

SCIA4001	DISASTER MANAGEMENT	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVE

- To create an awareness towards natural and man-made disasters, disaster preparedness and disaster management

UNIT 1 INTRODUCTION TO DISASTERS**12 Hrs.**

Natural resources and its importance - understanding on fragile eco-system - characteristics and types of Disasters, Geological and Mountain Area Disasters: Earthquakes, Volcanic eruption, landslides - Wind and Water Related Natural Disaster: Floods, Droughts, Cyclones, Tsunamis - Man Made Disasters: Forest fires, Nuclear, Biological and Chemical disaster - Causes and effects - Disaster Profile of India - Disaster Management cycle.

UNIT 2 DISASTER PREPAREDNESS**8 Hrs.**

Disaster management, mitigation and preparedness: Disaster Preparedness for People and Infrastructure, Community based Disaster Preparedness Plan - Roles & Responsibilities of Different Agencies and Government: Education, Communication & Training, Central, State, District and local administration, Armed Forces, Police, Para Military Forces, International Agencies, and NGO's - Disaster Mitigation: Strategies, Emerging Trends, Mitigation management and Role of Team and Coordination.

UNIT 3 REHABILITATION, RECONSTRUCTION AND RECOVERY**10 Hrs.**

Damage assessment – Development of Physical and Economic Infrastructure - Nature of Damage to Houses and Infrastructure due to Disasters - Funding Arrangements for Reconstruction - Monitoring and Evaluation of Rehabilitation Work: Training, Rescue and planning the rescue activities and rehabilitations - Role of Government and NGO's - Participative Rehabilitation Process: Case Studies

UNIT 4 DISASTER RESPONSE AND DISASTER MANAGEMENT**8 Hrs.**

Disaster Response Plan: Communication, Participation and Activation of Emergency Preparedness Plans, Search, Rescue, Evacuation and other logistic management - Human Behaviour and Response Management: Psychological Response and Psychological Rehabilitation, Trauma and Stress Management, rumour and Panic Management, Medical and Health Response to Different Disasters - Relief Measures: Minimum Standard of Relief, essential components of Relief Management, and funding.

UNIT 5 RISK ASSESSMENT AND VULNERABILITY ANALYSIS**7 Hrs.**

Hazard, Risk and Vulnerability: Concept and Relationship: Disaster Risk Reduction, People Participation in Risk Assessment - Vulnerability Analysis, Vulnerability Identification - Vulnerability profile of India - Strategies for Survival - Social Infrastructure for Vulnerability Reduction.

Max. 45 Hrs.**COURSE OUTCOMES**

On completion of the course, student will be able to

- CO1 - Know the fragile ecosystem and the types of the disasters
- CO2 - Acquire the preparedness and the responsibilities of different agencies on Disaster
- CO3 - Understand the rescue, rehabilitation and reconstruction process of disaster management
- CO4 - Understand the disaster response and relief measures
- CO5 - Understand the concepts of disaster risk
- CO6 - Understand the concepts of vulnerability reduction

TEXT / REFERENCE BOOKS

1. Bryant Edwards, "Natural Hazards", Cambridge University Press, U.K, 2005
2. Carter, W. Nick, "Disaster Management, Asian Development Bank", Manila, 1991.
3. Government of India, "Vulnerability Atlas of India", New Delhi, 1997.
4. Sahni, Pardeep et.al. (eds.), "Disaster Mitigation Experiences and Reflections", Prentice Hall of India, New Delhi, 2002
5. Sahni, Pardeep and Ariyabandu, "Disaster risk reduction in South Asia", Phi learning pvt. Ltd., New Delhi, 2012.
6. Sharma, R.K. & Sharma, G.,(ed), "Natural Disaster", APH Publishing Corporation, New Delhi, 2005.
7. Taori, K, "Disaster Management through Panchayati Raj", Concept Publishing Company, New Delhi, 2005.
8. NOAA Coastal Services Center, "Linking People Information and Technology",

END SEMESTER EXAMINATION QUESTION PAPER PATTERN**Max. Marks: 100****Exam Duration: 3Hrs.****PART A:** 10 Questions of 2 marks each – No choice**20 Marks****PART B:** 2 Questions from each unit of internal choice each carrying 16 marks**80 Marks**

SCIA4002	PUBLIC HEALTH ENGINEERING	L	T	P	Credits	Total Marks
		2	0	0	2	100

COURSE OBJECTIVES

- To provide knowledge about the solid waste management and its disposal.
- To implicate the importance of wastewater treatment.
- To create awareness and importance of the Rainwater Harvesting and Artificial Recharge Techniques.
- To provide an awareness about the health impacts due to water, air and land pollution.
- To gain knowledge on various regulatory bodies and acts.

