



List of New Course(s) Introduced

Department : *Civil Engineering*

Programme Name : *B.Tech.*

Academic Year : *2020-21*

List of New Course(s) Introduced

Sr. No.	Course Code	Name of the Course
01.	CE05THS07	MANAGEMENT (ORGANIZATIONAL BEHAVIOUR)
02.	CE06TPE01A	STRUCTURAL ANALYSIS BY MATRIX METHODS
03.	CE06TPE01E	BASICS OF COMPUTATIONAL HYDRAULICS
04.	CE06TOE01A	METRO SYSTEMS AND ENGINEERING
05.	CE06TOE01C	REMOTE SENSING AND GIS
06.	CE06TOE01D	ICT FOR DEVELOPMENT



Minutes of Meetings (MoM) of Board of Studies (BoS)

Academic Year : 2020-21

School : School of Studies of Engineering and Technology

Department : Civil Engineering

Date and Time : July 9, 2020 - 11:00 AM

Venue : Department of Civil Engineering

**Department of Civil Engineering
School of Studies, Engineering & Technology
Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur C.G.**

Minutes of Meeting of BoS

A meeting of Board of Studies (BoS) of Civil Engineering was held on 09-07-2020 at 11.00 AM in the Department of Civil Engineering (through ZOOM APP online) to discuss and finalize the syllabus of B.Tech. 3rd year (5th and 6th Semesters) Civil Engineering w.e.f 2020-21 academic session. The following internal members of BoS were present in the meeting.

1. Dr. M. C. Rao, Chairman BoS, Head of the Department Civil Engg.
2. Dr. Shailendra Kumar, Professor, Civil Engg. Dept., GGV, member of BoS
3. Shri.R.K. Choubey, Asso. Professor, Civil Engg. Dept., GGV, member of BoS
4. Mr.A.K. Parashar, Asst.Professor, Civil Engg. Dept., GGV, member of BoS

The following external members of DRC were attended the meeting through online (ZOOM meeting)

1. Shri. Sunil Kumar Shrivastava, Chief Manager (Civil), SECL Bilaspur, Industry Expert and member of BoS
2. Prof. Umesh K Dewangan, Professor, Civil Engineering Dept., NIT Raipur, Subject Expert and External member of BoS

At the outset the chairman welcomed all the esteemed members.

The chairman of the DRC has presented the B.Tech. Civil Engineering Scheme (Approved in the previous BoS meeting held on 29-06-2019) and the syllabus of B.Tech. 3rd year, prepared as per the approved scheme & as per the AICTE guidelines to all the esteemed members. During meeting the members discussed the scheme and syllabus at length and suggested minor changes in both the scheme & syllabus and accordingly the changes are incorporated in both the scheme as well as in the syllabus.

After incorporation of the changes in the scheme and syllabus, the members of BoS have approved the B.Tech. scheme (revised) and detailed syllabus of B.Tech. 3rd year (5th & 6th Semester) Civil Engineering and recommended to be made effective from session 2020-21. Further the external members have also sent their comments through e-mail (copies enclosed).

The meeting ended with vote of thanks.


Dr. M. C. Rao


Prof. Shailendra Kumar


Mr. R.K. Choubey


Mr. A.K. Parashar



The following revisions were introduced in the B.Tech. 3rd (5th & 6th semester) civil engineering :

- ❖ SOIL MECHANICS - I (CE05TPC11)
- ❖ HIGHWAY ENGINEERING LAB (CE05PPC04)
- ❖ SOIL MECHANICS LAB (CE05PPC05)
- ❖ WATER RESOURCES ENGINEERING -I (CE06TPC13)
- ❖ ENVIRONMENTAL ENGINEERING - II (CE06TPC14)
- ❖ SOIL MECHANICS - II (CE06TPC16)
- ❖ ADVANCED SURVEYING (CE06TPE01B)
- ❖ RURAL TECHNOLOGY AND COMMUNITY DEVELOPMENT (CE06TOE01B)

The following new courses were introduced in the B.Tech. 3rd (5th & 6th semester) civil engineering :

- ❖ MANAGEMENT (ORGANIZATIONAL BEHAVIOUR) (CE05THS07)
- ❖ STRUCTURAL ANALYSIS BY MATRIX METHODS (CE06TPE01A)
- ❖ BASICS OF COMPUTATIONAL HYDRAULICS (CE06TPE01E)
- ❖ METRO SYSTEMS AND ENGINEERING (CE06TOE01A)
- ❖ REMOTE SENSING AND GIS (CE06TOE01C)
- ❖ ICT FOR DEVELOPMENT (CE06TOE01D)

विभागाध्यक्ष
HOD
सिविल इंजीनियरी विभाग
Department of Civil Engineering,
प्रो.स.गु.घा.विश्वविद्यालय, बिलासपुर (छ.ग.)
I.T., G.G.V. Bilaspur (C.G.)

