# **NAAC Criterion-I**

# **Curricular Aspects**

# **Key Indicator -1.1 Curriculum Design and Development**

Sub-Criteria -1.1.2

# Programmes with Syllabus Revision



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Gola ka Mandir, Gwalior - 474005, Madhya Pradesh, India

Sr.No.	<b>Evidence/proof/Additional Information</b>					
1.			Percentage revision of all programmes			
	S.No. Program Code		Department Name	Page No.		
	1.	3010	B.Tech in Civil Engineering	3		
	2.	7048	M.E. in Construction Technology & Management	8		
	3.	7061	M.Tech in Environmental Engineering	13		
	4.	3018	B.Tech in Electronics Engineering(EC)	19		
	5.	3020	B.Tech in Electronics & Telecommunication Engineering(ET)	22		
	6.	7038	M.E in Communication, Control & Networking	26		
	7.	3031	B.Tech. Mechanical Engineering	28		
	8.	3005	B.Tech. Automobile Engineering	39		
	9. 7032 M.Tech. Production Technology		50			
	10.	0. 3029 B. Tech Information Technology		52		
	11.	11. 7030 M. Tech Information Technology		61		
	12.	12. 9711 B. Tech Internet of Things (IoT)		62		
	13.	9702	B. Tech Information Technology (Artificial Intelligence and Robotics)	64		
	14.	9701	B. Tech Artificial Intelligence and Data Science	66		
	15.	9704	B. Tech Artificial Intelligence and Machine Learning	68		
	16.	3008	B Tech. Chemical Engg.	70		
	17.	3013	B.Tech Computer Science and Engineering	73		
	18.	23462	B.Tech Computer Science and Design	75		
	19.	6001	Masters in Computer Applications	77		
	20.	7023	M.Tech Computer Science and Engineering	79		
	21.	6002	B.Arch.	80		
	22.	6005	Masters in Urban Planning	81		
	23.	9627	B. Tech. In Mathematics and Computing	82		
	23.	3017	B.Tech. in Electrical Engineering	84		
	25.	9710	B.Tech Internet of Things	89		
	25.		M.E in Industrial Systems Drives	91		
	20.	Contract Contractor	Masters of Business Administration	92		

INDEX Additional documents/evidence/proof

14.2.23 Dr. R. K. Pandit

DIRECTOR adhav Institute of Technology & Science GWALIOR (M.P.)-474005

## MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE, GWALIOR – 474005 (A Govt. Aided UGC Autonomous& NAAC Accredited Institute Affiliated to R.G.P.V. Bhopal)

CIVIL ENC	<b>SINEERING DEPARTMENT</b>
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		2019-2023 BATCH		2020-2024 BATCH	Percentage
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Change
	100101	Engineering Chemistry	100011	Engineering Mathematics-I	27.69
	100102	Engineering Mathematics-I	100012	Engineering Chemistry	
	100103	Technical English	100014	Engineering Graphics	
Ι	100104	Basic Electrical & Electronics Engineering	100015	Energy, Environment, Ecology & Society	
	100105	Engineering Graphics	100016	Technical Language	
	100106	Manufacturing Practices	100017	Language Lab	
			100018	Engineering Graphics Lab	
	100201	Engineering Physics	100020	Basic Civil Engineering & Mechanics	
	100202	Energy, Environment, Ecology & Society	110211	Building Planning & Design	
	100203	Basic Computer Engineering	100021	Basic Mechanical Engineering	
II	100204	Basic Mechanical Engineering	100022	Basic Electrical & Electronics Engineering	
	100205	Basic Civil Engineering & Mechanics	100023	Basic Computer Engineering	
	100206	Language Lab. & Seminars	100024	Manufacturing Practices	
			100026	Basic Civil Engineering Lab	
	100001	Engineering Mathematics-II	100025	Engineering Mathematics-II	_
	110302	Building Planning & Design	110311	Building Materials & Construction	_
	110303	Building Materials & Construction	110312	Fluid Mechanics - I	
	110304	Surveying	110313	Surveying	
	110305	Strength of Materials	110314	Strength of Materials	
III	110306	Software Lab	110315	Survey Practice Lab	
	110307	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)	110316	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)	
	110308	Summer Internship Project–I	200XXX	Novel Engaging Course (Informal Learning)	
			110317	Summer Internship Project-I (Institute Level)	
			1000001	Indian Constitution & Traditional Knowledge	

	100003	Engineering Mathematics- III	100028	Engineering Mathematics- III
	110402	Geotechnical Engineering	110411	Geotechnical Engineering - I
	110403	Fluid Mechanics - I	110412	Theory of Structure - I
	110404	Structural Analysis	110413	Transportation Engineering
IV	110406	Water Resources Engineering	110414	Water Resources Engineering
	100004	Cyber Security	100009	Cyber Security
	110407	Survey Practice Lab	110415	Civil Drawing lab
	100002	Biology for Engineers	200XXX	Novel Engaging Course (Informal Learning)
			1000002	Biology for Engineers
	110501	Estimating Costing & Contracting	110520	Data Science
	110502	Structural Design & Drawing (RCC)	110511	Water Supply Engineering
	110503	Fluid Mechanics - II	110512	Theory of Structure - II
	110509	Environmental Engineering	110513	Structural Design & Drawing (RCC)
	110505	Transportation Engineering	110514	Fluid Mechanics - II
	110506	Minor Project-I	110515	Minor Project-I
V	110507	Summer Internship Project-II	110516	Self-learning/Presentation (SWAYAM/NPTEL/ MOOC)
	110508	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)	200XXX	Novel Engaging Course (Informal Learning)
			110517	Summer Internship Project-II
			1000005	Project Management & Financing
			1000006	Disaster Management
	100005	Ethics, Economics, Entrepreneurship & Management	110620	Artificial Intelligence & Machine Learning
	110602	Structural Design & Drawing (Steel)	110621	Waste Water Engineering
		110612 Solid Waste Management		
	DE	110613 Construction Planning & Management	110622	
		110614 Railway Airport & Tunnel Engineering		Structural Design & Drawing (Steel)
		110652 Geotechnical Engg - II (Foundation Engg)		
	DE	110654 Concrete Technology	110623	
<b>X</b> 71		110655 Air Pollution & Control		
VI		110656 Disaster Recovery & Build Back Better		Estimating Costing & Contracting

	OC	900120 Building Services & Maintenance 900121 Sustainable Materials & Green Buildings	DE	<ul><li>110661 Geotechnical Engg - II (Foundation Engg)</li><li>110662 Concrete Technology</li><li>110663 Air Pollution &amp; Control</li></ul>
	100007	Disaster Management	OC	910111 Building Services & Maintenance 910110 Sustainable Materials & Green Buildings
	110607	Minor Project-II	110624	Minor Project-II
	100006	Indian Constitution & Traditional Knowledge	200XXX	Novel Engaging Course (Informal Learning)
			1000007	Intellectual Property Rights (IPR)
		110713 Advanced Structural Design (RCC)		110731 Advanced Structural Design (RCC)
	DE	110714 Hydraulic Structure	DE	110732 Hydraulic Structure
		110715 Advanced Structural Analysis		110733 Railway Airport & Tunnel Engineering
		110754 Wastewater Treatment & Recycling		110761 Wastewater Treatment & Recycling
	DE	110757 Principles of Construction Management	DE	110762 Principles of Construction Management
		110758 Advanced Geomatics Engineering		110763 Advanced Geomatics Engineering
VII	OC	900201 Integrated Waste Management for Smart City	OC	910201 Integrated Waste Management for Smart City
V 11	00	900202 Project Planning & Control	00	910202 Project Planning & Control
	OC	900213 Urban Planning & Transportation Systems	OC	910213 Urban Planning & Transportation Systems
		900226 Safety & Quality Management		910226 Safety & Quality Management
	100008	Intellectual Property Rights (IPR)	110721	Problems
	110701	Problems	110722	Creative Problem Solving
	110702	Summer Internship Project-III	110723	Summer Internship Project-III
	110703	Creative Problem Solving	1000008	Universal Human Values & Professional Ethics
		110851 Safety in Construction		110861 Safety in Construction
	DE	110856 Rock Engineering	DE	110862 Rock Engineering
		110857 Strategies for Sustainable Design		110863 Strategies for Sustainable Design
<b>X</b> / <b>I I I</b>		900614 Natural Hazards		910614 Natural Hazards
VIII	OC	900634 Safety in Construction	OC	910634 Safety in Construction
		900635 Geographic Information Systems		910635 Geographic Information Systems
	110801	Internship/Project	110811	Internship/Project
	110802	Professional Development	110812	Professional Development

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Course Code: 110411

## Course Name: Geotechnical Engineering - I

L	т	P	Credit
2	1	2	4

## Course Objectives:

1) The students will get the basic knowledge about natural material like rocks and get acquainted with natural dynamic processes and their actions.

The students will know the significance of geological investigations for civil engineering projects and site

3) To inculcate the basic knowledge of soil such as its identification and classification, determination of various engineering properties and its suitability as a foundation/subgrade material.

4) To develop an understanding of the relationships between physical characteristics and mechanical properties of soils by experimentally measuring them.

5) To explain role of water in soil behavior and how soil stresses, permeability and quantity of seepage including flow net are estimated.

6) To determine shear parameters and stress changes in soil due to foundation loads & estimate the magnitude and time-rate of settlement due to consolidation.

7) To apply the principles of soil mechanics in stability analysis of slopes and settlement calculations.

## Syllabus:

# Unit-I Engineering geology & soil properties

Introduction to geology, mineralogy, petrology - Three-fold classification of rocks and their characteristic features. Structural geology - Types and classification of structures (Joints, Unconformities, Folds and faults) and their effect

Introduction - Types of soils, their formation & deposition, basic definitions and relationships - Three phase system. Index properties of soil and their determination. Relationship between volume weight, void ratio-moisture content, moisture content-specific gravity, and unit weight- air voids etc.

Plasticity Characteristics of soil & indices and their determination, use of consistency limits, Classification of soil based on particle size and consistency limits, unified soil classification systems, Indian standard soil classification system, general characteristics of soil in different groups.

## Unit-II Soil Water and Consolidation:

Permeability of soil: Darcy law and its validity, Determination of permeability in laboratory and in field using various methods like constant head method, pumping tests etc. factors affecting permeability of soil, Seepage analysis - introduction, stream & potential functions, flow nets, uses of a flow net, Introduction to effective, neutral and total stresses, effect of water table, fluctuations of effective stress, effective stress in soils saturated by capillary action, seepage pressure, quick sand condition.

Consolidation - Introduction, Compressibility and consolidation, comparison between compaction and consolidation, initial, primary & secondary consolidation, spring analogy for primary consolidation, interpretation of consolidation test results, Terzaghi's Theory of consolidation, final settlement of soil deposits, Determination of consolidation settlement and secondary consolidation.

#### Unit-III Stress Distribution in Soils:

Stresses in soil - Introduction, stresses due to point load, line load, strip load, uniformly loaded circular area, rectangular loaded area, influence factors, isobars, Boussinesq's equation, westergaard's analysis. Newmark's influence chart. Contract pressure under rigid & flexible area, computation of displacements from elastic theory.

#### Unit - IV Shear Strength of Soils:

Mohr Circle and its characteristics, principal planes, relation between major and minor principal stresses. Mohr-

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(A Govt, Aided UGC Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V., Bhopal MP) Coulomb's theory, types of shear tests, direct shear test, merits of direct shear test, Triaxial compression test, test behaviour of UU, CU and CD tests, pore-pressure measurements, computation of effective shear strength parameters, unconfined compression test, vane shear test, critical void ratio, Liquefaction.

## Unit - V Stability of Slopes:

Introduction. Types of slopes and their failure mechanisms, factor of safety, analysis of Infinite and finite slopes, wedge failure, Swedish circle method, friction circle method, stability numbers and charts. Effect of ground water. Selection of shear strength parameters in slope stability analysis. Stability of Earth dams.

## Course Outcomes:

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

CO1: Evaluate different properties of rocks & soil and its classification.

- CO2: Examine the flow and shear parameters & their effects on various types of soil.
- CO3: Determine the stress distribution & shear failure by various methods.
- CO4: Evaluate the shear strength parameter of soil by various methods.

CO5: Analyse the stability of slopes using various methods.

#### Text Books:

- 1. Soil Mech. & Found. Engg., Dr. K.R. Arora, Std. Publishers Delhi, 7th Edition, 2014
- 2. Soil Mech. & Foundation, Dr. B.C. Punmia, Laxmi Publications, Delhi, 16th Edition, 2017
- 3. Soil Mech. & Found Engg., S.K. Garg, Khanna Publishers, Delhi, 1st Edition, 2003
- 4. Basic & Applied Soil Mechanics, Gopal Ranjan, New Age International Publishers, 2016
- 5. Parbin Singh., "Engineering and General Geology", S. K. Kataria and Sons, 2009

### **Reference Books:**

- 1. Modern Geotech Engg. Dr. Aram Singh, IBT Publishers, Delhi, 8th Edition, 2016
- 2. Geotech Engg., C. Venkatramaiah, New Age International Publishers, 16th Edition, 2018
- 3. Soil Testing for Engg., T.W. Lambe, John Wiley & Sons. Inc. 1969
- 4. Bangar, K.M, Principles of Engineering Geology, Standard Publishers Distributors, 1995, New Delhi

#### List of Experiment's:

- 1. Moisture Content Determination. Oven Drying-Method.
- 2. Grain Size Analysis Mechanical Method.
- 3. Grain Size Analysis Hydrometer Method.
- 4. Liquid Limit, Plastic Limit, Shrinkage Limit Tests.
- 5. In-Place Density tests Core Cutter Method, Sand Replacement Method.
- 6. Specific Gravity Tests.
- 7. Permeability Tests, Variable Head Method.
- 8. Compaction Test.
- 9. Unconfined Compression Test.
- 10. Direct Shear Test.
- 11. Triaxial Shear Test (UU)
- 12. Vane Shear Test.
- 13. Plate Load Test (Demonstration)
- 14. Consolidation Test.

Upon completion of practical course, the students will be able to:

CO 1: Check physical properties of soil.

- CO 2: Check strength properties of soil.
- CO 3: Differentiate the flow properties and stresses of soil.
- CO 4: Check shear strength of soil.

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		2017-2019 BATCH		2020-2022 BATCH	<b>D</b> (
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Percentage Change
	510101	Management Theory	510111	Computational Techniques	76.47
	510102	Materials & Equipments	510112	Construction Materials & Machines	
	510103	Quantitative Methods	510113	Contract Management	
Ι	510104	Contract Management	DE	510114 Maintenance Management 510115 Infrastructure Development 510116 Formwork for Concrete Structure	
	510105	Functional Planning Building Services & Maintenance Management	OC	800108 Organizational Behaviour & Management 800109 Safety & Quality Management	
	510106	Computer Lab - I	510119	Construction Lab	
	510107	Construction Lab - I	510120	Self Learning / Presentation (SWAYAM/NPTEL)	
	510201	Comnstruction Techniques	510211	Project Economics & Financing	
	510202	Construction Economics & Finance	510212	Construction Cost Management	
	510203	Construction Cost Management	510213	Construction Project Management	
Ш	510204	Project Management	DE	<ul><li>510214 Scheduling of Repetitive Construction Project</li><li>510215 Durability &amp; Repair of Concrete Structure</li><li>510216 Poject Procurement System</li><li>520217 Safety in Construction</li></ul>	
	510205	Project Planning Scheduling & Control	OC	800208 Sustainable Materials & Green Buildings	
	510206	Computer Lab - II	510219	Computational Laboratory for Construction Management	
	510207	Construction Lab - II	510220	Self Learning / Presentation (SWAYAM/NPTEL)	
	510301	Infrastructure Project Management	510311	Dissertation Part - I	
III	510302	Urban Hydrology & Waste Management	OC	800308 Urban Governance & Development Management	
	510303	Seminar			
	510304	Preliminary Dissertation			
IV	510401	Dissertation	510405	Dissertation Part II	

## **CIVIL ENGINEERING DEPARTMENT**

M.E. in Construction Technology & Management

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## Course Code: 510112

## **Course Name: Construction Materials & Machines**

P	C
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## Course Objectives:

1. To study the properties, design and production of various types of concrete i.e. cement

2. To understand the applications of polymeric materials, additives, admixtures.

3. To understand management of equipments used in construction industry.

4. To learn the design & methods of various foundations.

To study the design & manufacturing of various types of formwork and prefabricated components

6. To understand the concept of Modular coordination.

## Syllabus:

#### Unit-I

Construction Materials & Concrete: Physical properties of construction materials and testing in field and laboratory as per IS code. Design and production of concrete its manufacture eg. Batching, Mixing, Transporting, Placing compacting and curing. Design and production of high strength Ready mix concrete.

### Unit-II

New Construction Materials: Polymeric materials. Polymer concrete, Additives and admixtures in concrete, Light weight, Heavy and no fine concrete, Ferro cement and fiber reinforced concrete, high performance concrete and composite materials, roller compacted concrete.

### Unit-III

Construction Equipments: Construction equipments and its characteristics, Operation and selection. Different types of construction equipments eg. Power shovels, drag lines, Scrapper, Bulldozer, Tractor, Rippers, Motor graders, aggregate processing and batching plants, Cycle time and capacity ratings, Sizing and matching, Hot Mix plant, RMC Plant.

### Unit-IV

Foundations: Techniques of construction of piles, Cassions, Wells, Cofferdams and diaphragms, Drilling blasting, Underpinning, Shoring and shuttering of foundation.

Formwork: Design and construction of different types of formworks and temporary structures, Stationary and slip formwork techniques, Formwork of special structures eg. Shells, Bridges, Towers etc.

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#### Unit-V

Steel Construction, Prefabrication & Prestressing: Fabrication and erection (Shop and in situ construction techniques). Erection of steel structures like bridges, Chimneys and trusses.

Application of prefabrication in construction Modular coordination and standardization; Special equipments and plants for industrial production of prefabricated components.

Prestressing methods, Special equipments and plants for industrial production of prestressed components.

## Course Outcomes:

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

CO 1: Explain the advanced elements of buildings, engg. materials & construction.

CO 2: Distinguish the suitability of different foundations in Civil Engineering structure.

CO 3: Evaluate the properties of various types of concrete in construction industry accordingly.

CO 4: Apply various techniques for prefabrication & pre-engineered elements of building and modular coordination and standardization.

CO 5: Design different types of formwork as per their suitability.

CO 6: Describe various methods for design mix of concrete & equipment management.

#### **Reference Books:**

- D. G. Gransberg, C. M. Popescu and R. C. Ryan, Construction equipment management for engineers, estimators, and owners, Taylor & Francis, New York, 2006.
- R. L. Peurifoy, C. J. Schexnayder, A. Shapira and R. Schmitt, Construction planning, equipment, and methods, 8th ed., McGraw Hill, New York, 2010.
- 3. V. Shantha Kumar, Concrete, Oxford University press.
- 4. A.M. Neville, Properties of concrete, Pearson
- 5. M.L. Gambhir, Concrete Technology, Tata Mc Graw Hill Pub. Co.
- 6. Soil Mechanics by Gopal Ranjan, New Age Publishers.
- Mahesh Verma, Construction Equipment, its planning & Application, Metropolitan Book Co.(P) Ltd.,
- 8. Foundation Design Manual by Narayan V. Nayak
- 9. Prestressed concrete by Rajagopalan
- 10. Prestressed concrete by T.Y. Lin
- 11. Highway Engg by Justo and Khanna.

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## Course Code: 510211

## Course Name: Projects Economics & Financing

L	Т	P	C
3		-	3

## Course Objectives:

- 1. To understand managerial economics.
- 2 To understand demand analysis and forecasting in construction industry.
- 3 To understand Time value of money and Cost of Capital.
- 4 To understand budgeting of construction projects.
- 5 To understand selection and evaluation of construction projects.
- 6 To understand project financing and risk.
- 7. To understand the accounting processes in construction industry.

### Syllabus:

### Unit-I

3

Basic Economic Theories: Principles of managerial economics. Economic theories. Demand analysis and forecasting. Demand elasticity. Cost and production analysis. Production function. Pricing decisions. Policies & practice.

### Unit-II

Money: Time value of money. Different methods & comparisons. Cash flow, discounted cash flow, cash flow forecasting. Financial ratios and statements. Cost of Capital.

## Unit-III

Capital Budgeting: Working capital. Capital budgeting and performance budgeting. Break even analysis. Project selection. Project appraisals

### Unit-IV

Project Financing: Means of Finance, Financial institutions in India, Policies of financial institutions, Financial assistance, Special schemes, Project risk

## Unit-V

Financial Accounting: Book keeping processes of construction industry. Accountancy cycle. Journals. Forms and ledgers etc. for accounting and monitoring labour, equipment and material costs. PWD accounting procedure and types of financial statements in Government.

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## Course Outcomes:

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

COI: Apply principles of managerial economics.

CO2: Perform demand analysis in construction sector.

CO3: Workout time value of money and cost of capital.

CO4: Analyze break-even point and appraisal of projects.

CO5: Determine appropriate means of financing a project.

CO6: Monitor the various cost components of construction projects by using accounting procedures.

## Reference Books:

- 1. Project Planning, Analysis, Selection, Financing, Implementation & Review by Prasanna Chandra, Publisher Tata McGraw-Hill Education.
- 2 Engineering Economics & Analysis, by Donald G Newnan, Publisher Oxford University Press.
- 3. Economic Theory and The Construction Industry by P. Hillebrandt, Publisher Palgrave Macmillan UK
- 4. Construction Economics: A New Approach by Danny Myers, Publisher Routledge
- 5. Construction and Project Management Theory And Practices by K.N. Jha, Publisher Pearson Education India
- 6. Construction Project Management: Planning, Scheduling and Controlling by K.K. Chitkara, Publisher Tata McGraw-Hill Education

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## **CIVIL ENGINEERING DEPARTMENT**

		2017-2019 BATCH		Domoontogo	
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Percentage Change
	530101	Environmental Chemistry & Microbiology	530111	Environmental Chemistry & Microbiology	64.7
	530102	Materials & Equipments	530112	Solid & Hazardous Waste Management	
	530103	Quantitative Methods	530113	Advanced Treatment Process - I (Waste Water Engg)	
I	530104	Solid Waste Management	DE	<ul> <li>530114 Industrial Waste Management</li> <li>530115 Environmental Auditing &amp; Waste Management</li> <li>System</li> <li>530116 Environmental Hydraulics</li> </ul>	
	530105	Functional Planning Building Services & Maintenance Management	OC	800110 Sustainable Waste Management System	
	530106	Computer Lab - I	530118	Environmental Engineering Lab	
	530107	Env Lab - I	530119	Self Learning / Presentation (SWAYAM/NPTEL)	
	530201	Air Pollution & Sound Pollution	530211	Air Pollution & Noise Pollution	
	530202	Advanced Treatment Process - I (Water Supply Engg)	530212	Advanced Treatment Process - II (Water Supply Engg)	
II	530203	Advanced Treatment Process - II (Sanitary Engg)	530213	Environmental Impact Assessment & Ethics	
	530204	Project Management	DE	530214 Plastic Waste Management 530215 Electronic Waste Management	
	530205	Environmental Impact Assessment & Ethics	OC	800209 Global Climatic Changes & Disaster	
	530206	Computer Lab - II	530217	Advanced Environmental Engineering Lab	
	530207	Env Lab - II	530218	Self Learning / Presentation (SWAYAM/NPTEL)	
	530301	Frincipies & Design of Biological Treatment	530311	Dissertation Part - I	
Ш	530302	Urban Hydrology & Waste Management	OC	800309 Trace & Ultra Trace Analysis of Metals using Atomic Absorption Spectrometry	
	530303	Seminar			

## M.Tech in Environmental Engineering

	530304	Preliminary Dissertation			
IV	530401	Dissertation	530405	Dissertation Part II	

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# Course Code: 530112

# Course Name: Solid and Hazardous Waste Management

L	т	Р	Credit
3	0	0	3

# Course Objectives:

1) To provide broad knowledge on various aspects of planning & implementation of waste management system in a smart city town.

D To understand the principles applied in waste management.

3 To understand various ways to collect, treat & disposal of waste.

4) To understand various methods of energy recovery from waste.

5) To understand various aspects of hazardous waste management, E-waste management, biomedical waste management etc.

#### Syllabus:

#### Unit I:

Introduction: Introduction to waste management, classification of solid waste, objective of solid waste management, Solid waste sources - Nature and characteristics (physical, chemical & biological) -Quantities and Qualities - Generation rates - Potential of disease - Nuisance and other problems.

#### Unit II:

Collection and Storage: Solid waste management - Functional elements of solid waste - on - site storage - Collection and separation - Containers and its location - Collection systems and its example -Vehicle routing - Route balance - Transfer station - Processing - Recovery and reuse.

### Unit III:

Processing of Municipal Solid Waste: Conveying and compacting waste - Shredding - Types of shredders - Material separation - Types - Devices for material separation - Thermal processing of municipal solid waste - incineration, pyrolysis, gasification - Refuse Derived fuel - Biological process like composting, Vermicomposting and biomethanation.

### Unit IV:

Disposal: Disposal methods - Sanitary land filling - Planning - Site selection - Design - Landfill Process - Monitoring Closure - Post closure monitoring - leachate management & control of gases in landfills, environmental monitoring of landfills. MSW rules, Introduction to swachh bharat mission and smart cities program - current status, challenges and future trend of waste management.

### Unit V:

Hazardous Waste Management: Introduction to hazardous waste - Definition - Characterization and composition - TCLP test - Storage and transportation of hazardous waste - Labeling of hazardous waste - Physical, Chemical and Biological treatment of hazardous waste - Bioremediation of hazardous waste -Treatment of Bio medical - Nuclear waste and Radio - Active waste - Fly ash management and E-waste management.

## Course Outcomes:

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

Moundi Mont of P CO 1: Explain the principles & concepts of waste management.

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- CO 2: Apply various techniques of handling the waste.
- CO 3: Apply various techniques of energy recovery from waste.
- CO 4: Plan an effective & efficient waste management system.

## Text Books:

- Text Book of Solid Wastes Management, Iqbal H. Khan and Naved Ahsan, CBS Publishers, 1st edition 2012
- Integrated Solid Waste Management, Hilary Theisen and Samuel A, Vigil, George Tchobanoglous, McGraw Hill Yew York, 1993

### **Reference Books:**

- Environmental Engineering, Rowe, Peavy & Tchobanogolous, Tata McGraw Hill Publications, 2017
- CPHEEO, Manual on Municipal Solid Waste management, Central Public Health and Environmental Engineering organization, Government of India, New Delhi, 2016
- Solid Waste Engineering, Vesilind P.A., Worrel H. W. and Reinhard, Thomson Learning Inc, 2003
- 4. Charles A. Wentz, Hazardous Waste Management, McGraw Hill, New York. 1995.
- David Rimbers, Municipal Solid Waste Management: Pollution Technologies Review, Noyes Data Corporation, London, 1990.
- Michael D. Lagrega, Philip L. Buckingham, Jeffrey C. Evans. Hazardous Waste Management McGraw Hill, New York. 1994.

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## Course Code: 530211

# Course Name: Air Pollution & Noise Pollution

	L	Т	Р	Credit
Photo	3	0	0	3
Course Objectives:				

It To provide a broad knowledge on various sources & effects of air pollution.

in To disact the recliniques to control air pollution and apply them.

5) To provide homelsdge on air quality standards, monitoring of air quality.

to The possible a basic knowledge on sources, effects of noise pollution & also how to reduce the

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this the configurations.

Definition of Air Pollution, Sources and classification of air pollutants - Man made - Natural sources Type of air pollutionts - Pollution due to automobiles, Units of measurements of pollutants, Air unality entretity - emission standards - National ambient air quality standards - Air pollution indices -Air spealing management in India, Air pollution survey, Air pollution from major industrial operations, Air pollution in Indian cities, Major Air pollution episodes, Air Act.

## Unit H is trees of Air Pollution:

Analysis of air pollutants - Chemical, Instrumental and biological methods, Air pollution and its effects on human beings, plants and animals - Economic effects of air pollution - Effect of air pollution on meteroplogical conditions - Changes on the Meso scale, Micro scale and Macro scale, ethobal Wormung, Acid Rain, Ozone Layer Depletion, Indoor Air Pollution & Occupational Disense

## Unit III Sampling, Meteorology and Air Quality Modeling:

Sampling and measurement of particulate and gaseous pollutants - Ambient air sampling - Stack strepling. Environmental factors - Meteorology - temperature lapse rate and stability - Adiabatic inpact and - Wind Rose - Inversion - Wind velocity and turbulence - Plume behavior - Dispersion of air pullatants- Air Quality Modeling,

## Unit IV Air Follution Control Measures:

Control Subject correction methods - Control equipments - Particulate control methods - Bag house fifter - Settling chamber - cyclone separators - inertial devices - Electrostatic precipitator -Set ubierta

- Control of gascous emissions - Absorption - Absorption equipments - adsorption and combustion devices (Theory and working of equipments only), odour and its control, stack monitoring kit, auto exhaust analyser.

## Last V Suite Pathetion & its Control

Store of trend Units and Measurements of Noise - Noise Standards, Noise rating system, Characteristication of Noise from Construction, Mining, Transportation and Industrial Activities, Airport Noise - Control Measures - Effects of noise pollution - auditory effects, non - auditory officing Noise Menace- Prevention and Control of Noise Pollution - Control of noise at source,

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Sector and the sector of exposed person – Control of other types of Noise Sound Vision and Found level meter.

Contese Conconnest

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

CO It Explain the concepts of air & noise pollution.

<0.0 3) in the effects of air & noise pollution on environment.

CO 3: Apply various techniques to measure air & noise pollution.

TO 4: Sofee air and noise pollution problems by devising solutions to the identified problems

CO 5: Apply various techniques used in reducing the environmental pollution.

Text Books:

- 1 Air palestorn & Control, M. N. Rao & H. V. N Rao, Tata McGraw Hill Publications., 2017
- 2 Air Fostation of Control Technologies, Dr. Y. Anjaneyulu, Allied publishers Pvt. Ltd., 2002.