UNIT – I – SOLID WASTE MANAGEMENT

Importance of public health engineering - Role of public health engineer - Sources and types of solid wastes - Waste generation rates and variation - Components of Integrated SWM - Sustainable SWM techniques at source - Segregation and sorting, reduce, reuse, and recycle. Present scenario of SWM in Urban Local Bodies - Dumping of solid waste- sanitary landfills- waste disposal options - Case studies related to reuse of waste.

UNIT – II – WASTEWATER MANAGEMENT

Sewage - classification - Waste water treatment - primary, secondary and tertiary stages - Standards for Disposal - Methods - Self-purification of river- Oxygen sag curve - Land disposal - Sewage farming - Objectives - Sludge characterization - Thickening - Design of gravity thickener- Sludge digestion - Sludge Conditioning and Dewatering - Sludge drying beds- ultimate residue disposal - recent advances - Case studies related to wastewater reclamation.

UNIT – III – WATER QUALITY MANAGEMENT

Role of Environmental Engineer - Water supply - development of public water supply - need for protected water supplies - objectives of water supply systems – Quality of water - physical, chemical and biological aspects - analysis of water - water quality standards - Sustainable Development - Rainwater Harvesting-Artificial Recharge Techniques - Case studies related to water management.

UNIT – IV – HEALTH IMPACTS

Health and environmental effects of water, air and land pollution - Chemicals in drinking water - Sources of air pollution - Sources of land pollutants - Disease - Preventive measures - Case studies related to pollution effects.

UNIT – V – GUIDELINES FOR WATER ACT & AIR ACT

Role of regulatory bodies & Local bodies-CPCB-TWAD Board- CMWSSB etc - Case Studies related to Effective Water Management - National concern for environment: Important environmental protection acts in India - water, air (prevention and control of pollution) act.

COURSE OUTCOMES:

On completion of the course, student will be able to

- CO1 - Understand the segregation and 3R from the solid waste.
- CO2 - Perform basic design of the unit operations and processes that are used in sewage treatment.
- CO3 - Analysis of water quality criteria and standards and their relation to public health.
- CO4 - Study on health impacts and its preventive measures.
- CO5 - Understand about the various boards for water and air acts.
- CO6 - Understand the prevention and control of water and air pollution acts.

TEXT / REFERENCES BOOKS:

1. Khan, I. H., & Ahsan, N. (2019). Textbook of solid waste management. New Delhi: Satish Kumar Jain for CBS Publisher and Distributors.
2. Mantell C.L., (1975), "Solid Waste Management", John Wiley.
3. "Wastewater Engineering - Treatment and Reuse", Metcalf and Eddy Inc., (2012), 4th Edition, Tata McGraw Hill Publishing Co. Ltd., New Delhi.
4. Viessman Jr, Hammer J. M, Perez, E.M, and Chadik, P. A, Water Supply and Pollution Control, PHI Learning, New Delhi, 2009
5. CPHEEO (2016). Manual on Municipal Solid Waste Management, Central Public Health and Environmental Engineering Organisation, Ministry of Urban Development, Govt. of India, New Delhi.

**PROGRAMME: B.E.
CIVIL ENGINEERING
CURRICULUM**

SEMESTER 1										
Sl. No.	Course Type	Course Code	Course Title	L	T	P	C	Marks		Page No.
								CAE	ESE	
1.	Theory	SMTA1101	Engineering Mathematics - I	3	0	0	3	50	50	1
2.	Theory	SPHA1101	Physics for Engineers	3	1	0	4	50	50	2
3.	Theory	SBTA1101	Environmental Science and Engineering	2	0	0	0	-	-	4
4.	Theory	SCIA1101	Engineering Mechanics	3	*	0	3	50	50	5
5.	Theory	SCIA1102	Construction Materials	3	0	0	3	50	50	6
6.	Theory	SCIA1103	Engineering Graphics	3	*	0	3	50	50	7
7.	Practical	SPHA2101	Physics Lab	0	0	2	1	25	25	8
8.	Practical	SMEA2201	Workshop Practice	0	0	4	2	50	50	0
Total Credits for Semester 1 – 19										
Total Marks for Semester 1 - 650										