Signature & Seal of HoD



Scheme and Syllabus

CIVIL ENGINEERING DEPARTMENT, SOS, ENGINEERING & TECHNOLOGY GURU GHASIDAS VISHWAVIDYALAYA (A CENTRAL UNIVERSITY), BILASPUR

SCHEME OF B.TECH.V SEMESTER CIVIL ENGINEERING W.E.F. 2020-21 (ODD SEMESTER)

S. No	Subject Code	Subjects	period/Week			Scheme of Evaluation				Grand Total	Credits
						Internal Assessment (IA)			ESE		
			L	T	P	CT-I	CT-II	Total			
		Theory									
1	CE05TPC08	Design of Concrete Structures	3	1	0	15	15	30	70	100	4
2	CE05TPC09	Structural Analysis - II	3	1	0	15	15	30	70	100	4
3	CE05TPC10	Highway Engineering	3	0	0	15	15	30	70	100	3
4	CE05TPC11	Soil Mechanics - I	3	0	0	15	15	30	70	100	3
5	CE05TPC12	Environmental Engineering - I	3	0	0	15	15	30	70	100	3
6	CE05THS07*	Management (Organizational Behaviour)	3	0	0	!	!	!	!	!	0
		Practical									
1	CE05PPC04	Highway Engineering Lab	0	0	3	-	-	30	20	50	1.5
2	CE05PPC05	Soil Mechanics Lab	0	0	3	-	-	30	20	50	1.5
										Total Credits	20

L - Lecture Hours, T-Tutorial Hours, P - Practical Hours, CT - Class Test, ESE – End Semester Exam; * Mandatory Course



**CIVIL ENGINEERING DEPARTMENT, SOS, ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA (A CENTRAL UNIVERSITY), BILASPUR**

**SCHEME OF B.TECH.VI SEMESTER CIVIL ENGINEERING
W.E.F. 2020-21 (EVEN SEMESTER)**

S. No	Subject Code	Subjects	period/Week			Scheme of Evaluation				Grand Total	Credits
						Internal Assessment (IA)			ESE		
			Theory	L	T	P	CT-I	CT-II			
1	CE06TPC13	Water Resources Engineering -I	3	0	0	15	15	30	70	100	3
2	CE06TPC14	Environmental Engineering - II	3	0	0	15	15	30	70	100	3
3	CE06TPC15	Design of Steel Structures	3	1	0	15	15	30	70	100	4
4	CE06TPC16	Soil Mechanics - II	3	0	0	15	15	30	70	100	3
5	CE06TPE01	Professional Elective -IX	3	1	0	15	15	30	70	100	4
6	CE06TOE01	Open Elective -IX	3	0	0	15	15	30	70	100	3
		Internship/Industrial Training*									
		Practical									
1	CE06PPC06	Environmental Engineering Lab	0	0	3	-	-	30	20	50	1.5
2	CE06PPC07	Computer Applications in Civil Engg. Lab	0	0	3	-	-	30	20	50	1.5
										Total Credits	23

L - Lecture Hours, T-Tutorial Hours, P - Practical Hours, CT - Class Test, ESE – End Semester Exam; * Students have to undergo internship/industrial training for a period of 04 weeks during the summer vacation and shall submit a report signed by the concerned organization to the Department in the 7th Semester.