Roberton Bualist:

- J. Sewage Disposal & Air Pollution Engineering, S.K. Garg, Khanna Publishers, 31st edition, 2008
- 2 Environmental Pollution Control Engineering, C. S. Rao, New Age Intl Pub., 3rd edition, 2018
- Environmental Engineering, Rowe, Peavy & Tchobanogolous, Tata McGraw Hill Publication, 2017

MS medi

## B.Tech in Electronics Engineering(EC)

		0	0.
Department	of Electronics	Engineerin	ıg

CENTE		2019-2023 BATCH	of Electronics I	2020-2024 BATCH	
SEME STER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Percentage change
	100201	Engineering Physics	100013	Engineering Physics	30.64
	100202	Energy, Environment, Ecology & Society	100020	Basic Civil Engineering & Mechanics	
Ι	100203	Basic Computer Engineering	100021	Basic Mechanical Engineering	
1	100204	Basic Mechanical Engineering	100022	Basic Electrical & Electronics Engineering	
	100205	Basic Civil Engineering & Mechanics	100023	Basic Computer Engineering	
	100206	Language Lab. & Seminars	140111	Electronics Workshop	
	100101	Engineering Chemistry	100011	Engineering Mathematics-I	
	100102	Mathematics - I	100015	Energy, Environment, Ecology & Society	
П	100103	Technical English	100016	Technical Language	
	100104	Basic Electrical & Electronics Engineering	100017	Language Lab	
	100105	Engineering Graphics	140211	Electronics Devices	
	100106	Manufacturing Practices	140212	Engineering Materials	
_	100001	Mathematics-II	1000001	Indian Constitution and Traditional Knowledge	
_	140301	Electronics - I	100025	Engineering Mathematics - II	
	140302	Digital Circuits and Systems	140311	Electronics Circuit Design	
	140303	Network Theory	140312	Network Theory	
ш	140304	Signals & Systems	140313	Signals & Systems	
	140305	Software Lab (Introduction to MATLA	140314	Electronics Measurement & Instrumentation	
	100002	Biology for Engineers	140315	Software Lab Introduction to MATLAB	
	140306	Self Learning/Presentation	140316	Self Learning/Presentation	
	140307	Summer Internship Project-I	140317	Summer Internship Project-I	
			200XXX	Novel Engaging Course	
	100003	Mathematics - III	1000002	Biology for Engineers	]
[	100004	Cyber Security	100009	Cyber Security	
	140401	Electronics - II	100003	Engineering Mathematics-III	]
	140402	Analog Communication	140411	Digital Circuits & Systems	]
IV	140403	Communication Networks	140412	Analog Integrated Circuits	

	140404	Electronics Measurement and Instrument	140413	Analog Communication
	140405	Hardware Lab	140414	Communication Networks
			140415	PCB Design Lab
			200XXX	Novel Engaging Course
	100005	Ethics, Economics Entrepreneurship & Ma	1000005	Project Management & Financing
	140502	Electromagnetic Theory	1000006	Disaster Management
	140503	Data Communication	140511	Data Science
	140504	Linear Control Theory	140512	Microprocessor & Interfacing
	140505	Digital Communication	140513	Linear Control Theory
V	140506	Minor Project - I	140514	Digital Communication
v	140507	Summer Internship Project-II	140515	Electromagnetic Fields
	140508	Self Learning/Presentation	140516	Minor Project - I
	100006	Indian Constitution and Traditional Knowledge	140518	Summer Internship Project-II
			140517	Self Learning/Presentation
			200XXX	Novel Engaging Course
	100007	Disaster Management	140615	Digital Signal Processing
	140601	Microprocessor and Interfacing	140616	VLSI Design
	140602	Digital Signal Processing	140617	Learning
				140651 Spread Spectrum Communications
				and Jamming
			DE	140652 Digital IC Design
				140653 Fuzzy Sets,Logic and Systems &
	140606	Minor Project - II		Application
VI	DE	140611 Optical Communication 140612 Antennas and Wave Propagation 140613 Telecom Switching and Networks	OC	900116 Embedded System 900117 Intelligent Control

	DE OC	140651 Spread Spectrum Communications and Jamming 140652 Digital IC Design 140653 Fuzzy Sets,Logic and Systems & Application 900104 Intelligent Control 900105 Embedded System	140618 200XXX 1000007	Minor Project - II Novel Engaging Course Intellectual Property Rights
	100008	Intellectual Property Rights	100008	Intellectual Property Rights
	140701	VLSI Lab	140701	VLSI Lab
	140704	Creative Problem Solving	140704	Creative Problem Solving
		140711 Satellite and Radar		140711 Satellite and Radar Communication
		Communication		140712 VLSI Design
		140712 VLSI Design		140713 Microwave Engineering
	DE	140713 Microwave Engineering	DE	
VII		140751 Digital Image Processing		140751 Digital Image Processing
* 11		140752 Introduction to Wireless		140752 Introduction to Wireless Cellular
	DE	Cellular Communication	DE	Communication
		900206 Satellite System		900206 Satellite System
	ос	900207 Consumer Electronics	OC	900207 Consumer Electronics
	OC 140702	900218 MEMS & Mechatronics 900219 Multimedia Communication Summer Internship Project-III	OC 140702	900218 MEMS & Mechatronics 900219 Multimedia Communication Summer Internship Project-III
VIII	DE	140853 Power Management Integrated Circuits 140854 Fundamental of Power Electronics 140855 Biomedical Signal Processing	DE	140853 Power Management Integrated Circuits 140854 Fundamental of Power Electronics 140855 Biomedical Signal Processing
		900601 Linear Dynamical Systems		900601 Linear Dynamical Systems
	OC	900602 Sensors and Actuators	OC	900602 Sensors and Actuators
	140804	Internship/Project	140804	Internship/Project

		2019-2023 BATCH		onics Engineering 2020-2024 BATCH	
SEMES TER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Percentage change
	100201	Engineering Physics	100013	Engineering Physics	30.64
	100202	Energy, Environment, Ecology & Society	100020	Basic Civil Engineering & Mechanics	
Ι	100203	Basic Computer Engineering	100021	Basic Mechanical Engineering	
I	100204	Basic Mechanical Engineering	100022	Basic Electrical & Electronics Engineering	
	100205	Basic Civil Engineering & Mechanics	100023	Basic Computer Engineering	
	100206	Language Lab. & Seminars	<mark>200111</mark>	Electronics Workshop	
	100101	Engineering Chemistry	100011	Engineering Mathematics-I	
	100102	Mathematics - I	100015	Energy, Environment, Ecology & Society	
II	100103	Technical English	100016	Technical Language	
11	100104	Basic Electrical & Electronics Engineering	100017	Language Lab	
	100105	Engineering Graphics	200211	Electronics Devices	
	100106	Manufacturing Practices	200212	Engineering Materials	
	100001	Mathematics-II	1000001	Indian Constitution and Traditional Knowledge	
	200301	Electronics - I	100025	Engineering Mathematics - II	
	200302	Digital Circuits and Systems	200311	Electronics Circuit Design	
	200303	Network Theory	200312	Network Theory	
III	200304	Signals & Systems	200313	Signals & Systems	
111	200305	Software Lab (Introduction to MATLA	200314	Electronics Measurement & Instrumentation	
	100002	Biology for Engineers	200315	Software Lab Introduction to MATLAB	
	200306	Self Learning/Presentation	200316	Self Learning/Presentation	
	200307	Summer Internship Project-I	200317	Summer Internship Project-I	
			200XXX	Novel Engaging Course	
	100003	Mathematics - III	1000002	Biology for Engineers	1
	100004	Cyber Security	100009	Cyber Security	1
	200401	Electronics - II	100003	Engineering Mathematics-III	1
	200402	Analog Communication	200411	Digital Circuits & Systems	1
IV	200403	Communication Networks	200412	Analog Integrated Circuits	1

## B.Tech in Electronics & Telecommunication Engineering(ET)

	200404	Stochastic Processes in Communication	200413	Analog Communication
	200405	Hardware Lab	200414	Communication Networks
			200415	PCB Design Lab
			200XXX	Novel Engaging Course
	100005	Ethics, Economics Entrepreneurship & Ma	1000005	Project Management & Financing
	200502	Electromagnetic Theory	1000006	Disaster Management
	200503	Microprocessor & Interfacing	200511	Data Science
	200504	Linear Control Theory	200512	Microprocessor & Interfacing
	200505	Digital Communication	200513	Linear Control Theory
V	200506	Minor Project - I	200514	Digital Communication
	200507	Summer Internship Project-II	200515	Electromagnetic Fields
	200508	Self Learning/Presentation	200516	Minor Project - I
	100006	Indian Constitution and Traditional	200518	Summer Internship Project-II
			200517	Self Learning/Presentation
			200XXX	Novel Engaging Course
	100007	Disaster Management	200615	Digital Signal Processing
	200601	Digital Signal Processing	200616	VLSI Design
	200602	Data Communication	200617	Artificial Intelligence and Machine Learning
				140651 Spread Spectrum Communications and
				Jamming
			DE	140652 Digital IC Design
				140653 Fuzzy Sets,Logic and Systems &
	200606	Minor Project - II		Application
		140611 Optical Communication		
		140612 Antennas and Wave		
VI	DE	Propagation	OC	
		140613 Telecom Switching and		900116 Embedded System
		Networks		900117 Intelligent Control

		1		1
		140651 Spread Spectrum		
		Communications and Jamming		
	DE	140652 Digital IC Design	200618	
		140653 Fuzzy Sets,Logic and Systems		
		& Application		Minor Project - II
	ос	900104 Intelligent Control	200XXX	Novel Engaging Course
	00	900105 Embedded System		
			1000007	Intellectual Property Rights
	100008	Intellectual Property Rights	100008	Intellectual Property Rights
	200701	VLSI Lab	200701	VLSI Lab
	200704	Creative Problem Solving	200704	Creative Problem Solving
		140711 Satellite and Radar		140711 Satellite and Radar Communication
		Communication		140712 VLSI Design
		140712 VLSI Design		140713 Microwave Engineering
	DE	140713 Microwave Engineering	DE	
VII		140751 Digital Image Processing		140751 Digital Image Processing
V II		140752 Introduction to Wireless		140752 Introduction to Wireless Cellular
	DE	Cellular Communication	DE	Communication
		900206 Satellite System		900206 Satellite System
	ос	900207 Consumer Electronics	ос	900207 Consumer Electronics
		900218 MEMS & Mechatronics		900218 MEMS & Mechatronics
	ос	900219 Multimedia Communication	ос	900219 Multimedia Communication
	200702	Summer Internship Project-III	200702	Summer Internship Project-III
		140853 Power Management		
	DE	Integrated Circuits	DE	
		140854 Fundamental of Power		140853 Power Management Integrated Circuits
		Electronics		140854 Fundamental of Power Electronics
VIII		140855 Biomedical Signal Processing		140855 Biomedical Signal Processing

		900601 Linear Dynamical Systems		900601 Linear Dynamical Systems
ос	2	900602 Sensors and Actuators	ос	900602 Sensors and Actuators
200	0804	Internship/Project	200804	Internship/Project
20	0805	Professional Development	200805	Professional Development

		2019-2021 BATCH		2020-2022 BATCH	Percentage
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	change in syllabus
	600101	Mathematics	600111	Computational Techniques	84.21
	600102	Computer Networks	600112	Computer Communication Networks	
	600103	RF Circuits	600113	Commnucation System Design & Applica	
				600114 Communication Protocols 600115 Radar Signal Processing	
Ι	600104	Digital Communication	Elective	600116 Adaptive Control System 800102 Soft Computing Techniques in	
				RF Engineering 800103 5G Networks 800104 Image and Video Signal	
	600105	Modern Control Theory	ос	Processing	
	600105	Matlab Programming Lab	600120	Project Lab-I	
	600100	C++ Programming Lab	600121	Self Learning/Presentation	
	00010/				
		Advanced Microprocessor and			
	600201	Embedded Systems	600211	Information Coding Theory	
	600202	Digital Control Systems	600212	Computer Aided Control System	
	600203	Information and Design Coding Th	600213	Digital Filter Design & Algorithm	
п		600204 Microwave Circuit Design 600205 Internet and Network Security 600206 Wireless & Adhoc Network		600214 600215 600216	
	Elective	600207 Computer Graphics	Elective	600217	
				800201	
	600208	Digital Signal Processing	ос	800203	
	600209	Hardware Lab	600222	Project Lab-II	
	600210	Simulation Lab	600223	Self Learning/Presentation	

## M.E in Communication, Control & Networking Department of Electronics Engineering

		600301 Advance Communication		
		System		
		600302 Telecommunication		
	Elective	Networks	600311	Dissertation Part-I
III		600303 Radar Systems		
		600304 Advance Computer		
	Elective	Architecture	MOOC Course	MOOC Course
	600305	Seminar		
	600306	Dissertation Part-I		
IV	600401	Dissertation Evaluation and Defension	600405	Dissertation Part-II

(A Govt. Aided UGC Autonomous& NAAC Accredited Institute Affiliated to R.G.P.V. Bhopal )

#### 2019-2023 BATCH 2020-2024 BATCH Percentage SEM. COURSE COURSE Change COURSE NAME COURSE NAME CODE CODE 25.42 100101 Engineering Chemistry 100011 Engineering Mathematics-I 100102 Engineering Mathematics-I 100012 Engineering Chemistry 100103 Technical English 100014 Engineering Graphics Basic Electrical & Electronics Engineering Ι 100104 100015 Energy, Environment, Ecology & Society **Technical Language** 100105 Engineering Graphics 100016 100106 Manufacturing Practices 100017 Language Lab 100018 Engineering Graphics Lab Engineering Physics Material Science 100201 120211 100020 100202 Energy, Environment, Ecology & Society **Basic Civil Engineering & Mechanics** 100203 Basic Computer Engineering 100021 Basic Mechanical Engineering Π 100204 100022 Basic Electrical and Electronics Engineering Basic Mechanical Engineering 100205 Basic Civil Engineering & Mechanics 100023 Basic Computer Engineering 100206 Language Lab. & Seminars 100024 Manufacturing Practices Basic Mechanical Engineering Lab 120026 100001 Engineering Mathematics-II 100025 Engineering Mathematics-II 120301 Material Science 120311 Manufacturing Processes 120302 Mechanics of Materials 120312 Mechanics of Materials 120303 Theory of Machines –I 120313 Theory of Machines -I 120304 Fluid Mechanics and Hydraulic Machines 120314 Fluid Mechanics and Hydraulic Machines Ш 120305 Software Lab 120315 Software Lab Self-learning/Presentation Self-learning/Presentation (SWAYAM/NPTEL/MOOC) 120306 120316 Summer Internship Project-I (Institute Level) (Evaluation) 120307 200XXX Novel Engaging Course Summer Internship Project-I 120318 1000001 Indian Constitution and Traditional Knowledge 100003 Mathematics- III 100003 Mathematics- III Theory of Machines -II 120401 Theory of Machines -- II 120411 120412 Design of Machine Elements 120402 Design of Machine Elements Metal Cutting and Machine Tools 120403 Manufacturing Processes 120413 IV 120414 Engineering Thermodynamics 120404 Engineering Thermodynamics 100004 Cyber Security 100004 Cyber Security 120405 Production Lab 120415 Production Lab 100002 **Biology** for Engineers 200XXX Novel Engaging Course (Informal Learning) 1000002 **Biology** for Engineers 120501 Industrial Engineering 120519 Data Science

#### MECHANICAL ENGINEERING DEPARTMENT B.Tech. Mechanical Engineering

Г	120502	Metal Cutting and Machine Tools	120511	Industrial Engineering
	120502	Heat and Mass Transfer	120511	Heat and Mass Transfer
	120503	Thermal Engineering	120513	Thermal Engineering
-	120505	Machine Design	120514	Machine Design
-	120506	Minor Project-I	120515	Minor Project-I
v	120507	Summer Internship Project-II (Evaluation)	120510	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)
	120307		120317	Sen-icanning/Tesenation (SWATAW/WTEE/WOOC)
	120508	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)	200XXX	Novel Engaging Course (Informal Learning)
			120518	Summer Internship Project-II (Evaluation)
			1000006	Disaster Management
			1000005	Project Management & Financing
	100005	Ethics, Economics, Entrepreneurship & Management	120615	Mechanical Vibrations
	120601	Advance Production Technology	120616	Refrigeration and Air-Conditioning
	DE	120611 Vibration and Noise Engineering	120617	Artificial Intelligence & Machine Learning
		120612 Statistical Quality Control		
		120613 Work Study and Ergonomics		
		120614 Turbo Machinery		
	DE	120652 Fundamental of Welding Science and Technology	DE	120661 Fundamental of Welding Science and Technology
VI		120654 Viscous Fluid Flow		120662 Viscous Fluid Flow
		120655 Properties of Materials (Nature and Properties of Material: III)		120663 Properties of Materials (Nature and Properties of Material: III)
		120656 Nature and Properties of Materials		
	OC	900101 Robotics	OC	910108 Product Design
		900102 Product Design		910109 Robotics
	100007	Disaster Management	120618	Minor Project-II
	120605	Minor Project-II	200XXX	Novel Engaging Course (Informal Learning)
	100006	Indian Constitution & Traditional Knowledge (Audit Course)	100008	Intellectual Property Rights (IPR)
	DE	120711 Refrigeration and Air-Conditioning	DE	120713 Metrology, Measurement and Control
		120713 Metrology, Measurement and Control		120714 Total Quality Management
		120714 Total Quality Management		
	DE	120751 Foundation of Computational Fluid Dynamics	DE	120751 Foundation of Computational Fluid Dynamics
		120752 Introduction to Composites		120752 Introduction to Composites
		120753 Advanced Machining Processes		120753 Advanced Machining Processes
VII	OC	900203 Industrial Automation	OC	900203 Industrial Automation
V 11		900204 Solar Energy		900204 Solar Energy
[	OC	900214 Engineering Materials for Industrial Applications	OC	900214 Engineering Materials for Industrial Applications
		900215 Maintenance Engineering		900215 Maintenance Engineering
[	100008	Intellectual Property Rights (IPR)	120701	Reliability and Vibration Lab
[	120701	Reliability and Vibration Lab	120702	Summer Internship Project-III (04 weeks ) (Evaluation)
	120702	Summer Internship Project-III (04 weeks ) (Evaluation)	120703	Creative Problem Solving (Evaluation)
	120703	Creative Problem Solving (Evaluation)		
	DE	120851 Quality Design and Control	DE	120851 Quality Design and Control
		120852 Robotics: Basics and Selected Advanced Concepts		120852 Robotics: Basics and Selected Advanced Concepts
		120855 Carbon Materials and Manufacturing	1	120855 Carbon Materials and Manufacturing

VIII	OC	900605 Waste to Energy Conversion	OC	900605 Waste to Energy Conversion	]
vm		900609 Product Design and Manufacturing		900609 Product Design and Manufacturing	
		900610 Automatic Control		900610 Automatic Control	
	120801	Internship/Project	120801	Internship/Project	
	120802	Professional Development	120802	Professional Development	

#### REVISED SCHEME (2020-24)

#### MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALLOR (A Gav. Aided UGC Astronomous & XAAC Asycenized Institute Millioned to BGPV, Blogal) Department of Machinical Engineering

Scheme of Examination: Bachelor of Technology (B.Tech.) Mechanical Engineering

GROUP B: I Semester (Mechanical Engineering)

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GROUP & (Encircul, Encircule), Computer Scienced Engineering, Information Technology, Encircular & Telecommunication) GROUP B. (Cloid, Mechanical, Chemical, Bietech, Astronombil) (B. Dener) Permittel Condit, C. Promiter Periods 94 Condit

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MADBAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (A Gost, Aided UOC Automation & NAAC Accredited Institute Affiliated in BGPC, Baspal) Department of Machine Tenginsering Scheme of Examination: Bachelor of Technology (B.Tech.) Mechanical Engineering Group B: II Semester For baches administration Science, 2019-20

B.Tech. II Semester (Mechanical Engineering)

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Summer Enternthip Project - I (Institute Level) (Qualifier): Minimum two-work duration

GLOUP A. (Electrical, Electronics, Computer Science& Engineering, Information Technology, Electronics & Telecommunication) GROUP B. (Cred. Michanical, Constrait, Botech, Antonomich) 01Theory Devinder & Credit, 12 Proceedint Periods, +1 Credit



MADRAY DYDRUTH OF DECEMPTION A SERVER OF ALION (A first Add UCC Antonional Instituted NAM: According Institute allighted to RGPS, Bound, MP)

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#### B. Tech. I Semester (Mechanical Engineering)

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#### MADRAY INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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#### Scheme of Examination: Bachelor of Technology (B.Tech.) Mechanical Engineering

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#### MADHAY INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (A first, Aided UEC, Automasses & NAAC Acceedited Institute Allifated to ROPY, Respil-Department of Mechanical Engineering

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#### REVISED SCHEME (2020-24)

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Department of Mechanical Engineering

#### Scheme of Examination: Bachelor of Technology (B.Tech.) Mechanical Engineering For batches admitted in Section 2019-20

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Department of Mechanical Engineering

Scheme of Examination: Bachelor of Technology (B.Tech.) Mechanical Engineering

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Scheme of Examination: Bachelor of Technology (B.Tech.) Mechanical Engineering

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#### OLD SYLLABUS (2019-23)

#### MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR CA Gove, Added USE' Automations & NAAC According Institute Athilated to RGPV, Blogadi

Department of Mechanical Engineering

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a comparison of the model and eventual Ports, and an one of the model and eventual Ports,  $\beta$  - Model develop understarting these hydrostatic law, principle of become port setting the of a Boothy bridge and eventual functions and an energy expansion in Rule Bore.

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- fidentify the laws of fluid perchanics opplicable for the basis in various fluids under different conditions. Another various forces and fluid effects, rabied to fluids machanics. COL
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#### **REVISED SYLLABUS (2020-24)**

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR IA Gove Added UGC Automotions & NAAC Accordingl Institute Affiliated to BGPV, Bhopali Department of Mechanical Engineering

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Conver Objectives: To make the verdenic understand. I. Fundamentale of Fluid Miccharics, which is used in the applications of Aerodynamics. Hydroidics, Marine Englishering, Gas dynamics on. And give fundamental knowledge of Stati, as properties and whereive under various conditions of internal

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Unit-I Properties of fluid: Pressure, density, questile weight, classify, dynamic and historistic classify Newton's

Unit I Properties of fluid Pressure, during queues weight, thosening systems and attention theory execute and an effective pressure strategy and the applications.
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Course Outcomes: After incorrected completion of this course students will be able to

COL: Define the fundamental properties of fluids

CO2 Relate the concepts of anochronics with variants have of fluid unichlastics.
CO3 Identify the lates of fluid unichlastic applicable for the body in various throle under different conditions.
CO4 Analyse variants forces and their officients, related to thirds conclusion.

CO9. Measure and compare linears in different that first conditions.
CO6. Compare different tarbo machines depending on their behaviour and their merils and demotion.

#### Text & Reference Bankss

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#### MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (A Govet Added UEC Automousons & NAAC According Institute Affiliated to RGPV, Illagolt

Department of Mechanical Engineering For hatches adoption to keeping 2019, 21

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Placer.	Thermodynamics	1	.8	1		Diamitana-Thra

Conver Objective: To make madents able to-

- Understand the native and role of the various thermodynamic properties of matter-
- Represent a thermodynamic system by a control nases or control volume and identify work and/or last international-between the system and surroundings-

#### Stational .

Enit-I Bioic Concepts: Thermodynamics, Property, Equilibrium, Sune, Process, Cycle, Zeroth Inv. of durnerdynamics. Statement and operformer. Concept of an Ideal par. Gen Laws, Assignite's Hypothese, Hast and work number. First law of themeodynamics. Supersent of this law, of themestymetrics, first law, anytical to oloned system undergoing a cycle. Proceed analysis of alcond systems flow generos. Flow anargs, Steady flow sense applyin of cloud system processe. Limitations of first limit of thermodynamics

Unit -II Properties of pure substances to NV-T suchase, her, T-S, NV, Pdi, T-Y diagrams of pure substance, saturated and sub-asolied liquid, superheated suport, quality of strate. Mollier diagram, steam table, different processes, measurement of quality of secan

Unit .- HI Neward law of the most sounds. How ongive, How reservoir, Bafrigeroirs, Heat pump, CDP, Carnet's theorem. Conser's croke Efficience of Carnot's croke. Statement of second law, Rovenillic and Investedilic provision, Consequences of Neccord Ian-

Unit -IV Availability and Investsibility: Entropy Change of Ideal gas, Available energy, T-5 diagram; Avoilability and humanifeday.

Unit- V Thermodynamics Relations: Thermodynamics relations, e.g. Maxwell relation and their applications

Course Outcomers: After recorrection of this course endents will be able an

COD Deline energy interactions between system and surroundings

CO2: Correlate the law of thermodynamics to real life applications

CO3) Apply the laws of thermodynamics to analyze boilers, heat pumps, influencies, heat matters, compressors

and accordes COIr Investigate the effectiveness of energy conversion derive in machinesial power generation

COS: Anabas air standard cycles applied to prime movers.

COR Describe bandits of approximatis to thermodynamic costains

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- Chernal engineering by R.K. Heigner
- Thermal sugaranting by P.1. Ballancy а.

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#### MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (A Gevt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopali Department of Mechanical Engineering

#### For batches admitted in Academic Session 2020-21

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Course Objective: To make students able to:

Understand the nature and role of the varies a thermodynamic properties of matter. Represent a thermodynamic system by a control mass or control volume and identify work and/or heat

#### intervations between the system and varioundings.

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Unit-I Basic Concepts: Hurmodynamics, Property, Laoilibrium, State, Process, Cycle, Zeroth law of durantidynamics, Statement and agrifficance, Convegt of an Ideal gas, Oas Lows, Avogador's Hypothesis, Heat and work transfer. First law of thermodynamics. Statement of first law of thermodynamics, first law, applied to aloved assigns undergoing a syste. Privary analysis of closed system flow process. Flow energy, Standy flow process analysis of deard system preserves. Limitations of first law of thermodynamics,

Unit -D Properties of pure substances: - P-V-T methods, her, T-S, P-V, P-h, T-V diagrams of pure substance, saturated and sub-cooled topoid, superheated varear, spality of steam, Mulliar diagons, steam table, different toccases, mensurement of quality of steam

Unit -III Second law of thermodynamics: then engine. Their reserveir, Refrigerates: Their pump, COP, Carnor's theorem. Carmet's cycle. Efficiency of Carmot's cycle. Statament of second law, Reversible and Interceroble processes. Consequences of Second law

Unit -IV Availability and Inveversibility: Entropy Changes of Ideal gas, Available energy, T-5 diagram, Availability and Ingenerability. Unit, V. Thermodynamics Relations: Thermodynamics relations, e.g. Maxwell relations and their applications.

Air Standard Cycles: Carnot, Nerting, Ericsion, Ono, Dieset, Dout cycles and determination of their an intrafand afficiencies and their comprehent. Drayon cycle, Atkinson excle. PVT relationship, Mixture of ideal net Properties of monthes of

Course Outcomes: After successful completion of this course students will be after to:

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CO2: Correlate the law of thermodynamics to real life applications CO3: Apply the laws of themodynamics to analyze bodiers, beat pumps, relligeratory, heat engines, compressors

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COA: Analyze the thermal effletency of air standard evoles-

CO5: Analyze the entropy concept in thermodynamic systems

CO6: Describe benefits of improvements to thermodynamic systems

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- Engineering thermodynamics, by P.K. Nog-
- Thermal segmenting by R.K. Reput
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#### MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Gost, Added UGF Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bharadh Department of Mechanical Engineering

Fur insulary admitted in facular 2019-34

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Professional technical managerial, or kaderolip toke within industrial organizations.

The interviewing theory discovery, synthesis, and integration for the betterment of their organization re-Sollabore

## UNIT-L.

# Production Systems and Productivity: Production Management: design of production systems specific, job alog and bucht. Defention and types of productivity. Measurement of productivity. Sectors affairing the

productivity and productivity represented programs. Production Planning and Courted 1945-0110, reportance, need and function of production gluttering and centred. planning, passing, scheduling, dispersing, follow up & program report, production planning and production control.

#### UNIT-III

Preventing techniques. Need and type of framacing, farines affiniting formating, framewing in desired technique time series analysis, domain patterns, qualitative methods, manetees of formatic meaning and entry endpoint in quantitative Encounting. Capacity and appropriate planning: Copacity planning supporty measurement, long-some and short-term miningles, manipped production planning, and graphs of mention to choose approach plan.

## 12010-000

Excerting Control - Objectives and functions, need and characteristications and standardization. AIX: and new deterministic processity models, quartery discount perpendid and periods interpreting charges, hard stand-builded states attempting strangements, assesses excluding quartering and content of the period systems. or-polier protect.

# Project management - PERT uni-CPM.

#### 11501-15

Product Design and Development: Proceptes of good product design, inference, quality and error correlations, product life cycle, standardiantism, simplification, diversification, value engineering and analysis, methodology, applications, concernent arigmetring, comparison of production abstractives. Eacility Locations and Plaint Layout: Partity location theory and availables of alternate horations, qualitative superity, quantitative models for layout decisions, types of plant loyout and their evaluation, computer adult loyout decige techniques, soundby they belowing, materials handling system.

#### DOD: V

Control Production Scheduling and MRP. Functions, planning horizon and planning periods for survey production adiabatic types of innerer production schedule. Bill of Maturial, Independent Department densard, Functions, of maintain requirements planning and consultationing resource planning (MRP 1 and MRP II), inputs for MRP syltemic, performance characteristics of MRP system, maintain programming planning (MRP 1 and MRP).



## MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Goost Aided UCC Autonomous & NAAC According Institute Affiliated is RGPV, Bhomali Department of Mechanical Engineering

For batches admitted in Academic Session 2029-21

## 190911/120911: Industrial Engineering

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Departmental	Industrial	196511/128511/	L V P	Max Marke-50
Altera-DC	Engineering	100501-120501	a: + +	Min. Marka-14 Doration: Thrs.