SEMESTER 2										
Sl. No.	Course Type	Course Code	Course Title	L	T	P	C	Marks		Page No.
								CAE	ESE	
1.	Theory	SHSA1101	Technical English	3	0	0	3	50	50	10
2.	Theory	SMTA1201	Engineering Mathematics - II	3	0	0	3	50	50	13
3.	Theory	SCYA1101	Engineering Chemistry	3	1	0	4	50	50	14
4.	Theory	SCSA1103	Programming in C	3	*	0	3	50	50	16
5.	Theory	SCIA1201	Concrete and Construction Technology	3	0	0	3	50	50	17
6.	Theory	SCIA1202	Functional Design of Buildings	3	0	0	3	50	50	18
7.	Practical	SCYA2101	Engineering Chemistry Lab	0	0	2	1	25	25	19
8.	Practical	SCSA2104	Programming in C Lab	0	0	4	2	50	50	20
9.	Practical	SCIA2201	Building Planning and Drawing lab	0	0	4	2	50	50	21
Total Credits for Semester 2 – 24										
Total Marks for Semester 2 – 850										

L - LECTURE HOURS, T – TUTORIAL HOURS, P – PRACTICAL HOURS, C – CREDITS,
CAE – CONTINUOUS ASSESSMENT EXAMINATION,
ESE – END SEMESTER EXAMINATION

SEMESTER 3										
Sl. No.	Course Type	Course Code	Course Title	L	T	P	C	Marks		Page No.
								CAE	ESE	
1.	Theory	SMTA1301	Engineering Mathematics – III	3	0	0	3	50	50	22
2.	Theory	SCIA1301	Mechanics of Solids – I	3	*	0	3	50	50	23
3.	Theory	SCIA1302	Mechanics of Fluids	3	*	0	3	50	50	24
4.	Theory	SCIA1303	Surveying - I	3	*	0	3	50	50	25
5.	Theory	SCIA1304	Highway Engineering	3	0	0	3	50	50	26
6.	Theory	SCIA1305	Engineering Geology	3	0	0	3	50	50	27
7.	Practical	SCIA2301	Surveying Lab - I	0	0	4	2	50	50	28
8.	Practical	SCIA2302	Strength of Materials Lab	0	0	4	2	50	50	29
Total Credits for Semester 3 – 22										
Total Marks for Semester 3 - 800										

SEMESTER 4										
Sl. No.	Course Type	Course Code	Course Title	L	T	P	C	Marks		Page No.
								CAE	ESE	
1.	Theory	SMTA1401	Engineering Mathematics - IV	3	0	0	3	50	50	30
2.	Theory	SCIA1401	Mechanics of Solids - II	3	*	0	3	50	50	31
3.	Theory	SCIA1402	Applied Hydraulic Engineering	3	*	0	3	50	50	32
4.	Theory	SCIA1403	Environmental Engineering - I	3	0	0	3	50	50	33
5.	Theory	SCIA1404	Surveying - II	3	*	0	3	50	50	34
6.	Theory	SAIC4001	Industry 4.0	2	0	2	2	50	50	35
7.	Practical	SCIA2401	Surveying Lab - II	0	0	4	2	50	50	36
8.	Practical	SCIA2402	Hydraulic Engineering Lab	0	0	4	2	50	50	37
Total Credits for Semester 4 – 21										
Total Marks for Semester 4 – 800										

L - LECTURE HOURS, T – TUTORIAL HOURS, P – PRACTICAL HOURS, C – CREDITS,
 CAE – CONTINUOUS ASSESSMENT EXAMINATION,
 ESE – END SEMESTER EXAMINATION