List of Professional (Core) Electives

Sl. No.	Subject Code	Name of Subject	Credits	Semester
x	CE06TPE01X	Professional Elective-1 (PE Group-1)	4	VI
A	CE06TPE01A	Structural Analysis by Matrix Methods		
B	CE06TPE01B	Advanced Surveying		
C	CE06TPE01C	Advanced Concrete Design		
D	CE06TPE01D	Railway Engineering		
E	CE06TPE01E	Basics of Computational Hydraulics		
Sl. No.	Subject Code	Name of Subject	Credits	Semester
x	CE07TPE01X	Professional Elective-2 (PE Group-2)	3	VII
A	CE07TPE01A	Pre-stressed Concrete		
B	CE07TPE01B	Construction Engineering Materials		
C	CE07TPE01C	Disaster Preparedness and Planning		
D	CE07TPE01D	Advanced Structural Analysis		
E	CE07TPE01E	Low Cost Housing Techniques		
Sl. No.	Subject Code	Name of Subject	Credits	Semester
x	CE07TPE02X	Professional Elective-3 (PE Group-3)	3	VII
A	CE07TPE02A	Environmental Geo-technology		
B	CE07TPE02B	Air and Noise Pollution and Control		
C	CE07TPE02C	Solid and Hazardous Waste Management		
D	CE07TPE02D	Design of Hydraulic Structures		
E	CE07TPE02E	Environmental Impact Assessment and Life Cycle Analysis		
Sl. No.	Subject Code	Name of Subject	Credits	Semester
x	CE07TPE03X	Professional Elective-4 (PE Group-4)	3	VII
A	CE07TPE03A	Ground Water Hydrology		
B	CE07TPE03B	Structural Dynamics		
C	CE07TPE03C	Foundation Engineering		
D	CE07TPE03D	Rock Mechanics		
E	CE07TPE03E	Water Resources Planning & Management		



List of Open Electives

Sl. No.	Subject Code	Name of Subject	Credits	Semester
x	CE06TOE01X	Open Elective-1 (OE Group-1)	3	VI
A	CE06TOE01A	Metro Systems and Engineering		
B	CE06TOE01B	Rural Technology and Community Development		
C	CE06TOE01C	Remote Sensing and GIS		
D	CE06TOE01D	ICT for Development		
Sl. No.	Subject Code	Name of Subject	Credits	Semester
x	CE07TOE01X	Open Elective-2 (OE Group-2)	3	VII
A	CE07TOE01A	Artificial Neural Network		
B	CE07TOE01B	Economic Policies in India		
C	CE07TOE01C	History of Science and Engineering		
D	CE07TOE01D	Cyber Law and Ethics		
Sl. No.	Subject Code	Name of Subject	Credits	Semester
x	CE08TOE01X	Open Elective-3 (OE Group-3)	3	VIII
A	CE08TOE01A	Management Information System		
B	CE08TOE01B	Enterprise Resource Planning		
C	CE08TOE01C	Engineering Risk-Benefit Analysis		
D	CE08TOE01D	Human Resources Development and Organizational Behaviour		



DEPARTMENT OF CIVIL ENGINEERING B.TECH. THIRD YEAR SYLLABUS W.E.F 2020-21

SYLLABUS	(SEMESTER-V)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
Subject Code:	CE05THS07*									
Subject:	Management (Organizational Behaviour)	3	0	0	-	-	-	-	-	00

Course Learning Objectives:

The objective of this Course is

- To improve students understanding of human behavior in organization and the ability to lead people to achieve more effectively toward increased organizational performance.
- To understand individual behavior in organizations, including diversity, attitudes, job satisfaction, emotions, moods, personality, values, perception, decision making, and motivational theories.
- To understand group behavior in organizations, including communication, leadership, power and politics, conflict, and negotiations.
- To understand the organizational system, including organizational structures, culture, human resources, and change.

Course Content:

UNIT 1: FOCUS AND PURPOSE: Definition, need and importance of organizational behaviour – Nature and scope – Frame work – Organizational behaviour models.

UNIT 2: INDIVIDUAL BEHAVIOUR: Personality – types – Factors influencing personality – Theories – Learning – Types of learners – The learning process – Learning theories – Organizational behaviour modification. Misbehaviour – Types – Management Intervention. Emotions- Emotional Labour – Emotional Intelligence – Theories. Attitudes – Characteristics – Components – Formation – Measurement- Values. Perceptions – Importance – Factors influencing perception – Interpersonal perception- Impression Management. Motivation – importance – Types – Effects on work behavior.