Course Objectives industrial engineering is concerned with the design, imperventure, insultation, and management of magnated electric of men, manufal, and machine. After complexing this course, workness with lawn a set of skills that michaels manifesting introducting and initiates, compares whereas, human incomes, interpretered shifts, project correspondent, and as skilly to elements and addressive large to the argumenting and reasonich projects. This, underived adgreening may be through of as applied profiles/engine from immediant to implacementation

# Splinban. DATE: J

Production Systems and Productivity: Production Management: during of production systems (product, pds alog and hards). Orderica and types of productions, Management of productive, fewers affecting the productive and productivity improvement programs. Production Planning and Control Aggregate productive planning, Copacity planning, signate instant, long-term and dominant and control. Aggregate production planning, and graphed milled to down aggregate transmission.

#### UNIT-II

Forecasting techniques: Need and type of forecasting, factors officting forecasting. Increasting in decision making, thus series analysis, domend posterior, qualitative moderals, measures of Science accuracy and areas analysis for quantizative forecasting.

#### UNITAL

Incentury Control - Objectives and functions, need and classifications additionics and standardization ABC analysis, dimensionate inventory models, quantity discount, perpendent and periodic inventory control systems Probabilistic inventory management, demonstration quantity productional cost, carrying charges, load-time receiler point

#### Cold-TV

Facility Locations and Plant Layout: Facility location factors and evaluation of alternate locations, qualitative Project management - Project Scheduling, Network function and second descendence of the second scheduling address Project management - Project Scheduling, Network dagem, concel path marked (CPM), Project Evaluation ind accurate technologies (PSET), The second rade off

## UNIT-V

Master Production Scheduling and MBP: Functions, planning bottom and planning periods for minim-production ichedule, upper of master production schedule, BBI of Mineral, Independent Dennind versus dependent dynamic Functions of material requirements planning and manufacturing resource planning (MRP 1), and MRP 3), inputs for MRP containt performance characteristics of MRP system, materials requirement phararing explosion.



# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (A Gost, Aided UGC Automously & NAAC Accordited Inviting Affiliated to RGPV, Blogad)

#### Department of Mechanical Engineering For institute adjustitual to Senators 2829-28

## 120504: Thermal Engineering

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Departmental Loom	Theread Displayering	120504	1,		.P.	Max Marks N Mit Marks-22
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## Syllabas.

UNIT I -Air Mandard Cyclic, and Vapor Percer Cycles, Carren, Surling, Education, Otto, Distal: Buil cycles and information of these are very and very series and the series and the configuration. During each object that explore and information of the series of the series of minimum of passes. Very Correct cycle and its hymotoxias, Basking cycle and modified Basking cycle, actual upper power cycle, about cycle, ideal requirements of the opport of the series of the series of the series of minimum of the series of the caper systes, affliciency of acapted cycles , process hur, offlictencies to power cycles. Master of conflexions

#### UNITH - Engine Construction, Operation and Performance:

EVEL II - Engine Contraction, Operation and Performance. Biolass of Claud SI Enginese, Valve brand diagrams, Forng order and in significance - exhibite morits and damenin of SE and CL engines. Two stolke anguse sometimation and operations (Composition of Interstella and relevanda engines, Performance proceedings). Bost Indiance, Toxing of engine.

#### UNIT III - Condensities in 50 and CI Engineer.

Combinition process in 3C originals, Singles of combination, Plance propagation, volumity and area of flama from Bain of presents (siz - Cycle to cycle valuation - Absertial combiotien - Theories of detonation - Effect of organe operating variables on exclusion. Combinition characters for 56 and C1 angious, highermanics of are motion - Sociel, operate and turbulences. Sociel ratio. Field are ensuing - Stages of combinations - Delay period. Factors afflicting dalay present Kreach in C1 organis - multicals of correcting thread have.

#### UNIT IV - Tarbines and Passars

Chrydination, Pallon, Francis and Kaplan turbinos, victor diagrams and work done that! Tables, generating or write indvines, largedge singeng, velocity and pressure compounding antipation factor, analysis for optimizer U.F. Curits single, and Ratissi single, including qualitative studyers. Effect of thinks and ascelle lower on Vane effectively. Single efficiency. Analysis for optimizin efficiency cortex types of flow, flow with sometime machine. Application of dimensional analysis, similarity to induces and pamps, Classification, advantage over magnetization type, definition of encourterior local genesis head, while local cortex diagrams and work, done. Performance and Characteristics of mathematic send partype.

Unit F Beleggention and Air Conditioning. Revenue Beneton Coche, Bell-Coloran Cocke, Air Cycles for Airconft Bultigenoise. Projornes Beartrement, # Application of Religious AFC & BFC Religious. Supple super Absorption System Chartonn Religious. Plantamerers, Direrge depth ting, torth speta and

Vaprise Compression System Bright Briefste, Multi pressure tearmin Compression Multi-Economic Systems Compression Vapore discription events. Air Conditioning: hereduction in Psychonicity and Ad-Conditioning

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## MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (A Gevt, Aided UGC Autonomous & NAAC Acceeding Institute Affiliated to BGPV, Bhopab

Department of Mechanical Engineering

# 120814: Thermal Engineering

Category	Latte	Code	1	redit	4	Theory Paper
Departmental	Themal	120514	1	× .	P	Marx Markes-30 Min Markes-10
Com-DC	Tugissoning		2	1	2	Duration-2 hrs

Course Objectives: To make the endote understand-1. the fundamental principles of 4C engines and combustion phenomena-

3. The application of basic duremodynamics and fluid mechanics in share and gas tablics power station

#### No Hadease

DYNAMSES UNIT 1 - Yapar Perner Uyrley, Vapor Carnet syste and its limitations, Ranking syste and modelled Ranking cycle, actual vapor power syste. Refuse cycle, ideal regenerative cycle, actual regenerative cycle, Richau regenerative cycle, fisiologics function function, engineering of power and presents from working fluids in yapor power cycle, future vapor cycle, the efficiency of complete cycles. Busits of conferences.

## **UNIT II - D. Engine Booles and Combustion in IC Engines**

Desics of CI and SI Engines. Bostes of two-strike and functionale IC angines, Valve riming diagram. Performance parameters, Beat balance, Testing of the engine.

Sugar of combining in SI engine. Flame propagation, Rate of pressure rise. Although conduction, Theory of demonstring Effect of engine operating variables on basede. Stages of combinition in CI engines, Delay period -Fractors affecting although the SC combinition of an affecting of the basede. Combinition allouribury for SI and CI orginan.

#### UNFI SH - Hav Turbing

Open syste and closed cach arrangements, applications, assumptions in ideal cyclic analytics, compting as turbain cyclic near exchange cyclic, intercended cyclic carries combinations of referent hast exchange and increasing angestion of various cyclics. Combinated Brayton and Rushing Cyclic and ST-83 plants. Advantage and of stand Church

UNITIV - Subary Tachletes Classification (of steary territine, Impulse and quartery tarbury, Singing, Singe and overall efficiency, Releve form, Unitedim forder, Hindler, Schwarz diogram & work calculations, Impulse Newslop Tachnes, Lossen in some radiance, Governing of territies.

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# MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE, GWALIOR - 474005

(A Govt. Aided UGC Autonomous& NAAC Accredited Institute Affiliated to R.G.P.V. Bhopal )

		B.Tech. Automo	<u>bile Engin</u>	eering	
SEM.		2019-2023 BATCH	-	2020-2024 BATCH	Percentage
	COURSE	COURSE NAME	COURSE	COURSE NAME	Change
	CODE		CODE		
I		Engineering Chemistry	100011	Engineering Mathematics-I	25.031
	100102	Engineering Mathematics-I	100012	Engineering Chemistry	
	100103	Technical English	100014	Engineering Graphics	
	100104	Basic Electrical & Electronics Engineering	100015	Energy, Environment, Ecology & Society	
	100105	Engineering Graphics	100016	Technical Language	
	100106	Manufacturing Practices	100017	Language Lab	
			100018	Engineering Graphics Lab	
П	100201	Engineering Physics	190211	Material Science	
		Energy, Environment, Ecology & Society	190211	Basic Civil Engineering & Mechanics	
		Basic Computer Engineering	100020	Basic Mechanical Engineering	
	100203	Basic Mechanical Engineering	100021	Basic Electrical and Electronics Engineering	
	100204	Basic Civil Engineering & Mechanics	100022	Basic Computer Engineering	
	100203	Language Lab. & Seminars	100023	Manufacturing Practices	
	100200		120024	Basic Mechanical Engineering Lab	
			120020		_
III	100001	Engineering Mathematics-II	100025	Engineering Mathematics-II	
	190301	Material Science	190311	Automotive Materials	
	190302	Mechanics of Materials	190312	Mechanics of Materials	
	190303	Automotive Engines	190313	Automotive Engines	
	190304	Fluid Mechanics and Hydraulic Machines	190314	Fluid Mechanics and Hydraulic Machines	
	120305	Software Lab	190315	Software Lab	
	120306	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)	190316	Self-learning/Presentation	
	120307	Summer Internship Project-I (Institute Level) (Evaluation)	200XXX	Novel Engaging Course	
			190318	Summer Internship Project–I	
			1000001	Indian Constitution and Traditional Knowledge	
IV	100003	Mathematics- III	100003	Mathematics- III	
	190401	Theory of Machines –I	190411	Theory of Machines –I	
	190402	Automotive Electrical and Electronics System	190412	Automotive Electrical and Electronics System	
	190403	Engineering Thermodynamics	190413	Engineering Thermodynamics	
	190404	Manufacturing Processes	190414	Manufacturing Processes	
	100004	Cyber Security	100004	Cyber Security	

# MECHANICAL ENGINEERING DEPARTMENT B Tech Automobile Engineering

	190405	Production Lab	190415	Production Lab
	100002	Biology for Engineers	200XXX	Novel Engaging Course (Informal Learning)
			1000002	Biology for Engineers
V	190501	Industrial Engineering	190519	Data Science
	190502	Metal Cutting and Machine Tools	190511	Industrial Engineering
	190503	Heat and Mass Transfer	190513	Heat and Mass Transfer
	190504	Design of Machine Elements	190514	Design of Machine Elements
	190505	Automotive Chassis	190515	Automotive Chassis
	190506	Minor Project-I	190516	Minor Project-I
	190507	Summer Internship Project-II (Evaluation)	190517	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)
	190508	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)	200XXX	Novel Engaging Course (Informal Learning)
			190518	Summer Internship Project-II (Evaluation)
			1000006	Disaster Management
			1000005	Project Management & Financing
VI	100005	Ethics, Economics, Entrepreneurship & Management	190615	Automotive Transmission
	190601	Automotive Transmission	190616	Refrigeration and Air-Conditioning
	DE	190611 Automotive Materials	190617	Artificial Intelligence & Machine Learning
		190612 Work Study and Ergonomics		
		190613 Automotive Pollution and Control		
		190614 Automotive Component Design		
	DE	190652 Robotics and Control: Theory and Practice	DE	190661 Fundamentals of Automotive Systems
		190653 Fundamental of Automotive System		190662 Viscous Fluid Flow
		190654 Viscous Fluid Flow		
		190655 Nature and Properties of Materials		
	OC	900101 Robotics	OC	910108 Product Design
		900102 Product Design		910109 Robotics
	100007	Disaster Management	190618	Minor Project-II
	190605	Minor Project-II	200XXX	Novel Engaging Course (Informal Learning)
	100006	Indian Constitution & Traditional Knowledge (Audit Course)	100008	Intellectual Property Rights (IPR)
VII	DE	190711 Vehicle Dynamics	DE	190711 Vehicle Dynamics
		190713 Hybrid Electric Vehicles		190713 Hybrid Electric Vehicles
	DE	190751 Farm Machinery	DE	190751 Farm Machinery
		190753 Introduction to Mechanical Vibration		190753 Introduction to Mechanical Vibration
	OC	900203 Industrial Automation	OC	900203 Industrial Automation
		900204 Solar Energy		900204 Solar Energy
	OC	900214 Engineering Materials for Industrial Applications	OC	900214 Engineering Materials for Industrial Applications
		900215 Maintenance Engineering		900215 Maintenance Engineering

	100008	Intellectual Property Rights (IPR)	190701	Automotive Maintenance
	190701	Automotive Maintenance	190702	Summer Internship Project-III (04 weeks ) (Evaluation)
	190702	Summer Internship Project-III (04 weeks ) (Evaluation)	190703	Creative Problem Solving (Evaluation)
	190703	Creative Problem Solving (Evaluation)		
VIII	DE	120851 Quality Design and Control	DE	120851 Quality Design and Control
		120852 Robotics: Basics and Selected Advanced Concepts		120852 Robotics: Basics and Selected Advanced Concepts
		120855 Carbon Materials and Manufacturing		120855 Carbon Materials and Manufacturing
	OC	900605 Waste to Energy Conversion	OC	900605 Waste to Energy Conversion
		900609 Product Design and Manufacturing		900609 Product Design and Manufacturing
		900610 Automatic Control		900610 Automatic Control
	190801	Internship/Project	190801	Internship/Project
	190802	Professional Development	190802	Professional Development

## MADRAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (A fast hild VEC downson & VEM Avoided feature Addard's REP. Nagel Department of Mechanical Engineering

Scheme of Examination: Bachelor of Technology (B.Tech.) Automobile Engineering

GROUP B: I Semester Technike admitted in Second 2011-24 B. Tech I Semester (Automobile Engineering)

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MADRAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (A Gert Jakel 1757 Annuance & XAAC Accordinal Series Alliand to BCPL Bagali-Department of Machinical Engineering Scheme of Examination: Bachelor of Technology (B.Tech.) Automobile Engineering

Group B: II Semester Archebites admitted to fusion 3404-24

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# REVISED SCHEME (2020-24)

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# B.Tech. I Semester (Automobile Engineering)

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# B.Tech. II Semester (Automobile Engineering)

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# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR is fan Add 155 fernanae & DAC brokiel herne afhanfre REF. Beph Department of Medicalical Engineering

# Scheme of Examination: Bachelor of Technology (B.Tech.) Automobile Engineering B.Tech. III Semester (Automobile Engineering)

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# Scheme of Examination: Bachelor of Technology (B.Tech.) Automobile Engineering B.Tech. IV Semester(Antomobile Engineering)

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# REVISED SCHEME (2020-24)

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Total V Water Further therein provide and Beyendin's member, referring distribution in pipes, Barton Inster, Missely's shart Landow Bay Boregh pape Report Presently's signation. Totalistics they through pipe. Rydentice product have and total control fore. Missel have an expected by signation. Totalistics of power floctuate pipes. Further Water Further Reports and Beneficit principles. Pattern, Frances and Kaplan turbulation. Society diagrams, Work

done by notypes, that take weary.

Control Outcomest. After measureful comprision of this arrange made are will be oble to

- COL Define the fundamental properties of Datas.
- COR Relate the concepts of muchanics with variety laws of their muchanics.
- Identify the lates of their mechanics upplicable for the bully invariant thick under different conditions. Another variant forces and their effects, soluted to finds mechanics. COR.
- 0.04
- Measure and company broom to different fluid flow consistents. COURSE.
- 0.06 Compare different turbo madence dependence their behaviour and from month and demotite

Test & Reference Bashie

Front Nechanics by Stiveter & Wylls, Michigan Hills Fel-Faul Visionanics by Michie Seets. Gambrid publisher, Front Michanics by D. S. Koner, Kanen publisher, Prost Michanics by R.K. Barnal, Larrer Debulare, Blasse



# **REVISED SYLLABUS (2020-24)**

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR 1A Cover Aided UGC Autonomene & NAAC According Lineiture Affiliated to RGPV, Illiagab Department of Mechanical Engineering

Has beinden admitted in Anadomic Vehicles 2020 71

Conference	Totle	Cieda	- 4		÷.4	Three Paper
Departmental	their Nechanics and	12011-1499314	L	τ.	10.	Mark Minutes (6)
Constantine.	Electronic Machines	Low and the second second	3	h.	1	Jun Masher In Decision - Stars

Course Objecto et: Tornake the analysis and enabled and in the applications of Assochrantics, Hedranics, Markov Englishering, Gas decourses de: 2, And give fundamental hereologie of their, in properties and following socher variants accellation of internal.

and exterioral this size

10

Call-I Preparate at flaid: Presser, density, specific weight, tiscrate, duratic, and finaratic tiscson's Sewion's law of rischery and its applications. Finid Mader Pressue variation with depth, pressue insustaneed, pressue on nemicoid surface cosine pressue.

Find Made Department of the department of the department in the measurement of the measurement of the second section of the department 
(a.3-25: Hardwells's separation for incompressed in Baid Here, angularizing application of orange separation, Priori Taka, Vantari anta, Orifice meter Calledy Even Homoge Paper. Called Reproduce analysis, vehicult, distillution in paper, futtore factor. Moorphys.

Could'y Hore Hormany Pipers Circuit Expression wateries, velocity destribution in press, Automa Ecolo, Modell & Could, Lancard from thermal hormal horman pipers. Piper Networking and Transmission of power through pipers builty Water Tarchics and Parame Inspire. Piper Piper Scienceding and Transmission of power through pipers Units' Water Tarchics and Parame Inspire. They for the pipers pipers builty of the pipers and the pipers of the pipers and the pipers and the pipers and pipers and pipers. The pipers and pipers the pipers and pipers and pipers the pipers and pipers the pipers and pipers and pipers. The pipers and pipers the pipers and pipers and pipers and pipers the pipers and pipers and pipers and pipers. The pipers and pipers an

#### Course Outcomes: After constraided as registrate of this course studious will be able to:

\$2011 Deflar the fundamental properties of thads.

- CO2: Bohm the concepts of mechanics with votices laws of third mechanics.
- COT: Meanly the here of Baltmeetness applicable its the hely is server that it under different conditions.
- CO4: Analyse racion force and their effects, identitio flath reachings:
- COD: Measure and compute losses in different fluid dees conditions

CO4. Compare different active mechanic alepending on facil behaviour and their maxim and dimension

## Text difference flooks

- Charl Machanice by Shapper A Wyle, Micraris-thile Pub. Data Machanice by Model Soft: Standard politiking know. Third Machanice by D.S. Konwe Katsory publisher. Third Machanice by J.K. Pannel, Learne (Publishing Boone).
- 5. Third Michanics by Yonor A Cargolik John M. Crashola: Tum Meliraw Hill Edition.

No.

# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Gass, Aided UGC Automournes & NAAC Accredited Institute Affiliated to RGPV, Blogalt Department of Mechanical Engineering

For leateness admitted in Society 2014-20

Engineers		

Category	Title	Code		red	4.4	Theory Paper
Departmental	Engineering	129404/190403	T.	T	12	Max Marks-70
Cont-DC	Themodynamics		.3	1		Min.Marki-12 Damagoo-Mas

Course Objective: To make students able to:

- Understand the nature and role of the various thermodynamic properties of matter.
- Represent a thermodynamic system by a control mass or control volume and identify work and/or hear 2 attenutions between the system and surroundings.

#### Sollabar.

Unit-I Basic Concepts: Themedynamics, Property, Equilibrium, State, Process, Cycle, Zeroth law of thermodynamics, Statement and significance. Concept of an ideal gas, Gas Lates, Avogadro's Hypothesis, Heat and work transfer. First law of themsedynamics. Statement of first law of Insunoidynamics, first law applied to cloud system andergoing a cycle. Process analysis of cloud system flow process, Flow anergy, Steady three process analysis of closed viotem processos, Lanitations of first law of thermodynamics,

Unit -II Properties of pure substances > P-V-T suffaces, here, L-N, F-V, P-h, T-V diagrams of gure substance. untersted and sub-coscied tiquid, superhasted vapour, quality of storm, Mathier diagram, storm table, different processes, measurement of quality of shears.

Unit -III Second law of thermodynamics Hast orgina, Hast reservoir, Relignmer, Hast prosp. COP, Camet's theorem. Carnot's cycle, Efficiency of Carnot's cycle, Statement of second law, Reverable and Ineversible properties. Consequences of Second Low

Unit -IV Availability and Irreversibility: Entropy Entropy charge of Ideal gas, Available energy, T-8diagram. Availability and leavaryibility.

Unit- V Thermodynamics Relations: Thermodynamics relations, e.g. Maxwell scherows and their applications.

Course Outcomes: After successful completion of this course students will be able in-

CO1: Doflow energy interactions between system and surroundings.

CO2: Carrelate the low of thormodynamics to real life applications.

COM: Apply the laws of thorousdynamics to analyze boilers, heat pumps, relegenties, heat organes, compressore and moraley

CO4: Investigate the effectiveness of energy consumm device in mechanical gover generation

COS: Analyze or wondurd cycles applied in prime movers.

CO6: Describe hearfits of improvements to thermodynamic systems

## Text & Reference Beaks:

- Engineering thermolymentics by P.K. Neg.
- Thermal ungineering by R.K. Hagrest
- Thermal single sering by P.L. Balloovy s. .

# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Gor), Aided UGC Autonomous & NAAC Asseedled Institute Affiliated to RGPV, likepub Department of Mechanical Engineering

# For batches admitted in Academic Session 2020-21

#### Engineering Thermodyneerics

Category	This	Caile	1000	rollin-3	Theory Paper
Tropertmental	- Productive	120414/	1.	T 1 P	Max.Marker/90
Cose DC	Expansion	1490.013	2	1 .	Min Marks-Ht.
	Thermodynemics.				Deration-2 Ion

Course Objective: To insite students able to:

- Undestand the nature and role of the Genous thermodynamic properties of matter.
- 12. Represent a threased ensure assume by a control mass or control volume and identify work and/or heat interactions between the system and somutualings-

#### Sollabore

Unit-I Book Concepts: Thermodynamics, Property, Equilibrium, State, Process, Cycla, Zoroth law of tharmodynamics. Storement and significance, Concept of an Mexil gas, Gas Laws, Avogadro's Hypothesis, Heat and work transfer. First law of thermodynamics. Sustement of first law of thermodynamics, first law, applied to alward system undergoing a cycle. Presents analysis of alward system flow process. They emerge. Steady flow process andysis of closed system processes. Einstations of first law of thermodynemics,

Unit -II Properties of pure substances: - P-V-T surfaces, I-s, T-S, P-V, P-h, T-V diagrams of pure substances. saturated and sub-cooled liquid, superheated vapour, quality of steam. Molliss diagram, steam table, different processes, incovariance) of quality of ocum-

Fait -III Second law of thermodynamics: Heat engine. Heat miservers. Refingerator, Heat pump, COP, Carno's thrown, Cantol's cycle. Effectivey of Cantol's cycle. Statement of second law, Revensible and Inversible processes. Consequences of Second law

Call -IV Availability and Inverses/Billity Europy, Entropy damps of ideal gas, Available energy, T-5 diagnam. Availability and hosyamilability-

Unit- V Thermodynamics Relations: Thermodynamics relations, a g Maxwell relations, and their applications. Ale Standard Cycles: Conver. Storling, Ecconver. Otto, Deeol, Dud cycles and neuronination of their att-manifed afflicineses and their completion. Deryton cycle, Atkinesis cycle, PVT relationship, Minnae of ideal gases Properties of mixture of gases.

Course Outcomes: After successful completion of this course students will be afte to

COD Befine energy interactions have set system and accountings.

CO2: Correlate the low of the mediatation to real life applications

CO3: Apply the laws of flareneolycomics to analyze hollers, host partys, telligensters, laws engines, compression and interaction

No.

COM: Analyze the fluctual officiency of air standard cycles

C055: Analyze the statopy concept in thermodynamic systems.

CO6: Describe banefits of introvements to thermodynamic system.

Lent & Reference Books:

- Lupinomius Jornio dynamics. by P.B. Nag-
- Thornal arginouring by R.K. Rapper 18.
  - Thermal engineering by P.J. Balloney

6.

# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Gov), Added UGC Autonomous & NAAC Accessited Institute Affiliated to RGPV, Blogali Department of Mechanical Engineering

# For hatches admitted in Session 2015 (4

# Industrial Engineering

Consignery	Firis	Code	Costin: 3	Theory Puper
Departmental Contr-DC	Trabarrial Engineering	120301/100501	L I P	Max Marks-70 Mar Marks-22
			3.24	Constitute They

# Course Objectives: To make the stations teaderstand.

Professional, orchiteral managersal, or leadership toles within undesertal organizations.

The knowledge through discovery, synthesis, and integration for the betterment of their organization in stands after Tollafiase.

#### UNET-IL

Production Systems and Productivity: Production Management design of production systems (product, pri-slop and batch). Definition and types of productivity. Management of productivity, factors affecting the productivity and productivity improvement program.

Production Planating and Control. Objective, importance, used and feasible of production planning and control planning, routing scheduling, disputching, follow up & progress report, production planning and purchastion estatual

#### UNIT-II

Forecasting techniques: Need and type of forecasting, factors officering forecasting, forecasting in decision ENIT-II making, tone onice analysis, demand patterns, qualitative methods increases of forecast accuracy and error Presented inabits in gombiairie forecasting

Capacity and nagregate planning. Capacity planning curvery menomenon, long-arm and domnarm motoples sugregate prediction planning, and graphical method to-doone aggregate plan.

#### UNIT-III

Inventory Control - Objectives and Interious, and and classifications-codification and standardization ADC analysis, idmonistrative available analysis, idmonistrative available available grantity discount: perpendid and periodic available available grantity discount. Probabilistic recordery management, communic ordering quantity proclamment and, carrying charges, lead-time re-reder point. Project analogoman - PLET and CPM

# UNIT-IV

Product Design and Devalopment: Principles of good product design, televance, quality and cost considerations, product life cycle, standardization, surplification, discrimination, value segmenting and analysis, methodology, application, contention, methodology, application, contention, methodology, application, and even and Plant Lassone: Pacifity location theorem and evaluation of abstrate focustoms, qualitative supports, quantitative models for layout decisions, types of plant layout and their availantion; computer aided layout design techniques; assembly herer balancereg, maker sale landfiring conterns.

#### UNDOW!

Master Production Scheduling and MRP Functions, planning backgon and planning periods the master producting scheduly, piper of material aspirements planning and manufacturing percent new planning percent and expendent domain. Functions of material aspirements planning and manufacturing resource planning (MRP) and MRP file mpairs for MRP system, methomsonic observations (RRP system, nativents resource) planning (MRP) and MRP file.



## MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (A Greet, Added US2C Automounter & SAAC Assessment Institute Affiliated to RGPV, Blogadt

Dependenced of Mechanical Engineering For handkin solutions in Academic Sension 2020-21

196811-120511: Industrial Engineering

5.859047	T.Hbs	Cieda	Credits: 2	Listory Paper
Departmental	hadvertriat	190511/120524	L I P	Max.Marks-30
Con-DC	Engineering	190501-120501	2	Min Marks-16 Darmore-26rs

Course Objectives: Industrial sugmenting is concerned with the during, improvements, installation, and recomparison of recognized analysis of anis, measured, and enabling. After completing this scenar, reaching will been a set of delta that includes mentionnellation modeling, probability and emission, contrasted science, known hences, known of delta state property mercognetions, and as addition is another administer transmit, known inspection, and an administration of the state of the loss many set of delta state of the state of th

# No Hadoos

UNIT-1

UNITED Production Systems and Productivity: Production Managament: during of production systems unreduct, ark step and bands. Definition and trajest of productivity. Measurement of productivity: factors afflecting the productivity and productivity improvement parameters. Measurement of productivity factors afflecting the productivity and productivity intercomment parameters. Productivity Theorem 10 and productivity and a second s

chartest pleasing, and propile and manifered its observe dynamics and

Exerciseding techniques: Need and type of these string, fasters affecting features for antipic in decision radius, tans varies and years, denormal patterns, qualitative mathematics in particularly forces and array and percentage and percentage and array and percentage and percentage are array and percentage and percentage are array and percentage and percentage are array are are array are array are array are array are array are arra

#### UNIT-III

UNIT-III Eventory Control – Objectives and functions, used and encodifications, coefficiences and standardization ABC, analysis, deterministic tractatory models, quantity discuss pergenal and periodic investory control systems probabilities (overtex) analyzes, decomposition of quantity providential control systems). merder poter

#### Logic. 15/

Corelley Locations and Plant Layout. Facility bration factors and real-miner of alternatic brations, qualitation expects, quantizative enough destroyed discovers, types of plant layout and their evolutions compute solid layout design behaviour describes the behaviour externals function were as a solid solid or Poly, the law Trainance proper comparison of the period solid the solid solid Project meanings stant - if tochniques (PERTA Tates and task off

UNIT-V UNIT-7 Master Production Scholating and MRP. Prescience, planning between and planning periods for resolve production scholarla, types of manare production solucidae. Bills of Masserda, Independent Demand termin dependent demand. Functions of material consistences planning and namediationing researce planning (MRP 4) and MRP 40, impress for MRP system, preferences planning and manufacturing researce planning (MRP 4). plasning mploses.



# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (A Gert, Aided UGC Autonomous & NAAC Acceedited Institute Affiliated to HGPV, Bloopal)

Department of Mechanical Engineering For batches admitted in Academic Section 2019-20

# 196904 Design of Machine Elements

Category		Code		C.800	RH-14	Lineary Paper
Con-DC	Design of Martine Flements	190564	- 1.	1	2	Max Marke-70 Min Marke-72 Daming-three

## Course Objectives:

The coupling sites passivered to remainer standal

develop an ability to apply knowledge of mathemation, science and engeneering.
 develop an ability to design a system, component or penaes to mest desired made within

totalistic extensioners.