SEMESTER 5										
Sl. No.	Course Type	Course Code	Course Title	L	T	P	C	Marks		Page No.
								CAE	ESE	
1.	Theory	SCIA1501	Structural Analysis - I	3	*	0	3	50	50	38
2.	Theory	SCIA1502	Reinforced Concrete Structures - I	3	*	0	3	50	50	39
3.	Theory	SCIA1503	Design of Steel Structures - I	3	*	0	3	50	50	40
4.	Theory	SCIA1504	Soil Mechanics	3	*	0	3	50	50	41
5.	Theory	SCIA1505	Environmental Engineering - II	3	0	0	3	50	50	43
6.	Theory	SCIA1506	Water Resources Engineering	3	0	0	3	50	50	44
7.	Practical	SCIA2501	Soil Mechanics Lab	0	0	4	2	50	50	45
8.	Practical	SCIA2502	Environmental Engineering Lab	0	0	4	2	50	50	46
9.	Practical	S20APT	Professional Training	0	0	4	2	50	50	-
Total Credits for Semester 5 – 24										
Total Marks for Semester 5 – 900										

SEMESTER 6										
Sl. No.	Course Type	Course Code	Course Title	L	T	P	C	Marks		Page No.
								CAE	ESE	
1.	Theory	SCIA1601	Structural Analysis - II	3	*	0	3	50	50	47
2.	Theory	SCIA1602	Reinforced Concrete Structures - II	3	*	0	3	50	50	48
3.	Theory	SCIA1603	Design of Steel Structures - II	3	*	0	3	50	50	49
4.	Theory	SCIA1604	Foundation Engineering	3	*	0	3	50	50	50
5.	Theory		Professional Elective - 1	3	0	0	3	50	50	-
6.	Practical	SCIA2601	Concrete Technology Lab	0	0	4	2	50	50	51
7.	Practical	SCIA2602	Highway Engineering Lab	0	0	4	2	50	50	52
8.	Project	S20AMPROJ	Interdisciplinary Project	0	0	6	3	50	50	-
Total Credits for Semester 6 - 22										
Total Marks for Semester 6 - 800										

L - LECTURE HOURS, T – TUTORIAL HOURS, P – PRACTICAL HOURS, C – CREDITS,
 CAE – CONTINUOUS ASSESSMENT EXAMINATION,
 ESE – END SEMESTER EXAMINATION

SEMESTER 7										
Sl. No.	Course Type	Course Code	Course Title	L	T	P	C	Marks		Page No.
								CAE	ESE	
1.	Theory	SBAA4002	Principles of Management and Professional Ethics	3	0	0	3	50	50	53
2.	Theory	SCIA1701	Railways, Airport and Harbour Engineering	3	0	0	3	50	50	54
3.	Theory	SCIA1702	Estimation, Costing and Valuation	3	*	0	3	50	50	55
4.	Theory	SCIA1703	Prestressed Concrete Structures	3	*	0	3	50	50	56
5.	Theory	SCIA1704	Construction Management	3	0	0	3	50	50	57
6.	Practical	SCIA2701	Computer Aided Analysis, Design of Structural Elements Lab	0	0	4	2	50	50	58
7.	Project	S20APROJ1	Project Work (Phase I)	0	0	6	3	50	50	-
Total Credits for Semester 7 - 20										
Total Marks for Semester 7 - 700										

SEMESTER 8										
Sl. No.	Course Type	Course Code	Course Title	L	T	P	C	Marks		Page No.
								CAE	ESE	
1.	Theory		Professional Elective 2	3	0	0	3	50	50	-
2.	Theory		Professional Elective 3	3	0	0	3	50	50	-
3.	Project	S20APROJ2	Project Work (Phase – II)	0	0	14	7	50	50	-
Total Credits for Semester 8 - 13										
Total Marks for Semester 8 - 300										

L - LECTURE HOURS, T – TUTORIAL HOURS, P – PRACTICAL HOURS, C – CREDITS,
 CAE – CONTINUOUS ASSESSMENT EXAMINATION,
 ESE – END SEMESTER EXAMINATION

