

Teaching and Evaluation Scheme
B. Tech Civil Engineering: III Semester

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for Passing	Max	Min. for Passing	
1CVBS201	Applied Mathematics III	3	1	--	4	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CVPC202	Advanced Surveying	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CVPC203	Fluid Mechanics	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CVPC204	Strength of Materials	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CVPC205	Building Technology	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CVES251	CAD Practice Laboratory	--	--	2	1	ISE	--	--	--	25	10
1CVPC252	Advanced Surveying Laboratory	--	--	2	1	ISE	--	--	--	25	10
						ESE	--	--	POE	25	10
1CVPC253	Strength of Materials Laboratory	--	--	2	1	ISE	--	--	--	25	10
1CVPC254	Fluid Mechanics Laboratory	--	--	2	1	ISE	--	--	--	25	10
						ESE	--	--	POE	25	10
1CVPC255	Building Technology Laboratory	--	--	2	1	ISE	--	--	--	50	20
Total		15	1	10	21	--	500	--	--	200	--
Total Contact Hours/Week: 26 hrs						Total-500+200=700					

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	04	01	16	00	00	00
Cumulative Sum	04	20	21	16	00	00	00

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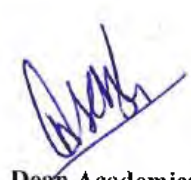
CV-5T-05/15

Teaching and Evaluation Scheme
B. Tech Civil Engineering: IV Semester

Course code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for Passing	Max	Min. for Passing	
1CVHS206	Engineering Management	4	--	--	4	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CVPC207	Structural Analysis	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CVPC208	Water Resources Engineering	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CVPC209	Building Design & Drawing	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CVPC210	Concrete Technology	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CVMC211	Environmental Studies	2	--	--	--	ISE	Grade	--	--	--	--
1CVHS212	Introduction to Psychology	1	--	--	1	ISE	--	--	25	10	
1CVPC256	Building Design & Drawing Laboratory	--	--	4	2	ISE	--	--	50	20	
1CVPC257	Concrete Technology Laboratory	--	--	2	1	ESE	--	--	25	10	
1CVHS258	General Proficiency I Laboratory	--	--	2	1	ISE	--	--	50	20	
						ESE	--	--	25	10	
						ISE	--	--	25	10	
Total		19	--	08	21		500	--	200	---	
Total Contact Hours/Week: 27 hrs						Total-500+200=700					

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	06	00	00	15	00	00	00
Cumulative Sum	10	20	21	31	00	00	00


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CV-57-06/15

Teaching and Evaluation Scheme
B. Tech Civil Engineering: V Semester

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for Passing	Max	Min. for Passing	
1##OE###	Open Elective I	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CVPC303	Design of Steel Structures	3	1	--	4	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CVPC304	Geotechnical Engineering I	4	--	--	4	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CVPC305	Environmental Engineering	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CVPE3**	Professional Elective I	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CVPC351	Geotechnical Engineering I Laboratory	--	--	2	1	ISE	--	--	--	25	10
1CVPC352	Building Planning& Drawing Laboratory	--	--	4	2	ESE	--	--	POE	25	10
1CVPE3**	Professional Elective I Laboratory	--	--	2	1	ISE	--	--	OE	25	10
1CVPC358	Environmental Engineering Laboratory	--	--	2	1	ISE	--	--	--	25	10
1CVES359	Professional Skill Practices	--	--	2	1	ISE	--	--	--	25	10
1CVPR360	Seminar	--	1	--	1	ISE	--	--	--	25	10
Total		16	2	12	24	--	500	--	--	200	--
Total Contact Hours/Week: 30 hrs						Total-500+200=700					

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	00	01	15	04	03	01
Cumulative Sum	10	20	22	46	04	03	01

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CV-5T-08/15

Sr. No.	Course Code	Professional Elective I	Sr. No.	Laboratory Course Code	Professional Elective I Laboratory
1	ICVPE306	Engineering Geology	1	ICVPE353	Engineering Geology Laboratory
2	ICVPE307	Advanced Structural Analysis	2	ICVPE354	Advanced Structural Analysis Laboratory
3	ICVPE308	Open Channel Flow	3	ICVPE355	Open Channel Flow Laboratory
4	ICVPE309	Town Planning & Traffic Engineering	4	ICVPE356	Town Planning & Traffic Engineering Laboratory
5	ICVPE310	Safety Aspects in Construction	5	ICVPE357	Safety Aspects in Construction Laboratory

Open Elective I		
Course Code	Course Name	Course Offered by
IME0E101	M/CS and Mechanisms	Mechanical Engineering
IME0E102	Manufacturing Engineering	
ICSOE301	Database Essentials	Computer Science and Engineering
ICSOE302	Software Engineering and Project Management	
ICSOE303	Data Structures and Algorithms	
IEEOE301	Electrical Technology	Electrical Engineering
IEEOE302	Electrical and Electronics Measurements	
ICVOE301	Air Pollution & Control	Civil Engineering
ICVOE302	Remote Sensing & GIS Applications	
IAUOE301	Product design and development	Automobile Engineering
IAUOE302	Automotive Refrigeration and air conditioning	
IAEOE101	Introduction to Aerospace Engineering	Aeronautical Engineering
IAEOE102	Drone Piloting	


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CV-5T-09/15

Teaching and Evaluation Scheme
B. Tech Civil Engineering: VI Semester

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for Passing	Max	Min. for Passing	
I##OE###	Open Elective II	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CVPC312	Theory of Structures	3	1	--	4	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CVPC313	Infrastructure Engineering	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CVPE3**	Professional Elective II	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CVPE3**	Professional Elective III	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CVMC324	Constitution of India	2	--	--	--	ISE	--	--	Grade	--	--
1CVPC361	Infrastructure Engineering Laboratory	--	--	2	1	ISE	--	--	25	10	
1CVPE3**	Professional Elective III Laboratory	--	--	2	1	ESE	--	--	OE	25	10
1CVPR367	Structural Design & Drawing I	--	--	4	2	ISE	--	--	25	10	
1CVES368	Software Training in Civil Engineering	--	--	4	2	ISE	--	--	50	20	
Total		17	1	12	22						
Total Contact Hours/Week: 30 hrs											
							500	--	200	--	
							Total-500+200=700				

*Students should undergo one month field training in vacation (15 May to 15 June) which will be assessed in the next semester

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	00	02	08	07	03	02
Cumulative Sum	10	20	24	54	11	06	03


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CV-5T-10/15

Sr. No.	Course Code	Professional Elective II
1	ICVPE314	Repair & Rehabilitation of Structures
2	ICVPE315	Solid Mechanics
3	ICVPE316	Disaster Management
4	ICVPE317	Ground Improvement Techniques
5	ICVPE318	Geotechnical Engineering II

Sr. No.	Course Code	Professional Elective III	Sr. No.	Course Code	Professional Elective III Laboratory
1	ICVPE319	Site Investigation Methods & Practices	1	ICVPE362	Site Investigation Methods & Practices Laboratory
2	ICVPE320	Structural Masonry	2	ICVPE363	Structural Masonry Laboratory
3	ICVPE321	Waste Treatment & Pollution Control	3	ICVPE364	Waste Treatment & Pollution Control Laboratory
4	ICVPE322	Advanced Construction Techniques	4	ICVPE365	Advanced Construction Techniques Laboratory
5	ICVPE323	Structural Auditing	5	ICVPE366	Structural Auditing Laboratory

Open Elective II		
Course Code	Course Name	Course Offered by
1ME0E103	Vehicle Engineering	Mechanical Engineering
1ME0E104	Energy Engineering	
1CSOE310	Internet of Things	Computer Science and Engineering
1CSOE311	Cyber Laws and Ethical Hacking	
1EE0E306	Electrical Wiring Harnessing	Electrical Engineering
1EE0E307	Electrical Economics & Energy Audit	
1CVOE310	Operations Research	Civil Engineering
1CVOE311	Economics & Management	
1AUOE310	Vibration based fault diagnosis	Automobile Engineering
1AUOE311	Engineering Tribology	
1AEOE103	Dynamics and Control of Aerospace Vehicles	Aeronautical Engineering
1AEOE104	Space Transportation Systems	


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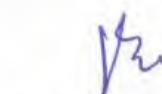

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CV-5T-11/15

Teaching and Evaluation Scheme
B. Tech Civil Engineering: VII Semester

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for Passing	Max	Min. for Passing	
I##OE###	Open Elective III	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50	20	--	--	
1CVPC403	Design of Reinforced Concrete Structures	4	--	--	4	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50	20	--	--	
1CVPE4**	Professional Elective IV	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50	20	--	--	
1CVPC409	Earthquake Resistant Structures	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50	20	--	--	
1CVPC410	Quantity Surveying & Valuation	4	--	--	4	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50	20	--	--	
1CVPC451	Quantity Surveying & Valuation Laboratory	--	--	2	1	ISE	--	--	25	10	
1CVPR452	Structural Design & Drawing II	--	--	4	2	ESE	--	POE	25	10	
1CVPR453	Project Phase – I	--	--	4	4	ISE	--	--	25	10	
1CVHS454	General Proficiency II Laboratory	--	--	2	1	ISE	--	--	50	20	
1CVPC455	Field Training	--	--	--	1	ESE	--	OE	25	10	
						ISE	--	--	25	10	
Total		17	--	12	26	ISE	--	--	25	10	
						--	500	--	200	--	
Total Contact Hours/Week: 29 hrs						Total-500+200=700					

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	01	00	00	13	03	03	06
Cumulative Sum	11	20	24	67	14	09	09



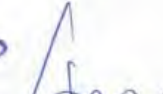
Head of Department



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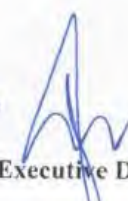
Sr. No.	Course Code	Professional Elective IV
1	1CVPE404	Entrepreneurship
2	1CVPE405	Hydraulic Structures
3	1CVPE406	Pavement Design & Analysis
4	1CVPE407	Advanced Design of Concrete Structures
5	1CVPE408	Design of Foundation

Open Elective III		
Course Code	Course Name	Course Offered by
1MEOE401	Total Quality Management	Mechanical Engineering
1MEOE402	Reliability Engineering	
1MEOE403	Renewable Energy Engineering	
1CSOE401	Introduction to image processing and computer vision	Computer Science and Engineering
1CSOE402	Introduction to machine learning	
1EEOE401	Electric Vehicles	Electrical Engineering
1EEOE402	Wind and Solar Energy Systems	
1CVOE401	Structural Auditing	Civil Engineering
1CVOE402	Disaster Management	
1AUOE401	Vehicle maintenance and safety	Automobile Engineering
1AUOE402	Vehicle Aerodynamics	
1AEOE421	Air Traffic Control and Airport Management	Aeronautical Engineering
1AEOE422	Aircraft General Engineering Maintenance	
1AEOE423	Design of Fixed wing unmanned aerial vehicles	
0FTOE411	Process Optimization	Food Technology
0FTOE412	Cold Storage and Supply Chain Management	


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Teaching and Evaluation Scheme
B. Tech Civil Engineering: VIII Semester

Course Code	Course	Teaching Scheme			
		L	T	P	Credits
1CVPE**	Professional Elective V	3	--	--	3
1CVPC416	Project & Finance Management	3	--	--	3
1CVPR456	Project Phase – II + Internship	--	--	8	8
Total		6	--	8	14
Total Contact Hours/Week: --14 hrs					

Evaluation Scheme					
Scheme	Theory (Marks)		Practical (Marks)		
	Max	Min. for Passing	Max	Min. for Passing	
ISE I	10	--	40	--	--
MSE	30			--	--
ISE II	10			--	--
ESE	50	20	--	--	
ISE I	10	--	40	--	--
MSE	30			--	--
ISE II	10			--	--
ESE	50	20	--	--	
ISE	--	--	--	250	100
ESE	--	--	OE	250	100
--	200	--	--	500	--
Total – 200+500=700					

Sr. No.	Course Code	Professional Elective V
1	1CVPE411	Design of Bridges
2	1CVPE412	Management Information System
3	1CVPE413	Advanced Engineering Geology & Rock Mechanics
4	1CVPE414	Industrial Waste Water Treatment
5	1CVPE415	Human Resources Development

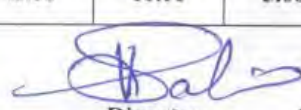
Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	00	00	03	03	00	08
Cumulative Sum	11	20	24	70	17	09	17

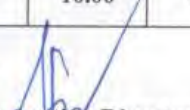
Comparison of AICTE & Institute Curriculum

Course Category	HS	BS	ES	PC	PE	OE	PR	Total
AICTE	12	25	24	48	18	18	15	160
Civil Department	11	20	24	70	17	09	17	168
AICTE (%)	8.00	16.00	15.00	30.00	11.00	11.00	9.00	100
Civil Department (%)	7.00	12.00	14.00	42.00	10.00	5.00	10.00	100


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ST-CV-02/02



Annasaheb Dange College of
Engineering and Technology, Ashta
(An Autonomous Institute)

F.Y. B. Tech. Structure

CIVIL ENGINEERING

SEM I- II

w. e. f. Academic Year: 2019-2020

Teaching and Evaluation Scheme
B. Tech Civil Engineering: I Semester

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for Passing	Max	Min. for Passing	
1CVBS101	Applied Physics	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CVBS102	Applied Mathematics I	3	1	--	4	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CVES103	Fundamentals of Civil Engineering	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CVES104	Engineering Graphics	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CVHS105	Professional Communication	2	--	2	3	ISE	--	--	--	50	20
1CVBS151	Applied Physics Laboratory	--	--	2	1	ISE	--	--	--	50	20
1CVES152	Fundamentals of Civil Engineering Laboratory	--	--	2	1	ISE	--	--	--	50	20
1CVES153	Engineering Graphics Laboratory	--	--	2	1	ISE	--	--	--	50	20
1CVHS154	Professional Ethics & Behavioral Science	--	--	2	1	ISE	--	--	--	50	20
Total		14	1	10	20	--	400	--	--	250	--
Total Contact Hours/Week: 25 hrs						Total-400+250=650					

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	04	08	08	00	00	00	00
Cumulative Sum	04	08	08	00	00	00	00

Head of Department

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CV&T-02/15

Teaching and Evaluation Scheme
B. Tech Civil Engineering: II Semester

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1CVBS106	Applied Chemistry	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CVBS107	Applied Mathematics II	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CVES108	Applied Mechanics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CVES109	Basic Electrical & Electronics Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CVES110	Computer Programming in C	2	--	--	2	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CVBS156	Applied Chemistry Laboratory	--	--	2	1	ISE	--	--	50	20
1CVES157	Applied Mechanics Laboratory	--	--	2	1	ISE	--	--	50	20
1CVES158	Basic Electrical & Electronics Engineering Laboratory	--	--	2	1	ISE	--	--	50	20
1CVES159	Computer Programming in C Laboratory	--	--	2	1	ISE	--	--	25	10
1CVES160	Workshop Practice	--	--	2	1	ISE	--	--	25	10
Total		14	1	10	20	--	500	--	200	--
Total Contact Hours/Week: 25 hrs						Total-500+200=700				

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	08	12	00	00	00	00
Cumulative Sum	04	16	20	00	00	00	00

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CV-5T-03/15



Annasaheb Dange College of
Engineering and Technology, Ashta
An Autonomous Institute