UNIT 3: GROUP BEHAVIOUR: Organization structure – Formation – Groups in organizations – Influence – Group dynamics – Emergence of informal leaders and working norms – Group decision making techniques – Team building - Interpersonal relations – Communication – Control.

UNIT 4: LEADERSHIP AND POWER: Meaning – Importance – Leadership styles – Theories – Leaders Vs Managers – Sources of power – Power centers – Power and Politics.



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UNIT 5: DYNAMICS OF ORGANIZATIONAL BEHAVIOUR: Organizational culture and climate – Factors affecting organizational climate – Importance. Job satisfaction – Determinants – Measurements – Influence on behavior. Organizational change – Importance – Stability Vs Change – Proactive Vs Reaction change – the change process – Resistance to change – Managing change. Stress – Work Stressors – Prevention and Management of stress – Balancing work and Life. Organizational development – Characteristics – objectives – Organizational effectiveness

TEXT BOOKS

1. Stephen P. Robins, Organisational Behavior, PHI Learning / Pearson Education, 11th edition, 2008.
2. Fred Luthans, Organisational Behavior, McGraw Hill, 11th Edition, 2001.

Course Outcomes:

At the end of the course the students shall be able

- To Compare and contrast theories of organizational behavior.
- To analyze management issues as related to organizational behavior.
- To evaluate ethical issues as related to organizational behaviour
- To examine challenges of effective organizational communication
- To examine the differences and similarities between leadership, power, and management.
- To assess the impact of culture on organizational behavior



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SYLLABUS		(SEMESTER-VI)						
Subject Code:	CE06TPE01X	CREDITS: 4			SESSIONAL - TA			ESE
Subject:	Professional Elective - IX	L	T	P	CT-I	CT-II	TOTAL	
		3	1	-	15	15	30	70
Professional Elective-1A or Professional Elective-1B or Professional Elective-1C or Professional Elective-1D or Professional Elective-1E		Any one subject to be Selected from the Professional Electives (Group-1 i.e. CE06TPE01A or CE06TPE01B or CE06TPE01C or CE06TPE01D or CE06TPE01E)						
Professional Electives Group -1								
CE06TPE01A		Structural Analysis by Matrix Methods						
CE06TPE01B		Advanced Surveying						
CE06TPE01C		Advanced Concrete Design						
CE06TPE01D		Railway Engineering						
CE06TPE01E		Basics of Computational Hydraulics						



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SYLLABUS	(SEMESTER-VI)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
Subject Code:	CE06TPE01A									
Subject:	Structural Analysis by Matrix Methods(Professional Elective -IX)	3	1	0	15	15	30	70	100	04

Course Learning Objectives:

The objective of this course is

- To understand the flexibility and stiffness matrices and their relationship between them
- To understand the analysis of continuous beams by force (flexibility) and displacement (stiffness) methods
- To understand the analysis of rigid and pin jointed plane frames by force and displacement methods
- To differentiate the force and displacement methods

Course Content:

UNIT-1: Static indeterminacy, kinematic indeterminacy; Matrix concepts and Matrix analysis of structures: Flexibility and Stiffness; Flexibility Matrix; Stiffness matrix; Relationship between Flexibility matrix and Stiffness matrix; Force displacement methods; Indeterminate Beams: Introduction; Analysis of indeterminate beams by flexibility and stiffness methods; Comparison of flexibility and stiffness methods;

UNIT-2: Rigid Joint Plane Frames: Introduction; Static indeterminacy; Analysis of rigid joint plane frames by flexibility method.

Unit-3: Rigid Joint Plane Frames: Introduction; Kinematic indeterminacy; Analysis of rigid joint plane frames by Stiffness matrix method.

UNIT-4: Pin-jointed Plane Frames (Trusses): Introduction; Static indeterminacy of pin jointed truss; Analysis of pin joint plane frames (trusses) by flexibility method.

Unit-5: Introduction; Kinematic indeterminacy of a Pin-jointed plane frame; Analysis of pin joint plane frames (trusses) by stiffness method.