LIST OF ELECTIVES

PROFESSIONAL ELECTIVE COURSES									
Sl. No.	Course Code	Course Title	L	T	P	C	Marks		Page No.
							CAE	ESE	
1.	SCIA3001	Irrigation Engineering	3	0	0	3	50	50	59
2.	SCIA3002	Air and Noise Pollution	3	0	0	3	50	50	60
3.	SCIA3003	Ground Water Engineering	3	0	0	3	50	50	61
5.	SCIA3004	Solid Waste Management	3	0	0	3	50	50	62
6.	SCIA3005	Energy and Environmental Management	3	0	0	3	50	50	63
7.	SCIA3006	Finite Element Techniques	3	0	0	3	50	50	64
8.	SCIA3007	Mass transport Management	3	0	0	3	50	50	65
9.	SCIA3008	Traffic Engineering	3	0	0	3	50	50	66
10.	SCIA3009	Highway Pavement Design	3	0	0	3	50	50	67
11.	SCIA3010	Transport Economics	3	0	0	3	50	50	68
12.	SCIA3011	Design of Bridges	3	0	0	3	50	50	69
13.	SCIA3012	Advanced Structural Systems	3	0	0	3	50	50	70
14.	SCIA3013	Basics of Dynamics and Seismic Design	3	0	0	3	50	50	71
15.	SCIA3014	Procurement Engineering	3	0	0	3	50	50	72
16.	SCIA3015	Quality Control and Safety Management	3	0	0	3	50	50	73
17.	SCIA3016	Computer Applications in Civil Engineering	3	0	0	3	50	50	74
18.	SCIA3017	Smart Materials and Smart Structures	3	0	0	3	50	50	75
19.	SCIA3018	Basics of Remote Sensing and GIS	3	0	0	3	50	50	76
20.	SCIA3019	Tall Buildings	3	0	0	3	50	50	77
21.	SARA3020	Sustainable Architecture	3	0	0	3	50	50	78
22.	SARA3021	Steel in Architectural Design	3	0	0	3	50	50	79
23.	SARA3022	Environmental Planning and Design	3	0	0	3	50	50	80
24.	SARA3023	Building Automation System	3	0	0	3	50	50	81

SAIC4001	INDUSTRY 4.0	L	T	P	Credits	Total Marks
		2	0	2	2	100

UNIT 1 ADVANCED TECHNOLOGY AND ADVANCED MATERIALS**7 Hrs.**

Advanced electro-optical sensing technology-active, passive multi-spectral and hyper spectral imaging; electronic beam steering; vacuum technology, surface and coating technology, health care technology, Nanotechnology- Nanomechanics, Nano optoelectronics; energy storage technology-next generation Li-based Batteries, Hydrogen storage, solar photovoltaic's, Flexible electronics. Intellectual Property Rights - case studies governing/pertaining to Materials/Technology.

UNIT 2 TRANSFORMING TECHNOLOGIES IN BIOENGINEERING**7 Hrs.**

Establishment of smart biotechnology factory, Artificial intelligence in Bioprocess technology, Omics - Big data analysis through automation, 3D bio printing for tissue engineering. Simulation tools, RSM and Box model. Cyber physical system based telemedicine, diagnosis and therapeutics through real time biosensors. Bionanotechnology. Intellectual Property rights (IPR): Case Studies.

UNIT 3 ADVANCEMENTS IN SUSTAINABLE BUILT ENVIRONMENT**7 Hrs.**

Introduction - Technological developments in Architectural, Engineering and Construction (AEC) - Building Information Modelling (BIM) using Cloud computing technology and Internet of things (IoT) - Unmanned Aerial Vehicles, sensors - Additive manufacturing in construction - Concrete 3D printing - Materials used - Lightweight and functionally graded structures - Net Zero Energy buildings, Bioswales, Biofiltration pond, Ecosan systems- Recent developments in Waste water Management, Air pollution control, waste disposal - Integration of energy, water and environmental systems for a sustainable development- Emerging Technologies: Robot Highway- Vertical farming - Intellectual Property rights: Case studies.

UNIT 4 SMART MANUFACTURING**8 Hrs.**

Smart factories and interconnection, Smart Manufacturing - automation systems, Additive Manufacturing, Smart grids, Micro Electro Mechanical Systems (MEMS), Stealth technology, Metal Finishing, Self-propelled vehicles, e mobility, Green fuels, drones - unmanned aerial vehicles(UAVs), aerodynamics. Robotic Automation and Collaborative Robots - Augmented reality and haptics, engineering cybernetics and artificial intelligence (AI), Disruptive Technologies - Frugal Innovations - Emerging Technologies- Autonomous Robots, Swam Robot, Modular Robotics, Space craft, Intellectual Property Rights (IPR): Case Studies.