S. Y. B. Tech. Structure

CIVIL ENGINEERING

SEM III - IV

w. e. f. Academic Year: 2020-2021

Head of Department

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CV-ST-04/75

Teaching and Evaluation Scheme
B. Tech Civil Engineering: III Semester

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1CVBS201	Applied Mathematics III	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CVPC202	Advanced Surveying	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CVPC203	Fluid Mechanics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CVPC204	Strength of Materials	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CVPC205	Building Technology	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CVES251	CAD Practice Laboratory	--	--	2	1	ISE	--	--	25	10
1CVPC252	Advanced Surveying Laboratory	--	--	2	1	ISE	--	--	25	10
						ESE	--	POE	25	10
1CVPC253	Strength of Materials Laboratory	--	--	2	1	ISE	--	--	25	10
1CVPC254	Fluid Mechanics Laboratory	--	--	2	1	ISE	--	--	25	10
						ESE	--	POE	25	10
1CVPC255	Building Technology Laboratory	--	--	2	1	ISE	--	--	50	20
Total		15	1	10	21	--	500	--	200	--
Total Contact Hours/Week: 26 hrs						Total-500+200=700				

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	04	01	16	00	00	00
Cumulative Sum	04	20	21	16	00	00	00

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CV-5T-05/15

Teaching and Evaluation Scheme
B. Tech Civil Engineering: IV Semester

Course code	Course	Teaching Scheme			
		L	T	P	Credits
1CVHS206	Engineering Management	4	--	-	4
1CVPC207	Structural Analysis	3	--	-	3
1CVPC208	Water Resources Engineering	3	--	--	3
1CVPC209	Building Design & Drawing	3	--	-	3
1CVPC210	Concrete Technology	3	--	-	3
1CVMC211	Environmental Studies	2	--	-	--
1CVHS212	Introduction to Psychology	1	--	-	1
1CVPC256	Building Design & Drawing Laboratory	--	--	4	2
1CVPC257	Concrete Technology Laboratory	--	--	2	1
1CVHS258	General Proficiency I Laboratory	--	--	2	1
Total		19	--	08	21

Total Contact Hours/Week: 27 hrs

Evaluation Scheme					
Scheme	Theory (Marks)		Practical (Marks)		
	Max	Min. for Passing	Max	Min. for Passing	
ISE I	10	--	40	--	--
MSE	30			--	--
ISE II	10			--	--
ESE	50	20	--	--	
ISE I	10	--	40	--	--
MSE	30			--	--
ISE II	10			--	--
ESE	50	20	--	--	
ISE I	10	--	40	--	--
MSE	30			--	--
ISE II	10			--	--
ESE	50	20	--	--	
ISE I	10	--	40	--	--
MSE	30			--	--
ISE II	10			--	--
ESE	50	20	--	--	
ISE I	10	--	40	--	--
MSE	30			--	--
ISE II	10			--	--
ESE	50	20	--	--	
ISE	Grade	--	--	--	--
ISE	--	--	--	25	10
ISE	--	--	--	50	20
ESE	--	--	POE	25	10
ISE	--	--	--	50	20
ESE	--	--	OE	25	10
ISE	--	--	--	25	10
--	500	--	--	200	--

Total-500+200=700

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	06	00	00	15	00	00	00
Cumulative Sum	10	20	21	31	00	00	00

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T. Y. B. Tech. Structure

CIVIL ENGINEERING

SEM V- VI

w. e. f. Academic Year- 2021-2022

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CV BT 01/18

Teaching and Evaluation Scheme
B. Tech Civil Engineering: V Semester

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1##OE###	Open Elective I	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CVPC303	Design of Steel Structures	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CVPC304	Geotechnical Engineering I	4	--	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CVPC305	Environmental Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CVPE3**	Professional Elective I	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CVPC351	Geotechnical Engineering I Laboratory	--	--	2	1	ISE	--	--	25	10
1CVPC352	Building Planning & Drawing Laboratory	--	--	4	2	ESE	--	--	POE	25
1CVPE3**	Professional Elective I Laboratory	--	--	2	1	ISE	--	--	---	25
1CVPC358	Environmental Engineering Laboratory	--	--	2	1	ESE	--	--	OE	25
1CVES359	Professional Skill Practices	--	--	2	1	ISE	--	--	--	25
1CVPR360	Seminar	--	1	--	1	ISE	--	--	--	25
Total		16	2	12	24	--	500	--	200	--
Total Contact Hours/Week: 30 hrs						Total-500+200=700				

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	00	01	15	04	03	01
Cumulative Sum	10	20	22	46	04	03	01

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Sr. No.	Course Code	Professional Elective I	Sr. No.	Laboratory Course Code	Professional Elective I Laboratory
1	1CVPE306	Engineering Geology	1	1CVPE353	Engineering Geology Laboratory
2	1CVPE307	Advanced Structural Analysis	2	1CVPE354	Advanced Structural Analysis Laboratory
3	1CVPE308	Open Channel Flow	3	1CVPE355	Open Channel Flow Laboratory
4	1CVPE309	Town Planning & Traffic Engineering	4	1CVPE356	Town Planning & Traffic Engineering Laboratory
5	1CVPE310	Safety Aspects in Construction	5	1CVPE357	Safety Aspects in Construction Laboratory

Open Elective I		
Course Code	Course Name	Course Offered by
1ME0E101	M/CS and Mechanisms	Mechanical Engineering
1ME0E102	Manufacturing Engineering	
1CSOE301	Database Essentials	Computer Science and Engineering
1CSOE302	Software Engineering and Project Management	
1CSOE303	Data Structures and Algorithms	
1EEOE301	Electrical Technology	Electrical Engineering
1EEOE302	Electrical and Electronics Measurements	
1CVOE301	Air Pollution & Control	Civil Engineering
1CVOE302	Remote Sensing & GIS Applications	
1AUOE301	Product design and development	Automobile Engineering
1AUOE302	Automotive Refrigeration and air conditioning	
1AEOE101	Introduction to Aerospace Engineering	Aeronautical Engineering
1AEOE102	Drone Piloting	


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CV-5T-05/15

Teaching and Evaluation Scheme
B. Tech Civil Engineering: VI Semester

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1##OE###	Open Elective II	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
ICVPC312	Theory of Structures	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
ICVPC313	Infrastructure Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
ICVPE3**	Professional Elective II	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
ICVPE3**	Professional Elective III	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
ICVMC324	Constitution of India	2	--	--	--	ISE	--	--	Grade	--
ICVPC361	Infrastructure Engineering Laboratory	--	--	2	1	ISE	--	--	25	10
ICVPE3**	Professional Elective III Laboratory	--	--	2	1	ESE	--	--	OE	25
ICVPR36*	Structural Design & Drawing I	--	--	4	2	ISE	--	--	25	10
ICVES368	Software Training in Civil Engineering	--	--	4	2	ISE	--	--	50	20
						ESE	--	--	OE	25
						ISE	--	--	50	20
Total		17	1	12	22	--	500	--	200	--
Total Contact Hours/Week: 30 hrs						Total-500+200=700				

*Students should undergo one month field training in vacation (15 May to 15 June) which will be assessed in the next semester

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	00	02	08	07	03	02
Cumulative Sum	10	20	24	54	11	06	03

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CV-5T-10/15

Sr. No.	Course Code	Professional Elective II
1	ICVPE314	Repair & Rehabilitation of Structures
2	ICVPE315	Solid Mechanics
3	ICVPE316	Disaster Management
4	ICVPE317	Ground Improvement Techniques
5	ICVPE318	Geotechnical Engineering II

Sr. No.	Course Code	Professional Elective III	Sr. No.	Course Code	Professional Elective III Laboratory
1	ICVPE319	Site Investigation Methods & Practices	1	ICVPE362	Site Investigation Methods & Practices Laboratory
2	ICVPE320	Structural Masonry	2	ICVPE363	Structural Masonry Laboratory
3	ICVPE321	Waste Treatment & Pollution Control	3	ICVPE364	Waste Treatment & Pollution Control Laboratory
4	ICVPE322	Advanced Construction Techniques	4	ICVPE365	Advanced Construction Techniques Laboratory
5	ICVPE323	Structural Auditing	5	ICVPE366	Structural Auditing Laboratory

Open Elective II		
Course Code	Course Name	Course Offered by
IME0E103	Vehicle Engineering	Mechanical Engineering
IME0E104	Energy Engineering	
ICSOE310	Internet of Things	Computer Science and Engineering
ICSOE311	Cyber Laws and Ethical Hacking	
IEEOE306	Electrical Wiring Harnessing	Electrical Engineering
IEEOE307	Electrical Economics & Energy Audit	
ICVOE310	Operations Research	Civil Engineering
ICVOE311	Economics & Management	
IAUOE310	Vibration based fault diagnosis	Automobile Engineering
IAUOE311	Engineering Tribology	
IAEOE103	Dynamics and Control of Aerospace Vehicles	Aeronautical Engineering
IAEOE104	Space Transportation Systems	


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CIVIL ENGINEERING

SEM VII -VIII

w. e. f. Academic Year-2022-2023

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Teaching and Evaluation Scheme
B. Tech Civil Engineering: VII Semester

Course Code	Course	Teaching Scheme			
		L	T	P	Credits
I##OE###	Open Elective III	3	--	--	3
ICVPC403	Design of Concrete Structures	4	--	--	4
ICVPE4**	Professional Elective IV	3	--	--	3
ICVPC409	Earthquake Resistant Structures	3	--	--	3
ICVPC410	Quantity Surveying & Valuation	4	--	--	4
ICVPC451	Quantity Surveying & Valuation Laboratory	--	--	2	1
ICVPR452	Structural Design & Drawing II	--	--	4	2
ICVPR453	Project Phase – I	--	--	4	4
ICVHS454	General Proficiency II Laboratory	--	--	2	1
ICVPC455	Field Training	--	--	--	1
Total		17	--	12	26
Total Contact Hours/Week: 29 hrs					

Evaluation Scheme					
Scheme	Theory (Marks)		Practical (Marks)		
	Max	Min. for Passing	Max	Min. for Passing	
ISE I	10	--	40	--	--
MSE	30			--	--
ISE II	10			--	--
ESE	50	20	--	--	
ISE I	10	--	40	--	--
MSE	30			--	--
ISE II	10			--	--
ESE	50	20	--	--	
ISE I	10	--	40	--	--
MSE	30			--	--
ISE II	10			--	--
ESE	50	20	--	--	
ISE I	10	--	40	--	--
MSE	30			--	--
ISE II	10			--	--
ESE	50	20	--	--	
ISE I	10	--	40	--	--
MSE	30			--	--
ISE II	10			--	--
ESE	50	20	--	--	
ISE	--	--	--	25	10
ESE	--	--	POE	25	10
ISE	--	--	--	25	10
ISE	--	--	--	50	20
ESE	--	--	OE	25	10
ISE	--	--	--	25	10
ISE	--	--	--	25	10
--	500	--	--	200	--
Total-500+200=700					

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	01	00	00	13	03	03	06
Cumulative Sum	11	20	24	67	14	09	09

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CN-ST-13/15

Sr. No.	Course Code	Professional Elective IV
1	ICVPE404	Entrepreneurship
2	ICVPE405	Hydraulic Structures
3	ICVPE406	Pavement Design & Analysis
4	ICVPE407	Advanced Design of Concrete Structures
5	ICVPE408	Design of Foundation

Open Elective III		
Course Code	Course Name	Course Offered by
IME0E105	Reliability Engineering	Mechanical Engineering
IME0E106	Vibration Measurement & Analysis	
ICSOE401	Computer Vision	Computer Science and Engineering
ICSOE402	Machine Learning	
IEEOE401	Electric and Hybrid Vehicles	Electrical Engineering
IEEOE402	Wind and Solar Energy Systems	
ICVOE401	Structural Auditing	Civil Engineering
ICVOE402	Disaster Management	
IAUOE401	Vehicle maintenance and safety	Automobile Engineering
IAUOE402	Vehicle Aerodynamics	
IAEOE105	Helicopter Engineering	Aeronautical Engineering
IAEOE106	Composite Structure Fabrication	


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Teaching and Evaluation Scheme
B. Tech Civil Engineering: VIII Semester

Course Code	Course	Teaching Scheme			
		L	T	P	Credits
ICVPE**	Professional Elective V	3	--	--	3
ICVPC416	Project management	3	--	--	3
ICVPR456	Project Phase – II + Internship	--	--	8	8
Total		6	--	8	14
Total Contact Hours/Week: --14 hrs					

Evaluation Scheme					
Scheme	Theory (Marks)		Practical (Marks)		
	Max	Min. for Passing	Max	Min. for Passing	
ISE I	10	40	--	--	
MSE	30		--	--	
ISE II	10		--	--	
ESE	50	20	--	--	
ISE I	10	40	--	--	
MSE	30		--	--	
ISE II	10		--	--	
ESE	50	20	--	--	
ISE	--	--	--	250	100
ESE	--	--	OE	250	100
--	200	--	--	500	--
Total – 200+500=700					

Sr. No.	Course Code	Professional Elective V
1	ICVPE411	Design of Bridges
2	ICVPE412	Management Information System
3	ICVPE413	Advanced Engineering Geology & Rock Mechanics
4	ICVPE414	Industrial Waste Water Treatment
5	ICVPE415	Human Resources Development

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	00	00	03	03	00	08
Cumulative Sum	11	20	24	70	17	09	17

Comparison of AICTE & Institute Curriculum

Course Category	HS	BS	ES	PC	PE	OE	PR	Total
AICTE	12	25	24	48	18	18	15	160
Civil Department	11	20	24	70	17	09	17	168
AICTE (%)	8.00	16.00	15.00	30.00	11.00	11.00	9.00	100
Civil Department (%)	7.00	12.00	14.00	42.00	10.00	5.00	10.00	100

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CV-5T-15/15

Course Details:

Class	F.Y.B. Tech, Sem.- I
Course Code and Course Title	1CVBS101, Applied Physics
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial	03 / 00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10 / 30 / 10 / 50

Course Objectives: The course aims

01	To upgrade students in their basic knowledge of Kinematics and nanophysics.
02	To know the importance of Architectural acoustics.
03	To develop their skills to utilise LASER and Optical Fibre for different industrial applications.
04	To provide knowledge and problem solving skills in the learning environment.

Course Outcomes (COs):

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

1CVBS101_1	Explain the factors affecting the architectural acoustics. (K ²)
1CVBS101_2	Explain the basic terms related to Kinematics and nanophysics. (K ²)
1CVBS101_3	Discuss the basic principle, concepts and applications of LASER and fibre optics. (K ²)
1CVBS101_4	Describe various properties of engineering materials in view of crystallography study. (K ²)
1CVBS101_5	Discuss the concept of diffraction and polarisation. (K ²)

Course Content

Unit 1	Architectural acoustics and Ultrasonic : I) Architectural Acoustics: Introduction, sound wave, properties of sound wave, Classification of sound waves, Reverberation, Reverberation time, Absorption coefficient, Sabine's formula (no derivation), Factors affecting the architectural acoustics and their remedy, Basic requirement for the acoustically good hall, Numerical II) Ultrasonic waves: Introduction, properties of ultrasonic waves, Production of ultrasonic waves by magnetostriction method, Detection of ultrasonic waves, Determination of wavelength and velocity of ultrasonic waves by using acoustic diffraction method, applications of ultrasonic waves, Numerical.	07 Hrs.
Unit 2	Kinematics and Kinetics of Rigid Body: Introduction, Plane Motion of Rigid Body, Velocity and Acceleration under Translation and Rotational Motion, Relative Velocity, Kinetics of Rigid Body: Introduction, Force, Mass and Acceleration.	07 Hrs.
Unit 3	Laser and Fibre Optics : I) Laser: Introduction, Basic concepts of Laser:- Absorption, spontaneous emission, stimulated emission, pumping, population inversion, metastable state, Characteristics of laser, Solid State laser (Ruby Laser), Applications of laser, Holography (Recording and reconstruction of Hologram). II) Optical fibre: Introduction, Basic principle (total internal reflection), Structure of optical fibre, Propagation of light through optical fibre, Acceptance angle and acceptance cone (no derivation), Fractional refractive	07 Hrs.