#### Syllatona

Unit I- Davige Philosophy: Principles of excitamati design Facine of salety, strength, rightly, fraction was and restored consideration. Since construction, Design for Integra, Linois and Ba-Loter, return Standardiziriant adhericits of materials, theory of failures

Unit H- Design of shafts and complings: Shaft, heye and couplings design of rigid and pto bashed flexible acceptingen

Unit HI-Design of Elements: Cottor and knuckle prate; screwed Elemenings, botted and rivered joints under direct and assenting leads. Walded points: Walded joints, strangth of walded goints, accountrically loaded walded joints, wald

Units PV+ Elevings of executamical groups. Design of Indiand, besulf and more groups, Ball, and chain deriver and Autopotten Gen ber ausemMe

Unit V- Design of Berrings Rolling contact hearing: Types of rolling contact bearing, static and dynamic load capacities, Stribeck's equation, equivalent bearing load, load life relationship, bearing life, bearing life. load factor, selection of bearing fires manufacturing catalogue. Labrication and mountings, discussional and proceeding of bearing mountain and matching Stating contact, bearing mountain and their properties, bearing types and their constructional details. Eyderdynamic histocation, bearing tradematic details, and their construction of bearing bearing tradematic details.

#### Consume Challenames

After successful completion of this course analogie will alloc to

F (31). Hitterie at the design Philosophy and Principles of seechanical design C323. Identify appropriate booting for a given application C334. The design data books at designing varies machine in congruence C334. Select appropriate drive for process restriction on the boost of load and agreed C334. And you for the senses and class addrawed in boost preclamatic components.

# in the second

#### MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (A Gov), Aided UGC Autonemous & NAAC Accredited Institute Affiliated to RGPV, Bhopab Department of Mechanical Engineering

For batch admitted in Academic Session 2020-21

#### 198514: Design of Machine Elements

Category	Title	Code	- 9	Credit	-4	Theory Paper	
Departmental	Dampy of Machine Flormation	190214-190504			Max. Marks-50 Silin Marks-10		
Core-DC	Clements	196614 196964	- 3	1	2	Duration-2 hrs	

## Course Fee Requisites.

Engineering Mathematics-1 Mechanics of Materials

# Course Objectives:

To make the students to understand,

develop an ability to apply knowledge of markematics, science and engineering, develop an ability to design a system, component or process to meet desired needs within

routistic construints.

devolup an ability to identify, formulate, and solve engineering problems 4: devolup anability to use technopus, shifts and modern engineering tools.

# Svillallour;

Unit Ethesign Philosophys Persopher of mechanical design, Factor of safety, Limits and fits, Standardimition: Selection of maturials. Theory of failures

Unit II- Design of Keys, Shafts and Couplings: Definitions, classifications and applications design of rigid and pin fushed flexible couplings

Unit III- Design of Permanent and Temperary Joints: Collar and Emachia prioris, waveled forecamps, bolled and reveled joints under direct and seconds. Welded priors, Welded priors, strength of welded prims, eccentrically loaded welded prims, welded points subjected to banding incomments and torsion.

Unit IV- Design of Machanical General Dusign of spin, helical, bayal and room paars

Unit V. Design of Bearings: Rolling contact hearing: Types of rolling contact bearing, static and dynamic load concernies. Stribeck's equation, equivalent bearing load, load life relationship, bearing life, bearing life, load factor, selection of bearing from manufacturing endoque. Stating contact bearing: Ibaring statematic and their projection, bearing types and their constructioned details. Design consideration in hydrodynamic bearings.



# **MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE, GWALIOR – 474005**

(A Govt. Aided UGC Autonomous& NAAC Accredited Institute Affiliated to R.G.P.V. Bhopal )

# **MECHANICAL ENGINEERING DEPARTMENT**

M.Tech. Production Technology

		2019-2023 BATCH	1	2020-2024 BATCH	Percentage
SEM.	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Change
	560101	Optimization Techniques In Mechanical Engineering	560111	Computational Techniques	47.05
	560102	Integrated Manufacturing & Resources Planning	560112	Production Engineering- I	
	560103	Production Engineering- I	560113	Production and Operations Management	
Ι	560104	Production & Operation Management	DE-I	560114: Maintenance Management 560115: Flexible Manufacturing Systems 560116: Ergonomics and Work Study 560117: Total Quality Management	
	DE	560105 Ergonomics and Work Study 560106 Project Management 560107 Reliability Availability and Maintainability 560108 World-Class Manufacturing	OC-I	800111: Product Design & Development 800112: Computer Integrated Manufacturing	
	560109	Simulation & Modeling LabI	560120	Production Engineering Lab-I	
	560110	Production Engineering Lab. – I	560121	Self Learning / Presentation	
	560201	Automation & Robotics in Production	560211	Automation & Robotics	
	560202	Advanced Statics & System Reliability	560212	Production Engineering-II	
	560203	Production Engineering-II	560213	Logistics and Supply Chain Management	
П	560204	Total Quality Management	DE-2	560214: Quality Design and Control 560215: Traditional and Non-Traditional Optimization Tools 560216: Product Design and Manufacturing 560217: Material characterization 560218: Generative Design for Additive Manufacturing	
	DE	560205 Engineering Estimation & Costing 560206 Flexible Manufacturing System 560207 Concurrent Engineering 560208 Logistics & Supply Chain Management	OC-2	800210 : Introduction to Operations Management 800211 : Tools in Scientific Computing	
	560209	Computer Lab-I	560220	Production Engineering Lab-II	
	560210	Production Engineering Lab-II	560221	Self Learning / Presentation	

	560301	Computer Integrated Manufacturing	560311	Dissertation Part-I
III	560302	Maintenance Management	800310	Automation in Manufacturing
111	560303	Seminar		
	560304			
IV	560401	Dissertation Part- II	560405	Dissertation Part-II

Department of Information Technology Programme: B. Tech (Information Technology)

		2019-2023 BATCH		2020-2024 BATCH	Perce
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Ch
	100201	Engineering Physics	230102	Introduction to Computer Programming	32
	100202	Energy, Environment, Ecology & Society	100022	Basic Electrical & Electronics Engineering	]
I	100203	Basic Computer Engineering	100020	Basic Civil Engineering & Mechanics	1
1	100204	Basic Mechanical Engineering	100021	Basic Mechanical Engineering	1
	100205	Basic Civil Engineering & Mechanics	100015	Energy, Environment, Ecology & Society	4
	100206	Language Lab. & Seminars	160111	IT workshop	
	100101	Engineering Chemistry	100011	Engineering Mathematics –I	1
	100102	Engineering Mathematics-I	160211	Data Structures	1
	100103	Technical English	160212	Object Oriented Programming & Methodology	1
II	100104	Basic Electrical & Electronics Engineering	160213	Digital Electronics	1
	100105	Engineering Graphics	100016	Technical Language	1
	100106	Manufacturing Practices	100017	Language Lab	
	100001	Mathematics-II	100025	Engineering Mathematics-II	
	160301	Digital Electronics	160311	Computer System Organization	4
	160302	Data Structures	160312	Design & Analysis of Algorithms	4
	160303	Computer Graphics & Multimedia	160313	Database Management System	4
III	160304	Object Oriented Programming and Methodology	160314	Operating System	4
	160305	Hardware Lab	160315	Java Programming Lab	4
	160306	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)#	160316	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)	4
	160307	Summer Internship Project–I (Institute Level) (Evaluation)	200XXX	Novel Engaging Course (Informal Learning)	-
	100002	Biology for Engineers	160317	Summer Internship Project–I (Institute Level) (Evaluation)	-
			1000002	Biology for Engineers	
	100002	Mathematica III	100002	Engineering Mathematics- III	-
	100003 160401	Mathematics- III Design & Analysis of Algorithms	100003 160411	Computer Graphics & Multimedia	-
				Software Engineering	-
	160402	Database Management System	160412	Computer Networks	4
IV     160403     Operating System     160413     Computer Networks       160404     Computer System Organization     100009     Cyber Security       100004     Cyber Security     160414     Python Programming Lab       160405     Programming Lab     200XXX     Novel Engaging Course (Informal Learning)       1000001     Indian Constitution and Traditional Knowledge				-	-
					-
			1000001	Indian Constitution and Traditional Knowledge	
	100005	Ethics, Economics, Entrepreneurship & Management	160511	Discrete Structures	1
	160501	Discrete Structures	160511	Data Science using Python	
	160502	Software Engineering	160513	Theory of Computation	1
	160502	Theory of Computation	160515	Microprocessor & Interfacing	1
	160503	Microprocessor & Interfacing	160511	Soft Computing Techniques	
v	160505	Minor Project-I	160516	Minor Project-I	1
	160506	Summer Internship Project-II (Evaluation)	160517	Self-learning/Presentation (SWAYAM/NPTEL/ MOOC)	1
	160507	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)	200XXX	Novel Engaging Course (Informal Learning)	1
	100006	Indian Constitution & Traditional Knowledge (Audit Course)	160518	Summer Internship Project-II (Evaluation)	
	100000		1000005	Project Management & Financing	
			1000006	Disaster Management	
	160601	Compiler Design	160611	Compiler Design	]
	160602	Computer Networks	160612	Data Mining & Pattern Warehousing	
		160611 Network & Web Security			
	DE	160613 Agile Methodology	160613		
		160614 Cloud Computing		Artificial Intelligence & Machine Learning	-
		160651 Data Analytics with Python		160661 Introduction To Internet Of Things	
¥ 77	DE	160652 Introduction to Machine Learning	DE	160662 Information Security - 5 - Secure Systems Engineering	
VI		160654 Artificial Intelligence: Knowledge Representation And		160663 Advanced Graph Theory	
		Reasoning 900108 Software Engineering		910102 Data Mining & Warehousing	-
	OC	900108 Software Engineering 900116 Data Mining & Warehousing	OC	910102 Data Mining & Warehousing 910103 Software Engineering	
		900110 Data Winning & Watchousing 900119 Robotics & Vision Control		stores source Englicering	
	100007	Disaster Management	160614	Minor Project-II	1
	160603	Minor Project-II	200XXX	Novel Engaging Course (Informal Learning)	1
			1000007	Intellectual Property Rights (IPR)	
		160714 Data Mining & Predictive Modelling		160714 Data Mining & Predictive Modelling	
	DE	160715 Soft Computing	DE	160715 Soft Computing	
		160716 Mobile Computing		160716 Mobile Computing	4
		160752 Scalable Data Science (8 Week)		160752 Scalable Data Science (8 Week)	1
	DE	160754 Social Natworks (12 Wester)	DE	160754 Social Naturalia (12 Weals)	
	DE	160754 Social Networks (12 Week) 160756 Big Data Computing (8 Week)	DE	160754 Social Networks (12 Week) 160756 Big Data Computing (8 Week)	
VII	DE OC	160754 Social Networks (12 Week) 160756 Big Data Computing (8 Week) 900208 Soft Computing	DE OC	160754 Social Networks (12 Week)         160756 Big Data Computing (8 Week)         900208 Soft Computing	

# Department of Information Technology Programme: B. Tech (Information Technology)

		2019-2023 BATCH		2020-2024 BATCH	Doucoutogo
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Percentage Change
	100008	Intellectual Property Rights (IPR)	160701	Departmental Lab	
	160701	Departmental Lab	160702	Summer Internship Project-III (04 weeks ) (Evaluation)	
	160702	Summer Internship Project-III (04 weeks ) (Evaluation)	160703	Creative Problem Solving (Evaluation)	
	160703	Creative Problem Solving (Evaluation)			
	DE	160854 Blockchain and its Applications 160857 Advanced Graph Theory 160859 Natural Language Processing	DE	160854 Blockchain and its Applications 160857 Advanced Graph Theory 160859 Natural Language Processing	
VIII	OC	900632 Information Security - 5 - Secure Systems Engineering 900621 Social Networks	OC	900632 Information Security - 5 - Secure Systems Engineering 900621 Social Networks	
	160801	Internship/Project	160801	Internship/Project	
	160802	Professional Development	160802	Professional Development	

# DESIGN & ANALYSIS OF ALGORITHMS 150401/160401 (DC-5)

# COURSE OBJECTIVES

- To introduce the topic of algorithms as a precise mathematical concept.
- To study the techniques like recursion, divide and compart, dynamic programming, grendy approach, backton-kong and branch and boand.
- To practice their skills on many well-known algorithms and data structures designed to solve real-file problems.

# Unit-I

Introduction to Computational Model: RAM. Theory mixture: Constituents: PEAM Bells sandowness perallel (BSP) Model: Algorithes and its Asportance, Recommenand Asymptotic Network, Mathematical Assigns of Non-Recences and Recursive

Algorithm, Review of Sarling & Scatthing Algorithms, Basic True and Graph Conceptor Reary Search Times, Bright Indiaical Tores, B-Dress and Traversal Technoges.

# Unit-II

Divide and Canquer Norbed: Introduction and its Examples such as "Finding: the Maximum and Minimum, Binary Scarib, Morge Sott, Oniek Sott and Steason's Marin Multiplication.

# Unit-III

Greedy Method: Introduction, Characteristics, Examples of Greedy Methods such as Single Searce Surfey Paths, Minimum Cost Spanning Trees : Prints's and Knadod's Algorithm, Ketapatck Problem, Dijkara's single source shortest path digerithm, Optimal Storage on Tapes.

# Unit-IV

Dynamic Programming: Introduction, The Principle of Optimality, Examples of Dynamic Programming Methods such as – 0/1 Knapsack, Traveling internan problem, Floyd's All Parts Shortost Path, Longost Correct Subsequence and Reliability Design.

# Unit-V

Backtracking: Concept and its Ecomplex like 4 Queen's Pachlern, Roopwack postdem Hamiltonian Circuit Problem, Graph Coloring Froblem on: Branck & Duardi Introduction and its Examples like - Traveling Salesperson Problem on: NP-Completeneous Introduction, Claus P and NP, Polynemial Reduction, NP-Hant and NP-Completeneous Introduction.

# RECOMMENDED BOOKS

- · Fundamentals of Computer Algorithms, Horowite & Sahani, Universities press
- Introduction to Algorithms, Caronan Thomas, Leinerson CE, Rovent RL, PHI.
- · Dorign & Analysis of Computer Algorithms, Ultrann, Frances
- · Algorithm Design. Michael T Goodrich, Roburts Terminin, Wiley Indon

# COURSE OUTCOMES

After completion of this course, the students would be able to:

- CD1. tuli the basic features of an algorithm.
- CO2. demonstrate a functionity with major algorithms and data sinchards
- CO3. opply important elastificatic design possidigrits and methods of analysis.
- CO4. ornalizes the asymptotic performance of algorithms
- CO3, compare different design techniques to develop algorithms for comparational problems
- COR. design algorithms using preedy strategy, divide and compact opposited, dynamic programming, his blacking softmarch in bound approach.

# DESIGN & ANALYSIS OF ALGORITHMS 160312

L	т	P	Tatist Credits
1	-	-2	4

# COURSE OBJECTIVES

- To introduce the topic of algorithms as a process mathematical concept.
- To study the techniques like recursion, divide and compact, dynamic programming, groudy approach, backtracking and branch and board.
- To practice their skills on many well-known algorithms and data structures designed to solve and-life problems.

## I. tink

introduction to Comparational Model: Algorithms and in Importance, Recurrences and Asymptotic Netations, Mathematical Analysis of Non-Recursive and Recursive Algorithm, Review of Sorting & Searching Algorithms, Basic Tree and Graph Concepts: Il-Trues and Travasual Techniques, Topological series.

# Unit-II

Divide and Conquer Method: Introduction and its Examples such as Finding the Maximum and Minimum, Binary Search, Merge Sort, Quick Sert and Stassen's Matrix. Multiplication and additional and world problems on divide and conquer.

# Dair-RD

Groedy Methad: Inteduction, Characteristica, Examples of Greedy Methods such as Single-Source Storiest Paths, Minimum Cost Spanning Trees : Prims's and Krisikal'a Algorithm, Knapsack Problem, Dijkatra'ssingle scoree shortest path algorithm, Optimal Storage on Tapes.

# Unit-IV

Dynamic Programming: Introduction, The Principle of Optimality, Esamples of Dynamic Programming Methods such as – 0/1 Knapsack, Traveling unlearnan problem, Ployd's All Pairs Shortest Path, Longest Constront Subsequence and Baliability Design, Matrix chain multiplication.



# Unit-V

Backtracking: Concept and its Examples like 4-Queen's Problem, Knapssok problem Hamiltonian Circuit Problem, Graph Coloring Problem etc. Branch & Boundt Introduction and its Examples like - Travelling Salesperson Problem etc. NP-Completeness: Introduction, Cham P and NP, Polynomial Reduction, NP-Start and NP-Completeness: Introduction, Cham P and NP, Polynomial Reduction, NP-Start and NP-Complete Problems.

# RECOMMENDED BOOKS

- Fundamentale of Computer Algorithms, Horowitz & Sahani, Universities press
- Introduction to Algorithms, Coremen Thomas, Leiserson CE, Rivest RL, PHL
- Design & Analysis of Computer Algorithms, Ullmann, Pearson.
- Algorithm Design, Michael T Goedrich, Robarto Tamassia, Wiley India.

# COURSE OUTCOMES

After completion of this course, the students would be able to:

- CO3. demonstrate a familiarity with major algorithms and data structures.
- CO2. apply important algorithmic design paradigms and methods of analysis.
- CO3. analyze the asymptotic performance of algorithms.
- CO4. compare different design techniques to develop algorithms for computational problems.
- CO5. design algorithms using greedy strategy, divide and conquer approach, dynamic programming, backtracking and branch a bound approach.
- CO6 understand the hardness and different classes of bardness. Further, design approximate solutions for computationally hard problems.

# MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous Institute Affiliated to R.G.P.V. Bhopal, M.P.)

# **Department of Information Technology**

# DATABASE MANAGEMENT SYSTEM 150492/160402 (DC-6)

# COURSE OBJECTIVES

- To understand the different issues involved in the design and applementation of a database voters.
- To study the physical and logical database database modeling, relational, heparchical and network models.
- To understand and use data monipulation integrage to query, optimic and manage a database.

# Unit-D

DBMS: Concepts & Architecture, Introduction of File Organization Techniques, Database Approach via Traditional File Approach, Advantages of Database System, Schemus, Instances, Basa Independence, Functions of DBA, Entition & Attributes, Entity Types, Value Sets, Key Attributes, Relationships, E-R Diagram. Data Models: Historchical Data Model, Network Data Model & Relational Data Model.

# Unit-II

Relational Data Module: Domains, Taples, Attributes, Relations, Cheresteristics of Relations, Keys, Attributes of Relation, Relational Database, Integrity Constraints Query Languages: Relational Algebra & Belational Calentas, Relational Algebra Operations (the Select, Project, Division, Intersection, Union, Division, Remance, Join pre-

# Unit-III

SQL: Data Definition, Data Manipulation in SQL, Update Statements & Views in SQL Query & Schaptery, Query by example Data Storage Definition, Data Retrieval Queries, Ser Operations, Aggregate functions, Nestad Sub-Queries, Data Manipulation Statements etc. Obserview of Taple Driemed & Domain Driemed Relational Calculus &



Comparison between Models.



# DATABASE MANAGEMENT SYSTEM 160313

L	T	P	Total Crodity
Ĩ	1	2	4

# COURSE OBJECTIVES

- To understand the different issues involved in the design and implementation of a database system.
- To study the physical and logical database designs, database modelling, relationsl, hierarchicol and network models.
- To understand and use data manipulation language to query, update and manage a metabose.

# Unit-I

DBMS: Database Approach wh Yinditional File Approach, Advantages of Database System, Database Users and Administrator, Database System Environment, Application Architectures, Schemas, Instances, Data Independence, Data Models: Hierarchical Esta Model, Network Data Model & Relational Data Model, Comparison between Models.

Entities and Rotationship Medul: Entity types, Entity ees, Antibores and Keys, Relationship Types and Sets, Constraints, Design issue, B-R Diagram, Weak Entity Sets.

# Unit-D

Relational Monte: Structure of Relational Distributes: Relation, Attribute, Donain, Tuples, Degree, Cambrid IV, View, Database Relations, Properties of Relations, Attributes, Soys, Attributes of Relation, Donain Constraints, Integrity Constraints.

Relational Algebra: Concepts and Operations: Scient, Project, Division, Interaction, Union, Division, Remain, Join etc.

Relational Calculus: Tuple Relational Calculus, Domnin Relational Calculus.

# Unit-III

SQL: Porpose of SQL, Data Definition Language (DDL) Statements, Data Nasapalation Language (DVL) Statements Update Statements & Views in SQL, Data Control Language (DCL)



# Unit-IV

Database Design: Introduction to Normalitation, Vienus Normal Forms: INF, INF, JNF, BCNF, Functional Dependency: Attribute Closure, Occomposition, Dependency Passervation, Loss Less & Lossy Join, Problems with Null Valued & Daugling Tuple, Multipolated Dependencies.

# Unit-V

Transaction Processing Concepts: Introduction, State Diagram, Properties of Transaction, Types of Transaction, Serializability, Conflict and View Socializability, Concurrency Control: Concepts, Techniques, Concurrent Operation of Databases, Recovery: Introduction, Types of Recovery.

Overview of Distributed Databases: Protuction, Security & Integrity Constraints, Relational Database Management Systems: Database & Microsoft Across Tools, Basic Concepts of Origen Oceaned Database System & Design

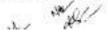
# RECOMMENDED BOOKS

- Thushuse System Concepts, Attention Silberschurg Henry F. Korth S. Sudavban, Mediense-Hill 6<sup>th</sup> Edition.
- Database Management System, Ragha Rosaikreiteten Johannes Gehrter, McGrow Hill 1<sup>st</sup> Edition
- Fundamentols of Database System, Element & Navafie, Addison-Wesley Publishing, Sh Editors
- An Introduction to Database Systems, Date C. J. Addison-Workey Putplishing, 5th Editors.

# COURSE OUTCOMES

After successful completion of the course students will be able to:-

- COL self the terminology, forcers, classifications, and storacteristics embedied in database systems.
- CO2. explain different actes involved in the disign and implementation of database system
- CO3. septy transaction processing concepts and memory methods over coal time data.
- CO4. analyze database schema for a group problem to main.



Unit-IV

Relational Database Design: Purpose of Normalization, Data Redundancy and Update Anomalies, Functional Dependency, The Process of Normalization, Various Normal Forms: INF, 2NF, 3NF, BCNF, Decomposition, Desirable Properties of Decomposition: Dependency Preservation, Lossless Join, Problems with Null Valued & Dangling Tuple, Multivalued Dependencies.

Department of Information Technology

# Unit-V

Transaction Management: Transaction Concept, Transaction State, Concurrent Executions, Serializability: Conflict and View Serializability, Concurrency Control: Lock-Based Protocol, Recovery: Log-Based Recovery.

# RECOMMENDED BOOKS

- Database System Concepts, Abraham Silberschatz Henry F. Korth S. Sudarshan, McGraw-Hill 6<sup>th</sup> Edition.
- Database Management System, Raghu Ramakrishnan Johannes Gehrke, McGraw Hill 3<sup>rt</sup> Edition.
- Fundamentals of Database System, Elmasri & Navathe, Addison-Wesley Publishing, 5<sup>th</sup> Edition.
- An Introduction to Database Systems, Date C. J, Addison-Wesley Publishing, 8th Edition.

# COURSE OUTCOMES

After completion of this course, the students would be able to:

- CO1. demonstrate the concepts of different type of database system.
- CO2. apply relational algebra concepts to design database system.
- CO3. make use of queries to design and access database system.
- CO4. analyze the evaluation of transaction processing and concurrency control.
- CO5. determine the optimize database for real world applications.
- CO6. design a database system for a real world application.



# COMPUTER GRAPHICS & MULTIMEDIA 160411

L	т	Р	Total Credits
2	4	2	4

# COURSE OBJECTIVES

- · To become familiar with computer graphics techniques and display devices.
- To enhance the proficiency in image representations, 2D and 3D graphics transformations.
- · To develop awareness with various illumination, color models and multimedia system.

# Unit-I

Introduction to Computer Graphics: Interactive Computer Graphics, Application of Computer Graphics, Random and Raster Scan Displays, Storage Tube Graphics Display, Calligraphic Refresh Graphics Display, Flat Panel Display, Refreshing, Flickering, Interlacing, Resolution, Bit Depth, Aspect Ratio etc.

# Unit-II

Scan Conversion Technique: Image representation, Line drawing: DDA, Bresenham's Algorithm. Circle Drawing: General Method, Mid-Point, DDA, Bresenham's Circle Generation Algorithm, Ellipse Generation Algorithm, Curves: Parametric Function, Bezier Method, B-Spline Method.

# Unit-III

2D & 3D Transformations: Translation, Rotation, Scaling, Reflection, Shearing, Inverse Transformation, Composite Transformation, World Coordinate System, Viewing Transformation, Representation of 3D object on Screen, Parallel and Perspective Projections.

# Unit-IV

Clipping: Point clipping, Line Clipping, Simple Visibility Line Clipping Algorithm, Cohen Sutherland Line Clipping Algorithm etc, Polygon Clipping, Convex and Concave Polygon, Sutherland Hodgeman Polygon Clipping Algorithm etc, Hidden Surface Elimination: Z- Buffer algorithm and Painter's Algorithm, Area Filling, **Basic** Illumination Models: Diffuse Reflection, Specular Reflection, Phong Shading, Gouraud Shading, Color Models: like RGB, YIQ, CMY, HSV etc.

# Unit-V

Multimedia System: An Introduction, Multimedia hardware and software, Multimedia Applications, Multimedia System Architecture, Multimedia Authoring. Data & File Format standards: RTF, TIFF, MIDI, JPEG, DIB, MPEG. Audio: digital audio, MIDI, moessing sund: Sampling, compression. Video: AVI, 3GP, MOV, MPEG, Compression standards, Compression through spatial and temporal redundancy.

# RECOMMENDED BOOKS

- Donald Hearn and M.P. Becker : Computer Graphics, PHI Publication
- · FoleyVandam, Feiner, Hughes : Computer Graphics principle and Practice
- · Rogers : Principles of Computers Graphics, TMH
- Sinha and Udai : Computer Graphics, TMH
- Prabhat K. Andleigh, Kiran Thakrar : Multimedia Systems Design, Prentice Hall PTR

# COURSE OUTCOMES

After completion of the course students will be able to:

- CO1. explore various display devices and applications of computer graphics.
- CO2. illustrate various scan conversion techniques like line, circle, curve and shape drawing algorithms.
- CO3. apply 2-dimensional, 3-dimensional transformations and projections on images.
- CO4. classify methods of image clipping and various algorithms for line and polygon clipping.
- CO5. apply appropriate filling algorithms, hidden surface elimination algorithm on images.

CO6. summarize various color models, shading methods and multimedia system.

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# **Department of Information Technology**

# COMPUTER NETWORKS 160413

L	т	Р	Total Credits
2	1	14	3

# COURSE OBJECTIVES

- Familiarize the student with the basic taxonomy and terminology of the computer networking.
- Provide detail knowledge about various layers, protocols and devices that facilitate networking.
- Enable Students to deal with various networking problems such as flow control, error control and congestion control.

# Unit-I

Introduction: Computer Network, Types- LAN, MAN & WAN, Data Transmission Modes- Serial & Parallel, Simplex, Half Duplex & Full Duplex, Synchronous & Asynchronous Transmission, Transmission Medium- Guided & Unguided, Cables-Twisted Pair, Coaxial Cable & Optical Fiber, Networking Devices-Repeaters, Hub, Switch, Bridge, Router, Gateway and Modern, Performance Criteria- Bandwidth, Throughput, Propagation Time & Transmission Time, Network Standardization- OSI Reference Model & TCP/IP Reference Mode, X.25.

# Unit-II

Physical Layer: Network Topologies- Bus, Ring, Star & Mesh, Line Coding- Unipolar, Polar and Bipolar, Switching- Circuit Switching, Message Switching & Packet Switching, Multiplexing: FDM – Frequency Division Multiplexing, WDM – Wavelength Division Multiplexing & TDM – Time Division Multiplexing.

# Unit-III

Data Link Layer: Introduction, Design Issues, Services, Framing, Error Control, Flow Control, ARQ Strategies, Error Detection and Correction, Parity Bits, Cyclic Redundant Code (CRC), Hamming Codes, MAC Sub Layer- The Channel Allocation Problem, Pure ALOHA, Slotted ALOHA, CSMA, CSMA/CD, IEEE 802.3, IEEE 802.4 and IEEE 802.5.

# Unit-IV

Network Layer & Transport Layer: Introduction, Design Issues, Services, Routing-Distance Vector Routing, Hierarchical Routing & Link State Routing, Shortest Path Algorithm- Dijkstra's Algorithm & Floyd–Warshall's Algorithm, Flooding, Congestion Control- Open Loop & Closed Loop Congestion Control, Leaky Bucket & Token Bucket Algorithm. Connection Oriented & Connectionless Service, IP Addressing.

# Unit-V

Presentation, Session& Application Layer: Introduction, Design Issues, Presentation Layer- Translation, Encryption- Substitutions and Transposition Ciphers, Compression- Lossy and Lossless. Session Layer – Dialog Control, Synchronization. Application Layer- Remote Login, File Transfer & Electronic Mail.

# RECOMMENDED BOOKS

- · Data Communication and Networking, Behrouz A. Forouzan, McGraw Hill.
- · Computer Networks, Andrew S. Tanenbaum, Pearson Education India.
- · Computer Networks and Internets, Douglas E. Comer, Pearson India.

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# COURSE OUTCOMES

After completion of this course, the students would be able to:

- CO1. explain the fundamental concepts of computer network.
- CO2. illustrate the basic taxonomy & terminologies of computer network.
- CO3. identify various parameter for affecting the performance of computer network.
- CO4. analyze the concepts of communication using various layer of OSI model.
- CO5. evaluate the performance of computer network in congestion and Internet.
- CO6. design the network environment and applications for implementation of computer networking concept.