UNIT 5 SMART WORLD**8 Hrs.**

Smart Sensors and IIOT, Smart grid, Hybrid renewable energy systems, Electronics in Smart city, Integration of Sensors in Robots and Artificial Intelligence, 5G Technology, Communication protocols, Human-Machine Interaction, Virtual Reality, Quantum Computing: Changing trends in transistor technology: Processor, Emerging Trends: Deep Space, Swarm Robots, Cyborg, Geofencing, Pervasive Computing, Intellectual Property Rights- Case Studies.

UNIT 6 CYBER PHYSICAL SYSTEMS**8 Hrs.**

Introduction to Cyber Physical Systems (CPS), Architecture of CPS, Data science and technology for CPS, Prototypes of CPS, Emerging applications in CPS including social space, crowd sourcing, healthcare and human computer interactions, Industrial Artificial Intelligence, Deep Learning, Gamification, Networking systems for CPS applications, Wearable cyber physical systems and applications, Domain applications of CPS: Agriculture, Infrastructure, Disaster management, Energy, Transportation, Intellectual Property Rights (IPR) : Case Studies.

Max. 45 Hrs.**COURSE OUTCOMES**

On completion of the course, student will be able to

- CO1 - Apply the basic concepts for electro optical sensing technology and selection of materials.
- CO2 - Analyze the technology on AI and Big Data for biomedical applications.
- CO3 - Elaborate the various technologies for sustainable built environment..
- CO4 - Evaluate different smart manufacturing technologies for industrial robotics-based automation.
- CO5 - Compare various advanced technologies for development of smart city..
- CO6 - Build Cyber physical systems using AI for Industry, Agriculture and disaster management applications.

TEXT / REFERENCE BOOKS

- William D. Callister, "Materials Science and Engineering, An Introduction", John Wiley and Sons Inc. Singapore, 2001.
- V. Raghavan, "Physical Metallurgy: Principle and Practice", Prentice Hall India Pvt Ltd., 2006.
- FlavioCraveiro, Jose Pinto Duarte, Helena Bartolo and Paulo JorgeBartolo, "Additive manufacturing as an enabling technology for digital construction: A perspective on Construction 4.0", Automation in Construction, Vol. 103, 2019.
- Klaus Schwab, "Fourth Industrial Revolution", Random House USA Inc, New York, USA, 2017.

SCI1615	COMPUTER APPLICATIONS IN CIVIL ENGINEERING	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVE

To study and understand the software requirements of computer, programming, optimization techniques, inventory models and scheduling techniques applied to civil engineering.

UNIT 1 INTRODUCTION**9 Hrs.**

Overview of software application in civil - Structural engineering, Transportation Engineering, Foundation and Soil mechanics, Construction Management, Environmental Engineering, Water resources and Irrigation Management - Application.

UNIT 2 SOFTWARE APPLICATION IN STRUCTURAL ENGINEERING**9 Hrs.**

Introduction - Drafting software - Auto CAD, Building information modeling - Revit Architecture, Design and Analysis of structure - STAAD Pro and ETABS, Structural design and detailing - STRUDS, Simulation software Finite Element Analysis - Casestudy.

UNIT 3 SOFTWARE APPLICATION IN TRANSPORTATION ENGINEERING AND SOIL MECHANICS**9 Hrs.**

Introduction - Transportation planning - CUBE and TRANSCAD, Alignment software - MX Roads, Pavement design software - HDM4, Signal Co-ordination - TRANSYT, Simulation software - VISSIM and VISSUM - Case study. Sub soil investigation - DC Software, Finite Element Analysis - Plaxis - 2D and 3D, Soil displacement and stability Oasys - Case study.

UNIT 4 SOFTWARE APPLICATION IN CONSTRUCTION MANAGEMENT AND ENVIRONMENTAL ENGINEERING**9 Hrs.**

Introduction - Planning and resource assessment - Microsoft Project, Project and resource management Primavera, Matchware Mind view, Project kick start, Rational plan multi project - Case study. Introduction - Finite element program for analyzing the ground water seepage - Pak P, Risk assessment tool - E-FRAT, Simulation software - BIOSCREEN - Case study.