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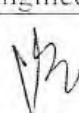
	index change, Numerical aperture (no derivation), Classification of optical fibre, Advantages and disadvantages of optical fibre, Applications of optical fibres, Numerical.	
Unit 4	Wave Optics : Introduction, diffraction, construction and theory of plane diffraction grating, Determination of wavelength of light for different color using plane diffraction grating, Resolving power of grating, Huygens' theory of double refraction (positive and negative Crystals), optical activity, Laurent's half shade Polari meter, numerical.	07 Hrs.
Unit 5	Solid State Physics : Crystallography: Introduction, Unit cell, Bravais lattices, Properties of unit cell (number of atoms per unit cell, coordination number, atomic radius, packing fraction), Calculation of lattice constant(Relation between lattice constant and density), Symmetry elements in cube, Miller indices:- Procedure, Features and Sketches for different planes, X-ray diffraction (Laue method), Bragg's law, X-ray diffractometer, Numerical.	07 Hrs.
Unit 6	Nano Physics: Introduction, Concept of nanotechnology, Production techniques:- Top-down (eg. Ball milling) and Bottom-up (eg. Sol-gel process), Tools – Scanning Electron Microscope (SEM) and Atomic Force Microscope (AFM). Applications of nano- materials. Carbon Nano Tube (CNT):- Structure, two types, properties and applications.	07 Hrs.

Text Books:

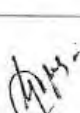
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Engineering Physics	P. K. Palanisamy	Sci Tech pub. (P) Ltd.	2 nd	2009
2	Engineering Physics	G Vijayakumari	Vikas Pub. House (P) Ltd	3 rd	2009
3	A Text Book of Engineering Physics	M.N.Avadhanulu & P. G. Kshirsagar	S. Chand Publication.	12 th	2006
4	Introduction to Nano science and Nanotechnology:	K.K. Chattopadhyay and A.N. Banerjee	PHI Learning	3 rd	2009

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Engineering Physics	R. K. Gaur & Gupta S. L	Dhanapat Rai Publication	8 th	2008
2	Engineering Physics	Resnick Halliday, Krane	John Wiley & Sons Pub.	8 th	2008
3	Introduction to Solid State Physics	Charles Kittel	Wiley India Pvt. Ltd	7 th	2008
4	Solid State Physics:	S. O. Pillai	New Age International Ltd.	6 th	2007
5	Materials Science and Engineering	V. Raghvan	PHI Learning	5 th	2006


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F.Y. CV/02/38

Course Details:

Class	F.Y. B. Tech., Sem.-I
Course Code and Course Title	1CVBS102 Applied Mathematics- I
Prerequisite	---
Teaching Scheme: Lecture/Tutorial	03/01
Credits	04
Evaluation Scheme: ISE I/ MSE/ISE II/ESE	10/30/10/50

Course Objectives:

01	To develop mathematical techniques for solving engineering problems.
02	To develop mathematical skills and enhance logical thinking power of students.
03	To increase interest towards the use of mathematics in engineering field.

Course Outcomes :After successful completion of this course, the students will be able to:

1CVBS101_1	Solve the system of linear equations by using matrix method and numerical techniques. (K^3)
1CVBS101_2	Calculate eigen values and eigen vectors and power of matrix by using Cayley-Hamilton theorem. (K^3)
1CVBS101_3	Describe the statistical data numerically by using lines of regression and curve fittings. (K^2)
1CVBS101_4	Apply Taylor series to find the expansion of functions. (K^3)
1CVBS101_5	Compute the n^{th} power and roots of the complex number by using De-Moivre's Theorem. (K^3)

Course Contents:

Unit 1	Matrices and Solution of Linear System Equations: Rank of a matrix, Normal form of a matrix, echelon form, Consistency of linear system of equations (system of homogeneous and nonhomogeneous linear equation).	06 Hrs.
Unit 2	Numerical Solution of System of Simultaneous Linear Equations : Gauss Elimination Method, Gauss-Jordan Method, Iterative Method – Gauss Jacobi method and Gauss Seidel method, LU-Decomposition Method.	07 Hrs.
Unit 3	Eigen Values and Eigen Vectors: Vectors, Linear dependence and linear independence of vectors, Eigen values, Properties of Eigen values, Eigen vectors, Properties of Eigenvectors, Cayley-Hamilton Theorem (Inverse and Higher powers of matrix).	08 Hrs.
Unit 4	Curve fitting and Statistics: Method of Least Squares, Fitting of Straight Line, Fitting of Parabola, Fitting of exponential curves, Lines of Regression.	06 Hrs.
Unit 5	Expansion of Functions and Indeterminate Forms: Taylor's series, Maclaurin's series, Standard expansions, Expansion of function using Standard series, Indeterminate forms.	07 Hrs.


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Unit 6	Complex Numbers: De Moivre's theorem, Roots of a complex number, Expansion of $\sin n\theta$ and $\cos n\theta$ in powers of $\sin\theta$ and/or $\cos\theta$, Circular functions of a complex variable, Hyperbolic functions, relation between circular and hyperbolic functions, Inverse Hyperbolic functions.	08 Hrs.
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Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Higher Engineering Mathematics	Dr. B. S Grewal	Khanna Publishers	44 th	2018
02	Advanced Engineering Mathematics	N. P. Bali, Manish Goyal	Infinity science press	7 th	2010
03	Advanced Engineering Mathematics	Erwin Kreyszig	Wiley Publishers	10 th	2017
04	Advanced Engineering Mathematics	H. K. Das	S. Chand	22 nd	2018
05	Numerical Methods in Engineering & Science	Dr. B. S Grewal	Khanna Publishers	9 th	2010
06	Numerical Methods	Dr. P. Kandasamy, Dr. K. Thilagavathy, Dr. K. Gunavathi	S. Chand	1 st	2010

List of Tutorials	
Sr. No.	Title of Tutorials
1	Matrices and Solution of Linear System of Equations
2	Numerical Solution of System of Simultaneous Linear Equations
3	Eigen Values and Eigen Vectors
4	Cayley-Hamilton Theorem
5	Curve fitting
6	Statistics
7	Expansion of Functions and Indeterminate Forms
8	Complex number


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F.Y. CV/04/38

Course Details:

Class	F. Y. B. Tech. Sem. I
Course Code and Course Title	1CVES103 , Fundamentals of Civil Engineering
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I/ MSE/ ISE II/ ESE	10/30/10/50

Course Objectives: The course aims to:

1	To Study the scope of civil engineering and various surveying, leveling techniques
2	To understand principles of planning with building byelaws and Property transaction
3	To study various building components & fundamentals of transportation, environmental & irrigation engineering

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVES103_1	Discuss the principles of planning and building bye laws (K^2)
1CVES103_2	Explain various building components. (K^2)
1CVES103_3	Discuss various Property Transaction rules (K^2)
1CVES103_4	Explain fundamentals of Transportation Environmental and Irrigation Engineering. (K^2)
1CVES103_5	Apply the knowledge of civil engineering, surveying techniques (K^3)

Course Contents:

Unit 1	Introduction to Civil Engineering and Building Planning Introduction, branches of civil engineering, application of civil engineering in other allied fields, Role of civil engineer in various construction activities. Principles of planning, Building bye laws - building line, Height of building, Open space requirements, FSI.	09 Hrs.
Unit 2	Building Components: Introduction to types of structures - load bearing and framed structures, types of loads Sub-structure: Elements of sub structure and their functions, types of soil and rocks, concept of bearing capacity, types of foundations i.e. shallow and deep and their suitability. Super-structure: Elements of super-structures and their functions	07 Hrs.
Unit 3	Surveying Principles of surveying, Measurement of horizontal angle: Meridian, bearing and its types, system of bearing, Types of compass, Calculation of included angles, correction for local attraction. Mechanical and Digital Planimeter	07 Hrs.
Unit 4	Leveling Terms used in leveling, leveling instruments, methods of reduction of levels, types of leveling. Contours: Characteristics of contours use of contour maps	06 Hrs.

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Unit 5	Property Transaction- Steps involved in property transaction, Documents required, Selection criteria and precaution, property taxes.	04 Hrs.
Unit 6	Introduction to Transportation, Environmental and Irrigation Engineering Components of rigid & flexible pavement, Cross section of road in cutting & filling. Components of railway track(Broad Gauge) Green Building – Introduction & rating system, concept of smart city. Components of water supply scheme (flow diagram). Introduction to Gravity and Earthen Dam.	09 Hrs.

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Basic Civil Engineering	G. K. Hiraskar	Dhanpatrai Publications	1 st	2008
02	Surveying	N. Basak	Tata Mac Graw Hill Publications	1 st	2008
03	Basic Civil Engineering	S. S. Bhavikatti	New Age International Publications	2 nd	2003
04	Surveying Vol. I, II, II	B. C. Punmia	Laxmi Publications	2 nd	2001
05	Engineering Hydrology	K Subramanya	Mac Graw Hill Publications	4 th	2013

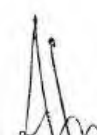
Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Civil Engineering Handbook	P.N.Khanna	Engineer's Publishers	17 th	1999
02	The A To Z of Practical Building Construction and its Management	Sandeep Mantri	Satya Prakashan	1 st	2010
03	Advanced Surveying: Total Station, GIS and Remote Sensing	SatheeshGopi, R. Sathikumar, N. Madhu	Pearson Education India	1 st	2006
04	Engineering Surveying	Schofield W.	Taylor and francies	6 th	2007
05	Surveying	A.Bannister, S. Raymond, R.Baker	Pearson	7 th	2002


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F.Y. CV-07/38

Course Details:

Class	F. Y. B. Tech, Sem.-I
Course Code and Course Title	1CVES104, Engineering Graphics
Prerequisite/s	Geometry
Teaching Scheme: Lecture/Tutorial	3/0
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Objectives:

01	To explain the basic knowledge of drawing, drawing tools and methods of projection
02	To explain the application of drawing in different disciplines of engineering
03	To demonstrate drawing technique to simplify complicated engineering structure and it's working
04	To create the interest among the student about engineering drawing
05	To identify interaction between the different branches of engineering

Course Outcomes:

Upon successful completion of this course, the student will be able to:

1CVES104_1	Discuss basic concepts in drawing and its application.(K ²)
1CVES104_2	Make projection of simple geometries. (K ³)
1CVES104_3	Draw projection of Orthographic (K ³)
1CVES104_4	Make projection of Isometric (K ³)
1CVES104_5	Draw projection of Perspective (K ³)

Course Contents:

Unit 1	Fundamentals of Engineering Graphics and Engineering Curves A) Fundamentals of Engineering Graphics: Introduction to Drawing instruments and their uses. Different types of lines used in drawing practice, Dimensioning system as per BSI (Theoretical treatment only) B) Engineering curves: Construction of regular Polygons up to hexagon). Ellipse, Parabola, Hyperbola, Involute, Archimedian spiral and Cycloid only.	06 Hrs.
Unit 2	Projections of Lines Introduction to First angle and third angle methods of projection. Projections of points on regular and auxiliary reference planes. Projections of lines (horizontal, frontal, oblique and Profile lines) on regular and auxiliary reference planes. True length of a line, Point View of a line, angles made by the line with reference planes. Projections of intersecting lines, Parallel lines, perpendicular lines, and skew lines. Grade and Bearing of a line.	05 Hrs.

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Unit 3	Projections of Planes: Projections on regular and on auxiliary reference planes. Types of planes (horizontal, frontal, oblique and Profile planes), Edge view and True shape of a Plane. Angles made by the plane with Principle reference planes. Projections of plane figures inclined to both the planes. (Circle & regular polygon).	05 Hrs.
Unit 4	Orthographic Projections Lines used, selection of views, spacing of views, dimensioning and sections. Drawing required views from given pictorial views (conversion of pictorial views in to orthographic views), including sectional orthographic views.	09 Hrs.
Unit 5	Isometric Projections Introduction to isometric. Isometric scale, Isometric projections and Isometric views /drawings. Circles in isometric view. Isometric views of simple solids and objects.	08 Hrs.
Unit 6	Prespective Projections Introduction, Concept of Prespective plane, Termenology in Presepctive plane, Types of Prespective plane, Methods of presepective a) vanishing point- visual ray method b) Parallel point	09 Hrs.

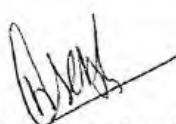
Text Book:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Machine Drawing,	N. D. Bhatt	Charotor Publication House, Bombay	15 th	2007
02	Engineering Drawing and Graphics	K. Venugopal	New Age Publication	5 th	2004
03	A text book of Engineering Drawing	R. K. Dhawan	S. Chand and Co	Revised	2008
04	Machine Drawing	K. L. Narayana	New Age Publication	-	-

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Fundamentals of Engineering Drawing	W. J. Luzadder	Prentice Hall of India.	-	-
02	Descriptive Geometry.	Rowes	-	-	-
03	Graphic Science	French and Vierck	Mc-Graw Hill International	-	-
04	Engineering Drawing	Sevsen and Street	-	-	-
05	Engineering Drawing	N. B. Shaha and B. C. Rana	Pearson Education	2 nd	2012


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Course Details:

Class	F. Y. B. Tech. Semester-I
Course Code and Course Title	1CVHS105, Professional Communication
Prerequisite/s	12 th Standard English Grammar
Teaching Scheme: Lecture/Practical	02/00/02
Credits	03
Evaluation Scheme: ISE	50

Course Outcomes (COs):

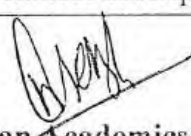
Upon successful completion of this course, the student will be able to:

1CVHS105_1	Strengthen his communicative competence and able to achieve considerable success in English Language competency tests such as IELTS.
1CVHS105_2	Solve the exercise related to Reading comprehension and Listening comprehension.
1CVHS105_3	Prepare and modify his portfolio considering own strength, weakness and career opportunities.
1CVHS105_4	Construct grammatically sound and meaningful sentences necessary for effective communication.
1CVHS105_5	Compose relevant professional letters and able to maintain official correspondence.