Department of Information Technology Programme: M. Tech (Information Technology)

		2019-2021 BATCH		2020-2022 BATCH	n (
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Percentage Change
	630101	Mathematical Foundation of Information Technology	630111	Database Systems	58.82
	630102	Distributed System	630112	Distributed Computing	50.02
	630103	Advance Computer Graphics	630113	High Speed Networks	
Ι	630104	Advance Computer Networks	DE-1	630114 Mobile Computing and M-commerce 630115 Adhoc and sensor based networks 630116 Information Security & Systems 630117 Models and Techniques in computer Graphics	
	630105	Mobile Computing and M-Commerce	OC-1	800105 Soft computing 800106 Blockchain Technology 800107 Machine Learning using Python	
	630106	Lab-I	630121	Lab-I	
	630107	Lab-II	630121	Self-Learning Presentation	
	630201	Web Technology and E-Commerce	630211	Algorithm Design Techniques and Analysis	_
	630202	Soft Computing	630212	Advanced Topics in Data Mining and Warehousing	
	630203	Advance Algorithms and Design	630213	Image Processing and Retrieval Techniques	
II	630204	Advance Topics in Data Mining and Warehousing	DE-2	630214 Internet of Things 630215 Deep Learning 630216 Cloud Computing 630217 Social Networking	
	630205	Adhoc & Sensor based networks	OC-2		
	630206	Lab-I	630221	Lab-II	
	630207	Lab-II	630222	Self-Learning Presentation	
	630301	Image processing and retrieval techniques	630311	Dissertation Part-I	
III	630302	Information Security and Systems	OC	800306 Big Data Computing 800307 Introduction to Industry 4.0 and Industrial Internet of things	
	630303	Seminar			1
	630304	Dissertation Part-I			
					l
IV	630401	Dissertation Part-II	630405	Dissertation Part-II	

Department of Information Technology Programme: B. Tech (Internet of Things (IoT))

		Programme: B. Tech (Internet of		//	
SEMESTER	COURSE	TENTATIVE COURSES: 2020-2024 BATCH	COURSE	PLEMENTED COURSES: 2020-2024 BATCH	Percen
JEWIE 51 EK	CODE	COURSE NAME	CODE	COURSE NAME	Cha
	PAPER 1	Introduction to Internet of Things (IoT)	230101	Introduction to Internet of Things (IoT)	4
	PAPER 2	Introduction to Computer Programming	230101	Introduction to Computer Programming	4
	PAPER 3	Basic Electrical & Electronics Engineering	100022	Basic Electrical & Electronics Engineering	1
Ι	PAPER 4	Energy, Environment, Ecology &	250100	Linear Algebra	
		Society	200100		
	PAPER 5	Technical Language and Lab	100015	Energy, Environment, Ecology & Society	
					1
	PAPER 1	Digital Logic Design	230201	Digital Logic Design	
	PAPER 2	Linear Algebra and Matrix	220202	Sensor Technology	
		Analysis			
II	PAPER 3	Sensor Technology	230202	Data Structures	
	PAPER 4	Data Structures	230203	Object Oriented Programming and Methodology	
	PAPER 5	Object Oriented Programming and Methodology	100016	Technical Language	
	PAPER 6	Sensor Technology &Hardware Lab	100017	Language Lab	
	DI DED 4				
	PAPER 1	Statistics and Random Processes	250106	Probability and Random Process	
	PAPER 2	Data Communication and Computer Networks	230301	Design & Analysis of Algorithms	
	PAPER 3	Impact of IoT &	230302	Operating System	
		Smart Services on Society	220202	Commenter Materia des en d'Distance la	
	PAPER 4	Wireless Sensor Networks & IoT Standards	230303	Computer Networks and Protocols	
	PAPER 5	Design & Analysis of Algorithms	230304	Database Management System	-
III	PAPER 6	IoT Lab	230305	Design and Thinking Lab	
	PAPER 7	Self-learning/Presentation (through SWAYAM/NPTEL	230306	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)	
		/MOOC)# or Interdisciplinary course from other institutions and			
	PAPER 8	platforms with credit transfer	200XXX	Nevel Encocing Course (Informal Learning)	
	PAPER 8	Summer Internship Project–I (Institute Level) (Evaluation)		Novel Engaging Course (Informal Learning)	
			230307	Summer Internship Project–I (Institute Level) (Evaluation)	
			1000002	Biology for Engineers	
	PAPER 1	Digital Logic Design	230401	Computer Architecture and Microprocessor	
			230401		
	PAPER 2	Linear Algebra and Matrix Analysis	230402	Cloud Computing	
	PAPER 3	Sensor Technology	230403	Software Engineering	
117	PAPER 4	Data Structures	230403	IoT Architecture and Protocols	-
IV	PAPER 5	Object Oriented Programming and Methodology	230404	Network & Web Security	
	PAPER 6	Sensor Technology &Hardware Lab	230405	Python Programming Lab	
	TALERO	Sensor rechnology & nardware Lab	200XXX	Novel Engaging Course (Informal Learning)	
			1000001	Indian Constitution and Traditional Knowledge	
			1000001	Indian Constitution and Traditional Knowledge	
	PAPER 1	Ethics, Economics,	230501	Discrete Structures	
	TALLET	Entrepreneurship& Management	230301		
	PAPER 2	Introduction to Human Computer	230502	Data Sciences in IoT	
		Interaction			
	PAPER 3	Data Mining & Analytics	230503	Theory of Computation	
	PAPER 4	IoT Architecture and Protocols	230504	Embedded System & IoT	
	PAPER 5	Artificial Intelligence & Machine Learning	230505	Soft Computing Techniques	
V	PAPER 6	Minor Project-I**	230506	Minor Project-I**	1
	PAPER 7	Summer Internship Project-II (Evaluation)	230507	Self-learning/Presentation (SWAYAM/NPTEL/ MOOC)#	1
	PAPER 7	Self- learning/Presentation (SWAYAM/NPTEL/	230307 200XXX	Novel Engaging Course (Informal Learning)	-
	IALEKO	MOOC)	2007777	To ver Engaging Course (informat Dearning)	
			230508	Summer Internship Project-II (Evaluation)	
			1000005	Project Management & Financing	
			1000005	Disaster Management	
			100000		
	PAPER 1	Deep Learning	230601	Compiler Design	
		Network Security	230602	Data Mining & Pattern Warehousing	1
	PAPER 2			Artificial Intelligence & Machine Learning	
	PAPER 2 PAPER 3	Departmental Elective-1	230603		-
	PAPER 3	Departmental Elective-1	230603 DE		
		Departmental Elective-1 Departmental Elective-2*	230603 DE	230661 Programming In Java	
	PAPER 3	1		230661         Programming In Java           230662         Foundation of Cloud IoT Edge ML	
VI	PAPER 3	Departmental Elective-2*	DE	230661         Programming In Java           230662         Foundation of Cloud IoT Edge ML           230663         Information Security - 5 - Secure Systems           Engineering         Foundation Security - 5 - Secure Systems	
VI	PAPER 3	1		230661       Programming In Java         230662       Foundation of Cloud IoT Edge ML         230663       Information Security - 5 - Secure Systems         Engineering       910102         Data Mining & Warehousing	
VI	PAPER 3 PAPER 4 PAPER 5	Departmental Elective-2* Open Category-1	DE OC	230661Programming In Java230662Foundation of Cloud IoT Edge ML230663Information Security - 5 - Secure SystemsEngineering910102Data Mining & Warehousing910103Software Engineering	
VI	PAPER 3 PAPER 4 PAPER 5 PAPER 6	Departmental Elective-2* Open Category-1 Disaster Management	DE OC 230604	230661       Programming In Java         230662       Foundation of Cloud IoT Edge ML         230663       Information Security - 5 - Secure Systems         Engineering       910102         910102       Data Mining & Warehousing         910103       Software Engineering         Minor Project-II**	
VI	PAPER 3 PAPER 4 PAPER 5	Departmental Elective-2* Open Category-1	DE OC	230661Programming In Java230662Foundation of Cloud IoT Edge ML230663Information Security - 5 - Secure SystemsEngineering910102Data Mining & Warehousing910103Software Engineering	

# Department of Information Technology Programme: B. Tech (Internet of Things (IoT))

		TENTATIVE COURSES: 2020-2024 BATCH	IM	PLEMENTED COURSES: 2020-2024 BATCH	Doucoutors
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Percentage Change
	PAPER 1	Departmental Elective-3	DE	Departmental Elective (DE-2)	
	PAPER 2	Departmental Elective-4 *	DE	Departmental Elective* (DE-3	
	PAPER 3	Open Category-2	OC	Open Category (OC-2)	
	PAPER 4	Open Category-3	OC	Open Category (OC-3)	
VII	PAPER 5	Intellectual Property Rights (IPR)	DLC	Departmental Lab	
,	PAPER 6	Departmental Lab	DLC	Creative Problem Solving (Evaluation)	
	PAPER 7	Summer Internship Project-III (04 weeks)(Evaluation)	DLC	Summer Internship Project-III (04 weeks) (Evaluation)	
	PAPER 8	Creative Problem Solving (Evaluation)	MAC	Universal Human Values & Professional Ethics(UHVPE)	
	PAPER 1	Departmental Elective-5 *	DE	Departmental Elective* (DE-4)	
	PAPER 2	Open Category-4*	OC	Open Category* (OC-4)	
VIII	PAPER 3	Open Category-5*	DLC	Internship/Research Project/ Innovation & Start-up***	
	PAPER 4	Internship/Project	-	Professional Development#	
	PAPER 5	Professional Development\$			

# Madhav Institute of Technology & Science, Gwalior (A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal) Department of Information Technology Programme: B. Tech (Information Technology (Artificial Intelligence and Robotics))

Ļ		TENTATIVE COURSES: 2020-2024 BATCH		APLEMENTED COURSES: 2020-2024 BATCH	Percen
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Char
	PAPER 1	Introduction to Artificial Intelligence	240101	Introduction to Artificial Intelligence	46.
-	PAPER 2	Introduction to Computer Programming	230102	Introduction to Computer Programming	_
I	PAPER 3	Basic Electrical & Electronics Engineering	100022	Basic Electrical & Electronics Engineering	-
-	PAPER 4	Energy, Environment, Ecology & Society	250100	Linear Algebra	-
	PAPER 5	Technical Language and Lab	100015	Energy, Environment, Ecology & Society	
	PAPER 1	Digital Logic Design	230201	Digital Logic Design	-
-	PAPER 2	Linear Algebra	220202	Sensor Technology	-
	PAPER 3	and Matrix Analysis Sensor Technology	230202	Data Structures	-
II	PAPER 4	Data Structures	230203	Object Oriented Programming and Methodology	
	PAPER 5	Object Oriented Programming and Methodology	100016	Technical Language	
	PAPER 6	Sensor Technology & Hardware Lab	100017	Language Lab	
	PAPER 1	Statistics and Random Processes	250106	Probability and Random Process	
	PAPER 2	Data Communication and Computer Networks	240301	Design & Analysis of Algorithms	
ł	PAPER 3	Design and Analysis of Algorithms	240302	Operating System	
ł	PAPER 4	Basics of Robotics	240302	Computer Networks and Protocols	-
ł	PAPER 4 PAPER 5	Graph Theory	240303	Database Management System	-
-		1 J			
ш	PAPER 6	Robotics Simulation Lab	240305	Python Programming Lab	_
ш	PAPER 7	Self-learning/Presentation (through SWAYAM/NPTEL /MOOC)# or Interdisciplinary course from other institutions and platforms with credit transfer	240306	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)	
	PAPER 8	Summer Internship Project-I (Institute Level) (Evaluation)	200XXX	Novel Engaging Course (Informal Learning)	
			240307	Summer Internship Project–I (Institute Level) (Evaluation)	
			1000002	Biology for Engineers	
	PAPER 1	Robot Kinematics and Dynamics	240401	Computer Architecture and Microprocessor	-
-	PAPER 2	Database Management System	240402	Cloud Computing	
	PAPER 3	Operating System	240403	Software Engineering	-
-	PAPER 4	Artificial Intelligence & Expert Systems	240404	Machine Learning and Optimization	
IV			240404	Network & Web Security	-
	PAPER 5	Data Mining & Analytics			_
_	PAPER 6	Cyber Security	240406	Design and Thinking Lab	
-	PAPER 7	Python Programming Lab	200XXX	Novel Engaging Course (Informal Learning)	_
			1000001	Indian Constitution and Traditional Knowledge	
	PAPER 1	Ethics, Economics, Entrepreneurship& Management	240501	Discrete Structures	
	PAPER 2	Robotics, Sensors, Actuators and Control	240502	Data Science using Python	
	PAPER 3	Algorithms for Intelligent Systems and Robotics	240503	Theory of Computation	
Ì	PAPER 4	Computer Graphics and Vision	240504	Robotics system and control	
ļ	PAPER 5	Machine Learning	240505	Soft Computing Techniques	
V	PAPER 6	Minor Project-I**	240506	Minor Project-I**	1
ł	PAPER 7	Summer Internship Project-II (Evaluation)	240507	Self-learning/Presentation (SWAYAM/NPTEL/ MOOC)#	-
	PAPER 8	Self- learning/Presentation (SWAYAM/NPTEL/	200XXX	Novel Engaging Course (Informal Learning)	
		MOOC)	240508	Summer Internship Project-II (Evaluation)	
-			1000005	Project Management & Financing	
			1000006	Disaster Management	
	PAPER 1	Deep Learning	240601	Compiler Design	
	PAPER 2	Microcontrollers & Embedded Systems	240602	Data Mining & Pattern Warehousing	
[	PAPER 3	Departmental Elective-1	240603	Artificial Intelligence in Robotics	
VI	PAPER 4	Departmental Elective-2*	DE	240661 Programming In Java 240662 Introduction to Internet of Things 240663 Advanced Graph Theory	
	PAPER 5	Open Category-1	OC	910102Data Mining & Warehousing910103Software Engineering	
Ì	PAPER 6	Disaster Management	240604	Minor Project-II**	
-	PAPER 7	Minor Project-II**	200XXX	Novel Engaging Course (Informal Learning)	
1		-			-
-			1000007	Intellectual Property Rights (IPR)	

# Madhav Institute of Technology & Science, Gwalior (A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal) Department of Information Technology Programme: B. Tech (Information Technology (Artificial Intelligence and Robotics))

		TENTATIVE COURSES: 2020-2024 BATCH	I	MPLEMENTED COURSES: 2020-2024 BATCH	Deventer
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Percentage Change
	PAPER 1	Departmental Elective-3	DE	Departmental Elective (DE-2)	
	PAPER 2	Departmental Elective-4 *	DE	Departmental Elective* (DE-3	
	PAPER 3	Open Category-2	OC	Open Category (OC-2)	
	PAPER 4	Open Category-3	OC	Open Category (OC-3)	
VII	PAPER 5	Intellectual Property Rights (IPR)	DLC	Departmental Lab	
	PAPER 6	Departmental Lab	DLC	Creative Problem Solving (Evaluation)	
	PAPER 7	Summer Internship Project-III (04 weeks)(Evaluation)	DLC	Summer Internship Project-III (04 weeks) (Evaluation)	
	PAPER 8	Creative Problem Solving (Evaluation)	MAC	Universal Human Values & Professional Ethics(UHVPE)	
	PAPER 1	Departmental Elective-5 *	DE	Departmental Elective* (DE-4)	
	PAPER 2	Open Category-4*	OC	Open Category* (OC-4)	
VIII	PAPER 3	Open Category-5*	DLC	Internship/Research Project/ Innovation & Start-up	
	PAPER 4	Internship/Project	-	Professional Development#	
	PAPER 5	Professional Development\$			

# Madhav Institute of Technology & Science, Gwalior (A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal) Department of Information Technology Programme: B. Tech (Artificial Intelligence and Data Science)

SEMESTER	COUPEE	TENTATIVE COURSES: 2021-2025 BATCH		MPLEMENTED COURSES: 2021-2025 BATCH	Perc
SEMILSIEK	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Ch
	PAPER 1	Introduction to Artificial Intelligence & Data Science	270101	Introduction to Artificial Intelligence & Data Science	1
	PAPER 2	Linear Algebra	270102	Introduction to Computer Programming	21
	PAPER 3	Basic Electrical & Electronics Engineering	100022	Basic Electrical & Electronics Engineering	_
I	PAPER 4	Introduction to Computer Programming	250100	Linear Algebra	_
	PAPER 5	Energy, Environment, Ecology & Society	100015	Energy, Environment, Ecology & Society	
	PAPER 6	C++ Programming Lab			
	PAPER 1	Digital Logic Design	270201	Digital Logic Design	
	PAPER 2	Data Structures	250106	Probability and Random Process	
	PAPER 3	Probability and Random Process	270202	Data Structures	
II	PAPER 4	Object Oriented Programming and Methodology	270203	Object Oriented Programming and Methodology	
	PAPER 5	Technical Language	100016	Technical Language	
	PAPER 6	Language Lab	100017	Language Lab	
	PAPER 7	Summer Internship Project-I (Institute Level)			
	PAPER 1	Discrete Structures	270301	Discrete Structure	_
	PAPER 2	Design and Analysis of Algorithms	270302	Design & Analysis of Algorithms	_
	PAPER 3	Operating System	270303	Operating System	
	PAPER 4	Database Management System	270304	Computer Networks and Protocols	
III	PAPER 5	Computer Networks and Protocols	270305	Database Management System	
111	PAPER 6	Python Programming Lab	270306	Python Programming Lab	
	PAPER 7	Self-learning/Presentation (through SWAYAM/NPTEL/MOOC)	270307	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)	
	PAPER 8	Biology for Engineers (Mandatory Audit Course)	200XXX	Novel Engaging Course (Informal Learning)	
	PAPER 9	Novel Engaging Course (Informal Learning)	270308	Summer Internship Project–I (Institute Level) (Evaluation)	
			1000005	Project Management & Financing	
	PAPER 1	Microprocessors and Computer Architecture	270401	Computer Architecture and Microprocessor	
	PAPER 2	Software Engineering	270402	Cloud Computing	
	PAPER 3	Data Mining and Predictive Modelling	270403	Software Engineering	
	PAPER 4	Artificial Intelligence	270404	Machine Learning and Optimization	
	PAPER 5	Theory of Automata and Compilers	270405	Network & Web Security	
IV	PAPER 6	Data Science and Visualization Lab	270406	Design and Thinking Lab	
	PAPER 7	Summer Internship Project-II	200XXX	Novel Engaging Course (Informal Learning)	_
		Indian Constitution and Traditional Knowledge (Mandatory			
	PAPER 8	Audit Course)	1000001	Indian Constitution and Traditional Knowledge	
	PAPER 9	Novel Engaging Course (Informal Learning)			
	PAPER 1	Ethics, Economics,	270501	Computer Vision	
	TATENT	Entrepreneurship& Management	270301	*	
	PAPER 2	Reinforcement Learning	270502	Data Science using Python	
	PAPER 3	Big Data Analytics and Business Intelligence	270503	Theory of Computation	
	PAPER 4	Computer Vision	270504	Reinforcement Learning	
	PAPER 5	Optimization Methods in ML	270505	Soft Computing Techniques	
V	PAPER 6	Minor Project-I**	270506	Minor Project-I**	
	PAPER 7	Self-learning/Presentation	270507	Self-learning/Presentation (SWAYAM/NPTEL/ MOOC)#	1
		(SWAYAM/NPTEL/ MOOC)			_
				$[\mathbf{N}]_{\mathbf{r}} \rightarrow [\mathbf{\Gamma}]_{\mathbf{r}} \rightarrow [\mathbf{r}]_{\mathbf{r}} \rightarrow [\mathbf{r}]_{\mathbf{r}$	1
	PAPER 8	IT Disaster Management (Mandatory Audit Course)	200XXX	Novel Engaging Course (Informal Learning)	_
	PAPER 8 PAPER 9	IT Disaster Management (Mandatory Audit Course) Novel Engaging Course (Informal Learning)	270508	Summer Internship Project-II (Evaluation)	
				Summer Internship Project-II (Evaluation) Project Management & Financing	
			270508	Summer Internship Project-II (Evaluation)	
		Novel Engaging Course (Informal Learning)	270508 1000005	Summer Internship Project-II (Evaluation) Project Management & Financing Disaster Management	
			270508 1000005	Summer Internship Project-II (Evaluation) Project Management & Financing Disaster Management Compiler Design	
	PAPER 9	Novel Engaging Course (Informal Learning) Deep Learning Cloud Computing	270508 1000005 1000006	Summer Internship Project-II (Evaluation) Project Management & Financing Disaster Management	
	PAPER 9	Novel Engaging Course (Informal Learning) Deep Learning	270508 1000005 1000006 270601	Summer Internship Project-II (Evaluation) Project Management & Financing Disaster Management Compiler Design	
	PAPER 9 PAPER 1 PAPER 2	Novel Engaging Course (Informal Learning) Deep Learning Cloud Computing	270508 1000005 1000006 270601 270602	Summer Internship Project-II (Evaluation) Project Management & Financing Disaster Management Compiler Design Data Mining & Pattern Warehousing Deep Learning 240661 Programming In Java 240662 Introduction to Internet of Things	
VI	PAPER 9 PAPER 1 PAPER 2 PAPER 3 PAPER 4	Novel Engaging Course (Informal Learning) Deep Learning Cloud Computing Departmental Elective-1 Departmental Elective-2*	270508 1000005 1000006 270601 270602 270603 DE	Summer Internship Project-II (Evaluation) Project Management & Financing Disaster Management Compiler Design Data Mining & Pattern Warehousing Deep Learning 240661 Programming In Java 240662 Introduction to Internet of Things 240663 Advanced Graph Theory	
VI	PAPER 9 PAPER 1 PAPER 2 PAPER 3	Novel Engaging Course (Informal Learning) Deep Learning Cloud Computing Departmental Elective-1	270508 1000005 1000006 270601 270602 270603	Summer Internship Project-II (Evaluation) Project Management & Financing Disaster Management Compiler Design Data Mining & Pattern Warehousing Deep Learning 240661 Programming In Java 240662 Introduction to Internet of Things 240663 Advanced Graph Theory	
VI	PAPER 9 PAPER 1 PAPER 2 PAPER 3 PAPER 4	Novel Engaging Course (Informal Learning) Deep Learning Cloud Computing Departmental Elective-1 Departmental Elective-2*	270508 1000005 1000006 270601 270602 270603 DE	Summer Internship Project-II (Evaluation) Project Management & Financing Disaster Management Compiler Design Data Mining & Pattern Warehousing Deep Learning 240661 Programming In Java 240662 Introduction to Internet of Things 240663 Advanced Graph Theory 910102 Data Mining & Warehousing	
VI	PAPER 9 PAPER 1 PAPER 2 PAPER 3 PAPER 4 PAPER 5 PAPER 6	Novel Engaging Course (Informal Learning) Deep Learning Cloud Computing Departmental Elective-1 Departmental Elective-2* Open Category-1	270508 1000005 1000006 270601 270602 270603 DE OC 270604	Summer Internship Project-II (Evaluation) Project Management & Financing Disaster Management Compiler Design Data Mining & Pattern Warehousing Deep Learning 240661 Programming In Java 240662 Introduction to Internet of Things 240663 Advanced Graph Theory 910102 Data Mining & Warehousing 910103 Software Engineering Minor Project-II**	
VI	PAPER 9 PAPER 1 PAPER 2 PAPER 3 PAPER 4 PAPER 5	Novel Engaging Course (Informal Learning)         Deep Learning         Cloud Computing         Departmental Elective-1         Departmental Elective-2*         Open Category-1         Minor Project-II**         Summer Internship Project-III         (04 weeks)	270508 1000005 1000006 270601 270602 270603 DE OC	Summer Internship Project-II (Evaluation)         Project Management & Financing         Disaster Management         Compiler Design         Data Mining & Pattern Warehousing         Deep Learning         240661 Programming In Java         240662 Introduction to Internet of Things         240663 Advanced Graph Theory         910102       Data Mining & Warehousing         910103       Software Engineering	
VI	PAPER 9 PAPER 1 PAPER 2 PAPER 3 PAPER 4 PAPER 5 PAPER 6	Novel Engaging Course (Informal Learning) Deep Learning Cloud Computing Departmental Elective-1 Departmental Elective-2* Open Category-1 Minor Project-III** Summer Internship Project-III	270508 1000005 1000006 270601 270602 270603 DE OC 270604	Summer Internship Project-II (Evaluation) Project Management & Financing Disaster Management Compiler Design Data Mining & Pattern Warehousing Deep Learning 240661 Programming In Java 240662 Introduction to Internet of Things 240663 Advanced Graph Theory 910102 Data Mining & Warehousing 910103 Software Engineering Minor Project-II**	

# Madhav Institute of Technology & Science, Gwalior (A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal) Department of Information Technology Programme: B. Tech (Artificial Intelligence and Data Science)

		<b>TENTATIVE COURSES: 2021-2025 BATCH</b>		IMPLEMENTED COURSES: 2021-2025 BATCH		
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	- Percentage Change	
	PAPER 1	Departmental Elective-3	DE	Departmental Elective (DE-2)		
	PAPER 2	Departmental Elective-4 *	DE	Departmental Elective* (DE-3		
	PAPER 3	Open Category-2	OC	Open Category (OC-2)		
VII	PAPER 4	Open Category-3	OC	Open Category (OC-3)		
VII	PAPER 5	Data Analytics using R	DLC	Departmental Lab		
	PAPER 6	Departmental Lab	DLC	Creative Problem Solving (Evaluation)		
	PAPER 7	Summer Internship Project-II	DLC	Summer Internship Project-III		
	PAPER 8	Creative Problem Solving (Evaluation)	MAC	Universal Human Values & Professional Ethics(UHVPE)		
	PAPER 1	Departmental Elective-5 *	DE	Departmental Elective* (DE-4)		
	PAPER 2	Open Category-4*	OC	Open Category* (OC-4)		
VIII	PAPER 3	Open Category-5*	DLC	Internship/Research Project/ Innovation & Start-up***		
	PAPER 4	Internship/Project	-	Professional Development#	7	
	PAPER 5	Professional Development\$			7	

# Madhav Institute of Technology & Science, Gwalior (A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal) Department of Information Technology Programme: B. Tech (Artificial Intelligence and Machine Learning)

	1	Programme: B. Tech (Artificial Intelligen		
EMESTER	COURSE CODE	TENTATIVE COURSES: 2021-2025 BATCH COURSE NAME	COURSE CODE	MPLEMENTED COURSES: 2021-2025 BATCH COURSE NAME
	PAPER 1	Introduction to Artificial Intelligence & Machine Learning	280101	Introduction to Artificial Intelligence & Machine Learning
	PAPER 2	Linear Algebra	280102	Introduction to Computer Programming
,	PAPER 3	Basic Electrical & Electronics Engineering	100022	Basic Electrical & Electronics Engineering
I	PAPER 4	Energy Ecology Environment	250100	Linear Algebra
	PAPER 5	Programming using C++	100015	Energy, Environment, Ecology & Society
	PAPER 6	C++ lab		
	PAPER 1	Digital Logic Design	280201	Digital Logic Design
	PAPER 2	Data Structures	250106	Probability and Random Process
	PAPER 3	Probability and Random Process	280202	Data Structures
II	PAPER 4	Technical Language	280203	Object Oriented Programming and Methodology
	PAPER 5	Object Oriented Programming and Methodology	100016	Technical Language
	PAPER 6	Language Lab	100017	Language Lab
	PAPER 7	Summer Internship Project–I (Institute Level)		
	PAPER 1	Discrete Structures	280301	Discrete Structure
	PAPER 2	Design and Analysis of Algorithms	280302	Design & Analysis of Algorithms
	PAPER 3	Microprocessors and Computer Architecture	280303	Operating System
	PAPER 4	Database Management System	280304	Computer Networks and Protocols
	PAPER 5	Computer Networks and Protocols	280305	Database Management System
III	PAPER 6	Python Programming Lab	280306	Python Programming Lab
	PAPER 7	Self-learning/Presentation (through SWAYAM/NPTEL /MOOC)	280307	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)
	PAPER 8	Biology for Engineers (Mandatory Audit Course)	200307	Novel Engaging Course (Informal Learning)
	PAPER 9	Novel Engaging Course (Informal Learning)	280308	Summer Internship Project–I (Institute Level) (Evaluation)
			1000005	Project Management & Financing
			1000005	
	PAPER 1	Operating System	280401	Computer Architecture and Microprocessor
	PAPER 2	Software Engineering	280401	Cloud Computing
			280402	
	PAPER 3	Data Mining and Predictive Modeling		Software Engineering
	PAPER 4	Artificial Intelligence & Expert System	280404	Machine Learning and Optimization
IV	PAPER 5	Machine Learning	280405	Network & Web Security
	PAPER 6	Data Science and Visualization Lab	280406	Design and Thinking Lab
	PAPER 7	Summer Internship Project-II	200XXX	Novel Engaging Course (Informal Learning)
	PAPER 8	Indian Constitution and Traditional Knowledge (Mandatory Audit Course)	1000001	Indian Constitution and Traditional Knowledge
	PAPER 9	Novel Engaging Course (Informal Learning)		
	TALER 9	Nover Engaging Course (informat Learning)		
	DADED 1	Ethias Economics Entropropourchin& Management	280501	Computer Vision
	PAPER 1	Ethics, Economics, Entrepreneurship& Management	280501	Computer Vision Data Science using Python
		Reinforcement Learning	280502	6 3
	PAPER 3	Big Data Analytics and Business Intelligence	280503	Theory of Computation
	PAPER 4	Computer Vision	280504	Reinforcement Learning
<b>.</b> -	PAPER 5	Theory of Automata and Compilers	280505	Soft Computing Techniques
V	PAPER 6	Minor Project-I	280506	Minor Project-I
	PAPER 7	Self-learning/Presentation (SWAYAM/NPTEL/ MOOC)	280507	Self-learning/Presentation (SWAYAM/NPTEL/ MOOC)#
	PAPER 8	IT Disaster Management (Mandatory Audit Course)	200XXX	Novel Engaging Course (Informal Learning)
	PAPER 9	Novel Engaging Course (Informal Learning)	280508	Summer Internship Project-II (Evaluation)
-			1000005	Project Management & Financing
			1000006	Disaster Management
	PAPER 1	Deep Learning	280601	Compiler Design
	PAPER 1 PAPER 2	Deep Learning Optimization Techniques	280601 280602	Compiler Design Data Mining & Pattern Warehousing
	PAPER 2	Optimization Techniques	280602	Data Mining & Pattern Warehousing Deep Learning
	PAPER 2 PAPER 3	Optimization Techniques Departmental Elective-1	280602 280603	Data Mining & Pattern Warehousing         Deep Learning         240661 Programming In Java
	PAPER 2	Optimization Techniques	280602	Data Mining & Pattern Warehousing         Deep Learning         240661 Programming In Java         240662 Introduction to Internet of Things
VI	PAPER 2 PAPER 3	Optimization Techniques Departmental Elective-1	280602 280603	Data Mining & Pattern Warehousing         Deep Learning         240661 Programming In Java         240662 Introduction to Internet of Things         240663 Advanced Graph Theory
VI	PAPER 2 PAPER 3	Optimization Techniques Departmental Elective-1	280602 280603	Data Mining & Pattern Warehousing         Deep Learning         240661 Programming In Java         240662 Introduction to Internet of Things         240663 Advanced Graph Theory         910102       Data Mining & Warehousing
VI	PAPER 2 PAPER 3 PAPER 4 PAPER 5	Optimization Techniques Departmental Elective-1 Departmental Elective-2* Open Category-1	280602 280603 DE OC	Data Mining & Pattern Warehousing         Deep Learning         240661 Programming In Java         240662 Introduction to Internet of Things         240663 Advanced Graph Theory         910102       Data Mining & Warehousing         910103       Software Engineering
VI	PAPER 2 PAPER 3 PAPER 4 PAPER 5 PAPER 6	Optimization Techniques Departmental Elective-1 Departmental Elective-2* Open Category-1 Minor Project-II	280602 280603 DE OC 280604	Data Mining & Pattern Warehousing         Deep Learning         240661 Programming In Java         240662 Introduction to Internet of Things         240663 Advanced Graph Theory         910102 Data Mining & Warehousing         910103 Software Engineering         Minor Project-II
VI	PAPER 2 PAPER 3 PAPER 4 PAPER 5 PAPER 6 PAPER 7	Optimization Techniques Departmental Elective-1 Departmental Elective-2* Open Category-1 Minor Project-II Summer Internship Project-III	280602 280603 DE OC 280604 200XXX	Data Mining & Pattern Warehousing         Deep Learning         240661 Programming In Java         240662 Introduction to Internet of Things         240663 Advanced Graph Theory         910102       Data Mining & Warehousing         910103       Software Engineering         Minor Project-II         Novel Engaging Course (Informal Learning)
VI	PAPER 2 PAPER 3 PAPER 4 PAPER 5 PAPER 6	Optimization Techniques Departmental Elective-1 Departmental Elective-2* Open Category-1 Minor Project-II	280602 280603 DE OC 280604	Data Mining & Pattern Warehousing         Deep Learning         240661 Programming In Java         240662 Introduction to Internet of Things         240663 Advanced Graph Theory         910102 Data Mining & Warehousing         910103 Software Engineering         Minor Project-II