UNIT 5 SOFTWARE APPLICATION IN WATER RESOURCES ENGINEERING**9 Hrs.**

Surface water models (HMS) - Storm Water Management Models (SWMM) - culvert hydraulic design(HY) River Analysis system models (HEC-RAS)-Ground Water Flow models - Groundwater transport models. Soil water assessment simulation models (SWAT) - Basin simulation models (MITSIM, VASIM) Real time operation models Water Resources Information System, Management Information System. Decision support system for Irrigation management.

Max. 45 Hours**TEXT / REFERENCE BOOKS**

1. Billy E.Gillet., "Introduction to Operations Research: A Computer - Oriented Algorithmic Approach", Tata McGraw Hill Education, 1979.
2. Paulson, B.R., "Computer Applications in Construction", Mc Graw Hill, 1995
3. Feigenbaum,L., Construction Scheduling with Primavera Project Planner Prentice Hall Inc., 2002
4. Kazda, I., "Finite element Techniques in ground water flow studies (with Applications in Hydraulic and Geotechnical Engineering)", Elsevier, 1990.

END SEMESTER EXAM QUESTION PAPER PATTERN**Max. Marks: 80****Exam Duration : 3 Hrs.****PART A** : 10 questions of 2 marks each - No choice**20 Marks****PART B** : 2 questions from each unit of internal choice, each carrying 12 marks**60 Marks**

PROGRAMME: B.E. CIVIL ENGINEERING CURRICULUM

SEMESTER I

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C	PAGE No.
1.	SMT 1101	Engineering Mathematics I	3	1	0	4	2
2.	SPH 1101	Physics of Engineering Materials	3	0	0	3	8
3.	SCY 1101	Engineering Chemistry	3	0	0	3	13
4.	SCS 1102	Fundamentals of Programming	3	0	0	3	18
5.	SCI 1101	Engineering Mechanics	3	0	0	3	20
6.	SCI 1102	Construction Materials	3	0	0	3	21
7.	SCI 4051	Engineering Graphics Lab	0	0	4	2	49
8.	SCS 4101	Programming in C Lab	0	0	4	2	48

Total Credits 23

SEMESTER II

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C	PAGE No.
1.	SHS 1101	English for Science and Technology	3	0	0	3	1
2.	SMT1105	Engineering Mathematics II	3	1	0	4	3
3.	SPH 1102	Physics of Electronic Devices /	3	0	0	3	10
	SPH 1103	Engineering Physics /	3	0	0	3	11
	SPH 1104	Applied Biophysics	3	0	0	3	12
4.	SCY 1102	Chemistry of Electronic Materials /	3	0	0	3	14
	SCY 1103	Chemistry of Industrial Materials /	3	0	0	3	15
	SCY 1104	Bio Organic Chemistry /	3	0	0	3	16
	SCY 1105	Physical Chemistry	3	0	0	3	17
5.	SCI 1103	Construction Technology	3	0	0	3	22
6.	SCI 1104	Functional Design of Buildings	3	0	0	3	23
7.	SCI 4052	Material Testing Lab	0	0	4	2	50
8.	SPH 4051	Engineering Physics Lab	0	0	2	1	48
9.	SCY 4051	Engineering Chemistry Lab	0	0	2	1	48

Total Credits 23

L - LECTURE HOURS, T – TUTORIAL HOURS, P – PRACTICAL HOURS, C – CREDITS

SEMESTER III

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C	PAGE No.
1.	SMT1201	Engineering Mathematics III	3	1	0	4	4
2.	SCI 1201	Mechanics of Solids I	3	1	0	4	24
3.	SCI 1202	Mechanics of Fluids	3	0	0	3	25
4.	SCI 1203	Surveying I	3	0	0	3	26
5.	SCI 1204	Highway Engineering	3	0	0	3	27
6.	SCI 1205	Engineering Geology	3	0	0	3	28
7.	SCI 4053	Surveying Lab I	0	0	4	2	50
8.	SCI 4054	Building Planning and Drawing	0	0	4	2	51
TotalCredits						24	

SEMESTER IV

[illegible]