Text Books:

1. Devdas Menon, "Advanced Structural Analysis", Narosa Publishing House, 2009



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2. Asslam Kassimali, "Matrix Analysis of Structures", Brooks/Cole Publishing Co., USA, 1999.
3. Weaver W. and Gere J. M., "Matrix Analysis of Framed Structure", CBS Publishers, Delhi.
4. Amin Ghali, Adam M Neville and Tom G Brown, "Structural Analysis: A Unified Classical and Matrix Approach", Sixth Edition, 2007, Chapman & Hall.
5. Devdas Menon, "Structural Analysis", Narosa Publishing House, 2008.
6. McGuire, W., Gallagher R. H. & Zimian, R. D. "Matrix structure analysis", John Willey Publication
7. G S Pandit & S P gupta, "Structural Analysis-A Matrix Approach"

Course Outcomes

At the end of the course the students shall be able

- To develop stiffness and flexibility matrix for prismatic members
- To do matrix computations to analyse structures



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SYLLABUS	(SEMESTER-VI)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
Subject Code:	CE06TPE01E									
Subject:	Basics of Computational Hydraulics (Professional Elective - IX)	3	1	0	15	15	30	70	100	04

Course Learning Objectives:

The objective of this Course is to

- Provide knowledge on application of computational fluid mechanics to different Civil of engineering problems.
- Provide knowledge on conservation law and the numerical approach to solve by converting different form of partial differential equations.
- Provide some experience in the software engineering skills associated with the implementation of MATLAB computer programming and use of Computational Fluid Dynamics (CFD) software.

Course Content:

Unit 1: Introduction, significance of computational hydraulics, discrete forms of the laws of conservation of mass, momentum and energy, examples of free surface flows.

Unit 2: Continuous forms of the conservation laws, lateral inflow's 1-D expansions and contractions, homogeneous and stratified fluid flows.

Unit 3: Introduction to computer programming and computation with MATLAB and using of Computational Fluid Dynamics (CFD) software.

Unit 4: Pipe flow analysis, Open channel flow: Types of Open Channel Flow, Estimation of normal and critical depth, uniform flow computations

Unit 5: Computation of water surface profile (WSP) gradually varied flow estimation using direct step methods.

Text Books:

1. Sreenivas Jayanti, Computational Fluid Dynamics for Engineers and Scientists, Springer, 2018.
2. J.D. Hoffman, Numerical Methods for Engineers and Scientists, CRC Press, Special Indian Edition, 2011.



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3. K. A Hoffmann, Computational Fluid Dynamics, Engineering Education System, 2000.
4. M.H. Choudhary, Applied Hydraulic Transients, Van Nostrand Reinhold, New York, 1997.
5. M.B. Abbot & A.W. Minns, Computational Hydraulics, Ashgate Publication, 1994.
6. J.D. Anderson, Computational Fluid Dynamics, McGraw Hill, 1995.
7. C.B. Vreugdenhill, Computational Hydraulics: An Introduction, Springer-Verlag, Berlin, 1989.
8. M.B. Abbott & J.A. Gunge, Engineering Applications of Computational Hydraulics – Pitman Books Ltd., 1982.

Course Outcomes

At the end of the course the students shall be able

- To understand the governing equations based on conservation principals in fluid flow problems,
- To know the use of finite difference method applied to fluid flow problems,
- To check the output from numerical method as compared to the observed data
- To develop computer skill.



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SYLLABUS	(SEMESTER-VI)							
Subject Code:	CE06TOE01X	CREDITS:3			SESSIONAL - TA			ESE
Subject:	Open Elective - IX	L	T	P	CT-I	CT-II	TOTAL	
		3	-	-	15	15	30	70
Open Elective-IA or Open Elective-1B or Open Elective-1C or Open Elective-1D		Any one subject to be Selected from the Open Electives Group (i.e. CE06TOE01A or CE06TOE01B or CE06TOE01C or CE06TOE01D)						
Open Electives Group 1								
	CE06TOE01A	Metro Systems and Engineering						
	CE06TOE01B	Rural Technology and Community Development						
	CE06TOE01C	Remote Sensing and GIS						
	CE06TOE01D	ICT for Development						



DEPARTMENT OF CIVIL ENGINEERING B.TECH. THIRD YEAR SYLLABUS W.E.F 2020-21

SYLLABUS	(SEMESTER-VI)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
Subject Code:	CE06TOE01A									
Subject:	Metro Systems and Engineering (Open Elective -IX)	3	0	0	15	15	30	70	100	03

Course Learning Objectives:

- To introduce concepts of different types of mode of transportation and associated facilities.
- To familiarize the students with the concepts of 1-D and 2-D signals, design of 1-D and 2-D filters and various aspects of image processing.
- To study town planning concepts and theories.
- To perceive the concept of urbanization and various growth patterns.
- To study the concepts for different area planning for urban PTS.
- To understand the concept of urban transport scenario, traffic characteristics and transport development.
- To get the knowledge of advanced transportation engineering planning and management techniques.
- To understand the approach and utility of Environmental Impact Assessment for the urban infrastructural measures.