# Madhav Institute of Technology & Science, Gwalior (A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal) Department of Information Technology Programme: B. Tech (Artificial Intelligence and Machine Learning)

		TENTATIVE COURSES: 2021-2025 BATCH	IMPLEMENTED COURSES: 2021-2025 BATCH		
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	<ul> <li>Percentage</li> <li>Change</li> </ul>
	PAPER 1	Departmental Elective-3	DE	Departmental Elective (DE-2)	
	PAPER 2	Departmental Elective-4 *	DE	Departmental Elective* (DE-3	
	PAPER 3	Open Category-2	OC	Open Category (OC-2)	
	PAPER 4	Open Category-3	OC	Open Category (OC-3)	
VII	PAPER 5	Intellectual Property Rights (IPR)	DLC	Departmental Lab	
V 11	PAPER 6	Departmental Lab	DLC	Creative Problem Solving (Evaluation)	
	PAPER 7	Summer Internship Project-III (04 weeks)(Evaluation)	DLC	Summer Internship Project-III (04 weeks) (Evaluation)	
	PAPER 8	Creative Problem Solving (Evaluation)	MAC	Universal Human Values & Professional Ethics(UHVPE)	
	PAPER 1	Departmental Elective-5 *	DE	Departmental Elective* (DE-4)	
	PAPER 2	Open Category-4*	OC	Open Category* (OC-4)	
VIII	PAPER 3	Open Category-5*	DLC	Internship/Research Project/ Innovation & Start-up***	7
-	PAPER 4	Internship/Project	-	Professional Development#	
	PAPER 5	Professional Development\$			7

# **Chemical Engineering Department**

		2019-2023 BATCH		2020-2024 BATCH	Percentage
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Change
	100101	Engineering Chemistry	100012	Engineering Chemistry	35.9375
	100102	Mathematics-I	100020	Basic Civil Engineering and Mechanics	
	100103	Technical English	100021	Basic Mechanical Engineering	
Ι	100104	Basic Electrical and Electronics Engineering	100022	Basic Electrical and Electronics Engineering	
	100105	Engineering Graphics	100023	Basic Computer Engineering	
	100106	Manufacturing Practices	100024	Manufacturing Practices	
				NSS/NCC	
	100201	Engineering Physics	100011	Engineering Mathematics-I	_
	100202	Energy, Environment, Ecology and Society	170211	Chemical Process Calculation	_
	100203	Basic Computer Engineering	100014	Engineering graphics	4
II	100204	Basic Mechanical Engineering	100015	Energy, Environment, Ecology and Society	_
	100205	Basic Civil Engineering and Mechanics	100016	Technical Language	_
	100206	Language lab and Seminars	100017	Language Lab	
			100018	Engineering graphics Lab	
	100001	Engineering Mathematics-II	100012	Engineering Mathematics-II	-
	170302	Organic Process Technology	170311	Fluid Mechanics	1
İ	170303	Fluid Mechanics	170312	Organic Process Technology	1
İ	170304	Material and Energy Balance	170313	Chemical Engineering thermodynamics	
III	170305	Fluid Particle Mechanics	170314	Fluid Particle Mechanics	]
111	170306	Chemical Synthesis lab	170315	Chemical Synthesis lab	1
	170307	Self Learning/Presentation (SWAYAM	170316	Self Learning/Presentation	1
	170308	Summer Internship Project-I	200XXX	NSS/NCC/Novel Engaging Courses	
		NSS/NCC	170317	Summer Internship Project-I	
			100006	Indian Constitution and Traditional	
					ļ
	100003	Engineering Mathematics-III	100028	Engineering Mathematics-III	1
	170402	Heat Transfer	170411	Heat Transfer	1
	170403	Mass Transfer –I	170412	Instrumentation and Process Control	
	170404	Instrumentation and Process Control	170413	Mechanical Design of Process Equipment	

IV	170405	Mechanical Design of Process Equipment	170414	Mass Transfer –I
1 V	100004	Cyber Security	100009	Cyber Security
	170407	Process Control Lab	170415	Process Control Lab
	100002	Biology for Engineers	200XXX	NSS/NCC/ Novel Engaging Courses
	100002	NSS/NCC	100002	Biology for Engineers
			100002	biology for Engineers
	170501	Chemical Engineering Thermodynamics	170511	Data Science
	170502	Mass Transfer-II	170512	Mass Transfer-II
	170503	Chemical Reaction Engineering-I	170513	Chemical Reaction Engineering-I
	170504	Computational Methods in Chemical	170514	Computational Methods in Chemical
	170505	Inorganic Process Technology	170515	Inorganic Process Technology
V	170506	Minor Project-I	170516	Minor Project-I
·	170507	Summer Internship Project-II	170517	Self Learning/ Presentation
	170508	Self Learning/ Presentation	200XXX	NSS/NCC/ Novel Engaging Courses
		5	170518	Summer Internship Project-II
			1000006	Disaster Management
			1000005	Project Management and financing
	100005	Ethics Economics Entrepreneurship and	170611	Process Modeling and simulation
	170602	Process Modeling and simulation	170612	Process Equipment Design
	Elective-I	<ul> <li>a. Process Equipment Design(170611)</li> <li>b. Fluidization Engineering(170612)</li> <li>c. Multicomponent Distillation(170613)</li> <li>d. Polymer Technology(170614)</li> </ul>	170613	Artifical Intelligent and machine learning
VI	Elective-II	a. Chemical Reaction Engineering-II(170651) b. Multiphase Flows(170652) c. Membrane Technology(170653)	Elective-I	a. Multiphase Flows(170652) b. Membrane Technology(170653) c. Physical and Electrochemical characterizations in Chemical Engineering(170654)
	Open Course –I	a. Fuels and Combustion(900109) b. Nano Technology(900110)	Open Course –I	Fuel and Combustion(910115)
	100007	Disaster management	170614	Minor Project-II
	170603	Minor Project-II	200XXX	NSS/NCC/ Novel Engaging Courses
	170005			

VII         a. Transport Phenomena(170711) b. Equilibrium Staged Operations(170712) c. Industrial Pollution Prevention and Control() d. Petrochemical Technology(170714) d. Petrochemical Technology(170714) d. Petrochemical Technology(170714) d. Petrochemical Technology(170715) c. Principle and practices of process equipment and plant design(170755) c. Principle and practices of process equipment and plant design(170755) c. Principle and practices of process equipment and plant design(170755) d. Petroleum Processing Technology(900211)         Elective -III Elective -III         a. Chemical Process Safety(0 b. Energy Conservation and Waste heat recovery(170754)           Open Course -II         Petroleum Processing Technology(900211)         Open Course -III         Petroleum Processing Technology(90021)           Open Course -III         Industrial Safety and Hazards(900223)         Open Course -III         Industrial Safety and Hazards(900223)           170701         Process Computation Lab         170712         Creative Problem Solving           170702         Summer Internship-III         170713         Summer Internship-III           170703         Creative Problem Solving         Universal Human Values and professional           VIII         a. Optimization in Chemical Engineering(170851)         Elective-IV         a. Optimization in Chemical Engineering(0)         b. Chemical Process Utilities(170855)         e. Chemical Process Utilities(170855)         b. Electrochemical technology in pollution           VIII         a. Environmental quality monitoring and analysis(900623) <td< th=""><th></th><th></th><th></th><th></th><th></th></td<>					
VIIa. Energy conservation and waste heat recovery(170754)a. Chemical Process Safety() b. Chemical Process Safety(170752) c. Principle and practices of process equipment and plant design(170755)Elective -III Elective -IIIa. Chemical Process Safety() b. Energy Conservation and Waste heat Recovery() c. Principle and practices of process equipment and plant design(170755)Elective -III b. Chemical Process Intervation CFE - 1/170720Recovery() c. Principle and practices of process equipment and plant design(170755)Elective -III b. Chemical Process Intervation CFE - 1/170720Recovery() c. Principle and practices of process equipment and plant design(170755)Open Course -IIIIndustrial Safety and Hazards(900223)Open Course -IIIIndustrial Safety and Hazards(900223)Open Course -IIIIndustrial Safety and Hazards(900223)Open Course -IIIIndustrial Safety and Hazards(900223)100008Intellectual Property rights170711Process Computation Lab170712170701Process Computation Lab170713Summer Internship-III170702Summer Internship-III170713Summer Internship-III170703Creative Problem Solvinga. Optimization in Chemical Engineering(170851) b. Chemical Process Utilities(170855) c. Biomass Conversion and Biorefinery (170853)Elective-IVa. Environmental quality monitoring and analysis(006623) b. Electrochemical technology inOpen Course -IVa. Environmental quality monitoring and analysis() b. Electrochemical technology in pollution170801Internship/Project170811Internship/Research Project		Elective-III	b. Equilibrium Staged Operations(170712) c. Industrial Pollution Prevention and Control(170713)	Elective-II	<ul><li>b. Equilibrium Staged Operations()</li><li>c. Industrial Pollution Prevention and Control()</li></ul>
Open Course -IIIIndustrial Safety and Hazards(900223)Open Course -IIIIndustrial Safety and Hazards()100008Intellectual Property rights170711Process Computation Lab170701Process Computation Lab170712Creative Problem Solving170702Summer Internship-III170713Summer Internship-III170703Creative Problem SolvingUniversal Human Values and professional170704ea. Optimization in Chemical Engineering(170851)a. Optimization in Chemical Engineering(170853)VIII0a. Optimization and Biorefinery (120853)a. Environmental quality monitoring and analysis(900623)a. Environmental quality monitoring and analysis()00Internship/Project170811Internship/Research Project	VII	Elective –IV	a. Energy conservation and waste heat recovery(170754) b. Chemical Process Safety(170752) c. Principle and practices of process	Elective –III	<ul> <li>b. Energy Conservation and Waste heat Recovery()</li> <li>c. Principle and practices of process</li> </ul>
100008Intellectual Property rights170711Process Computation Lab170701Process Computation Lab170712Creative Problem Solving170702Summer Internship-III170713Summer Internship-III170703Creative Problem SolvingUniversal Human Values and professional170704ea. Optimization in Chemical Engineering(170851) b. Chemical Process Utilities(170855) c. Biomass Conversion and Biorefinery (170853)Elective-IVa. Optimization in Chemical Engineering() b. Chemical Process Utilities(170855) c. Biomass Conversion and Biorefinery (170853)a. Environmental quality monitoring and analysis(900623) b. Electrochemical technology inOpen Course -IVa. Environmental quality monitoring and analysis() b. Electrochemical technology in170801Internship/Project170811Internship/Research Project		Open Course –II	Petroleum Processing Technology(900211)	Open Course –II	Petroleum Processing Technology()
170701Process Computation Lab170712Creative Problem Solving170702Summer Internship-III170713Summer Internship-III170703Creative Problem SolvingUniversal Human Values and professional170704Creative Problem SolvingUniversal Human Values and professional170705Creative Problem SolvingUniversal Human Values and professional170706Elective-IVa. Optimization in Chemical Engineering(170851) b. Chemical Process Utilities(170855) c. Biomass Conversion and Biorefinery (170853)Elective-IVVIII0pen Course-IVa. Environmental quality monitoring and analysis(900623) b. Electrochemical technology inOpen Course –IV170801Internship/Project170811Internship/Research Project		Open Course –III	Industrial Safety and Hazards(900223)	Open Course –III	Industrial Safety and Hazards()
170702Summer Internship-III170713Summer Internship-III170703Creative Problem SolvingUniversal Human Values and professional170703Creative Problem SolvingUniversal Human Values and professionalImage: Section Control of C		100008	Intellectual Property rights	170711	Process Computation Lab
170703Creative Problem SolvingUniversal Human Values and professional170703Creative Problem SolvingUniversal Human Values and professionalImage: Construct of the problem SolvingImage: Construct of the problem SolvingImage: Construct of the professionalImage: Construct of the problem SolvingImage: Construct of the professionalImage: Construct of the professionalImage: Construct of the profession of the profe		170701	Process Computation Lab	170712	Creative Problem Solving
VIII       a. Optimization in Chemical Engineering(170851)       a. Optimization in Chemical Engineering(170851)       a. Optimization in Chemical Engineering()         VIII       b. Chemical Process Utilities(170855)       Elective-IV       b. Biomass Conversion and Biorefinery (170853)         VIII       a. Environmental quality monitoring and analysis(900623)       a. Environmental quality monitoring and analysis(900623)       open Course -IV         170801       Internship/Project       170811       Internship/Research Project		170702	Summer Internship-III	170713	Summer Internship-III
VIII       Engineering(170851)       Elective-V       Engineering(170851)       Elective(170855)       Elective-IV       Engineering()       Biomass Conversion and Biorefinery()         VIII       0       0       a. Environmental quality monitoring and analysis(900623)       b. Electrochemical technology in       0       a. Environmental quality monitoring and analysis()       b. Electrochemical technology in       a. Environmental quality monitoring and analysis()       b. Electrochemical technology in       b. Electrochemical technology in pollution		170703	Creative Problem Solving		Universal Human Values and professional
VIII       Engineering(170851)       Elective-V       Engineering(170851)       Elective(170855)       Elective-IV       Engineering()       Biomass Conversion and Biorefinery()         VIII       0       0       a. Environmental quality monitoring and analysis(900623)       b. Electrochemical technology in       0       a. Environmental quality monitoring and analysis()       b. Electrochemical technology in       a. Environmental quality monitoring and analysis()       b. Electrochemical technology in       b. Electrochemical technology in pollution					
Open Course-IV       analysis(900623)       Open Course – IV       analysis()         b. Electrochemical technology in       b. Electrochemical technology in       b. Electrochemical technology in         170801       Internship/Project       170811       Internship/Research Project		Elective-V	Engineering(170851) b. Chemical Process Utilities(170855) c. Biomass Conversion and Biorefinery	Elective-IV	Engineering() b. Biomass Conversion and Biorefinery()
	VIII	Open Course-IV	a. Environmental quality monitoring and analysis(900623)	Open Course –IV	analysis()
170802Professional Development170812Professional Development		170801	Internship/Project	170811	Internship/Research Project
		170802	Professional Development	170812	Professional Development

# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. aided UGC Autonomous NAAC Accredited Institute Affiliated to RGPV, Bhopal) Department of Computer Science and Engineering Change in Syllabus and Scheme for B.Tech Computer Science and Engineering (2017-2022)

		2019-2023 BATCH		2020-2024 BATCH
SEMESTER	COURSE	COURSE NAME	COURSE	COURSE NAME
	CODE		CODE	
	100201	Engineering Physics	230102	Introduction to Computer Programming
	100202	Energy, Environment, Ecology & Society	100022	Basic Electrical & Electronics Engineering
Ι	100203	Basic Computer Engineering	100020	Basic Civil Engineering & Mechanics
	100204	Basic Mechanical Engineering	100021	Basic Mechanical Engineering
	100205	Basic Civil Engineering & Mechanics	100015	Energy, Environment, Ecology & Society
	100206	Language Lab. & Seminars	150111	IT workshop
	100101	Engineering Chemistry	100011	Engineering Mathematics –I
	100102	Engineering Mathematics-I	150211	Data Structures
II	100103	Technical English	150212	Object Oriented Programming & Methodology
п	100104	Basic Electrical & Electronics Engineering	150213	Digital Electronics
	100105	Engineering Graphics	100016	Technical Language
	100106	Manufacturing Practices	100017	Language Lab
	100001	Mathematics-II	100025	Engineering Mathematics-II
	150301	Digital Electronics	150311	Computer System Organization
	150302	Data Structures	150312	Operating System
	150303	Computer Graphics	150313	Computer Graphics
	150304	Object Oriented Programming and Methodology	150314	Design & Analysis of Algorithms
	150305	Hardware Lab	150315	Computer Hardware & Troubleshooting Lab
III	150206	Self-learning/Presentation		Self-learning/Presentation
	150306	(SWAYAM/NPTEL/MOOC)#	150316	(SWAYAM/NPTEL/MOOC)
	150307	Summer Internship Project–I (Institute Level) (Evaluation)	200XXX	Novel Engaging Course
	100002	Biology for Engineers	150317	Summer Internship Project–I (Institute Level) (Evaluation)
			1000002	Biology for Engineers
	100003	Engineering Mathematics- III	150411	Computer Networks
	150401	Design & Analysis of Algorithms	150412	Database Management System
	150402	Database Management System	150413	Software Engineering
	150403	Operating System	150414	Theory of Computation
IV	150404	Computer System Organization	150415	Programming Lab Python Programming
	100004	Cyber Security	150416	Discrete Structures
	150405	Programming Lab	200XXX	Novel Engaging Course
			1000001	Indian Constitution and Traditional Knowledge
	100005	Ethics, Economics, Entrepreneurship & Management	150511	Data Science
	150501	Discrete Structures	150512	Networking with TCP/IP
	150502	Software Engineering	150513	Information Security
	150503	Theory of Computation	150514	Compiler Design
	150503	Microprocessor & Interfacing	150515	Artificial Intelligence
	150504	Minor Project-I	150516	Minor Project-I
V	150506	Summer Internship Project-II (Evaluation)	150510	Summer Internship Project-II (Evaluation)
	130300	Summer Internship Project-II (Evaluation) Self-learning/Presentation		
	150507	(SWAYAM/NPTEL/MOOC)	200XXX	Novel Engaging Course (Informal Learning)
	100006	Indian Constitution & Traditional Knowledge (Audit Course)	150518	Self-learning/Presentation (SWAYAM/NPTEL/ MOOC)
			1000005	Project Management & Financing
	1		1000006	Disaster Management

	150601	Compiler Design	150611	Cloud Computing & Virtualization
	150602	Computer Networks	150612	Digital Image Processing
	DE	150611 Network & Web Security 150612 Image Processing 150613 Mobile Computing	150613	Machine Learning
VI	DE	150656 Introduction to Internet of Things 150657 Object Oriented System Development Using UML, Java And Patterns 150654 An Introduction to Artificial Intelligence	DE	150658 Ethical Hacking 150651 Data Analytics using Python 150659 Blockchain and its Application
	OC	900106 Data Structures 900107 Python Programming	OC	910100 Data Structures 910101 Python Programming
	100007	Disaster Management	150614	Minor Project-II
	150603	Minor Project-II	200XXX	Novel Engaging Course (Informal Learning)
			1000007	Intellectual Property Rights (IPR)
	DE	150711 Networking with TCP/IP 150712 Data Mining & Warehousing 150713 Distributed Systems	DE	150711 Networking with TCP/IP 150712 Data Mining & Warehousing 150713 Distributed Systems
	DE	150756 Software Testing 150757 Big Data Computing 150758 Introduction to Machine Learning	DE	150756 Software Testing 150757 Big Data Computing 150758 Introduction to Machine Learning
VII	OC	900208 Soft Computing 900209 Network Security	OC	900208 Soft Computing 900209 Network Security
	OC	900220 R Programming 900222 Computer Networks	OC	900220 R Programming 900222 Computer Networks
	100008	Intellectual Property Rights (IPR)	100008	Intellectual Property Rights (IPR)
	150701	Departmental Lab	150701	Departmental Lab
	150702	Summer Internship Project-III (04 weeks ) (Evaluation)	150702	Summer Internship Project-III (04 weeks ) (Evaluation)
	150703	Creative Problem Solving (Evaluation)	150703	Creative Problem Solving (Evaluation)
VIII	DE	150859 Information Security -5- Secure Systems Engineering 150852 Privacy and Security in Online Social Media 150856 Blockchain and its Applications	DE	150859 Information Security -5- Secure Systems Engineering 150852 Privacy and Security in Online Social Media 150856 Blockchain and its Applications
	OC	Data Science for Engineers Introduction to Internet of Things An Introduction to Artifical Intelligence	OC	Data Science for Engineers Introduction to Internet of Things An Introduction to Artifical Intelligence
	150801	Internship/Project	150801	Internship/Project
	150802	Professional Development	150802	Professional Development

# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. aided UGC Autonomous NAAC Accredited Institute Affiliated to RGPV, Bhopal) Department of Computer Science and Engineering

Change in Syllabus and Scheme for B.Tech Computer Science and Design(2021-2022)

	TENTATIVE COURSES: 2021-2025 BATCH		2021-2025 BATCH		
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Percenta
	Course 1	Digital Logic Design	290101	Introduction to Computer Science and Design	21.43
	Course 2	Introduction to Computer Programming	230102	Introduction to Computer Programming	
Ι	Course 3	Engineering Drawing	100022	Basic Electrical & Electronics Engineering	
	Course 4	Energy, Environment, Ecology & Society	250100	Linear Algebra	
	Course 5	Technical Language and Lab	100015	Energy, Environment, Ecology & Society	
	Course 6	Object Oriented Analysis and Design	250106	Probability and Random Process	
	Course 7	Numerical Methods and Simulation Techniques	290201	Digital Electronics	
II	Course 8	Computer Graphics	290202	Data Structures	
11	Course 9	Data Structures	290303	Object Oriented Programming and Methodology	
	Course 10	Computer System Architecture	100016	Technical Language	
	Course 11	Python Programming Lab	100017	Language Lab	
	Course 12	Discrete Mathematics	290301	Discrete Structures	
	Course 13	Operating Systems	290302	Design and Analysis of Algorithms	
	Course 14	Design and Analysis of Algorithms	290303	Operating System	
	Course 15	Database Management System	290304	Computer System Organization	7
	Course 16	Computer Networks	290305	Computer Graphics and Animation	7
	Course 17	Computer Network Designing and Modeling Lab.	290306	Digital Circut Design Lab	
Ш	Course 18	Self-learning/Presentation (through SWAYAM/NPTEL /MOOC)# or Interdisciplinary course from other institutions and platforms with credit transfer	290307	Self Learning Presentation(SWYAM/NPTEL/MOOC)	
	Course 19	Summer Internship Project–I (Institute Level) (Evaluation)	200XXX	Novel Engaging Course	
			290308	Summer Internship Project–I (Institute Level) (Evaluation)	
			1000005	Process Management and Fincancing	
	Course 20	Software Engineering	290401	Web Technologies	
	Course 21	Multimedia Computing and Applications	290402	Database Management System	
	Course 22	Website Designing and Publishing	290403	Theory of Computation	
IV	Course 23	Software Modeling and Design	290404	Computer Networks	
	Course 24	Theory of Computations	290405	Programming Lab Python Programming	
	Course 25	Virtual Reality	200XXX	Novel Engaging Course	
	Course 26	Video Editing & Photography Lab.	1000001	Indian Constitution and Traditional Knowledge	
	Course 27	Ethics, Economics, Entrepreneurship & Management		Ethics, Economics, Entrepreneurship & Management	
	Course 28	User Interface Design & Usability		User Interface Design & Usability	
	Course 29	Animation Principles and Design		Animation Principles and Design	7
17	Course 30	Hardware Modeling	1	Hardware Modeling	1
V	Course 31	Compiler Design		Compiler Design	1
	Course 32	Minor Project-I**		Minor Project-I**	1
	Course 33	Summer Internship Project-II (Evaluation)		Summer Internship Project-II (Evaluation)	1
	Course 34	Self learning/Presentation (SWAYAM/NPTEL/ MOOC)		Self learning/Presentation (SWAYAM/NPTEL/ MOOC)	
	Course 35	Artificial Intelligence and Game Designing		Artificial Intelligence and Game Designing	7
	Course 36	Machine Learning		Machine Learning	7
	Course 37	Departmental Elective-1		Departmental Elective-1	1
VI	Course 38	Departmental Elective-2*		Departmental Elective-2*	1
	Course 39	Open Category-1		Open Category-1	1
	Course 40	Disaster Management		Disaster Management	1
	Course 41	Minor Project-II**		Minor Project-II**	1
	UCOURSE 41				

	Course 42	Departmental Elective-3	Departmental Elective-3
	Course 43	Departmental Elective-4	Departmental Elective-4
	Course 44	Open Category-2	Open Category-2
	Course 45	Open Category-3	Open Category-3
VII	Course 46	Intellectual Property Rights (IPR)	Intellectual Property Rights (IPR)
	Course 47	Internet of Things(IoT) Lab.	Internet of Things(IoT) Lab.
	Course 48	Summer Internship Project-III (04 weeks)(Evaluation	Summer Internship Project-III (04 weeks)(Evaluation
	Course 49	Creative Problem Solving (Evaluation)	Creative Problem Solving (Evaluation)
	Course 50	Departmental Elective-5	Departmental Elective-5
	Course 51	Open Category-4	Open Category-4
VIII	Course 52	Open Category-5*	Open Category-5*
	Course 53	Internship/Project	Internship/Project
	Course 54	Professional Development	Professional Development

# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (A Govt. aided UGC Autonomous NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Department of Computer Science and Engineering

Change in Syllabus and Scheme for Master of Computer Applications(2021-2022)

		2018-2020 Batch		2020-2022 Batch	Percent
SEMESTER	COURSE COURSE NAME		COURSE COURSE NAME		Chan
	CODE		CODE		
	680101	SAD and Software Engineering	680111	Mathematical Foundations	45.8
	680102	Mathematical Foundation of Computer Science	680112	Data Structures and Algorithms	_
	680103	Programming and Problem Solving in C	680113	Database Managemen Systems	
Ι	680104	Computer Organization and Assembly Language Programming	680114	Operating Systems	
	680105	Communication Skills	680115	Management Fuctions and Oral & written COmmunication	
	680106	Programming Laboratory in C	680116	Lab-1 (Object Oriented Programming Lab)	
	680107	Assembly Language Laboratory	680117	Lab-II(DBMS Lab)	
	680201	Multimedia Systems	680211	Software Engineering	
	680202	Computer Graphics	680212	Internet of Things(IoT)	
	680203	Data Structures	680213	Computer Networks	
	680204	Computer Oriented Numerical & Statistical Methods	DE-1	680214 Computer Architecture and Organization 680215 Computer Graphics and Multimedia 680216 Web Technology 680217 Machine Learning using Python	-
Π	680205	Accounting & Management Control	DE-2	680218 Management Economics 680219 Corporate Planning 680220 MIS Framework and Implementation 680221 Management and SOftware Projects 680222 Organizational Behavior	
	680206	Data Structures Programming Laboratory	680223	Lab-III (Java Programming Laboratory)	
	680207	Programming Laboratory in Computer Graphics	680224	Lab-IV(Busciness Programming Laboratory)	
	680301	Computer Oriented Optimization	680311	Artificial Intelligence and Applications	
	680302	Operating System	680312	Management Support System	
	680303	Object Oriented Methodology & C++	680313	Datamining and Warehousing	
III	680304	Database Mgmt. System	DE-III	Department Elective -III(MOOC) 680314 Cloud Computing 680315 Social Networks 680316 Big Data Computing	
	680305	Managerial Economics	OC	680317 Web Technologies 680318 Human Computer Interaction 680319 Network and Cyber Security	
	680306	Minor Project-I(VB+MySql)	680322	Minor Project	
	680307	C++ Programming Laboratory	680323	Lab-V (Python Programming Lab)	
	680401	Theory of Computation	680405	Self Learning Presentation Seminar	
	680402	Artificial Intelligence and Machine Learning	680406	System Development Project/Internship	
	680403	Unix and Shell Programming(Elective-I)	-	-	
IV	680404	Java Programming and Technologies	-	-	1
	680405	Computer Networks and Communication	-	-	1
	680406	Minor Project-II(Java and My-SQL)	-	_	1
		j(		1	4