Course Contents:

Unit 1	Goal Setting and Portfolio (16hr) Testing my competence in professional English (IELTS diagnostic test) , Analysis of all four bands, Introducing my Portfolio, Achieving my goals, Exploring my career opportunities, Challenging my assumptions, Planning my Career, Presenting my career choices
Unit 2	Grammar and Vocabulary (08hr) Checking my English communication competence (IELTS test I - all four bands), Building up my word power, Beginning to write and speak like a professional , Getting better at using good sentences , How to avoid common errors
Unit 3	Listening band activities (06hr) Listening like a Professional Listening for answers
Unit 4	Reading band activities (08hr) Getting better at reading professional literature - The Professional, Getting even smarter with technical texts , Checking my English communication competence (IELTS test II - all four bands)
Unit 5	Writing band activities (10hr) Becoming skilled in writing professional correspondence, Analysing my skills in reading and writing technical/scientific texts , Becoming a competent researcher Getting smart with technical descriptions of charts/images and technical processes


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Unit 6	Speaking band activities (18hr) How to prepare and present my research review like a professional. Putting my research into words: writing a technical review, How good is my professional English? (IELTS test)
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Textbook					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Cambridge Guide to IELTS	Pauline Cullen, Amanda French	Cambridge University Press	Reprint	2017
2	Ultimate Guide to IELTS Writing	Parthesh Thakkar	M K Books	Reprint	2013
3	Target Band 7	Braverman Simone	Paperback	Third	2018
4	The Professional: Defining the New Standard of Excellence at Work	Subroto Bagchi	Penguin Books India Pvt. Ltd.	Revised Edition	2011

Reference Books					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	High-school English Grammar and Composition	Wren and Martin	S. Chand and Co., New Delhi	1 st	2015
2	Grammar for IELTS	Diana Hopkins, Pauline Cullen	Cambridge University Press	First	2018
3	Vocabulary for IELTS	Pauline Cullen	Cambridge University Press	First	2013


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Course Details

Class	F.Y.B.Tech Semester: I
Course Code and Course Title	1CVBS151 Applied Physics Laboratory
Prerequisite/s	
Teaching Scheme: Practical/Tutorial	02/00
Credits	01
Evaluation Scheme: ISE/ESE	50/00

Course Objectives : The students carrying out experiments are expected	
1	To perform experimental task as per instructions given by faculty.
2	To obtain and interpret experimental results individually.
3	To complete desired task (calculation, graph etc.) during lab session.
4	To respond and participate in oral questions asked by faculty.

Course Outcomes : The students will be able to	
1CVBS151_1	Interpret the characteristics of LASER such as mono-chromaticity and divergence. (K^2)
1CVBS151_2	Calculate band gap energy, specific rotation, wavelength of light, frequency of sound and verify Inverse Square law. (K^2)
1CVBS151_3	Demonstrate fourteen Bravais lattices; explain symmetries of cube and different properties of cubic lattices. (K^2)
1CVBS151_4	Communicate effectively and work in a team for laboratory activities. (S^1)
1CVBS151_5	Follow professional and ethical principals during laboratory. (A^2)

Exp. No	Title of the Experiment (Any Eight)
1	Kund's tube for determination of velocity of sound
2	Plane Diffraction Grating
3	Laurent's Half Shade Polarimeter
4	Divergence of The LASER Beam
5	Wavelength of LASER
6	Inverse Square Law
7	Band Gap energy
8	Seven Crystal System
9	Symmetry Element of Cube


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Course Details:

Class	F. Y. B. Tech, Sem. I
Course Code and Course Title	1CVES152, Fundamental of Civil Engineering Laboratory
Prerequisite/s	--
Teaching Scheme: Practical	2
Credits	01
Evaluation Scheme: ISE	50

Course Objectives:

01	To study working and use of compass
02	To study working and use of dumpy level
03	To measure area of an irregular shape of figure
04	To understand working of Total Station
05	To understand components of building

Course Outcomes (COs):

Upon completion of this course, students will be able to

1CVES152_1	Compute corrected included angles of traverse by compass. (K^3)
1CVES152_2	Calculate reduced levels of different points by leveling. (K^3)
1CVES152_3	Compute the area of an irregular shape of figure mechanical and digital Planimeter. (K^3)
1CVES152_4	Draw line plan of residential building by applying principles of planning. and draw components of building on sheet (K^3)
1CVES152_5	Calculate linear and angular measurement by Total Station (K^2)
1CVES152_6	Communicate effectively about laboratory work both orally and in writing journals. (S^2)
1CVES152_7	Practice professional and ethical behaviour to carry forward in their life. (A^2)

List of Experiments

Expt. No.	Title of Experiment
1.	Traversing by Compass.
2.	Determination of reduced levels for different points by HI method.
3.	Determination of reduced levels by rise and fall method.
4.	Measurement of area of irregular figure by mechanical and digital planimeter.
5.	Study of total station and Linear measurement.
6.	Angular measurement by using total station.
7.	Measurement of area by using total station.
8.	Visit to construction site and Report on visit
9.	Draw various building components (Sub structure & super structure) on drawing sheet.
10.	Draw a line plan of residential building by applying principles of planning.

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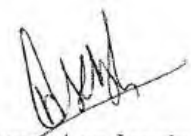
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Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Basic Civil Engineering	G. K. Hiraskar	Dhanpatrai Publications	1 st	2008
02	Surveying	N. Basak	Tata Mac Graw Hill, Publications	1 st	2008
03	Basic Civil Engineering	S. S. Bhavikatti	New Age International Publications	2 nd	2003
04	Surveying Vol. I, II, II	B. C. Punmia	Laxmi Publications	2 nd	2001

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Civil Engineering Handbook	P.N.Khanna	Engineer's Publishers	17 th	1999
02	The A To Z of Practical Building Construction and its Management	Sandeep Mantri	Satya Prakashan	1 st	2010
03	Advanced Surveying: Total Station, GIS and Remote Sensing	Satheesh Gopi, R. Sathikumar, N. Madhu	Pearson Education India	1 st	2006
04	Engineering Surveying	Schofield W.	Taylor and francies	6 th	2007
05	Surveying	A.Bannister, S.Raymond, R.Baker	Pearson	7 th	2002


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F.Y.CV-13/38

Course Details:

Class	F. Y. B. Tech, Sem.-I
Course Code and Course Title	0CVES153, Engineering Graphics Laboratory
Prerequisite/s	Geometry
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	01
Evaluation Scheme: ISE	50

Course Objectives:

01	To explain the basic knowledge of drawing, drawing tools and methods of projection
02	To explain the application of drawing in different disciplines of engineering
03	To demonstrate drawing technique to simplify complicated engineering structure and it's working
04	To create the interest among the student about engineering drawing
05	To identify interaction between the different branches of engineering

Course Outcomes:

After successful completion of this lab work, the student will be able to

0CVES153_1	Discuss basic concepts in drawing and its application.(K ²)
0CVES153_2	Make projection of simple geometries. (K ³)
0CVES153_3	Draw projection of Orthographic (K ³)
0CVES153_4	Draw projection of Isometric (K ³)
0CVES153_5	Make projection of Prespective (K ³)

Exp. No.	Title of Experiment
01	Lines, Lettering, Loci of points for Simple link mechanisms and Geometrical constructions
02	Engineering Curves
03	Projections of Straight lines and Projections of Planes (2 Sheets)
04	Orthographic projections of objects
05	Orthographic projections of objects
06	Isometric projections of objects
07	Isometric projections of objects
08	Prespective projection

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F.Y.C.V-14/38

Text Book:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Machine Drawing,	N. D. Bhatt	Charotar Publication House, Bombay	15 th	2007
02	Engineering Drawing and Graphics	K. Venugopal	New Age Publication	5 th	2004
03	A text book of Engineering Drawing	R. K. Dhawan	S. Chand and Co	Revised	2008
04	Machine Drawing	K. L. Narayana	New Age Publication	-	-

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Fundamentals of Engineering Drawing	W. J. Luzadder	Prentice Hall of India.	-	-
02	Descriptive Geometry.	Rowes	-	-	-
03	Graphic Science	French and Vierck	Mc-Graw Hill International	-	-
04	Engineering Drawing	Sevsen and Street	-	-	-
05	Engineering Drawing	N. B. Shaha and B. C. Rana	Pearson Education	2 nd	2012


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P.Y.-CV-15/38

Course Details:

Class	F. Y. B. Tech, Sem. I
Course Code and Course Title	1CVHS154, Professional Ethics & Behavioral Science
Prerequisite/s	-
Teaching Scheme: Lecture/Practical	00/02
Credits	01
Evaluation Scheme: ISE	25

Course Objectives:

01	Understand the process and importance of Goal Setting in Profession
02	Acquire important and relevant skills of Decision Making
03	Gain Knowledge and importance of Emotions and Emotional Intelligence
04	Get insight into concepts of Attitude and Critical Thinking
05	Achieve competency to manage Stress

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVHS155_1	Find the importance of Goal Setting in Profession. (K ¹)
1CVHS155_2	Interpret the importance of right Decision Making Skills. (S ²)
1CVHS155_3	Explain the concept of emotions, its types& Emotional Intelligence. (K ²)
1CVHS155_4	Build a right attitude and involve wisely in critical thinking. (K ³)
1CVHS155_5	Identify stress level, type & Utilize proper stress management techniques. (K ³)

Course Contents:

Unit 1	Goal Setting – Locke’s Goal setting theory, 7 steps of goal setting, SMART goal, +Activity	2 Hrs.
Unit 2	Decision Making – Importance of this skill, techniques of Decision-making, +activity	2 Hrs.
Unit 3	Emotions – body-emotion connection, emotions and thinking, + activity	2 Hrs.
Unit 4	Emotional Intelligence – definition, components of emotional intelligence, +activity	2 Hrs.
Unit 5	Psychology of Attitude – definition, Characteristics, components of attitude, formation of attitude, types of attitude, + activity	2 Hrs.
Unit 6	Critical Thinking - The role of emotion, language and curiosity in critical thinking, + activity	2 Hrs.
Unit 7	Stress management – I – definition, types of stress, causes, +activity	2 Hrs.
Unit 8	Stress management – II symptoms of stress, coping styles, types of coping strategies, Activity	2 Hrs.


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Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Introduction to Psychology	Clifford T. Morgan	Mcgraw Hill Education	4 th	2004
02	Behavior Science	Dr. Abha Singh	Willy	1 st	2013

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Introduction to Psychology	Clifford T. Morgan	Mcgraw Hill Education	4 th	2004
02	Behavior Science	Dr. Abha Singh	Willy	1 st	2013

Course Details:

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Course Details:

Class	F.Y.,B. Tech., Sem- II
Course Code and Course Title	1CVBS106 Applied Chemistry
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISEI /MSE/ISE II/ESE	10/30/10/50

Course Objectives: The course aims to

01	Discuss basic concepts of chemistry in engineering.
02	Develop the ability to understand the effect of various impurities on water quality.
03	Outline the characteristics of fuels and alloys in domestic and industrial use.
04	Justify the properties of metal and alloys and effect of corrosion on them.

Course Outcomes :Upon successful completion of this course, the students will be able to:

1CVBS106_1	Identify water quality parameters and methods for water softening. (K^2)
1CVBS106_2	Discuss types, properties, applications of engineering materials and energy resources. (K^2)
1CVBS106_3	Summarize theories of corrosion and methods to prevent metals from corrosion. (K^2)
1CVBS106_4	Describe principles of chemical and instrumental techniques of analysis. (K^2)
1CVBS106_5	Calculate total hardness of water and calorific values of fuel. (K^3)

Course Contents:

Unit 1	General principles of chemical Analysis: Chemical analysis, Its types, Advantages and Disadvantages of instrumental and non-instrumental methods, Different ways to express concentration of solution. Numerical problems. Standards and its types. Titrimetric analysis, Definition of terms associated with titrimetry. Classification of titrimetry, Gravimetry and its requirements, applications.	06 Hrs.
Unit 2	Water Technology: Introduction, impurities in natural water, Water Testing: Total solids, acidity, alkalinity and chlorides, hardness of water (definition, causes and significance), Calculations of total hardness, disadvantages of hard water. Scale and sludge: formation in boilers and removal, Treatment of hard water by ion exchange process, Desalination of brackish water by Reverse Osmosis, Disinfection of domestic water by chlorination and ozone, Electrodialysis (ion-selective), Acceptable level of impurities in drinking water (As per international standards).	07 Hrs.
Unit 3	Ceramic & Advanced Materials: Cement:- Introduction to ceramic materials. Classification of cement, Portland cement –manufacturing (Wet Process), chemical composition, setting and hardening. Alloys: Introduction, alloy definition and classification, purposes of making alloys. Ferrous alloys: Plain carbon steels (mild, medium and high). Copper Alloys (Brass) Polymers: Introduction, industrially important plastics like phenol formaldehyde.	08 Hrs.

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	urea formaldehyde (preparation, properties and applications). Composites: Introduction, composition, properties and uses of fiber reinforced plastics (FRP) and glass reinforced plastic (GRP). Nanomaterials: Introduction, Introduction to nanocomposites, applications of nanomaterials- Catalysis, Electronics, Medicines, Energy Sciences, construction, environment.	
Unit 4	Modern Analytical Techniques: p^H-metry: Introduction, pH measurement using glass electrode and applications. Spectrometry: Introduction, Laws of spectrometry (Lamberts and Beer-Lambert's law). Principles, instrumentation and applications of UV-Visible spectrophotometer, Atomic absorption spectroscopy. Chromatography: Introduction, Principle, instrumentation and applications of gas-liquid chromatography (GLC) and high performance liquid chromatography (HPLC).	07 Hrs.
Unit 5	Fuels and Non-conventional energy sources: Introduction, classification, characteristics of good fuels, comparison between solid, liquid and gaseous fuels, types of calorific value (higher and lower), Bomb calorimeter and Boy's calorimeter. Numerical on Bomb and Boy's calorimeter. Photocatalysis of water for H₂ generation, introduction to solar cells. Batteries: Introduction, Rechargeable Li- ion batteries (Diagram, charging-discharging reactions, advantages and applications). Fuel Cells: Introduction, H₂-O₂ Fuel cell (Construction, working and applications), applications of fuel cells.	07 Hrs.
Unit 6	Corrosion & Green Chemistry: Introduction, causes, classification, atmospheric corrosion (oxidation corrosion), electrochemical corrosion (hydrogen evolution and oxygen absorption mechanism), factors affecting rate of corrosion. Prevention of corrosion by proper design and material selection, hot dipping (galvanizing and tinning), cathodic and anodic protection methods, electroplating. Green Chemistry: Definition, Twelve principles of green chemistry, Research and industrial applications.	07 Hrs.

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	A Text Book of Engineering Chemistry	S. S. Dara	S. Chand & Co. Ltd., New Delhi	11 th	2008
02	A Text book of Engineering Chemistry	Shashi Chawala	Dhanpat Rai Publishing Co. New Delhi	3 rd	2007
03	A Test Book of Applied Chemistry	Ziyauddin D. Sande, Vijayalaxmi M. Vairat, Pratapsingh V. Gaikwad	Wiley Publications	1 st	2018


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p.y.cv-19/38

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Chemistry	Jain & Jain	Dhanpat Rai Publishing Co., New Delhi	15 th	2010
02	Industrial Chemistry	B. K. Sharma	Goel publication (P) Ltd.	10 th	1999
03	Fundamentals of Engineering Chemistry	S. K. Singh	New Age International (P) Ltd, New Delhi	1 st	2009
04	Instrumental Methods of Chemical Analysis	Chatwal and Anand	Himalaya Publishing House, Mumbai	5 th	2005
05	Engineering Chemistry	Wiley India	Wiley India Pvt. Ltd., New Delhi	1 st	2012


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F.Y. CV-20/38

Course Details:

Class	F.Y. B. Tech, Sem.-II
Course Code and Course Title	1CVBS107 Applied Mathematics- II
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial	03/01
Credits	04
Evaluation Scheme: ISEI/ MSE/ISEII/ESE	10/30/10/50

Course Objectives:

01	To develop mathematical techniques for solving engineering problems.
02	To develop mathematical skills and enhance logical thinking power of students.
03	To increase interest towards the use of mathematics in engineering field.