Course Content:

Unit 1: Modes of Transportation: Transportation parameters- Traffic and Transport Problems of a city, Mass transport system, Modes of transportation & characteristics, Public transport system, public private transport system, Advantages and disadvantages of Public transport system. Role of transportation in mass transportation, advanced modes.

Transportation Infrastructure- Green bays, control stations, mitigation buildings, separator lanes and safety islands.

Unit 2: Urban Public Transport System Rapid transit systems: BRTS, Bus Lane system, Advantages and limitations in Indian Scenario, Rail System, Types of rail system, advantages and disadvantages of rail system, sky walk and under bridge and its advantages. Advances in infrastructure.

Urban Pedestrian Safety- Skyways, Intersection subways, halt stations, crossing measures, flexibility in accessibility.

Unit 3: ITS Background and Telemetric systems: Definitions, features and objectives of ITS, History of ITS and its development over the world, telemetric concept, transport telemetric, telemetric structure, ITS taxonomy, ITS application areas, uses, and application overview, ITS implication through AI, ITS based regression models.

Unit 4: ITS components, tools and strategies: Components of user services; advanced traffic management system, advanced traveler information systems, advanced vehicle control



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system, commercial vehicle operational management, advanced public transportation system, electronic payment system, advanced rural transportation, security and safety systems, urban traffic control, benefits and limitations, traffic calming systems, freight management by ITS.

Unit 5: Environmental Impact Assessment: Description of proposed activity, structural audits, analysis of site selection procedure, baseline conditions / major concerns, green building and its advantages, description of potential positive and negative environmental, social, economic and cultural impacts including cumulative, regional, temporal and spatial considerations, significance of mitigation plans and monitoring plans (impacts and mitigation efforts)

Text Books:

1. Kadialy L.R., "Traffic Engg. and Transport Planning", 8th edition, Khanna Publishers, 2011.
2. O. Flaherty C.A., "Traffic Engineering and Transport Planning", 2006.
3. AUSTROADS, The Implication of Intelligent Transport Systems for Road Safety, Austroads Incorporated, 1999. 2. Bob Williams, Intelligent Transport Systems Standards, Artech House Publishers, 2008.
4. Chowdhury, M. A. and Sadek, A, Fundamentals of Intelligent Transportation Systems Planning, Artech House, 2003.
5. E. Bekiaris and Y.J. Nakanishi, Economic Impacts of Intelligent Transportation Systems: Innovations and Case Studies, Elsevier/JAI, 2004. 5. IET Intelligent Transport Systems and 15th International IEEE Conference on Intelligent Transportation Systems (ITSC), 16-19 September, 2012. (<http://digital-library.theiet.org/content/journals/iet-its>)
6. J.M. Sussman, Perspectives on Intelligent Transportation Systems (ITS), Springer, 2005
7. L. Vlacic, M. Parent, F. Harashima, Intelligent Vehicle Technologies – Theory and Applications, Butterworth-Heinemann, 2010.
8. M.A. Chowdhury and A. Sadek, Fundamentals of Intelligent Transportation Systems Planning, Artech House, 2010.
9. R. Stough, Intelligent Transport Systems: Cases and Policies, Edward Elgar, 2001, Artificial Intelligence and Intelligent Transportation Systems, National Academy Press, 2010.
10. Gonzalez R. C. and Woods R. C., "Digital Image Processing", 2nd Ed., Pearson Education, 2007.
11. Jain A. K, "Fundamentals of Digital Image Processing", Prentice Hall, 2007.
12. R.R. Barthwal "Environmental Impact Assessment" New Age International, January 2012.
13. A.R. Gajbhiye & S.R. Khandeshwar N.S. Raman, "Environmental Impact Assessment", I.K. International, 2014

Course Outcomes: At the end of the course, students will be able to

- Concepts of different types of mode of transportation and associated facilities with advanced system.
- Identify and differentiate ITS user services and its components.