	680501	Analysis and Design of Algorithms	NA	NA	
	680502	Network and Cyber Security	NA	NA	
	680503	Web Technologies and Cloud Computing	NA	NA	
	680504	Elective-I(.NET Technologies and C#)	NA	NA	
V	680505	Elective-II(Data Warehousing and Mining)	NA	NA	
	680506	Minor Project-III Web Based Application using .NET	NA	NA	
	680507	Programming Laboratory in PHP and Web Technologies	NA	NA	
			NA	NA	
VI	680601	System Development Project	NA	NA	

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Department of Computer Science and Engineering

Change in Syllabus and Scheme for Master of Technology(CSE)(2017-2022)

		2017-2019 Batch		Percentage	
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Change
	620101	Theoretical Foundations of Computer Science	620111	Database System	58.82
	620102	Distributed System	620112	Distributed Computing	
	620103	Advance Computer Architecture	620113	High-speed Networks	
Ι	620104	Advance Computer Networks	DE-1	620114 Mobile Computing & M-Commerece 620115 Adhoc & Sensor Based Networks 620116 Network Security 620117 Computer Architecture and Parallel Processing	
	620105	Moblie Computing & M-Commerce	OC-1	620118 Soft Computing 620119 Blockchain Technology 620120 Machine Learning using Python	
	620106	Lab I	620121	Lab-1	
	620107	Lab II	620122	Self-Learning/Presentation	
	620201	Advance Database Management	620211	Algorithm Design Technique and Analysis	
	620202	Soft Computing	620212	Advance Topic in Data Mining & Warehousing	
	620203	Advance Algorithm and Design	620213	Image Processing and Retrival Technique	
II	620204	Advance Topics in Data Mining and Warehousing	DE-II	620216 Cloud Computing 620217 Social Networking	
	620205	Adhoc & Sensor Networks	OC-II	620214 Internet of Things 620215 Deep Learning	
	620206	Lab I	620221	Lab-II	
	620207	LabII	620222	Self Learning/Presentation	
	620301	Image Processing and Retrival Technique	620311	Dissertation Part-1	
III	620302	Network Security	OC	Big Data Computing Computer Vision	
	620303	Seminar			
	620304	Disertation Part I			
IV	620401	Disertation Part-II	620405	Disertation Part-II	

# **B.Architecture**

EMESTER	COURSE CODE	2019-2023 BATCH COURSE NAME	COURSE CODE	2020-2024 BATCH COURSE NAME	
	210112	Architectural Design I	210112	Architectural Design I	
_	210113	Building Materials	210113	Building Materials	
T	210114	Graphics I	210114	Graphics I	-
· -	210115	Structure I History of Architecture I	210115	Structure I	
F	210116 210117	History of Architecture 1 Workshop I	210116 210117	History of Architecture I Workshop I	-
	210117	Professional Communication	210117	Professional Communication	-
	210211	Architectural Design II	210211	Architectural Design II	
	210212	Building Construction I	210212	Building Construction I	
-	210212	Graphics II	210212	Graphics II	-
п	210214	Structure II	210214	Structure II	
	210215	History of Architecture II	210215	History of Architecture II	
	210216	Theory of Design	210216	Theory of Design	
	210217	Workshop II	210217	Workshop II	
		Architectural		Architectural	
	210311	Design III Building	210311	Design III Building	
_	210312	Construction II	210312	Construction II	_
-	210313	Graphics III	210313	Graphics III	-
III	210314 210315	Surveying & Leveling History of Architecture III	210314 210315	Surveying & Leveling History of Architecture III	
	210315	Structure III	210315	Structure III	-
	210010	Novel engaging courses	210010	Novel engaging courses	-
	AR0323S1/S2/S3	Summer Internship Project I	AR0323S1/S2/S3	Summer Internship Project I	
	210310	Biology for Architects	210310	Biology for Architects	
					-
F	210413 210414	Architectural Design IV Building Construction III	210413 210414	Architectural Design IV Building Construction III	-
F		Building Construction III Building Services I		Building Services I	-
F	210415 210416	(Water Supply & Sanitation)	210415 210416	(Water Supply & Sanitation)	-
	210416 210417	History of Architecture IV Structure IV	210416 210417	History of Architecture IV Structure IV	-
IV	210417	ECTIVE I	210417	CTIVE I	_
_	DE I	210421 - Ecology & Environment 210422 - Society, Culture And Architecture	DE I	210421 - Ecology & Environment 210422 - Society, Culture And Architecture	_
-	210419	Novel engaging courses Tour/ Seminar / Workshop/ NASA Training during winter break	210419	Novel engaging courses Tour/ Seminar / Workshop/ NASA Training during winter break	-
	1000001	Indian constitution & Traditional Knowledge	1000001	Indian constitution & Traditional Knowledge	
	210514	Architectural Design V	210514	Architectural Design V	_
	210515	Building Construction IV	210515	Building Construction IV	
	210516	Building Services II (Electrical & Mechanical)	210516	Building Services II (Electrical & Mechanical)	
	210517	Building Sciences & Energy Conservation	210520	Green Building & Rating Systems	
v		ECTIVE II 210521 - Architectural Photography & Journalism	210521	Culturally Responsive Built Environment	
-	DE II 210518	210522 - Vernacular Architecture # Self study, Seminar (SWAYAM/NPTEL & MOOC)	210518	# Self study, Seminar (SWAYAM/NPTEL & MOOC)	
	210010	Novel engaging courses	210010	Novel engaging courses	
	210519	Summer Internship Project II	210519	Summer Internship Project II	
	210510	Disaster Management	210510	Disaster Management	
	210615	Architectural Design VI	210615	Architectural Design VI	
	210616	Building Services III (Acoustic & Fire Fighting)	210616	Building Services III (Acoustic & Fire Fighting)	
_	210617	Site Planning and Landscaping Architecture	210618	Working Drawing	_
-	210618	Working Drawing TIVE III	210620	Building System Integration & Management	_
VI	DE III	210611 - Housing 210619 - Design Thinking in Architecture	210621	Advanced Structural Systems	
	D.C.III	FIVE IV	210021	ELECTIVE II	
		210651 - Strategies for Sustainable Design 210652 - Environmental Impact Assessment		210651 - Strategies for Sustainable Design 210652 - Environmental Impact Assessment	
F	DE IV	210653 - Urban Services Planning Novel engaging courses	DE II	210653 - Urban Services Planning Novel engaging courses	-
	210619	Tour/ seminar / Workshop/ Training during winter break	210619	Tour/ seminar / Workshop/ Training during winter break	1
	210610	Intellectual Property Rights	210610	Intellectual Property Rights	
	210711	And in some 1 Parties 1 M	310711	Andreas I Brain 199	
F	210711 210712	Architectural Design VII Adv Building Construction	210711 210712	Architectural Design VII Adv Building Construction	-
F	210712	Project Management & Building economics	210712 210714	Estimating and Costing & Specifications	
	210714	Estimating and Costing & Specifications	210720	Building Performance & Compliance	
VII		ECTIVE V 210761 - Structural System in Architecture		CTIVE III 210761 - Structural System in Architecture	
	DE V	210762 - Urban Landuse and transportation planning 210763 - Urban governance and Development Management (UGDM)	DE III	210761 - Urban Landuse and transportation planning 210763 - Urban governance and Development Management (UGDM)	
F	210717	210763 - Urban governance and Development Management (UGDM) Urban & Regional Planning	210721	210763 - Urban governance and Development Management (UGDM) Sustainable Cities & Communities	
	210719	Summer Internship Project III	210719	Summer Internship Project III	1
F	210815	Architectural Design VIII	210815	Architectural Design VIII Professional Practice & Ethics	-
F	210816 210817	Urban Design Professional Practice & Ethics	210817 210818	Professional Practice & Ethics Dissertation	-
F	210818	Dissertation	210818	Architectural Conservation & Historic Preservation	
VIII	DE VI	ECTIVE VI 210851 - Architectural Journalism	210821	City & Metropolitan Planning	
F	DE VII	210852 - Housing LECTIVE VII 210861 - Interior Design		TIVE IV 210851 - Interior Design	
F	210810	210862 - Sustainable Architecture	310810	210852 - Housing	-
	210819	Tour/ seminar / NASA/Workshop/Training during winter break	210819	Tour/ seminar / NASA/Workshop/Training during winter break	
IX -	210911	Professional Training	210911	Professional Training	
17	210912	Online Course (SWAYAM/ NPTEL/ COURSERA etc)	210912	Online Course (SWAYAM/ NPTEL/ COURSERA etc)	
	211011	Thesis Project	211011	Thesis Project	-
	211012	Professional Development	211012	Professional Development	
х		ELECTIVE VIII	211014		
Х	211013	PROFESSIONAL CERTIFICATION COURSE	211014	Photography, Journalism, Reviews & Travel Diary	

# Masters in Urban Planning

onecren		2019-2021 BATCH		2020-2022 BATCH	Overall Percentage change due to
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	change in content
		SOCIO-ECONOMIC BASIS FOR		SOCIO-ECONOMIC BASIS FOR	28.5
	670102	PLANNING	670102	PLANNING	
	670103	PLANNING TECHNIQUES	670103	PLANNING TECHNIQUES	
		INFRASTRUCTURE AND		INFRASTRUCTURE AND	
	670104	TRANSPORTATION PLANNING	670104	TRANSPORTATION PLANNING	
		STUDIO COURSE-I STUDIO		STUDIO COURSE-I STUDIO	
I		ASSIGNMENTS/FILM APPRECIATION/		ASSIGNMENTS/FILM APPRECIATION/	
		LITERATURE REVIEW/AREA		LITERATURE REVIEW/AREA	
L L	670106	APPLICATION	670106	APPLICATION	-
		STUDIO COURSE-II SITE PLANNING/		STUDIO COURSE-II SITE PLANNING/	
- F	670107	CITY DEVELOPMENT PLANNING	670107	CITY DEVELOPMENT PLANNING	-
L L	670101	PLANNING PRINCIPLES AND THEORY	670111	PLANNING PRINCIPLES AND THEORY	_
	670105	HOUSING	670115	HOUSING	
	670202	Urban Heritage Conservation	670202	Urban Heritage Conservation	
		Urban Development Finance & Project		Urban Development Finance & Project	
	670203	Planning	670203	Planning	
п	670204	Legal Issues & Professional	670204	Legal Issues & Professional	
"	670205	Research Methodology	670205	Research Methodology	
	670206	Studio-I	670206	Studio-I	
ſ	670207	Studio-II	670207	Studio-II	
Γ	670201	City and Metropolitan Planning	670211	City and Metropolitan Planning	
	670303	Seminar	670303	Seminar	7
ſ	670304	Pre-Dissertation	670304	Pre-Dissertation	1
ш	670301	Elective - I (Planning for Tourism)	670311/670312	Elective - I (Planning for Tourism)	
Ī		Elective - II (Energy, Climate Change		Elective - II (Energy, Climate Change	
	670302	and Urban Development)	670313/670314	and Urban Development)	
IV	670401	Dissertation	670401	Dissertation	]

# **Department of Mathematics & Computing**

# Link of Proposed Scheme -2020-24:

https://drive.google.com/file/d/10QvPlsx\_OJIQD9iDojyp3BzULMJQKUbA/view?usp=share\_link

# Link of Impleted Scheme (2020-2024):

https://drive.google.com/file/d/1nzfYUiFKUXkCv-3i8CK3pb7oKrGv1wT/view?usp=share link

SEMESTER		2020-2024 BATCH (Proposed)		2020-2024 BATCH (Implemented )	Percentage change
	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	
	MAC-101	Basic Computer Engineering	250101	Introduction to Computing	51.61
	MAC-102	Introduction to Computer Programming	250102	Introduction to Computer Programming	1
т	MAC-103	Calculus	250103	Statistical Techniques	
1	MAC-104	Energy, Environment, Ecology & Society	250104	Element of Calculus	
	MAC-105	Technical Language & Lab	100015	Energy, Environment, Ecology & Society	
	MAC-106	Language Lab	250105	Computing Lab (SPSS)	
	MAC-201	Digital Logic Design	250201	Computer Organization and Logic Design	
	MAC-201	Differential Equations	250201	Differential Equations	+
П	MAC-202	Computer Systrm Organization	250202	Object Oriented Methodology and Programming with C++	
	MAC-204	Statistical Tool and Techniques	250204	Linear Algebra	1
	MAC-2105	Object Oriented Programming	100016	Technical Language	
	MAC-206	Computing Lab	100017	Language Lab.	
	MAC- 301	Simulation and Modeling	250301	Simulation Modeling and Analysis	
	MAC- 302	Discrete Structure	250302	Discrete Mathematical Structures	
	MAC- 303	Data Structures	250303	Operating System Concepts	
	MAC- 304	Data Communications	250304	Data Structures and Algorithms	
III	MAC- 305	Numerical Techniques	250305	Numerical Techniques	
111	MAC- 306	Computing Lab	250306	Computing Lab	
	MAC- 307	(SWAYAM/NPTEL/MOOC)#	250307	Self-learning/ Presentation#	
	MAC- 308	Summer Internship Project-I	200XXX	Novel Engaging Course	
	MAC- 309	(Institute Level) (Evaluation)	250308	Summer Internship Project–I	
			MAC	Biology for Engieering	<u> </u>
	MAC-401	Advanced Algebra and Its Application	250401	Transform and Vector Calculus	
	MAC-402	Operationg System	250402	Data Base and Management System & SQL	
	MAC-403	Algorithm Design and Analysis	250403	Theory of Computation	
IV	MAC-404	Computer Networks	250404	Design & Analysis of Algorithm	
1 V	MAC-405	Number Theory and Cryptography	250405	Number Theory and Cryptography	
	MAC-406	Cyber Security/Forensic	100004	Cyber Security	1

			200XXX	Novel Engaging Course
			10000001	Indian Constitution and Traditional Knowledge
	MAC-501	Ethics, Economics, Entrepreneurship & Managem	250501	Computer Networks
	MAC-502	Optimization Techniques	250502	Real and Complex Analysis
	MAC-503	Theory of Computation	250503	Software Engineering
	MAC-504	Database Management System	250504	Data Science using Python
	MAC-505	Real and Complex Analysis	250505	Optimization Techniques
V	MAC-506	Minor Project-I**	250506	Minor Project-I
	MAC-507	Summer Internship Project-II (Evaluation)	250507	Self-learning/Presentation <sup>#</sup> (NPTEL/SWAYAM/MOOC)
	MAC-508	Self-learning/Presentation (SWAYAM/NPTEL/MO	200xxx	Novel Engaging Course (Informal Learning)
			250508	Summer Internship Project -II
			MAC	Disaster Management
			MAC	Project Management and Financing
	MAC-601	Artificial Intelligence & Machine Learning	250601	Computer Graphics
	MAC-602	Data Mining & Analytics	250602	Compiler Design
	MAC-603	Departmental Elective-I		Departmental Elective (DE-I)
VI	MAC-604	Departmental Elective-2*	250603	Artificial Intelligence & Machine Learning (AI & ML)
	MAC-605	Open Category-I		Open Category (OC-1)
	MAC-606	Disaster Management	250604	Minor Project-II
	MAC-607	Minor Project-II*	200xxx	Novel Engaging Course
			MAC	Intellectual Property Right (IPR)
	DE	Departmental Elective-3	DE	Department Elective (DE-2)
	DE	Departmental Elective-4*	DE	Department Elective* (DE-3)
	OC	Open Category-2	OC	Open Category (OC-2)
VII	OC	Open Category-3	OC	Open Category (OC-3)
VII	DLC	Intellectual Property Rights (IPR)	DLC	Deparmental Lab
	DLC	Departmental lab Summer Internship Project-III (	DLC	Creative Problem Solving (Evaluation)
	DLC	Creative Problem Solving (Evaluation)	DLC	Summer Intership Project - III (04 weeks) (Evaluation)
			MAC	Universal Human Values & Proessional Ethics (UHVPE)
	DE	Departmental Elective-5	DE	Department Elective* (DE-4)
VIII	OC	Open Category-4*	OC	Open Category* (OC-4)
v 111	DLC	Open Category-5*	DLC	Intership/ Research Project/ Innovation & Start- up **
		Internship/Project		Professional Development
		Professonal Development\$		

			of Electrical E		1
		2019-2023 BATCH		2020-2024 BATCH	Percentag
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Change
I	100201	Engineering Physics	100011	Engineering Mathametics-I	
	100202	Society	100013	Engineering Physics	
	100203	Basic Computer Engineering	100014	Engineering Graphics	
	100204	Basic Mechanical Engineering	100015	Energy, Environment, Ecology & Society	
	100205	Basic Civil Engineering & Mechanics	100016	Technical Language	
	100206	Language Lab. & Seminars	100017	Language Lab	
			130111	Mini Project	
	100101	En aire a min a Chamistra	130211	Carelina anisa Matanial	
	100101 100102	Engineering Chemistry Engineering Mathematics-I	130211	Engineering Material	
	100102		100020	Basic Civil Engineering and Mechanics	-
п	100103	Technical English Basic Electrical & Electronics	100021	Basic Mechanical Engineering Basic Electrical and Electronics Engineering	-
-	100104	Engineering Graphics	100022	Basic Computer Engineering	-
-	100105	Manufacturing Practices	100023	Electrical Workshop	
	100100		100024		
	100001	Engineering Mathametics-II	100025	Engineering Mathametics-II	1
-	130301	Electromagnetic Field Theory	130311	Electromagnetic Field Theory	1
-	130302	Measurement and Instrumentation	130312	Electrical and Electronics Measurement	1
-	130303	Network Analysis	130312	Network Analysis	1
-	130304	Analog Electronics	130314	Analog Electronics	1
1	130305	Software Lab-1	130315	Software Lab	1
Ш		Self-learning/Presentation		Self-learning/Presentation	-
-	130306	(SWAYAM/NPTEL/MOOC)# Summer Internship Project–I (Institute	130316	(SWAYAM/NPTEL/MOOC)	
-	130309	Level) (Evaluation)	200xxx	Novel Engaging Course (Informal Learning)	_
	100002	Biology for Engineers	130317	Summer Internship Project–I (Institute Level) (Evaluation)	
			1000001	Indian Constitution and Traditional Knowledge	
	100003	Engineering Mathametics-III	100003	Engineering Mathametics-III	
ŀ	130401	Digital Electronics & MicroProcessor	130411	Digital Electronics & MicroProcessor	-
-	130402	Electrical Machines -I	130412	Electrical Machines -I	1
1	130403	Control System	130413	Power System-I	1
IV	130404	Power System-I	100009	Cyber Security	1
ľ	100004	Cyber Security	130414	Python Programming Lab	
ľ	130405	Software Lab-II	130415	Renewable Energy Lab	
ľ			200xxx	Novel Engaging Course (Informal Learning)	
			1000002	Indian Constitution and Traditional Knowledge	]
		Ethics, Economics, Enterpreneurship and			-
-	100005	Management	130511	Signals and Systems	
	130501	Signal and System	130512	Power System-II	4
	130502	Power System-II	130513	Electrical Machines -II	-
	130503	Electrical Machines -II	130514	Power Electronics	
ļ	130504	Power Electronics	130515	Data Science	
17	130505	Minor Project-I	130516	Minor Project-I	4
V	130506	Summer Internship Project-II (Evaluation)	130517	Self-learning/Presentation (SWAYAM/NPTEL/ MOOC)	
Ī	130507	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)	200XXX	Novel Engaging Course (Informal Learning)	
ľ	100006	Indian Constitution & Traditional Knowledge (Audit Course)	130518	Summer Internship Project-II (Evaluation)	1
-			1000005	Project Management & Financing	1
			1000006	Disaster Management	]
	120 (01		120 (01		-
-	130601	Switchgear and Protection	130601	Switchgear and Protection	4
ŀ	130602	Electrical Engineering Material	130602	Control System	4
		130611 Computer Aided Power System		130656 Renewable Enerry Engineering: Solar,	
	DE	Analysis	DE	Wind and Biomass Energy Systems 130657 Non-Conventional Energy Resources	
			1 175	1130037 Non-Conventional Energy Resources	1
	DE	130612 Industrial Automation 130613 Transducers and Sensors	DE	130658 Microprocessor and Interfacing	

# B.Tech. in Electrical Engineering

VI	DE	Resources 130652 DC Power Transmission Systems 130653 Fuzzy Logic and Neural Networks 130656 Renewable Energy Engineering: Solar, Wind, and Biomass Energy Systems	130605	Artificial Intelligence and Machine Learning
	OC	900103 Energy Conservation and Management 900115 Biomedical Instrumentation	130603	Minor Project-II
	100007	Disaster Management	200xxx	Novel Engaging Course (Informal Learning)
	130603	Minor Project-II	100008	Intellectual Property Rights (IPR)
		~		
	DE	130713 IoT in Microgrid 130715 Electric Vehicles 130716 Biomedical Instrumentation	DE	160714 Data Mining & Predictive Modelling 160715 Soft Computing 160716 Mobile Computing
	DE	130755 Fundamentals of Electrical	DE	130751 Introduction to Smart Grid 130755 Fundamentals of Electrical Drives
VII	OC	900205 Applications of Electrical Equipments and Motors 900230 Sensor Technology	OC	900205 Applications of Electrical Equipments and Motors 900230 Sensor Technology
	OC	900216 IoT in Microgrid 900217 Electric Vehicles	OC	900216 IoT in Microgrid 900217 Electric Vehicles
	100008	Intellectual Property Rights (IPR)	100008	Intellectual Property Rights (IPR)
	130704	Departmental Lab	160701	Departmental Lab
	130702	Summer Internship Project-III (04 weeks ) (Evaluation)	160702	Summer Internship Project-III (04 weeks ) (Evaluation)
	130703	Creative Problem Solving (Evaluation)	160703	Creative Problem Solving (Evaluation)
		130851 Introduction to Internet of		
	DE	Things 130855 Power System Dynamics Control and Monitoring 130556 Microprocessors and Interfacing 130857 Industrial automation and	DE	130851 Introduction to Internet of Things 130855 Power System Dynamics Control and Monitoring 130556 Microprocessors and Interfacing 130857 Industrial automation and Control
		G000603 Renewable Enerry Engineering: Solar, Wind and Biomass Energy Systems 900608 Non-Conventional Energy	OC	900607 Renewable Enerry Engineering: Solar, Wind and Biomass Energy Systems 900608 Non-Conventional Energy Resources
VIII	OC	Resources 900633 Smart Grid: Basics to Advanced Technologies 900605 Waste to Energy Conversion	00	900633 Smart Grid: Basics to Advanced Technologies 900605 Waste to Energy Conversion
VIII	OC 130801	900633 Smart Grid: Basics to Advanced Technologies	160801	Technologies

### MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALJO (4-Gev), Alifed L/GE' Avring ment balland XAAC is colled feature Alliand in RAP 1 . Propi 189 Electrical Engineering Department

## Power System-11: 130502 (Old)

# **Course Objectives:**

- · To expose the students to the concepts of Load How Studies. Symmetrical and Herpmeters Fade, Yower System Subjety, Dram System Coated, Underground Cables and HVU TERMINE AVION NUMBER
- To enable the students to solve problems related to Load Flow Studies, Facili and you, Pare Statem Stability, Power Statem Control and Underground Califer

Unit 1. System Representation and Load Flow Analysis: Single line representation, Per unit ryte Network Model formulation, Formulation of YIM/S, Formulan of state load floor reactions, solid of load flow publics by disess Scolel, Newton Riphson (polar and sectangular) and last decorp last for methods.

Unit II. Symmetrical and announcertical liash: Review of symmetrical components, stope retworks, symmetrical fault analysis, masymmetrical fault analysis, analysis of spin comfactor fa full calculators for vocatizatian and unstrumential fasts.

Unit III. Power System Stability: Basic concepts of steady state, dynamic and transient stabi power angle equation, synchronizing power coefficient, equal area esturion, critical clearing of Swing equation, conceptual idea of emili-machine transient stability studies with classical mad representation, factor affecting stability and methods of its improvement.

Unit IV Power System Control: Elementary idea of land-frequency control, machine power voltage control. Series and sharet compensation techniques, tap changing transformers, photo that transformers. Induction regulator, Economic limit of VAR control.

### Unit V.

Underground Cables and HVDC Transmission: Types of cables, baselation resistance of a Electrostatic stress and grading of cohies, rating and power factor of cohies, Brief lastery of transmission, companian of HVDC with EHV AC transmission systems. Basic convertor circuit in HVDC system, types of HVDC links.

# Recommended Books:

- Advanced Parser System Analysis and Dynamics, LP. Singh, Wiley Easters Ltd. 6-ed. 2017.
- Mudem Power System Analysis, Nagrathik Kathan, TMII Publishers, 4 ed. 2016.
- Elements of Power System Analysis, W.D. Stevenan, McGraw-Hall, 4 ed. 2017.
- Power system operation and control, A.J. Wood & Woolfminner, 3- ed. 2018.
- 1. HVDC Power Transmission Systems: Technology and System Interactions, X. R. Podyot, No. Inexatoral, 3-pl 2017.

## Course Outcames

After the scorpletion of this course, students will be able to:

- CO.1. Employ the superson and per and system
- O(1 (p)) (from had for interpret works lead for police
- (11). Partice that calculation for quantum and unconnected halfs
- 094. Topica the theoretical and precised appents of Priori System Stability and as enhancement
- OVE. Busides for secondly prototion control reader power, solvage control, solve and
- (orgenation
- COA. House he induces relatest spectrum of some type of sides and he was of THE OWNER.



## REVISED SYLLABUS

# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Gent. Add (1927) Announced Betteriell, Viller, Arrendiad Southern Addition to B.G.R.F., Blogal Mar-**Destrical Engineering Department** 

# Power System-II: 130502 (Revised)

# Course Objection:

- . To repose the indexts to the concepts of Load film Studio Separatical and Distances in all substances of the Solidity Power System Control, Underground California and HVDC Transmission System
- To enable the students to solve problems related to Load Flow Tudies. Fault and you, Power System Stateliev, Power System Control and Underground Califor-

### Unit

System Representation and Load Flow Analysis: Single low representation; Per out system, Network Made formulation, Formulation of URCS, Formation of data: load flow equations, winters of lead flew problem by Gauss Sedd, Newton Raphon (polar and rectangular) and Int decoupled load flow eachods

## Unit II.

Strumetrical and componentrical fault: Review of symmetrical components, organice, tetrevelor, connectingal fault analysis, unsynemetrical fault analysis, analysis of open conductor Init, full calculators for competitical and ensymmetrical facility

### Dei III.

Power System Stability: Basic concepts of neady state, dynamic and transient stability, power angle equation, surchronizing power caefficient, equal area enterion, entical clearing angle. Swing equation, so to get a mathematicse transient stability mades with classical machine representation, factor officency stability and methods of its improvement.

### Linit IV

Priver System Control: Elementary idea of load-frequency control. ments marrier power and voltage control. Series and short compensation techniques, tap charging transforment, place during transforment, balantion regulator, Economic limit of VAM 1021

### 1881

Laderground Cables and HVDC Transmission: Types of cables, lesilator resonance of unity. Electronates: must and grading of tables, rating and power factor of cables. Brief history 10" mentioned, comparison of BVDC web-HBVAC transmission systems, this is consume land out with UC spins, type, of HDDC balo,

## Recommended Books;

- 1. Alternativers System And printed Dynamics, J. P. Sagh, Wiley Execution of Fil
- Stoley, Provident Malleri, Signik & Kohan, 1981 Publisher, 471 J. 2018.
- 1. Linear of ProceSystem Studyer, WD. Streenen, McGau, HH, 4912, 367
- 4. Prant to the quantum informed, 5.1 World & Wolfenberg, 24 fail 2011
- 5, 1992, Poet Innamou Sphere Todovley, and Navo Innamou A. B. rolps ha be benetad 1º12,007



MADEAU INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR Mart Matter American Indiad Mad. In order India (1977), Begalith Electrical Engineering Department

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## ELECTRICAL MACHINES II: 13690-1066

Course (b)grades: To deving how one established it much loss, their contents and databased weberg procedure relaterated and the processing applications and operational trans of these given transformer and observations procedure.

UNITA Transformer: They your startlownst, Speed control for forture, South place Tourformer Prinnered to 3 place bank. These degrees of starters, Nacioba, Erikaldek, Brillware, concerted b place transformers and their new Place commune. They to use place ups of the or 3 comments. Paulity openational angle place and Place Tourformer, Isolidaring humanics in reactioners, Magnetonian communes and their place Tourformer, Isolidaring humanics in reactioners, Magnetonian communes and Place and Place Starters.

UNT-H Induction Mater III. Cache desputs and its experimental determinion suggrag and Usavirug Lorent Efference and Torcing DM. Budde ange induction ancient: Operation on advaluanted subtrapy. Speed control. Rote: westware control publichoughg method. Programs you and Induction primities.

UNIT-IE Sendermone Machine & Contractural Interest, solicet pile oni cylindrall spactness makines. Echnischerszenopol, Proposy and no. of piles, escheriot, Volage genolism, Scienciar rock, Interactive lymere escherices that and annature IME, Volage registrion, phone diagnation bad. Laskage reactance and syndromous machines, Stealy rate properties of synchronous machines, oper creates, Short romat and serv power lacter rate, Description of wildinge registrion by synchronous impedance rockol. MME method and Protectionage netbod.

UNT-W Synchronous Machine III. Two reaction theory, Sig test, Expression for power deviced and, privat tests curves, Synchronization: of alumnitiss Delt and builts lang mobiol, Synchron your Panille' represent and land sering. Effect of processor domination on land-during spectration on white how has

EVER-3 Synchronous Machine EE Monoing mock transition from motionized spectrating mode. V carrier starting, Synchronous condenser, Burling damper winding synchronizing trapie and power analysis under molder durat carcuit, Transient parenties of synchronous machine, Vaccois monient and solt transient reactures. Trans constant, Expression of transient and solt transient machine, Machine Institute sections and determination of monient parenties from and/open 300 storated ratio.

