester.

Result Analysis of Semester II: GE(Group-A)

Pass Students	78.63%
Passed with SGPA<6.75	15.29%
Passed with SGPA>=6.75 and <8.25	51.94%
Passed with SGPA>=8.25	32.77%

Result Analysis of Semester II: GE(Group-B)

Pass Students	74.16%
Passed with SGPA<6.75	18.05%
Passed with SGPA>=6.75 and <8.25	51.63%
Passed with SGPA>=8.25	30.33%

Result Analysis of Semester II: AIDS(Dept. of CT)

Pass Students	89.39%
Passed with SGPA<6.75	13.56%
Passed with SGPA>=6.75 and <8.25	61.02%
Passed with SGPA>=8.25	25.42%

Result Analysis of Semester II: AIML(Dept. of CSE)

Pass Students	95.45%
Passed with SGPA<6.75	15.87%
Passed with SGPA>=6.75 and <8.25	55.56%
Passed with SGPA>=8.25	28.57%

Result Analysis of Semester II: IIoT

Pass Students	90.32%
Passed with SGPA<6.75	17.86%
Passed with SGPA>=6.75 and <8.25	58.93%
Passed with SGPA>=8.25	23.21%

Result Analysis of Semester II: CSD

Pass Students	91.18%
Passed with SGPA<6.75	13.56%
Passed with SGPA>=6.75 and <8.25	62.90%
Passed with SGPA>=8.25	24.19%

iii) Stake holder's feedback on review and design of curriculum.

S.N.	Stakeholder	Feedback	Action Taken
1.	Parent	The number of teaching hours are engaged appropriately but students do not get sufficient time for learning	Informed to Dean academic matters
2	Faculty	Shuffling of units is required in the course Differential Equation and Complex Analysis	Will be incorporated in the said syllabus.

iv) In Sem, End Sem and Exit feedback on Teaching Learning & curriculum.

Sem	Faculty with feedback more than 90%		Faculty with feedback 80-90%		Faculty with feedback less than 80% and greater than 60%		Faculty with feedback less than 60%	
	In Sem	End Sem	In Sem	End Sem	In Sem	End Sem	In Sem	End Sem
I	51.57%	65.59%	46.31%	34.40%	2.1%	--	-	-

Agenda No. 26.04

To discuss and suggest the changes in the Scheme of Examination (known as Autonomous 2018 & B.Tech 2022) of the Undergraduate programs conducted under the Board. To approve and ratify SoE22 and all syllabi of B.Tech I & II year.

The discussion was held on changes in the Scheme of Examination (known as Autonomous 2018 & B.Tech 2022) of the Undergraduate programs. The SoE and syllabi are approved by all members.

Agenda No. 26.05

To discuss and suggest the minor changes in the syllabi of various courses in Autonomous 2018 & B.Tech 2022 Schemes of Undergraduate conducted under the Board.
Reshuffling of units is required in course “Differential Equation and Complex Analysis” in SoE 2022..

Agenda No. 26.06

To discuss and suggest the changes in the books/ Reference Books/ Literature Sources published in the syllabi of courses in various Schemes of Undergraduate Programs.

The discussion was held on changes in the books/ Reference Books/ Literature Sources published in the syllabi of courses in various Schemes of Undergraduate Programs .The changes in books are not required in currently implemented courses

Agenda No. 26.07

To discuss and approve the list of experiments, wherever there is a change, in the laboratory courses of Under-Graduate programs.
The list of experiments as per new syllabi, was approved by members in 25th BoS meeting.

Agenda No. 26.08

To discuss and suggest the changes in the Academic Regulations governing the ndergraduate programs conducted under the Board.

The Academic Regulations were accepted by the members with no suggestions.

Agenda No. 26.09

To discuss and propose the new courses/MOOCS received from the faculty for inclusion in the curriculum.

MOOCS courses were not proposed in meeting.

Agenda No.26.10

To prepare and propose the panel of paper setters, Moderators and Valuers for the various theory courses at Undergraduate programs that will examine in End Semester Examination of Odd Term/Even Term 2022-23.

HoD's have submitted the names of the faculty for question paper setting, moderation and evaluation, for odd and even semester examination 2022-23 to the chairman General Engineering.

Agenda No. 26.11

To prepare and propose the panel of internal and external examiners for the various laboratory and other non-theory courses at UG levels that will examine in End Semester Examination Odd/Even Term 2022-23.

HoD's shall submit the panel of internal and external examiners for the various laboratory and other non-theory courses at UG levels that will be examined in End Semester Examination Odd/Even Term 2022-23 to to the chairman General Engineering

Agenda No. 26.12

Preparation of Electronic question Bank UG courses according to B.Tech SoE 2022
To review solutions to all questions of Electronic Question Banks for all courses

E-question answer bank of all Courses up to first semester are updated according to SoE 2022. Experts have suggested to frame more real life and application based problems.

Agenda No. 26.13

To discuss and suggest the changes/additions/deletions/alterations in the existing Evaluation Process for theory and other courses.

The BoS members have suggested to continue with the existing evaluation process for theory and other courses but the level of questions must be set as per level of the students. 10% marks must be allotted for very difficult level questions.

Agenda No. 26.14

To discuss and propose scheme for Minor an Honor course and its syllabus. To Discuss and propose Certificate courses and value-added courses in Even Term 2022-23.

Minor Programmes- No new Minor program was proposed in meeting.

Agenda No. 26.15

Any other matter with the permission of the Chair

The meeting ended with the vote of thanks.

Dr. Anushree Aserkar
Member Secretary- Bard of Studies
(General Engineering)
Department of Applied Mathematics and Humanities

Dr. Manjusha P. Gandhi
Chairman-Bard of Studies
(General Engineering), First Year Coordinator
Department of Applied Mathematics and Humanities

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Website : www.ycce.edu , Email : principal@ycce.edu

Declaration by the Head of the Institution

I hereby declare that the data, information and support documents attached herewith are genuine and correct to my knowledge.

Dr. U.P. Waghe
Principal
Principal
Yeshwantrao Chavan
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Y. C. COLLEGE OF ENGINEERING AUTONOMOUS INSTITUTION SEAL NAGPUR