Course Outcomes : After successful completion of this course, the students will be able to:

1CVBS107_1	Use partial derivatives to solve the problems based on functions of two or more variables. (K^3)
1CVBS107_2	Solve problems on Ordinary Differential Equations by using analytical method and numerical techniques. (K^3)
1CVBS107_3	Solve the mathematical problems involving the Numerical Differentiation and Integration. (K^3)
1CVBS107_4	Apply the concept of Special Functions to solve improper integrals. (K^3)
1CVBS107_5	Make use of multiple integral to find area and mass of plane lamina. (K^3)

Course Contents:

Unit 1	Partial Differentiation and Its Applications: Function of two or more variables, Partial derivatives, Euler's theorem, Change of variables, Jacobin, Maxima and minima of functions of two variables.	08 Hrs.
Unit 2	Ordinary Differential Equation and Its Application(First order and First degree): Linear differential equation, Equation reducible to linear differential equation, Exact differential equation, Equation reducible to exact equation, Applications to orthogonal trajectories.	07 Hrs.
Unit 3	Numerical Solution of Ordinary Differential Equation(First order and First degree): Picard's method, Taylor's series method, Euler's method, modified Euler's method, Runge-kutta method.	06 Hrs.
Unit 4	Numerical Differentiation and Integration: Numerical Differentiation – Newton's Forward Difference, Newton's Backward Difference, Central Difference (Stirling's Formula) Numerical Integration - Trapezoidal Rule, Simpson's $1/3^{rd}$ and $3/8^{th}$ Rule.	06 Hrs.
Unit 5	Special Functions: Gamma function, Properties of Gamma function, Beta function, Properties of Beta function, Relation between Beta and Gamma functions, Differentiation under integral sign (DUIS).	07 Hrs.

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F.Y. CV-21/38

Unit 6	Multiple Integral and It's Applications: Double Integrals, evaluation of double integral over the region, Change of Order of Integration, Change to polar, Applications to Area and Mass of plane lamina, Triple integral.	08 Hrs.
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Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Higher Engineering Mathematics	Dr. B. S Grewal	Khanna Publishers	44 th	2018
02	Advanced Engineering Mathematics	N. P. Bali, Manish Goyal	Infinity science press	7 th	2010
03	Advanced Engineering Mathematics	Erwin Kreyszig	Wiley Publishers	10 th	2017
04	Advanced Engineering Mathematics	H. K. Das	S. Chand	22 nd	2018
05	Numerical Methods in Engineering & Science	Dr. B. S Grewal	Khanna Publishers	9 th	2010
06	Numerical Methods	Dr. P. Kandasamy, Dr. K. Thilagavathy, Dr. K. Gunavathi	S. Chand	1 st	2010

List of Tutorials	
Sr. No.	Title of Tutorials
1	Partial Differentiation
2	Application of Partial Differentiation
3	Ordinary Differential Equation and Its Applications
4	Numerical Solution of Ordinary Differential Equation
5	Numerical Differentiation
6	Numerical Integration
7	Special Functions
8	Multiple Integral and It's Applications


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Course Details:

Class	F.Y. B. Tech, Sem.-II
Course Code and Course Title	1CVES108, Applied Mechanics
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISEI /MSE/ISE II/ESE	10/30/10/50

Course Objectives:

01	To understand various force systems and concept of equilibrium on static and moving bodies
02	To analyze truss
03	To understand the concept of Centroid and Moment of Inertia
04	To Study dynamics of rigid bodies

Course Outcomes: Upon successful completion of this course, the student will be able to:

1CVES108_1	Use knowledge of resolution and composition of forces. (K^2)
1CVES108_2	Calculate Centroid and Moment of Inertia of a given plane lamina. (K^2)
1CVES108_3	Apply the concepts of equilibrium to find unknown forces acting on rigid bodies. (K^3)
1CVES108_4	Calculate forces in members of truss with their nature. (K^3)
1CVES108_5	Apply the knowledge of dynamics to analyze rigid bodies (in motion). (K^3)

Course Contents:

Unit 1	Introduction to Engineering mechanics: Basic concepts - Particle, Body, Rigid body, Force, Types of force systems, Law of transmissibility of force, Resolution of a force, Resultant force, Moment of a force, couple, Varignon's theorem.	06 Hrs.
Unit 2	Equilibrium of forces Concept of equilibrium, Conditions of equilibrium, Free Body Diagram, Lami's theorem, Law of moments, Introduction to surface friction, wedge and ladder friction. Beams: Types of Loads, Types of supports, Types of Beams, Analysis of Simple and Compound beams using conditions of equilibrium, Analysis of beam using Virtual Work Method.	08 Hrs.
Unit 3	Analysis of Truss Introduction of roof truss, Types of Trusses, Determinacy of a Truss, Assumptions for analysis of truss, Analysis of truss using method of Joints and method of Sections.	07 Hrs.
Unit 4	Centroid and Moment of Inertia Introduction to Centroid and Center of Gravity, Centroid of plain laminae, Moment of Inertia, Moment of Inertia of Standard shapes from first principle, Parallel and perpendicular axis theorem, Moment of Inertia of plain and composite figures, Radius of Gyration.	07 Hrs.

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Unit 5	Kinetics of Linear and Circular motion Kinetics of linear motion, D' Alembert's Principle, Work- Energy Principle, Impulse Momentum Principle, Kinetics of Circular Motion, Torque.	08 Hrs.
Unit 6	Collision -Introduction. Phenomenon of Collision, Law of Conservation of Momentum, Newton's law of Collision of Elastic Bodies, Coefficient of Restitution, Types of Collisions, Direct Collision of Two Bodies, Loss of Kinetic Energy During Collision, Indirect Impact of Two Bodies, Direct Impact of a Body with a Fixed Plane, Indirect Impact of a Body with a Fixed Plane.	06 Hrs.

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Mechanics	S. Ramamrutham	Dhanpat Rai Publishing Company (P). Ltd	9 th	2010
02	Engineering Mechanics	R.S. Khurmi	S. Chand	Revised	2006
03	Engineering Mechanics	R. K. Bansal and Sanjay Bansal	Laxmi Publications Pvt. Ltd.	6 th	2013
04	Engineering Mechanics	K. L. Kumar	Tata McGraw Hill Education	4 th	2012
05	Engineering Mechanics	S. B. Junnarkar	Charotar Publications	16 th	2011
06	Engineering Mechanics	S.S. Bhavikatti	New Age International Pvt. Ltd.	4 th	2012

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Mechanics	Irving H. Shames	Prentice Hall of India, New Delhi	5 th	2011
02	Vector Mechanics for Engineers Vol.-I and II	F. P. Beer and E. R. Johnson	Tata McGraw Hill Education	6 th	2011
03	Engineering Mechanics: Statics & Dynamics	Ferdinand Singer	Harper and Row Publications	9 th	2009
04	Fundamentals of Engineering Mechanics	S. Rajasekaran	Vikas Publishing House Pvt. Ltd.	3 rd	2005
05	Mechanics of Materials	Dr. B. C. Punmia	Laxmi Publications Pvt. Ltd.	Reprint	2010

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P. Y. CV-24/38

Course Details:

Class	F. Y. B. Tech. Sem. II
Course Code and Course Title	1CVES109, Basic Electrical & Electronics Engineering
Prerequisite/s	Simultaneous linear equations, Semiconductor Physics
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE/ISE II / ESE	10/30/10/50

Course Objectives:

01	Explore the students with the field of Electrical and Electronics Engineering
02	Frame and solve problems on Electric and Electronic circuits
03	Introduce concept of Earthing and illumination schemes for Civil Engineering.
04	Explain the prerequisites of electrical machines and correlations of electric and magnetic circuits with applications
05	Describe the working and characteristic Electronic components, Transducers & their Applications

Course Outcomes:

Upon successful completion of this course, the student will be able to:

1CVES109_1	Explain various terms related to electric & magnetic circuits (K^1)
1CVES109_2	Explain fundamental concept of number system and its conversion amongst them and interpret logic functions, circuits and Boolean algebra expressions. (K^2)
1CVES109_3	Describe the construction, working and characteristic Electronic components, Transducers & their Applications. (K^2)
1CVES109_4	Apply conceptual understanding to solve numerical related to Electrical circuits, magnetic circuits and Electronic circuits (K^2)
1CVES109_5	Apply the fundamentals of Earthing and illumination schemes for different workspace. (K^3)


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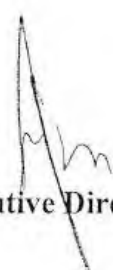

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Course Contents:		
SECTION-I		
Unit 1	DC Circuits Definitions: EMF, Current, Work, Power, Energy, Ohm's Law, Temperature Coefficient of Resistance (Theoretical treatment), Kirchhoff's Law, Analysis of DC Circuit using KCL & KVL, Conversion between Electrical, Mechanical & Thermal quantities.	08 Hrs.
Unit 2	A. Single Phase A.C Circuit Faraday's law of Electromagnetic Induction, Generation of Sinusoidal voltage, RMS value, Average value, Form Factor, Peak factor, phasor representation of AC quantities. B. Magnetic Circuit Concept of Magnetic circuit & definitions, Comparison between Electric and Magnetic circuit Series magnetic circuit, Magnetization (B-H) curve, Magnetic Leakage and Fringing	08 Hrs.
Unit 3	Earthing and Illumination Schemes Necessity of Earthing, Earthing methods, Fuse, Fluorescent tube, CFL, mercury Vapour lamp, LED lamp, study of energy meter.	05 Hrs.
SECTION- II		
Unit 4	Number Systems & Logic Gates Decimal, Binary, Octal & Hex number system. Inter-conversion of number system, binary addition, subtraction, division, multiplication, classification of logic Gates.	06 Hrs.
Unit 5	Introduction to Electronics Components: Resistors, Capacitors, Inductors, FET Construction, V-I characteristics, Types of Diode (Zener diode, Photo diode, LED- symbol, construction, working, characteristics).	07 Hrs.
Unit 6	Transducers & Applications: Transducers: for Displacement, level, Temperature, Pressure, Speed measurement, Range, Specifications. Appliances: Block diagram, Specifications, Operation and use of the Appliances: Digital Thermometer, Weighing Machine, Washing machine, Microwave oven and Mobile Handset.	08 Hrs.


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P.Y. CV-26/38

Text Books:

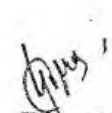
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	A Textbook of Electrical Technology	B L Theraja & A K Theraja	S. Chand Publications, New Delhi	5 th	2008
02	Basic Electrical Engineering	J. M. Kharade, M. D. Patil, D. B. Kanase	Wiley Publications	1 st	2018
03	Fundamentals of Digital Design	Anand Kumar	PHI	4 th	2016
04	Principle of Electronics	V.K. Mehta	S. Chand	5 th	2016
05	A Text Book of Applied Electronics	R S Sedha	S. Chand	4 th	2008

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Basic Electrical Engineering	I.J. Nagrath D. P. Kothari	Tata McGraw Hill	6 th	2008
02	Electrical Engineering Fundamental	Vincent Del Toro	Pearson Publication	3 rd	2007
03	Fundamentals of Electrical Engineering	Ashfaq Husain	DhanpatRai&co.	6 th	2008
04	Basic Electrical & Electronics Engineering	S. K. Bhattacharya	Pearson Publication	3 rd	2001
05	Fundamental of Electronics Engineering	R.Prasad	CENGAGE-Learning	4 th	2008
06	Digital Design	John Wakerly	Prentice Hall India Publication	3 rd	2006
07	Electronic instrumentation	H. S. Kalsi	Tata Mc Graw hills publications	4 th	2010


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Course Details:

Class	F. Y. B. Tech. Sem. II
Course Code and Course Title	1CVES110, Computer Programming in C
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial	02/00
Credits	02
Evaluation Scheme: ISE I/ MSE/ ISE II/ ESE	10/30/10/50

Course Objectives:

01	To understand C programming environment
02	To learn fundamentals of C programming
03	To develop problem solving skills using C language
04	To write, compile and debug programs in C language

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVES110_1	Demonstrate structured approach to solve a problem. (K ²)
1CVES110_2	Explain C programming fundamentals. (K ²)
1CVES110_3	Illustrate concepts like array, functions, structures, and pointers and file handling in C Programming language. (K ²)
1CVES110_4	Apply C Programming constructs to solve a given problem. (K ³)
1CVES110_5	Prepare and present a power point presentation on assigned topic (S ³)

Course Contents:

Unit 1	Basics of Programming The meaning of algorithms, Flowcharts, Pseudo codes, Writing algorithms and drawing flowcharts for simple exercises, Memory concepts, C Program development environment.	03 Hrs.
Unit 2	C Fundamentals Importance of 'C' Language, History, Structure of 'C' Program, Sample 'C' Program, Constants, variables and data types. Operators and expressions, Managing input / output operations, Control statements- Decision making, Case control & Looping Constructs.	07 Hrs.
Unit 3	Array The meaning of an array, one dimensional and two dimensional arrays, declaration and initialization of arrays, reading , writing and manipulation of above types of arrays, multidimensional arrays. Strings-Declaring and initialing character array, reading and writing string to/from terminal, arithmetic operations on characters, putting strings together, string handling functions.	04 Hrs.
Unit 4	Functions Need of user defined functions, elements of User defined functions, defining functions, return values and their types, function calls, function declaration, methods of parameter passing, Scope rule of functions, user defined and library functions.	05 Hrs.

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Unit 5	Structure & Pointers Need of Structure, Defining a structure, declaring and accessing structure variables, structure initialization, copying and comparing structure variables, array of structures, structures and functions, Unions. Understanding pointers, accessing the address space of a variable, declaring and initialization pointer variables, accessing a variable through its pointer, pointer expressions, pointers and arrays, pointer and character strings, pointer and structure.	06 Hrs.
Unit 6	File Handling Defining and opening a file, closing a file, input/output operations on files, error handling during I/O operations, random access files, command line arguments, C preprocessor.	03 Hrs.

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Programming And Problem Solving Using C Language	ISRD Group	McGraw-Hill Publications	4 th	2012
02	Let Us C	Yashwant Kanetkar	BPB	3 rd	2011
03	C How to Program	Harvey M. Deitel, Paul J. Deitel, Abbey Deitel	Pearson	2 nd	2009
04	Programming in ANSI C	E. Balguruswamy	Tata Mc-Graw Hill	4 th	2008

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	The 'C' Programming Language	D. M. Ritchie	Pearson	2 nd	1998
02	C Programming Laboratory: Handbook for Beginners	Sidnal	Wiley India Limited	1 st	2012
03	The Complete Reference C	Herbert Schildt	McGraw-Hill Publications	4 th	2000
04	Test your C Skills	Yashwant Kanetkar	BPB Publications	5 th	2013

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F.Y. CV-24/31

Course Details:

Class	F.Y.,B. Tech., Sem- II
Course Code and Course Title	1CVBS156, Applied Chemistry Laboratory
Prerequisite/s	---
Teaching Scheme: Lab/Tutorial	02/00
Credits	01
Evaluation Scheme: ISE	50

Laboratory Objectives:

01	To test water quality parameters like hardness, acidity and chloride content
02	To synthesize polymers and plastics
03	To understand the mechanism of corrosion of metals in different environments
04	To know the handling of different analytical Instruments

Laboratory Outcomes : Upon successful completion of this course, the student will be able to:

1CVBS156_1	Identify hardness, acidity, alkalinity, chloride content of water and percentage of elements in some alloys. (K ²)
1CVBS156_2	Produce various advanced materials and analyze aqueous solutions using instruments. (K ³)
1CVBS156_3	Carry out experimental tasks by handling different glassware's. (S ¹)
1CVBS156_4	Perform various experiments by following written instructions. (S ²)
1CVBS156_5	Express involvement by understanding concepts in applied chemistry. (A ²)

List of Experiments:

Sr. No.	Title of Experiments
1	Determination of acidity of water (Neutralization Titration).
2	Determination of alkalinity of water (Acid- Base Titration).
3	Determination of chloride content of water by Mohr's method. (Precipitation Titration).
4	Determination of total hardness of water by EDTA method (Complexometric Titration).
5	Determination of moisture, volatile and ash content in a given coal sample. (Proximate analysis).
6	Preparation of urea-formaldehyde resin.
7	Preparation of phenol-formaldehyde resin.
8	Estimation of zinc in brass solution (Displacement Titration).
9	Estimation of copper percentage in brass solution.
10	Determination of rate of corrosion of aluminium in acidic and basic medium by weight loss method.
11	Determination of p ^H of sample solution by p ^H meter.
12	Demonstration of photo-colorimeter / spectrophotometer.
13	Demonstration of paper chromatography.