## Recommended Books:

- 1. Theory of Alternating ranset Machinery in Alexander S Langebori.
- 2. The performance and design of AC machines by M.G. Say, CBS Publication.
- 1. Entrie incluse by Negraficial Electric TMFL
- 1. Generalizat theory of decision mediate by P.S. Binklins, Khanna publication
- 1. Herrial machine by P.S. Bielder, Chemi publication
- 8 The Parliaments and Design of AC Commutator Machines by Dipersitive Taylor, CBS Publication



# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALJOR 13 Gent, Mild TGC Assessment Instituted XXXC Assessment Instituted in ECETY, Broad MY

Electrical Engineering Department

1.1.1

# ELECTRICAL MACHINES-II: 131503 (Revised)

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Course Objective: To develop losic concepts silved 10 machines, then constructional details and sorking principles and to understand the practical applications and operational issues of these plane transference and other rotating machines.

UNIT-1 Transformer: Theo piece transformers, Special construction listners, Nargle place Transformers connected as 3 place bank, Placer disputs of startiste, Narsidelia, Debaldaha, Debalitat, connected 3 place transformers and theo uses. Place conversion, Throtte biophane specialization V connection, Pacofiel operation of single phase and there place Transformers, load shoring, humanian in transformer, Magnetization current Narre form, Techany visiding.

EMIT-II Induction Motor II: Usele dispate and its experimental determination, orgging and Franking Lesses, Efficiency and Testing DA, Doolfe cage induction motor, Operation on subalanced wohenes, Speed control, Rotor resistance control, pole changing includ, Franceice control, Induction generator, Detectionin-Stephy on the distance motor.

UNIT-III Spectrosomi Machine 1: Constructional features, Saferti pole and cylindrical spectromous machines, Relature between speed, Frequency and no. of poles, eschariane, Voltage generation, Generator mode, interaction between excitation flux and aerusture EME, Voltage regulation, phasor diagram on load. Leakage machines and synchronous seactance, Steady state parameters of synchronous machines, open circuits, door circuit and zero power factor tests, Determination of voltage segulation by synchronous impedance method. MMF method and Patier trangle method.

UNIT-IV Synchronous Mitchine II: Two reaction theory, Silp test, Expression for power developed and power angle curves. Synchronization of alternators Dark and bright lamp method, Synchro scope Parallel operation and load string, Effect of governor characteristics on load sharing, Operation on infinite but but.

UNIT-V Synchronous Machine III: Motoring mode, transition from motoring to generating mode, V correct starting, Synchronous condenser, Heating, damper winding synchronizing torque and power analysis under suckler short circuit, Transient parameters of synchronous machines, Variana transient and sub-transient resistance, Time constant, Expression of transient and sub-transient reactance Analysis of 3 phase short circuit uncillogram and determination of transient parameters from sucklegars, Short circuit ratio.

# Recommended Baoks:

- 1. Theory of Alternating current Machinery by Aleseader S Langesdorf.
- 2 The performance and design of AC machines by M.G. Say, CBS Publication.
- 3. Electric nucline by Nagach and Khotan, TMH.
- 4 Generalized theory of electrical nucleus by P.S. Benkhar, Khoma publication
- 5. Electrical mathines by P.S. Houkhen, Khanna publication
- 6. The Performance and Design of AC Commutator Machines by Opensiane Taylor, CFS Publication

# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALJOR

O Get, Adult ( GC Astronomic Bellined NAM: According Institute Affiliant's RGPN, Reported Electrical Engineering Department

# Pawer Electronics: 136544 (Old)

Course Objective: To introduce the molecule the funct theory of power containables of ensure and passive components, their practical application in power electronics and to familiarize the operation Winciple of AC-DC, DC-DC, DC-AC conversion encourts and here applications, also to provide the basis for fasther study of power electronics concuts and systems.

Link I, Power Semiconductor Berlow: Powerdodes, Transitions, Power MUGIEL Will, Digener TRIAC and GTD. Diprimer static and dynamic characteristics. Pow transition operation evolet, tem on and stars off. Theriner performance parameters, Diprimertypes Balange and protection, Energy Calculus, Design of stability calculations and protection.

Tait B. Controlled Roctifiers: Line commutated converter. Procepte of Ac phase speniol, Single and term phase Ac voltage controllers. Principle of phase-controlled converter spencion. Single phase half nerve, full wore indicensi converters, Three phase half wave, full wave and some converters and inverters, Power factors improvement, Symmetrical angle control, Pulse width multi-balon control, Effect of Indi and spence indicators.

Unit III. Cycla-Converter: practical syste-converter circuits, Single phase to single phase, three phase to single phase. three phase to three phase sat put vallage control circuit, Cyclo-converter dry-te, simulating and anto-circulating type deal converters.

Unit IV. Inverter divasitie Principle of operation of voltage source inverter, Single phase and drate phase inverters, Voltage control using PWM technique, Forced communicability issue, Current source, inverters, Series inverter, Inverter applications.

Unit V. Chapper: Thytakos commutation schemes, Principles of single quadrant, Two quadrant, fixer quadrant chapper. Central strategies, Palae width modulation, Fraquersey modulation, Valrage commutated Chapper, switched mode power supplies, back becamepulatess.

# Recommended Books:

- 1. Nows Electronics by P.C. Sea, McGrawHill, 1\* EL, 2011
- 2. Nover Electronics by P.S. Binthim, Khanas Nublishen, 5<sup>th</sup> Ed., 2012.
- 1. Newsy Electronics: Circuits, Ilevien & Applications by MH Robid, Penner, 97 Ed., 2012
- 4. Nover Electronics by Cyril W. Lander, McGraw-Hill; 2nd Ed. 1887
- 5. Yourr Electronics Principles and Applications by Judicph Vidyathil, ThIH (1910).



# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR 16 Get AldeUTE Amount Infinite NAC Available in Alline in R.S.P.Y. Bayed NY Electrical Engineering Department

# Power Electronics: 130504 (Revised)

WHE Objective: To introduce the students the basic theory of power sumconductor ices and positive components, their practical application in power electronics and its illustice file operation principle of AC-DC, DC-DC, DC-AC conservion circuits and their fications. Also to provide the basis for further study of power electronics incluits and term.

a) L. Power Semiconductor Devices: Classification of Power decramic solution, Power dec. Transition, Power MERSET, KIBT, Thyrator TREAC and GTO, Thyrator static and write characteristics, two transition equivalent resold. Turn on and hart of Federal structure positions. Training for statistic classific for an above classification.

it IL Controlled Boettliers: Principle of plaze-controlled converter operation, Single are half wave, full wave and serie converters. These phase half wave, full wave and serie warters and coverage, Payser factor improvement, Symmetrical angle control. Pulse width elulation control, Effect of lead and scatter inductors.

iii III. Chopper: Principles of single quotient, Five quotient, four quotient chepper, atral strategies, Palse width modulation, Frequency modulation, Thyrintor commutation senses, evoluted mode power supplies, back-losser regulators.

iii IV. AC voltage southelier: Principle of Ac plane control. Single and force plane Ac large controllers, practical cyclo-convertor circuits, Single phase to single phase, three plane to firste plane to firste plane to three plane not put voltage control circuit. Cyclo-researc, Carcularing and Non Circularing type. Dual convertors.

alt V, Barretter circultur Principle of operation of voltage source investor, Single phase and tee phase investors, Voltage access of sing PVVI technique, Forced commutated fryeinters, invest source investors, Series investor, Investor applications.

# commended Books

Paper Electronics by P.S. Berdden, Khama Publishen, 5<sup>4</sup> Ed. 2021 Paper Electronics Ciscain, Devices & Applications by MH Rashid, Pearson, 5<sup>th</sup> Ed. 2022

Passer Electronics by Cycl W Lander, Micharw Hill, 2<sup>nd</sup> Ed. 1987 Passer Electronics Principles and Applications by Josheph Welynhil, TME 2018 Boot, B.K., Handhook of Power Electronics, IEEE Publications.

# NUTRE ORIGINAL

for complexing this course, the student will be able to

- 0.1. Name power doctroness devices and replate their static' dynamic characteristics.
- Ability is analyze for configuration of AE to DC conserver, Dual conserver, chapter, colliconserver.
- (1). Clearly converters and identify their applications.
- 04. De che diffesti noti ol differe constant scaladar fui priemosci paratar
- 0.5. Month to pickets handward provident in driver, common and organizations



		Department of Ele Internet	of Thing	0 0	
	2020	-2024 BATCH (Tentative Scheme)		2020-2024 BATCH	Percentag
SEMESTER	COURSE		COURSE	COURSE NAME	Change
	CODE	COURSE NAME	CODE	COURSE NAME	Change
	220101	Basic of Internet of Things (IoT)	220101	Basic of Internet of Things (IoT)	25.42
	230102	Introduction to Computer Programming		Introduction to Computer Programming	+
Ι	100022	Basic Electrical & Electronics Engineering	100022	Basic Electrical & Electronics Engineering	+
	250100	Linear Algebra and Matrix Analysis	250100	Linear Algebra	+
	100015	Energy, Environment, Ecology & Societ	100015	Energy, Environment, Ecology & Society	
	220201		220201		
II	220201	Digital Electronics and Logic Design	220201	Digital Electronics and Logic Design	+
	220202	Sensor Technology	220202	Sensor Technology	
	230202	Data Structures	230202	Data Structures	
	230203	Object Oriented Programming and Method		Object Oriented Programming and Methodology	+
	100016	Technical Language	100016	Technical Language	+
	100017	Language Lab	100017	Language Lab	
	250106	Drohahility theory and Dandom process	250106	Duch chility theory and Dandom process	
III	250106	Probability theory and Random process	250106 220301	Probability theory and Random process Fundamentals of Signals and Control Systems	ł
	220301 220302	Fundamentals of Signals and Control Syster	220301	Design & Analysis of Algorithms	ł
		Design & Analysis of Algorithms			ł
	220303	Operating system	220303	Operating system	
	220304	Software Engineering	220304	Analog Electronics	
	220305	Arduino Programming and Simulation	220305	Programming and Simulation Lab	
	220306	Self-learning/ Presentation (SWAYAM/NP		Self-learning/ Presentation (SWAYAM/NPTEL/N	
	200xxx	Novel Engaging Courses	200xxx	Novel Engaging Courses	l.
	220307	Summer Internship Project-I (Institute Leve	220307	Summer Internship Project-I (Institute Level) (Ev	
	220404		220404		
IV	220401	Database Management System	220401	Database Management System	+
	220402	Computer Networks & Protocols	220402	Computer Networks & Protocols	-
	220403	Robotics and Mechatronics	220403	Power Electronics	
	220404	Microprocessor & Embedded Systems	220404	Microprocessor & Embedded Systems	+
	220405	Network and Web Security	220405	Network and Web Security	-
	220406	Software Lab	220406	Programming with Python	
	200xxx	Novel Engaging Course	200xxx	Novel Engaging Course	
V	220501	IoT in Microgrid	220501	IoT in Microgrid	-
	220502	Theory of Computation	220502	Cloud computing	ļ
	220503	Energy Conversion Systems	220503	Embedded Control of Electrical Machines	ļ
	220504	Special Machines	220504	IoT Architecture & Protocol	ļ
	220505	IoT in Smart Grid	220505	Data Science in IOT	ļ
	220506	Minor Project-I	220506	Minor Project-I	
	220507	Self-learning/ Presentation (SWAYAM/NP		Self-learning/ Presentation (SWAYAM/NPTEL/N	1
	200xxx	Novel Engaging Course	200xxx	Novel Engaging Course	ļ
	220508	Summer Internship Project-II (Evaluation)	220508	Summer Internship Project-II (Evaluation) (DLC-	Į
	1000006	Disaster Management	1000005	Project Management & Financing	ļ
			1000006	Disaster Management	
VI	220601	Industrial Automation and IoT	220601	Soft Computing	ļ
	220602	Wireless Sensor Networks	220602	Software Engineering	
	DE	DE-1(a):Data Analytics using Python DE-1	DE	220651 Introduction to Industry 4.0 and	
	DE	DE-1(a). Data Anarytics using Fytholi DE-1	DE	Industrial Internet of Things	
				220652 Data Mining	
				220652 Data Mining 220653 Foundation of Cloud IoT Edge ML	
				220654 Industrial Automation and Control	
				22000 r industrial rationation and control	l

	OC	910104 Energy Conservation and Managen	OC	910104 Energy Conservation and Management 910105 Biomedical Instrumentation 910106 Industrial Automation 910107 Solar PV Systems: Design and
	220603	Artificial Intelligence	220603	AI and ML
	220604	Minor Project -II	220604	Minor Project-II
	200xxx	Novel Engaging Course	200xxx	Novel Engaging Course
	100008	Intellectual Property Rights (IPR)	100008	Intellectual Property Rights (IPR)
VII	DE	220711 Ethical Hacking220712 Object Ori	DE	220711 Ethical Hacking220712 Object Oriented :
	DE	220751 Embedded Systems Design220752	DE	220751 Embedded Systems Design220752 Desig
	OC	910108 Applications of Electrical Equipments and Motors 910109 Sensor Technology	OC	910108 Applications of Electrical Equipments and Motors 910109 Sensor Technology
	OC	910110 IoT in Microgrid 910111 Electric Vehicles	OC	910110 IoT in Microgrid 910111 Electric Vehicles
	220701	IoT is Smart Grid Lab	220701	Industrial Internet of Things Lab
	220702	Summer Internship Project-III (04 weeks )	220702	Summer Internship Project-III (04 weeks )
	220703	Creative Problem Solving (Evaluation)	220703	Creative Problem Solving (Evaluation)
VIII	DE	220851 Deep Learning220852 Big Data An	DE	220851 Deep Learning220852 Big Data Analytics
	OC	900607 Renewable Enerry Engineering:	OC	900607 Renewable Enerry Engineering: Solar,
	220801	Internship/Project	220801	Internship/Project
	220802	Professional Development	220202	Professional Development
				Total Change

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		Department of Electri M.E Industrial Syste	0	8	
	20	19-2021 BATCH (Old Scheme)		-2022 BATCH (New Scheme)	
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Percentage Change
	580101	Computational Techniques	580111	Computational Techniques	68.42
	580102	Static Power Converters	580112	Power Electronics Converters	
	580103	Advanced Microprocessors and	580113	Intelligent Control Techniques	
I	580104	Advanced Control System	Elective-I	580114 Power Quality and FACTS Controllers 580115 Smart grid Technology	
	Elective-I	580105 Power Quality and FACTS Controllers	OC-I	800100 Industrial Instrumentation	
	580106	Systems & Drives Lab-I	580118	Systems & Drives Lab -I	
	580107	Computer Simulation Lab-I	580119	Self Learning / Presentation (run through SWAYAM )	
	580201	Advanced Power Electronics	580211	Semiconductor Controlled Drives	
	580202	Computer Aided Protection	580212	Electrical Machines Modeling and	
	580203	Modeling Simulation and Evolutionary Techniques	580213	Microcontroller and Its Applications to Power Converters	
Π	580204	Electrical Machine Modeling and Drives	Elective -II 5802014	580214 Industrial Automation and Control	
	Elective-II	580205 Restructured Power System 580206 Digital Signal Processing	OC-II	800200 Optimal Control	
	580207	Systems & Drives Lab II	580216	Systems & Drives Lab II	
	580208	Computer Simulation Lab-II	580217	Self Learning / Presentation	
	580301	Semiconductor Controlled Drives	580311	Dissertation Part-I (Literature	]
Ш	Elective-III	580302 Industrial Instrumentation 580303 Fuzzy Control 580304 Power System Instrumentation and Control 580305 Power System Analysis and Control	MOOCS	580312 Advances in UHV Transmission and Distribution 580312 Introduction to Internet of things	
	580306	Industrial Training			
	580307	Prelim Dissertation			]
					1
IV	580401	Dissertation Evaluation and Defense	580411	Dissertation Part-II	]
				Total Change	-

		2020-2022 BATCH		2021-2023 BATCH	Domoontogo
SEMESTER	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Percentage Change
	700111	Management Functions and Behaviour	700101	Managerial Functions and Practices	35.12
	700112	Teamwork, Leadership and Corporate Finance	700102	Accounting for Managers	
	700113	Business, Government, Society and International Economy	700103	Operations Management	
	700114	Managerial Communication	700104	Managerial Economics	
	700115	Microeconomics	700105	Organizational Behaviour	
	700116	Marketing Management	700106	Transforming Business Through Technology	
Ι	700117	Managing People and Performance in Organizations	700107	Syndicate Personality Development Program (SPDP)	
	700118	Financial & Management Accounting and Control	700114	Managerial Communication	
	700219	Self-learning/Presentation (through SWAYAM/NPTEL/MOOC or Interdisciplinary course from other institutions and platforms	700116	Marketing Management	
			MC0101	Corporate Governance & Ethics (MAC)	
	700211	Organizational Behavior	700201	Managing People and Performance in Organizations	
	700212	Operations Management	700202	Statistics for Managers	
	700213	Financial Management	700203	Business Research Methods	
	700214	Research Methodology & Statistics	700204	International Business Perspectives	
II	700215	Entrepreneurship & Innovation	700213	Financial Management	
	700216	Legal Aspects of Business	700215	Entrepreneurship & Innovation	
	700217	International Business Management	700216	Legal Aspects of Business	
	700218	Business, Environment and Sustainability	700218	Business, Environment and Sustainability	

# Masters of Business Administration

	MC0201	Self-learning/Presentation	MC0201	Digital Business (MAC)
	700311	Strategic Management	700301	Strategic Management
	700318	Summer Internship/Minor Project	700302	Summer Internship/Minor Project
	MC0201	Data Analytics in Business (MAC)	MC0201	Data Analytics in Business (MAC)
	MB0111	Strategic HRM	MB0111	Strategic HRM
	MB0112	Talent and Competency Management	MB0112	Talent and Competency Management
	MB0113	Industrial Relations & Labour Laws	MB0113	Industrial Relations & Labour Laws
	MB0114	e-HRM	MB0114	e-HRM
	MB0221	Consumer Behavior	MB0221	Consumer Behavior
	MB0222	Service Marketing	MB0222	Service Marketing
III	MB0223	Sales & Distribution Management	MB0223	Sales & Distribution Management
	MB0224	Advertising & Promotion Management	MB0224	Advertising & Promotion Management
	MB0331	Total Quality Management	MB0331	Total Quality Management
	MB0332	Project Management	MB0332	Project Management
	MB0333	Production Planning and Control	MB0334	Services Operation Management
	MB0334	Services Operation Management	MB0335	Analytics for Supply Chain Management
	MB0441	Investment & Portfolio Management	MB0441	Investment & Portfolio Management
	MB0442	Financial Services	MB0442	Financial Services
	MB0443	Working Capital Management	MB0443	Working Capital Management
	MB0444	Corporate Tax Planning & Management	MB0444	Corporate Tax Planning & Management
	700401	Internship/Major Project	700401	Internship/Major Project
	MB0115	Managing Change in Organization	MB0115	Managing Change in Organization
	MB0116	Leadership & Team Effectiveness	MB0116	Leadership & Team Effectiveness
	MB0117	Training & Development	MB0119	Talent Acquisition & Management
	MB0118	International Human Resource Management	MB0120	Organizational Theory/ Structure & Desig
	MB0225	Product & Brand Management	MB0229	Integrated Marketing Communication
	MB0226	Global Marketing Management	MB0226	Global Marketing Management
	MB0227	Retail Management	MB0227	Retail Management
11.7	MB0228	Digital Marketing	MB0230	Marketing Analytics
IV	MB0335	Analytics for Supply Chain Management	MB0339	Six Sigma

MB0336	Management of Inventory System	MB0336	Management of Inventory System
MB0337	Operations Strategy	MB0340	Quality Design & Control
MB0338	Productivity Management	MB0341	Introduction to Operations Research
MB0445	Financial Institutions & Markets	MB0445	Financial Institutions & Markets
MB0446	Financial Statement Analysis & Reporting	MB0446	Financial Statement Analysis & Reporting
MB0447	Cost Accounting	MB0449	Management of Commercial Banking
MB0448	Corporate Finance	MB0450	Financial Derivatives & Risk Management

# Old Syllabus

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#### UNIT A

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# New Syllabus

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10.0284	Managing Propie and Preformance in Organizations	44	20	20	1	+1:	10.9	.8	4	ľ	8

### Course Objectives:

The objective of the control is to teach the basic principles of hornan resource introgement - how of vigatization magness rewards, indicates, toos, and generally manages its possile ulterrively. In addition to providing a basis legal and conceptual framework for managers, the course will introduce The manager to practices and techniques for evolutions performance, veseturing seams, considing and encoding people, and parliaming the wide range of other people related duties of a manager in triday's moreasingly armples workplace."

#### Unit 1

lititudation to HICM: Definition, nature, features, ebaracturistics, functions, objectives & slope of 1100M, Landonna of HRM, Role & skills of H8 Mosager, Ingranmental HRM; Important Trands in HH Management.

### Con H

HR Planning, Recruitment and Selection HR Planning, Job Analysis-Job deteription and Jubspecification, Job Devign, Recruitment & Selection process, Sources of Recruitment, Importance of control relation. Types of Texes for relation, Interview- Methods of Selection, Placement & Induction.

#### Unit III

Performance Management System: Inorditation, Identification of issues in performance appraisal. User of Performance Approisal, Techniques of Parlsmance Approach, Performance Management, Talent Munagement, Training and Development: Objectives, Concept and Nature, Training matheds. Management development program

#### Unit W.

Wage and Salary Administration Job Evaluation: meaning and methods, Money & motivation, individual & group incentives, Employee benefits; leaves, insurance, automore, theathe hearing, Payfor parliamance

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#### UNIX.

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#### Unit's

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### Unit V

Employee estimations. Employee experiment, Career planning & management, Supervision Planning, promotions, Transfer, Separation, VRS, International HR54, Introduction of Industrial Relations & Management, Trade Unions, Group HRM, HR Audit.

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### Course Objectives)

It has objective to introduce key concepts of communication theory, improving workal and non-verteal communication and to develop content's skills in applying these concepts to realistic situations in a different workplace environment.

### Unit 1

Concepts of Communications: Definition, Objectives of Communication, Characteristics of Communication, Process of Communication, Porne of communication, Itoles of a Mongest, Communication, Readblacks and Overcoming them, Divercenting Communication Borriers, Effectiveness in Managerial Communication

#### Unit II.

Role of Vestel & Nor-vestal Symbols in communication: Forms of Nonverbal Communication, Incorporing Non-vestal neurogen, Tips for effective use of non-verbal Communication, Listening Definition, Anatomy of poor Linearing, Festures of a good Listense, Types of Linearing Wills, somegies, Banleys to effective Listening.

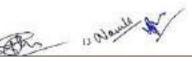
#### Unit III

Oral Presentation, Planning procentation, delivering presentation, Developing & displaying visual side, Handling cuestions from the audience, Telephone, Telephone, Teleconferencing, Challenges and elipsette, Principles of successful end communication, Ramiere to communication, Conversation control – Raflection and Empathy: two sides of effective oral communication.

#### Unit IV

Group Discussion & Interviews: Role Functions in Group Discussions, From of Group, Elementeristics of Effective Groups, Group Decision Making, Group Conflict, Pandomental principles of Interviewing, Types of Interviewing Questions, Types of Interviewi, Style of Interviewing Mock Interview, Dressing and Geneming, Normal of Hartness Dressing.

Meetings: Ways and Meane of enrolating meeting effectively, pluming a Maning, Meeting Process, How to Leed Effective Meeting, Evaluating Meeting, Writing Agenda and Minutes of meetings, Web Conferencing.



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#### Unit V

Business Communication, Basic Principles, Tips for effective writing, The Seven Cs of Letter writing, Planning steps for effective writing, Writing Business Reports (Short & Long), Kinds of Business Letters, inquiries, unders & replying to them, sales letters, Job application Letters, Writing Effective Memory, Format and Principles of writing Memory Identifying potential career opportunities, Preparing Resources, Composing Application Messages

Writing F-mail, Business Reports, Business Proposats: Effective E-mail, E-mail Etiqueites, Writing Business Reports and Proposals, Purpose of Business Reports, Parts of Report, Format of Business Proposals, Practice for Writing Business Reports.

Course Outcomes focused on employability/ennepreneurship/skill development:

COs	After successful completion of this course, students would be able to:	Mapping
COL	Define the concept, process and barriers of corporate communication	Employability
CO2	Describe verbal communication with its implications	Entrepreneurship
CO3	Apply the concept of Non-Verbal Communication	Skill Development
CO4	Analyse the concept of incorpersonal communication	Skill Development
cos	Evoluate cross-cultural communication and its implication while interacting with foreign clients.	Employability
CO6	Create the concept of Media management and Business negotiation	Entrepreneurship

Suggested Text and Reference Books:

- 1. Essentials of Business Communication, Mary Ellen Guffey, South-Westorn Educational
- 2. Business Communication AshaKaul Prentice Hall of India
- 3. M.K. Schgal& V. Khetrapal Business Communication (Excel Books).
- 4. Rajendra Pal Business Communication (Sultanchand& Sons Publication)
- 5. P.D., Chaturvedi Business Communication (Pearson Education, 1st Edition 2006).
- 6. Communication for Business (Pearson Education, 4th Edition)

Lab/Practical Work	700117: Managerial Communication
and a second second second second second second second second second second second second second second second	toorres internet to the communication

- Tentative activities\* of Lab/Practical Work in Managerial Communication: 1. Email writing, writing Business letters, preparing reports andminutes of the meeting
- 2. CV and Cover letter writing,
- 3. Facing Interviews 4. Presentation Skills
- 5. Effective oral communication/ Public speaking skills
- 6. Role Play
- 7. Personal branding, story telling

\*These activities are tentative and can be modified as per the industrial requirements in the same domain.

Hank



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Subject Unit	Subject Name	Maximum Marks Atlosted					Total Marks	-11	Seete Vars j Vicek	per	Total Credits
		Theory			Project/Internship/ Presentation/Self Learning			L	Т	P	
		End Sen	Mid Sem	Quior Assignment	Internal	Esternal	1				
700116	Marketing Management	40	20	20	1	-	106	3	1.4		3

### Course Objectives:

Marketing management course enables a student to understand the fundamentals of marketing concept and the rule marketing plays in business. This occarse crubles a student to understand the 'Marketing

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Course personners offer completion of this assists chosen is it to affer to 001: Lewis further to caring to of marketing management. COC Clearing the database settion and handbars of charmed mumbers. case analy the promotion terms to perurate and increase demond. COS: Analyze the content of service marketing and its wire.

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mix' elements and the strategies and principles underlying the modern marketing practices. Students should be able to demonstrate their comprehension of marketing concepts and knowledge by applying those in their written exams, case studies discussions, presentations and projects.

## Unit 1

Understanding Marketing Management: Introduction to Marketing: Nature and Scope of Marketing, Morketing Concepts, Marketing Philosophies, Customer Value, Holistic Marketing, Emerging Trends in Marketing. The marketing process: Introduction, Marketing Mix-The Traditional 4Ps, The Modern Components of the Mix- The Additional 3Ps, Developing on Effective Marketing Mix. Morketing Planning, Marketing Implementation and Control

### Unit II

Segmentation, Targeting and Positioning: Introduction, Concept of Market Segmentation, Benefits of Market Segmentation, Requisites of Effective Market Segmentation, The Process of Market Segmentation, Bases for Segmenting Consumer Markets, Targeting (T), Market Positioning (P). Product Management: Decisions, Development and Lifecycle Strategies: Introduction, Levels of Products, Classification of Products, Product Hierarchy, Product Line Strategies, Product Mix Strategies, Packaging and Labelling, New Product Development, Product Life Cycle (PLC)

## Unit III

Product Management-Brand and Branding Strategy: Introduction, Brand and Brandine, Advantages and disodvantages of branding. Brand Equity, Brand Positioning, Brand Name Selection, Brand Sponsorship, Brand Pricing: Introduction, Factors Affecting Price Decisions, Cost Based Pricing, Value Based and Competition Based Pricing, Product Mix Pricing Strategies, Adjusting the Price of the Product, Initiating and Responding to the Price Changes,

#### Unit IV

Promotion Management-Managing Non-Personal Communication Chancels: Introduction, Integrated Marketing Communications (IMC), Communication Development Process, Budget Allocation

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MADRAY INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (A Gave Aided UGC Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V., Bhopal, MP)

Decisions in Marketing Communications, Introduction to Advertising Fundamentals of Suley Promotion, Basics of Public Relations and Publicity

### Unit V

Personal Communication Channels Introduction, Personal Selling, Sales Management Basics, Hg Practices in Sales Management, Evaluation of Training, Personal Selling Process, Direct Marketing, Channels of distribution - concept and importance; Role of Channel intermediaries and their functions;

Course Outcomes focused on employability/entrepreneurship/skill development:

COs	After successful completion of this course, students would be able to:	Mapping
:01	Learn fundamental concepts of marketing management for customer satisfaction.	Employability
02	Classify the distribution system and functions of channel members,	Entrepreneurship
03	Apply the promotion tools to generate and increase demand.	Skill Development
04	Analyze the concept of service marketing and its mix	Skill Development
	Evaluate various elements of marketing mix as well as their influence on functioning of an organization	Employability
206	Select various evolving marketing concepts for the better solutions.	Entrepreneurship

Suggested Text and Reference Books:

Kotler Phillip - Marketing Management, Analysis, Planning, Implementations and Control (Penrons Education 14th Table)

- Station William J- Fundamentals of Marketing (MC Graw Hill)
   Kotler, Philip and ArmstrongGraw Principles of Marketing (Pearson Education, 11th Edition)
   Kotler, Philip Keller, Kevind Lane, KoshyAhmham and JhaMithileshwar Marketing Management: A South Asian Perspective (Pearson Education (2<sup>th</sup>Edition))
   McCarthy and Perreault Basic Marketing: A Global Marketing Approach (Tata McGraw Hill 1985) Hill, (5<sup>th</sup>) 6. Kurtz and Boone - Principles of Marketing (Thomson India Edition, 2007)

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