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- Select and provide appropriate ITS technology to solve real-life traffic problems.
- Manage the traffic congestion by acquisition of big data using advanced devices.
- Implement the suitable ITS and services for effective transportation.
- Propose the mitigation plan for the EIA for the urban infrastructure.



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SYLLABUS	(SEMESTER-VI)	Periods/Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
Subject Code:	CE06TOE01C									
Subject:	Remote Sensing and GIS (Open Elective - IX)	3	0	0	15	15	30	70	100	03

Course Learning Objectives:

The objective of this Course is

- To understand the basic concept of Remote Sensing and know about different types of satellite and sensors.
- To illustrate Energy interactions with atmosphere and with earth surface features, Interpretation of satellite and topo sheet maps.
- To understand different components of GIS and Learning about map projection and coordinate system.
- To develop knowledge on conversion of data from analogue to digital and working with GIS software.

Course Content:

UNIT 1: INTRODUCTION AND CONCEPTS : Introduction of Remote Sensing – Energy sources and Radiation principles, Energy equation, EMR and Spectrum, EMR interaction with atmosphere scattering, absorption, EMR interaction with earth surface features reflection, absorption, emission and transmission, Spectral response pattern , vegetation, soil, water bodies- Spectral reflectance.

UNIT 2: AERIAL PHOTOGRAPHY AND PHOTOGRAMMETRY: Introduction- Terrestrial and Aerial photographs - vertical and oblique photographs - height determination contouring - photographic interpretations - stereoscopy – parallax bar- Flight Planning- Photo Interpretation, Applications of aerial photos-photo theodolite.

UNIT 3: SATELLITE REMOTE SENSING PRINCIPLES: Data acquisition –Procedure, Reflectance and Digital numbers- Intensity Reference data, Ground truth, Analog to digital conversion, Detector mechanism-spectro- radiometer-ideal remote sensing system – characters of real and successful remote sensing system- platforms and sensors- orbits types – resolution

UNIT 4: REMOTE SENSING SATELLITES:Land observation satellites, characters and applications, IRS series, LANDSAT series, SPOT series, High resolution satellites, character and applications, CARTOSAT series, IKONOS Series, QUICKBIRD series, Weather/Meteorological satellites, INSAT series, NOAA, GOES, NIMBUS Applications, Marine observation satellites OCEANSAT.



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UNIT 5: BASICS OF GIS: Introduction, concepts , information system , components of GIS, History, Geospatial data architecture, Operations, geographic co-ordinate systems, map projections, concepts, input data for GIS , display ,types of output products. GIS categories, Level and scale of Measurement, importance of data quality.

Text Books:

1. M. Anji Reddy, Textbook of Remote Sensing and Geographical Information systems, BS Publications, Hyderabad. 2011. ISBN: 81- 7800-112-8.
2. A.M.Chandra and S.K. Gosh. Remote Sensing and GIS, Narosa Publishing Home, New Delhi 2009.
3. Thomas M. Lillesand, Ralph W. Kiefer, Jonathan W. Chipman Remote sensing and image interpretation John Wiley & Sons, 2008.
4. George Joseph, Fundamentals of Remote Sensing Universities Press, Hyderabad

Course Outcomes

At the end of the course the students shall be able

- To understand the concepts of Photogrammetry and compute the heights of objects;
- To understand the principles of aerial and satellite remote sensing, able to comprehend the energy interactions with earth surface features, spectral properties of water bodies;
- To understand the basic concept of GIS and its applications, know different types of data representation in GIS;
- To understand and Develop models for GIS spatial Analysis and will be able to know what are the questions that GIS can answer and
- To apply knowledge of GIS software and able to work with GIS software in various application fields.



DEPARTMENT OF CIVIL ENGINEERING B.TECH. THIRD YEAR SYLLABUS W.E.F 2020-21

SYLLABUS	(SEMESTER-VI)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
Subject Code:	CE06TOE01D									
Subject:	ICT for Development (Open Elective -IX)	3	0	0	15	15	30	70	100	03

Course Learning Objectives:

The objective of this Course is to provide a

- Multi-disciplinary platform along with an emphasis on modern day real time applications.
- Due to the day to day changes in the field of science and technology, ICT program of Engineering will facilitate and provide an opportunity to equip with the skills and knowledge required to design, implement & manage a variety of Information system.