Minimum 8 experiments should be performed from the list out of which two experiments should be on instrumental methods.

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P.Y. CV-30/38

Course Details:

Class	F.Y. B. Tech, Sem.- II
Course Code and Course Title	1CVES157, Applied Mechanics Laboratory
Prerequisite/s	---
Teaching Scheme: Practical/Tutorial	02/00
Credits	01
Evaluation Scheme: ISE	50

Course Objectives:

01	To conduct the experiments to verify the laws of mechanics
02	To execute the graphical methods to verify the analytical solutions

Course Outcomes :

Upon successful completion of laboratory work, the student will be able to

1CVES157_01	Compute the resultant & moments of a force system to verify the Laws for forces. (K^3)
1CVES157_02	Calculate and compare support reactions of a simply supported beam and centroid of plane lamina by experimental and analytical methods. (K^2)
1CVES157_03	Calculate forces in the members of truss and coefficient of friction of different material surfaces (K^3)
1CVES157_04	Follow the teacher and repeat the experiment performances individually and interpret the results (S^3)
1CVES157_05	Express involvement and understanding concepts and applications in the laboratory (A^3)

List of Experiments

Exp. No.	Title of Experiments
1	To verify law of polygon of forces using force table.
2	To verify lami's theorem using force table.
3	To verify law of moments by Bell crank lever.
4	To calculate support reactions of beam.
5	To calculate forces in member of truss with their nature by experimental method.
6	To compute centroid of plain lamina.
7	To calculate coefficient of friction of different material surfaces.
8	To find out support reactions of a beam by graphical method.
9	To calculate forces in member of truss with their nature by graphical method.

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F.Y. CV-31/38

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Mechanics	S. Ramamrutham	Dhanpat Rai Publishing Company (P). Ltd	9 th	2010
02	Engineering Mechanics	R.S. Khurmi	S. Chand	Revised	2006
03	Engineering Mechanics	R. K. Bansal and Sanjay Bansal	Laxmi Publications Pvt. Ltd.	6 th	2013
04	Engineering Mechanics	K. L. Kumar	Tata McGraw Hill Education	4 th	2012
05	Engineering Mechanics	S. B. Junnarkar	Charotar Publications	16 th	2011
06	Engineering Mechanics	S.S. Bhavikatti	New Age International Pvt. Ltd.	4 th	2012

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Mechanics	Irving H. Shames	Prentice Hall of India, New Delhi	5 th	2011
02	Vector Mechanics for Engineers Vol.-I and II	F. P. Beer and E. R. Johnson	Tata McGraw Hill Education	6 th	2011
03	Engineering Mechanics: Statics & Dynamics	Ferdinand Singer	Harper and Row Publications	9 th	2009
04	Fundamentals of Engineering Mechanics	S. Rajasekaran	Vikas Publishing House Pvt. Ltd.	3 rd	2005
05	Mechanics of Materials	Dr. B.C. Punmia	Laxmi Publications Pvt. Ltd.	Reprint	2010

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F.Y. CV-32/38

Course Details:

Class	F.Y. B. Tech. Sem. II
Course Code and Course Title	1CVES158, Basic Electrical & Electronics Engineering Laboratory
Prerequisite/s	--
Teaching Scheme: Practical/Tutorial	02/00
Credits	01
Evaluation Scheme: ISE	50

Course Objectives:

01	To explain safety precautions in electrical engineering practices
02	To familiarize with Electrical and Electronic components and equipment & their testing with proper measuring instruments
03	To develop the ability to analyze analog and digital Electronics Circuits.
04	To perform hands on experiments with Electrical and Electronics appliances
05	To relate mathematical treatments (Laws and Theorems) with real world case studies

Course Outcomes:

Upon completion of this course, students will be able to

1CVES158_1	Identify Electrical and Electronic components & equipment (K^1)
1CVES158_2	Interpret the measurement of different electrical parameters of Electric circuits and Electronic circuits with appropriate measuring instruments (K^2)
1CVES158_3	Perform different tests to study the characteristics of different Electrical & Electronic components (S^1)
1CVES158_4	Correlate the observations and results of experiment with different laws and theorem (S^2)
1CVES158_5	Practice safety precautions required for electrical engineering practices (A^2)

Expt. No.	Title of Experiment (Any Eight)
1	Study of Laboratory Tools, Measuring Instruments, Energy Meter
2	Electrical Safety Precaution and Earthing
3	Wiring Circuits and Single line diagram
4	Lamps and Illumination Schemes
5	Kirchhoff's Voltage and Current Law
6	Familiarization with Laboratory Instruments (Oscilloscope, Function Generator, Digital Multimeter, DC Power Supply) and electronics components (R, L, C, Diodes, Transistor, LED, Switches)
7	Implement logic gates and verify its truth table. (OR, AND, NOT, NAND, NOR, EXOR, EXNOR)
8	Verify V-I Characteristics of PN junction diode.
9	Verify V-I Characteristics of Zener diode.
10	Study of displacement measurement using LVDT.

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F.Y. CV-33/31

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	A Textbook of Electrical Technology	B L Theraja & A K Theraja	S. Chand Publications, New Delhi	5 th	2008
02	Fundamentals of Digital Design	Anand Kumar	PHI	4 th	2016
03	Principle of Electronics	V.K. Mehta	S. Chand	5 th	2016
04	A Text Book of Applied Electronics	R S Sedha	S. Chand	4 th	2008

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Basic Electrical Engineering	I.J. Nagrath D. P. Kothari	Tata McGraw Hill	6 th	2008
02	Fundamentals of Electrical Engineering	Ashfaq Husain	DhanpatRai&co.	6 th	2008
03	Basic Electrical & Electronics Engineering	S. K. Bhattacharya	Pearson Publication	3 rd	2001
04	Fundamental of Electronics Engineering	R.Prasad	CENGAGE-Learning	4 th	2008
05	Digital Design	John Wakerly	Prentice Hall India Publication	3 rd	2006


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F.Y. CV-34/38

Course Details:

Class	F.Y. B. Tech, Sem. II
Course Code and Course Title	1CVES159, Computer Programming in C Laboratory
Prerequisite/s	--
Teaching Scheme: Practical	02
Credits	01
Evaluation Scheme: ISE	25

Course Objectives: The course aims to:

01	To expose programming constructs of C language to the students
02	To develop problem solving skills amongst the students
03	To learn how to write modular and efficient C programs
04	To implement C programs for various Civil Engineering problems

Course Outcomes:

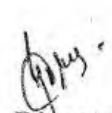
Upon successful completion of this course, the student will be able to:

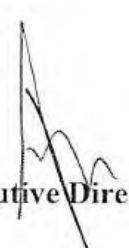
1CVES159 _1	Write , compile and debug programs in C language. (K ²)
1CVES159 _2	Make use of different data types and operators to solve various civil Engineering problems (K ³)
1CVES159 _3	Make use of conditional expressions and looping statements to solve civil Engineering problems associated with conditions and repetitions (K ³)
1CVES159 _4	Demonstrate C Programs for various problem statements. (A ³)
1CVES159 _5	Practice C program for various Civil Engineering problem statements (S ³)

Expt. No.	Title of Experiment
1.	Write an algorithm and draw flowchart for given problem statement.
2.	Implement a program using different data types and operators in C.
3.	Implement a program using decision control statements
4.	Implement a program using repetitive control statements(for,while do-while)
5.	Implement a program to demonstrate 1d array and 2d array
6.	Implement a program using user defined functions in c
7.	Implement a program to demonstrate concept of structures in c.
8.	Implement a program to demonstrate concept of array of structures in c.
9.	Implement a program to demonstrate concept of pointers in c.
10.	Implement a program to demonstrate concept of file handling in c.


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F.Y.CV-35/33

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Programming And Problem Solving Using C Language	ISRD Group	McGraw-Hill Publications	4 th	2012
02	Let Us C	Yashwant Kanetkar	BPB	3 rd	2011
03	C How to Program	Harvey M. Deitel, Paul J. Deitel, Abbey Deitel	Pearson	2 nd	2009
04	Programming in ANSI C	E. Balguruswamy	Tata Mc-Graw Hill	4 th	2008

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	The 'C' Programming Language	D. M. Ritchie	Pearson	2 nd	1998
02	C Programming Laboratory: Handbook for Beginners	Sidnal	Wiley India Limited	1 st	2012
03	The Complete Reference C	Herbert Schildt	McGraw-Hill Publications	4 th	2000
04	Test your C Skills	Yashwant Kanetkar	BPB Publications	5 th	2013

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P.Y.CV-36/38

Course Details:

Class	F.Y.B. Tech, Sem.I
Course Code and Course Title	1CVES160, Workshop Practice
Prerequisite/s	-
Teaching Scheme: Lecture/Practical	0/2
Credits	01
Evaluation Scheme: ISE	25

Course Objectives:

01	To explain causes of accident and safety precautions while working in shop
02	To demonstrate different measuring instruments and their applications
03	To present different welding joints by using electric arc welding
04	To demonstrate different tools for fitting operations
05	To demonstrate different sheet metal working operations and tools

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVES160_1	Apply appropriate instruments and handle them carefully and safely to make measurements of the physical quantity. (K ³)
1CVES160_2	Create a male-female joint by carrying out different fitting operations. (K ³)
1CVES160_3	Prepare a job with different joining operations by electric arc welding. (K ³)
1CVES160_4	Produce a component using different sheet metal operations and tools. (K ³)
1CVES160_5	Work effectively in team to accomplish the assigned task. (K ²)

Course Contents:

Exp. No.1	Safety: Concept of accidents causes of accidents, safety precautions while working in shop, safety equipments and their use. Measuring Instruments: Brief introduction to instruments like – Steel rule, Calipers, Vernier Caliper, Micrometer, Vernier height Gauge etc. Least counts, common errors and care while using them. Use of marking gauge, 'V' block and surface plate.	04 Hrs.
Exp. No. 2	Fitting: Study of various tools like- files, drills, taps, dies. Fitting operations. Fitting: One job Male/Female fitting with operations- Marking, cutting, drilling, tapping filing etc	10 Hrs.
Exp. No. 3	Welding : Importance of welding in Engineering, Introduction to different welding tools. Welding: One job on Arc welding- Lap / Butt Joint etc. (For individual student)	06 Hrs.
Exp. No. 4	Sheet metal working: Introduction to sheet metal working operations like- cutting ,bending, forming, riveting. Introduction of sheet metal tools. Sheet metal working: One job on sheet metal working involving sheet metal cutting, bending, forming, riveting etc.	08 Hrs.

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f.y. CV-37/38

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Workshop Technology-I & II	SK Hajara Choudhury, AK Hajara Choudhury, Nirjhar Roy	MMP Pvt. Ltd.	14 th	2003
02	Workshop Technology	Gupta and Kaushik,	New Heights	--	--

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Workshop Technology, Vol-I	B.S.Raghuvanshi	Dhanpat Rai and Sons	9 th	2007
02	Workshop Practice	H.S.Bawa	TMH Publications, New Delhi	2 nd	2012


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Course Details:

Class	B. Tech, Sem.- III
Course Code and Course Title	1CVBS201, Applied Mathematics- III
Prerequisite/s	1CEBS102, 1CEBS107
Teaching Scheme: Lecture/Tutorial	03/01
Credits	04
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of the course, the student should be able to

1CVBS201_1	Solve the problems of vector calculus. (K^3)
1CVBS201_2	Solve the problems on Partial Differential Equation. (K^3)
1CVBS201_3	Construct the Fourier Series for the any functions. (K^3)
1CVBS201_4	Solve Algebraic and transcendental Equations using numerical method. (K^3)
1CVBS201_5	Solve the Civil engineering problems using Linear Differential Equation. (K^3)
1CVBS201_6	Evaluate Laplace Transform and inverse Laplace transform of any function. (K^3)

Course Contents:

Unit 1	Vector Calculus: Introduction, Scalar and vector point functions - vector operator del, Del applied to scalar point functions - gradient, directional derivative, Del applied to vector point functions - Divergence and curl, Line integral, Green's theorem in the plane	07 Hrs.
Unit 2	Partial Differential Equations and its Application: Introduction, Formation of Partial Differential Equation, Linear partial differential equation of first order (Lagrange's Method), Non-linear equations of first order (Four Standard Forms of Partial Differential Equation)	06 Hrs.
Unit 3	Fourier Series: Introduction, Euler's Formulae, Conditions for a Fourier expansion, Functions having points of discontinuity, Change of interval, Expansion of odd or even periodic functions, Half range series	08 Hrs.
Unit 4	Numerical Solution of Algebraic and Transcendental Equations: Bisection Method, Regular - Falsi Method, Newton - Raphson Method, Secant Method, Muller's Method, Multiple roots by Newton's method.	06 Hrs.
Unit 5	Linear Differential Equations and Its Application: Definitions, Complete solution, Operator D, Rules for finding Complementary function, Inverse operator, Rules for finding the Particular integral, Applications of Linear Differential Equations with constant coefficients Cantilever, Strut, Beam.	08 Hrs.