SEMESTER V

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C	PAGE No.
1.	SCI 1301	Structural Analysis I	3	1	0	4	34
2.	SCI 1302	Reinforced Concrete Structures I	3	1	0	4	35
3.	SCI 1303	Design of Steel Structures I	3	1	0	4	36
4.	SCI 1304	Soil Mechanics	3	0	0	3	37
5.	SCI 1305	Water Resources Engineering	3	0	0	3	38
6.	SCI 1306	Environmental Engineering II	3	0	0	3	39
7.	SCI 4057	Concrete Technology Lab	0	0	4	2	53
8.	SCI 4058	Environmental Engineering Lab	0	0	4	2	53
Total Credits						25	

SEMESTER VI

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C	PAGE No.
1.	SCI 1307	Structural Analysis II	3	1	0	4	40
2.	SCI 1308	Reinforced Concrete Structures II	3	1	0	4	41
3.	SCI 1309	Design of Steel Structures II	3	1	0	4	42
4.	SCI 1310	Foundation Engineering	3	0	0	3	43
5.	SCI 1311	Estimation, Costing & Valuation	3	0	0	3	44
6.		Elective 1	3	0	0	3	
7.	SCI 4059	Soil Mechanics Lab	0	0	4	2	54
8.	SCI 4061	Computer Aided Design and Drafting Lab I	0	0	4	2	55
9.	S20 PT 2	Professional Training II	0	0	10	5	
						Total Credits	30

SEMESTER VII

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C	PAGE No.
1.	SBA 1101	Principles of Management & Professional Ethics	3	0	0	3	19
2.	SCI 1401	Irrigation Engineering	3	0	0	3	45
3.		Elective 2	3	0	0	3	
4.		Elective 3	3	0	0	3	
5.	SCI 4060	Highway Lab	0	0	4	2	54
6.	SCI 4062	Computer Aided Design and Drafting Lab II	0	0	4	2	55
7.		Project Work (Phase I)					
						Total Credits	16

SEMESTER VIII

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C	PAGE No.
1.	SCI 1402	Prestressed Concrete Structures	3	0	0	3	46
2.	SCI 1403	Construction Management	3	0	0	3	47
3.		Elective 4	3	0	0	3	
4.	S20 PROJ	Project Work (Phase I & II)	0	0	30	15	
						Total Credits	24

Total Credits for the Programme 195

LIST OF ELECTIVES

DEPARTMENT ELECTIVES

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C	PAGE No.
GROUP A							
1.	SCI 1601	Air and Noise Pollution	3	0	0	3	56
2.	SCI 1602	Ground Water Engineering	3	0	0	3	57
3.	SCI 1603	Solid Waste Management	3	0	0	3	58
4.	SCI 1604	Energy and Environmental Management	3	0	0	3	59
5.	SCI 1605	Finite Element Techniques	3	0	0	3	60
6.	SCI 1606	Advanced Structural Systems	3	0	0	3	61
7.	SCI 1607	Basics of Dynamics and Seismic Design	3	0	0	3	62
8.	SPR1307	Resource Management Techniques	3	0	0	3	63
GROUP B							
1.	SCI 1608	Mass transport Management	3	0	0	3	64
2.	SCI 1609	Traffic Engineering	3	0	0	3	65
3.	SCI 1610	Highway Pavement Design	3	0	0	3	66
4.	SCI 1611	Transport Economics	3	0	0	3	67
5.	SCI 1612	Design of Bridges	3	0	0	3	68
6.	SCI 1613	Procurement Engineering	3	0	0	3	69
7.	SCI 1614	Quality Control and Safety Management	3	0	0	3	70
8.	SCI 1615	Computer Applications in Civil Engineering	3	0	0	3	71

FACULTY ELECTIVES

1.	SCI1616	Smart Materials and Smart Structures	3	0	0	3	72
2.	SCI1617	Basics of Remote Sensing and GIS	3	0	0	3	73
3.	SCI1618	Tall Buildings	3	0	0	3	74
4.	SAR 1612	Sustainable Architecture	3	0	0	3	75
5.	SAR 1613	Steel in Architectural Design	3	0	0	3	76
6.	SAR 1614	Environmental Planning and Design	3	0	0	3	77
7.	SAR 1615	Building Automation System	3	0	0	3	78