Course Content:

Unit-1: ICT Fundamentals; Information Technology philosophy, Need of information technology, Logic of Information, Cybernetics, Definitions(Peirce, Shannon-Weaver, Bateson), Information and society, Information Processing cycle, Impact of information on the society, IT act of India (Just Introduction), ICT models (brief), Analog Communication, Digital Communication, Data Communication, Structure of Communication, Transmission modes (Simplex, half duplex, Full duplex), Synchronous and Asynchronous transmission, Serial and Parallel communication, Need of Modulation, Antenna Height/length, Energy, Band-Edge Ratio, Multiplexing, Amplitude modulation, Definition, Mathematical derivation and calculation of modulation index, power, Frequency spectrum, Frequency modulation, Definition, Mathematical Derivation and calculation of frequency deviation Frequency spectrum.

Unit-2: Data Networks; Models of Network Computing (Centralize Computing, distributed Computing, collaborative Computing), Client Server Network and Peer to Peer Network, Network Topologies (Bus, Mesh, Star, Ring), Various types of computer Network (LAN, MAN, WAN), Types of switching network (Circuit and Packet), Need of layered mechanism, OSI Model (brief description of each layer), TCP/IP Model(brief description of each layer).

Unit-3: Physical View of ICT; Multiplexing, Definition and need, Time Division Multiplexing, Frequency Division Multiplexing, Code Division Multiplexing, Orthogonal Frequency Division Multiplexing, Identification of various transmission media, Wired media (Coaxial, Twisted Paid cable and their connectors), Wireless media (Microwave, Radio), Application of wireless media in satellite Communication, block diagram, important Definitions, Network Connecting devices (Switch, Router, Repeater, Bridges, Gateway) 3.4 IEEE standards for LAN(Introduction only).



Unit-4: Network Addressing; IPv4 addressing, Need of IP address, IPv4 addressing scheme, Address space and notations, Mask, netid, hosted, Sub-netting and super-netting, Classful and classless notations, Network address translations, IPv6 addressing, Need for IPv6 migration, IPv6 addressing scheme, Hexadecimal column notation, Uni-cast addresses, multicast addresses, anycast addresses Reserved addresses and local addresses, Address mapping (logical to physical, physical to logical), Ping and trace-route commands.

Unit-5: Protocols and Data Transportation; UDP and TCP protocols, Connectionless and connection oriented communication, Reliable and Unreliable communication UDP and TCP protocols, Data traffic and congestion management, DNS, Domain, domain name, domain zone, root server, Domain types, Address resolution, Address mapping, Address, mapping address to names, recursive resolution, iterative resolution, caching) Protocols(introduction only), Data link layer protocols, ARP,RARP,ICMP protocols (only brief explanation), Routing (brief explanation), Routing table, Uni-cast routing protocols and multicast routing protocols), SMTP, POP, IMAP, WWW and HTTP.

Text Books:

1. Richard Heeks, "Information and Communication Technology for Development". Routledge; 1 edition (November 7, 2017)
2. Nureni and Yekini "Information Communication Technology", Hasfem Publication center Shomolu
3. Sreekumar T.T., "ICTs and Development in India", Anthem Press.

Ravichandran A. "Fundamentals of Information Technology", Khanna Publishers
4. James Irvine and David Harle "Data Communications and Networks", Wiley-Blackwell; 1 edition (22 October 2001)
5. Achyut S. Godbole and Atul Kahate "Data Communications and Networks", 2nd Edition, June 13, 2011, McGraw-Hill Education
6. Keshav S. "An Engineering Approach to Computer Networking", Pearson Education India; 1 edition (2002)
7. Prakash C. Gupta, "Data Communication and Computer Networks", 2nd Edition, Jan 2014 PHI Learning Pvt. Ltd.

Course Outcomes

At the end of the course the students shall be able

- To understand the importance of information and information communication technology.
- To understand basic concept of analog communication.
- To Identify network, servers, topologies and networking component
- To understand protocols and IEEE standards