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Unit 6	Laplace Transform: Introduction, Laplace transform of elementary functions. Properties of Laplace Transforms, Transforms of derivatives, Transforms of integrals, Multiplication by t^n , Division by t , Evaluation of integrals by Laplace Transforms. Inverse Laplace transforms - Method of Partial Fractions, convolution Theorem, Applications of Laplace transform to solve linear differential equations	07 Hrs.
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Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Higher Engineering Mathematics	Dr. B. S. Grewal	Khanna Publication	40	2007
02	Higher Engineering Mathematics.	H. K. Das	S. Chand and company Ltd.,	1	2011
03	Advanced Engineering Mathematics	Erwin Kreyszig	John Wiley & Sons, Inc.	9	2007
04	Engineering Mathematics Vol I, II	ITL Education Solution Limited	Cengage Learning	1	2015

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Higher Engineering Mathematics.	B.V. Ramana	Tata McGraw Hill Education Pvt., Ltd.	1	2007
02	Advanced Engineering Mathematics.	Potter Merle C.	Oxford University Press,	3	2005
03	Engineering Mathematics Volume I and II	ITL Education	Cengage Learning India Private limited	1	2015
04	Advanced Engineering Mathematics.	ONeil Peter V	Cengage Learning India Pvt. Ltd. ,	1	2012

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SY-CV-02/42

Course Details:

Class	B. Tech, Sem.- III
Course Code and Course Title	1CVPC202, Advance Surveying
Prerequisite/s	1CVES103
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I /MSE/ ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of the course, the student should be able to

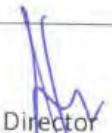
1CVPC202_1	Explain the phenomenon of leveling and contouring. (K^2)
1CVPC202_2	Discuss use and applications of modern surveying techniques. (K^2)
1CVPC202_3	Describes the field applications of tacheometry in distance and elevation calculations. (K^2)
1CVPC202_4	Illustrate the field procedure for the traverse computation and leveling. (K^3)
1CVPC202_5	Calculate the various parameters for setting out curves. (K^3)

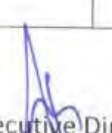
Course Contents:

Unit 1	Levelling and contouring Construction and Permanent adjustments of Dumpy Level, Tilting and Auto Level, Sensitivity of Bubble Tube, Contouring, Characteristics of Contours, Methods of Plotting Contours, Uses of Contour Maps,	07 Hrs.
Unit 2	Theodolite Travers surveying System of bearings, Types of theodolite, measurement of horizontal angle and vertical angle, theodolite traversing-closing error, Calculation of Latitude and departure, Gales traverse table, Trigonometric levelling.	07 Hrs.
Unit 3	Photogrammetry Types of photogrammetry and photographs, Aerial photogrammetry, Stereoscopy and interpretation. Introduction to Satellite photogrammetry and its applications. How to Download Satellite Images, Uses and applications of Satellite Photogrammetry, Applications of drone survey.	07 Hrs.
Unit 4	Remote Sensing, GPS and GIS Definition and applications. Basics and applications of Geographical Positioning system (GPS), Basics and applications of GIS.	05 Hrs.
Unit 5	Tacheometry Significance & Systems, Principle, constants, Basic Formulae distance and RL calculations, Stadia method, Tangential system.	09 Hrs.
Unit 6	Curves Significance of curves and curve setting, Type of horizontal curve, elements of simple, compound, Transition and combined curve. Setting out of simple curve by linear and angular methods. Vertical curves – types, lengths of vertical curves	07 Hrs.


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Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Surveying and Levelling	N. N. Basak	Tata Mcgraw Hill, New Delhi	2 nd	2014
02	Surveying Vol. I and II	S. K. Duggal	Tata Mcgraw Hill, New Delhi	4 th	2009
03	Surveying Vol. I, II and III	Dr. B.C. Punmia,	Laxmi Publishers, New Delhi.	-	2004
04	Surveying and Levelling Vol. I and II	T.P Kanetkar and S.V Kulkarni,	Pune Vidhyarthi Gruha. Pune	-	-

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Elements of Photogrammetry	Paul R. Wolf,	McGraw Hill Publication New Delhi	2 nd	1984
02	Remote sensing and Geographical Information System	A. M. Chandra and S. K. Ghosh	Alpha Science International Ltd	1 st	2005
03	Advanced Surveying - Total Station, GIS and Remote Sensing	SatheeshGopi, R. Sathikumar and N. Madhu	Pearson publication	2 nd	2012
04	Remote Sensing and Geographical Information System	M. Anji Reddy	B. S. Publications	4 th	2014

Codes:

1. IRC: SP: 19 - Manual for surveying, Investigation and preparation of Road Projects
2. IRC: SP: 54 -Project preparation Manual for Bridges
3. IRC: SP: 42 - Guidelines on Road Drainage
4. IRC: SP: 50 – Guidelines on Urban Drainage
5. IRC: 38 – Design Tables for Horizontal curves for Highways

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SY-CV-04/42

Course Details:

Class	B. Tech, Sem.- III
Course Code and Course Title	1CVPC203, Fluid Mechanics
Prerequisite/s	1CVBS102, 1CVBS107, 1CVES108
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC203_1	Summarize the basic properties of fluids and examine their behavior under application of various force systems. (K ²)
1CVPC203_2	Identify the different types of turbines and explain their working principle. (K ²)
1CVPC203_3	Apply the principles developed in fluid statics, fluid kinematics and fluid dynamics in fluid flow problems. (K ³)
1CVPC203_4	Illustrate the applications of principles of continuity, momentum and energy to a fluid in motion. (K ³)
1CVPC203_5	Use the principle and equations for pressure flow and momentum analysis in open channel flows (K ³)

Course Contents:

Unit 1	Properties of fluids & Dimensional analysis: Physical Properties of Fluids, Types of Fluids; Dimensional Homogeneity, Importance and use of Dimension Analysis, Buckingham's Pie Theorem.	06 Hrs.
Unit 2	Fluid Statics: Types of Pressure, Hydrostatic Law, Pressure Measurement Devices, Total Pressure and Centre of Pressure for Plane and Curved Surfaces. Fluid Kinematics: Types of Flows, Reynold's Experiment Fluid Dynamics: Euler's Equation along a Streamline, Bernoulli's Theorem: Assumptions & Limitations, Applications: Venturimeter, Orificemeter	10 Hrs.
Unit 3	Losses in Pipes: Major and Minor Losses, Concept of Equivalent Pipe, Pipes in Series & Parallel, Two Reservoir Problems, Concept of Siphon Boundary Layer Theory: Concept, Separation of Boundary Layer, Control of Separation.	05 Hrs.
Unit 4	Hydraulic Turbines: Classification of Turbines- Pelton, Francis and Kaplan Turbines: Unit Quantities, Specific Speed, Performance Characteristics, Selection of Type of Turbine, Concept of Draft Tube.	06 Hrs.
Unit 5	Uniform Flow in Open Channel: Introduction, Types of Open Channels and flows, Velocity Distribution, Measurement of Velocity - Chezy's and Manning's Formula, Uniform Flow Computations, Hydraulically Efficient Section, Specific Energy & Specific Force	08 Hrs.

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Unit 6	Non-Uniform Flow in Open Channel: Gradually Varied Flow (GVF): Classification of Channel Slopes & GVF Profiles, Dynamic Equation of GVF, Direct Step Method of Computation of GVF Profiles Rapidly Varied Flow (RVF): Hydraulic Jump - Phenomenon, Conjugate Depth Relationship, Uses and Types of Hydraulic Jump, Hydraulic Jump as an Energy Dissipater	07 Hrs.
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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	A text book of Fluid Mechanics	R.K. Rajput	Chand Pub.	9 th	2013
02	Engg. Fluid Mechanics	K.L.Kumar	Eurasia Pub.	7 th	2001
03	Fluid Mechanics	S. Ramamurtham	Dhanpat Rai & sons	3 rd	2009
04	Fluid Mechanics and Hydraulic Machines	R.K.Bansal	Khanna Pub.	10 th	2013

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Fluid Mechanics – Hydraulic & Hydraulic Mechanics	Modi-Seth	Standard Book House, Delhi	10 th	2011
02	Fluid Mechanics	Streeter, Wylie, Bedford	Mc-Graw hill Pub.	7 th	2009
03	Fluid Mechanics	Frank M White	Mc-Graw hill Pub	9 th	2010
04	Fluid Mechanics	Garde-Mirajgaonkar	Nemchand Bros., Roorkee	1 st	2011

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SY-CV-06/42

Course Details:

Class	B. Tech, Sem.-III
Course Code and Course Title	ICVPC204, Strength of Materials
Prerequisite/s	ICVES108, ICVES157
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I /MSE/ ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of the course, the student should be able to

ICVPC204_1	Identify various types of stress and strain in various structural elements. (K^2)
ICVPC204_2	Draw shear force and bending moment diagrams for beam supports and various loading conditions. (K^3)
ICVPC204_3	Calculate dimensions of structural member subjected to Torsion. (K^3)
ICVPC204_4	Calculate shear stresses and bending stresses for different beam sections. (K^3)
ICVPC204_5	Compute strain energy stored in material under different loadings. (K^3)

Course Contents:

Unit 1	Stress and Strain: Introduction to Elasticity, Plasticity, Brittleness and Strength of materials. Types of stresses and strains, stress strain diagrams, Hooke's law, Behavior of composite sections, Stress distribution in the compound bar and bar of varying c/s, temperature stresses. Elastic constants of isotropic materials. Analysis of thin and thick wall cylinders.	07 Hrs.
Unit 2	Bending moment and shear force in beams: Introduction, Relationship between loading, shear force and bending moment, Shear force and bending moment equations, SFD and BMD with salient values for cantilever beams, simply supported beams and overhanging beams considering point loads, UDL, UVL and Couple, calculate reactions and loadings from SFD and BMD (Reverse Method)	07 Hrs.
Unit 3	Torsion: Stresses, strains and deformation in determinate and indeterminate shafts of hollow and solid sections of homogenous and composite materials subjected to torque, concept of torsion on beam and slab.	07 Hrs.
Unit 4	Bending Stresses in Beams: Theory of pure bending, Curvature of a beam, Assumptions, flexure formula, Moment of resistance of cross section, Bending stress distribution diagrams for symmetrical and unsymmetrical sections.	07 Hrs.
Unit 5	Shear stresses in Beams: Shear Stresses in Beams of various commonly used sections such as rectangular, triangular, T, circular and I section, Concept of Shear Centre.	07 Hrs.
Unit 6	Strain energy Concept, expression of strain energy for axially loaded member under gradual, sudden and impact loads. Strain energy due to self-weight.	07 Hrs.

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54-CV-07/42

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Strength of Materials	Subramanyam	Oxford University Press	2 nd	2011
02	Text book of Mechanics of Materials	M.N. Shesha Prakash, G.S.Suresh,	PHI, Learning Pvt. Ltd., New Delhi	-	2011
03	Strength of Materials	Ramamrutham	Dhanapath Rai Publishers, New Delhi.	-	2011
04	Strength of Materials	Bhavikatti S.S	Vikas Publishers, New Delhi.	3 rd	2009
05	Strength of Materials	Punmia B.C., Ashok Jain, Arun Jain	Lakshmi Publications, New Delhi.	-	2011

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Fundamentals of Solid Mechanics	Gambhir. M.L	PHI Learning Private Limited., New Delhi	1 st	2009
02	Mechanics of Materials	Gere and Timoshenko	CBS Publishers & Distributors Pvt. Ltd. Old Delhi	2 nd	2004
03	Strength of Material	Timoshenko. S. & Young. D. H,	McGraw Hill Book Company Publication	4 th	2006
04	Mechanics of Material	Beer and Johnston	Mc Graw Hill publication	3 rd	2004
05	Mechanics of Structures, Vol-I	S.B. Jurnarkar and Dr. H.J. Shah	Charotar Publishing house	6 th	2005

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SY-CV-08/42

Course Details:

Class	B. Tech, Sem.-III
Course Code and Course Title	1CVPC205, Building Technology
Prerequisite/s	1CVES103
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I /MSE/ ISE II / ESE	10/30/10/50
Duration of ESE	4 hrs.

Course Outcomes (COs):

Upon successful completion of the course, the student should be able to

1CVPC205_1	Explain the properties and suitability of various building materials((K ²)
1CVPC205_2	Discuss different building components. (K ²)
1CVPC205_3	Describe different bonds in masonry (K ²)
1CVPC205_4	Summarize different types of roof coverings and different types of flooring. (K ²)
1CVPC205_5	Draw different building components. (K ³)

Course Contents:

Unit 1	Engineering Properties of Building Materials: Stones - Requirements of good building stone, uses of building stones. Bricks - Manufacturing, Types(clay bricks, fly ash, cellular light weight concrete brick, aerated cement concrete brick or autoclave brick) and Engineering Properties. Aggregates - Fine Aggregates and coarse aggregates - Origin, types, particle size and shape, mechanical and physical properties, artificial sand. Timber - Characteristics, seasoning of timber, preservation of timber, their application in Civil Engineering. Steel - Standard structural sections, steel as reinforcement. High Yield Strength Steel and high tensile steel, uses of steel in Building Construction. Tiles - Ceramic, Vitrified, Natural Stone, Paving Blocks etc. Advanced Materials- Precast Concrete and Bamboo as structural member	09 Hrs.
Unit 2	Masonry: Types of stone masonry (Introduction only) Brickwork and Brick Bonds - English, Flemish, and Rat trap bond (one- brick thick). Composite masonry, various types of composite masonry walls Reinforced brick masonry types of mortar for masonry	05 Hrs.
Unit 3	Building components Foundations –Deep foundation Pile foundation-Classification based on uncton, Material and composition Pier foundation and Well foundation Arches: Technical terms in arches, types of arches. Lintel: Necessity, types of lintels Formwork: Requirement and economy Materials used as formwork: Timber, Steel, Plywood, Basic requirements of a building as a whole: strength and stability, Dimensional	07 Hrs.

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	stability, comfort and convenience, damp prevention, waterproofing techniques, heat insulation, day lighting and ventilation. Sound insulation and anti-termite treatment	
Unit 4	Stairs Stairs: Technical terms, requirements of a good stair, uses, types, Materials for construction. Ramps, lifts and escalator. Design of stairs (Dog Legged, quarter turn and Open Well)	07 Hrs.
Unit 5	Doors and Windows Doors - Classification, Teak wood Paneled Door, Flush Door, Aluminum Glazed Doors, Steel Doors, fixtures and fastening. Windows - Classification, Teakwood Glazed Windows, Aluminum, Glazed Windows, Steel Windows, UPVC Windows fixtures and fastening.	07 Hrs.
Unit 6	Roofs and Roof coverings: Terms used types of roof, pitched roofs and their types, Steel Trusses types and their suitability. Roof covering materials and their selection Concept of proflex (truss less) roof and their selection. Concrete Flooring (Tremix Flooring) Water proofing- materials and methods	07 Hrs.

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Building Construction	B.C.Punmia	Laxmi Publications	5 th	2016
02	Basic Civil Engineering A Text Book of Building Construction	G. K. Hiraskar	Dhanpat Rai Publications	5 th	2010
03	Building Construction	S.P. Arora, S.P. Bindra	Dhanpat Rai Publications	5 th	2005
04	Civil Engineering Drawing	M.Chakraborty.	M.Chakraborty	4 th	2001

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Materials	R.K.Rajput	S. Chand	3 rd	2012
02	A Course in Civil Engineering Drawing	V.B.Sikka	S.K.Kataria and Sons	7 th	2005
03	Building materials	S.K Duggal	New age international publishers	3 rd	2008
04	Practical Building Construction & its Management.	Sandeep Mantri	Satya Prakashan	10 th	2012
05	I.S. 962 - 1989 Code for Practice for	-	B.I.S. New Delhi	-	-

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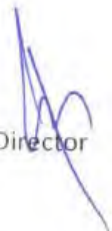
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	Architectural and Building Drawings				
06	SP 7- National Building Code Group 1 to 5	-	B.I.S. New Delhi	-	-


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SY-CV-11/42

Course Details:

Class	B. Tech, Sem-III
Course Code and Course Title	1CVPC251, CAD Practice Laboratory
Prerequisite	1CVES103
Teaching Scheme : Practical (Drawing)	02
Credits	01
Evaluation Scheme: ISE	25

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC251_1	Summarize various Commands of Auto CAD (K ²)
1CVPC251_2	Demonstrate the Auto CAD Commands (K ³)
1CVPC251_3	Draw components of building.(K ³)
1CVPC251_4	Engage in lifelong learning the drawing knowledge of residential building. (A ²)
1CVPC251_5	Use Auto Cad software as a modern tool for Civil Engineering drawing. (S ²)

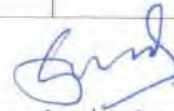
Course Contents:

Expt No.	Title of Experiment
1	Study of basics of Auto CAD software.
2	Study of various Auto CAD Commands.
3	Demonstrate the Auto CAD Commands.
4	Draw isolated column footing with reinforcement.
5	Draw combined column footing with reinforcement.
6	Draw plan and sectional elevation of dog legged staircase.
7	Draw plan, elevation of T.W. Paneled door along with door frame in different layers.
8	Draw sectional side elevation of T.W. Paneled door along with door frame in different layers.
9	Draw plan of one room showing position of door, window along with wall thickness.

Reference books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Civil Engineering Drawing	V.B.Sikka	S.K.Kataria & Sons	5 th	2008
2	Building Design and Drawing	Y. S. Sane	Allied Book Stall, Pune	4 th	2011
3	Practical Building Construction & its Management	Sandeep Mantri	Satya Prakashan	10 th	2011-12


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4	AutoCAD	George Omura	Sybex	1 st	2012
5	AutoCAD	David Frey	BPB Sybex Publications	-	2011

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Course Details:

Class	B. Tech, Sem-III
Course Code and Course Title	1CVPC252, Advance Surveying Laboratory
Prerequisite/s	1CVES103, 1CVPC202
Teaching Scheme: Practical	00/02
Credits	01
Evaluation Scheme: ISE / ESE	25/25

Course Outcomes (COs):

Upon successful completion of the course, the student should be able to

1CVPC252_1	Compute the area and levels of points by taking field observation by leveling instruments and theodolite. (K ³)
1CVPC252_2	Apply the principle of tacheometry to find the required parameters from field observation. (K ³)
1CVPC252_3	Calculate the necessary data for setting out the curve. (K ³)
1CVPC252_4	Express the knowledge of surveying for solving the civil engineering problems. (A ³)
1CVPC252_5	Use the advance surveying instruments and its applications. (S ²)

Course Contents:

At least 8 experiments along with two surveying project

Expt. No.	Title of Experiment
1	To study Dumpy Level, Tilting Level and Auto Level and Calculating reduced levels.
2	Study and use of theodolite, Measurement of Horizontal angle by Repetition and Reiteration method
3	To measure the vertical angle and calculate the reduced levels by trigonometrical levelling
4	To carry out the study of toposheets.
5	Determination of the Multiplying and Additive Constant of given Tacheometer.
6	To set out the simple curve by linear method: By ordinates from the long chord or By Rankine's method of tangential angle (deflection angle).
7	Measurement of Horizontal distance, horizontal angle, vertical distance and Vertical Angle and Measurement of area by total station
8	Measurement of an area by using GPS
9	Applications of Q-GIS
10	Surveying Projects (Any Two) 1. Theodolite traverse project 2. Profile levelling and Road Project by Total Station 3. Block Contouring by Total Station

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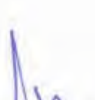
Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Surveying and Levelling	N. N. Basak	Tata Mcgraw Hill, New Delhi	2 nd	2014
02	Surveying Vol. I and II	S. K. Duggal	Tata Mcgraw Hill, New Delhi	4 th	2009
03	Surveying Vol. I, II and III	Dr. B.C. Punmia,	Laxmi Publishers, New Delhi.	-	2004
04	Surveying and Levelling Vol. I and II	T.P Kanetkar and S.V Kulkarni,	Pune Vidhyarthi Gruha. Pune	-	-

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Elements of Photogrammetry	Paul R. Wolf,	McGraw Hill Publication New Delhi	2 nd	1984
02	Remote sensing and Geographical Information System	A. M. Chandra and S. K. Ghosh	Alpha Science International Ltd	1 st	2005
03	Advanced Surveying - Total Station, GIS and Remote Sensing	SatheeshGopi, R. Sathikumar and N. Madhu	Pearson publication	2 nd	2012
04	Remote Sensing and Geographical Information System	M. Anji Reddy	B. S. Publications	4 th	2014


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SY-CV-15/42

Course Details:

Class	B. Tech, Sem.-III
Course Code and Course Title	1CVPC253, Strength of Materials Laboratory
Prerequisite/s	1CVES103, 1CVES152, 1CVES108, 1CVES157
Teaching Scheme: Practical	02/00
Credits	01
Evaluation Scheme: ISE / ESE	25/00

Course Outcomes (COs):

Upon successful completion of the course, the student should be able to

1CVPC253_1	Compute tensile strength on Mild steel and tor steel. (K^3)
1CVPC253_2	Calculate compressive strength of timber and Bricks. (K^3)
1CVPC253_3	Observe structural properties of different materials. (K^3)
1CVPC253_4	Communicate effectively about laboratory work both orally and while performing experiments. (S^2)
1CVPC253_5	Participate effectively in performing laboratory work. (A^2)

Course Contents:

Expt. No.	Title of Experiment
1.	Tension test on Mild steel and Tor Steel
2.	Compressive strength test on timber
3.	Compressive Strength and water absorption test on Brick.
4.	Brinell and Rockwell Hardness test on different metals.
5.	Impact test on different metals.
6.	Bending test on Timber.
7.	Torsion Test on Bar.
8.	Shear Test on different bars.
	Assignments : One assignment per unit


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54-CV-16/42

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Strength of Materials	Subramanyam	Oxford University Press	2 nd	2011
02	Text book of Mechanics of Materials	M.N. Shesha Prakash, G.S.Suresh,	PHI, Learning Pvt. Ltd., New Delhi	-	2011
03	Strength of Materials	Ramamrutham	Dhanapath Rai Publishers, New Delhi.	-	2011
04	Strength of Materials	Bhavikatti S.S	Vikas Publishers, New Delhi.	3 rd	2009
05	Strength of Materials	Punmia B.C., Ashok Jain, Arun Jain	Lakshmi Publications, New Delhi.	-	2011

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Fundamentals of Solid Mechanics	Gambhir. M.L	PHI Learning Private Limited., New Delhi	1 st	2009
02	Mechanics of Materials	Ugural. A.C	Wiley India Pvt. Ltd., New Delhi	-	2013
03	Strength of Material	Timoshenko. S. & Young. D. H,	McGraw Hill Book Company Publication	4 th	2006
04	Mechanics of Material	Beer and Johnston	Mc Graw Hill publication	3 rd	2004
05	Mechanics of Structures, Vol-I	S.B. Jurnarkar and Dr. H.J. Shah	Charotar Publishing house	6 th	2005

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54-CV-17/42

Course Details:

Class	B. Tech, Sem.- III
Course Code and Course Title	1CVPC254, Fluid Mechanics Laboratory
Prerequisite/s	1CVPC203
Teaching Scheme: Practical	02
Credits	01
Evaluation Scheme: ISE / ESE	25/25

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC254_1	Explain the behavior of fluid flow rate under various conditions. (K^2)
1CVPC254_2	Illustrate and plot the graphical results and its comparison with experimental results. (K^2)
1CVPC254_3	Examine the fluid motion equations in laboratory. (K^4)
1CVPC254_4	Communicate effectively about the laboratory work orally. (S^3)
1CVPC254_5	Follow the given instructions in laboratory for handling flow measurement equipment's. (A^2)
1CVPC254_6	Prepare a report based on the site visit. (A^2)

Course Contents:

At least 10 experiments from the following

Expt. No.	Title of Experiment
01	Calibration of Measuring Tank, Measurement of Discharge and Study of Pressure Measuring Devices
02	Calculation of Reynolds's number for Laminar and Turbulent flow
03	Verification of Bernoulli's Theorem
04	Calibration of Venturimeter
05	Calibration of Orificemeter
06	Determination of hydraulic coefficients of orifice
07	Study of factors affecting coefficient of friction for pipe flow (at least for two different materials and two different diameters)
08	Study of hydraulic jump for different discharges
09	Plotting specific energy curve for different discharges
10	Study of centrifugal pump [only Efficiency is expected]
11	Determination of loss of head due to i) Sudden expansion, ii) contraction iii) elbow iv) bend v) Globe Valve etc. (At least Two minor losses)
12	Report on Visit to CWPRS or hydropower generation plant


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Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	A text book of Fluid Mechanics	R.K. Rajput	Chand Pub.	9 th	2013
02	Engg. Fluid Mechanics	K.L.Kumar	Eurasia Pub.	7 th	2001
03	Fluid Mechanics	S. Ramamurtham	Dhanpat Rai & sons	3 rd	2009
04	Fluid Mechanics and Hydraulic Machines	R.K.Bansal	Khanna Pub.	10 th	2013

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Fluid Mechanics – Hydraulic & Hydraulic Mechanics	Modi-Seth	Standard Book House, Delhi	10 th	2011
02	Fluid Mechanics	Streeter, Wylie, Belford	Mc-Graw hill Pub.	7 th	2009
03	Fluid Mechanics	Frank M White	Mc-Graw hill Pub	9 th	2010
04	Fluid Mechanics	Garde-Mirajgaonkar	Nemchand Bros., Roorkee	1 st	2011

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54-CV-19/42

Course Details:

Class	B Tech Sem.-III
Course Code and Course Title	1CVPC255, Building Technology Laboratory
Prerequisite/s	0CVPC205
Teaching Scheme: Practical	02
Credits	01
Evaluation Scheme: ISE/ ESE	25/00

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC255_1	Summarize the market rates of various building materials and construction units (K^2)
1CVPC255_2	Draw various types of foundations. (K^3)
1CVPC255_3	Draw brick bonds, Stairs, Doors and window (K^3)
1CVPC255_4	Communicate effectively about laboratory work both orally and while drawing sheet. (S^2)
1CVPC255_5	Display the professional and ethical behavior while performing laboratory work (A^2)

Course Contents:

Expt. No.	Title of Experiment
01	On Sketch book Drawing of Symbols, used in civil engineering drawing and dimensioning as per IS 962.
02	Identification of different building materials and market survey of building materials its rates and units used on site.
03	Drawing to a scale, on half imperial drawing sheet Foundations: Isolated, Combined Footing, Under Reamed Piles. (With reinforcement details)
04	Construction of various types of bonds in masonry and drawing it on sheet
05	Drawing to a scale, on half imperial drawing sheet. Detailed plan and sectional elevation of Dog legged staircase
06	Drawing to a scale, on half imperial drawing sheet. Detailed plan and sectional elevation of Open newel staircase
07	Drawing to a scale, on half imperial drawing sheet. Detailed plan and sectional elevation of Quarter turn staircase
08	Drawing to a scale, on half imperial drawing sheet. Sectional plan, elevation and sectional side view of T.W. Paneled door.
09	Drawing to a scale, on half imperial drawing sheet. Sectional plan, elevation and sectional side view of Glazed window.
10	Site visit and Market survey of item rates of various building construction units like foundation, beam, column slab, brickwork, plastering etc.

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Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Building Construction	B.C.Punmia	Laxmi Publications	5 th	2016
02	Basic Civil Engineering A Text Book of Building Construction	G. K. Hiraskar	Dhanpat Rai Publications	5 th	2010
03	Building Construction	S.P. Arora, S.P. Bindra	Dhanpat Rai Publications	5 th	2005
04	Civil Engineering Drawing	M.Chakraborty.	M.Chakraborty	4 th	2001

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Materials	R.K.Rajput	S. Chand	3 rd	2012
02	A Course in Civil Engineering Drawing	V.B.Sikka	S.K.Kataria and Sons	7 th	2005
03	Building materials	S.K Duggal	New age international publishers	3 rd	2008
04	Practical Building Construction & its Management.	Sandeep Mantri	Satya Prakashan	10 th	2012
05	I.S. 962 - 1989 Code for Practice for Architectural and Building Drawings	-	B.I.S. New Delhi	-	-
06	SP 7- National Building Code Group 1 to 5	-	B.I.S. New Delhi	-	-

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SY-CV-21/42

Course Details:

Class	B. Tech, Sem. - IV
Course Code and Course Title	1CVHS206, Engineering Management
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial	04/00
Credits	04
Evaluation Scheme: ISE I / MSE / ISE II/ ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVHS206_1	Explain the importance of management and entrepreneurship in Construction. (K ²)
1CVHS206_2	Discuss various Techniques for Material Management. (K ²)
1CVHS206_3	Illustrate the importance of legal aspects and Quality management in construction. (K ²)
1CVHS206_4	Choose various Quantitative Techniques for problem solving. (K ³)
1CVHS206_5	Apply the concept of Engineering Economy in construction. (K ³)

Course Contents:

Unit 1	Elements of Management History and development of management, Principle of management (Henry Fayol), Functions of management, Decision Making: Process, Decision Tree, Management theories-Neoclassical theory and Maslow's theory.	07 Hrs.
Unit 2	Material Management Objectives, Need for Inventory Control, EOQ Analysis, ABC analysis, Safety Stock, Purchase Procedure, Stores Record.	09 Hrs.
Unit 3	Quantitative Techniques Linear Programming – Simple LP model, Graphical Method, Transportation Problem, Assignment Problem.	10 Hrs.
Unit 4	Economics: Importance, Time Value of Money, Equivalence Economic Comparison Methods: Present Worth Method, EUAC method, future worth method. Financial management: Introduction to standard forms of financial statements, ie., balance-sheet, profit and loss, and income statement.	10 Hrs.
Unit 5	Other Economic Comparison Methods: Linear Break Even Analysis, Capitalized Cost method, Net Present Value, Rate of Return, Benefit- Cost Ratio, Payback Period Method, and Linear Break Even Analysis.	10 Hrs.
Unit 6	Industrial Act- Workman compensation act, Minimum wages act, Child labour act, The Contract Labour Act, 1970. Quality Management: Quality Circle, difference between Quality control &	10 Hrs.

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	Quality Assurance (QA/QC), Total quality control (TQC) and Total Quality Management (TQM), Need for TQM in construction industry, monitoring for quality - PDCA Cycle, 360° feedback for quality, Concept of Six Sigma.	
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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year
01	Engineering Management	Stoner	Pearson Education	6 th	2003
02	Operation Research	Pradip Jha	Mcgraw Hill Publishing Ltd.,	3 rd	2014
03	Engineering economics and financial accounting	Prasanna Chandra	Tata Mcgraw Hill Publishing Ltd.,	4 th	2005
04	Management Information System	K. C. and J. P. Laudon	Prentice Hall	4 th	2011

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year
01	Construction project management	Kumar Niraj Jha	Pearson Education India	2 nd	2015
02	Material Management	Gopal Krishnan, Sdueshan	McGraw Hill Education	1 st	2001
03	Engineering Management	A K gupta	Chand publication	4 th	2007
04	Principles of Management	Charles W. L. Hill, Steven Mcshane	McGraw Hill Education	1 st	2017



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Course Details:

Class	B. Tech, Sem.-IV
Course Code and Course Title	ICVES207, Structural Analysis
Prerequisite/s	1CVPC204, 1CVPC253
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I /MSE/ ISE II / ESE	10/30/10/50

Course Outcomes (COs):

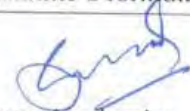
Upon successful completion of the course, the student should be able to

ICVES207_1	Describe concepts of structural analysis and degree of indeterminacy. (K^2)
ICVES207_2	Compute principal stresses and strains for a strained material. (K^3)
ICVES207_3	Draw Influence line diagram for determinate structure. (K^3)
ICVES207_4	Calculate slope and deflections of determinate beams(K^3)
ICVES207_5	Calculate combined, direct and bending stresses in the various structural elements. (K^3)
ICVES207_6	Compare elastic stability of column by using Euler's and Rankine's theory (K^4)

Course Contents:

Unit 1	Structural Systems And Energy Concept Forms of structures, Conditions of equilibrium, Degree of freedom, Linear and Nonlinear structures. One, two, three dimensional structural systems. Determinate and indeterminate structures [Static and Kinematics]. Theorem of minimum potential energy, Law of conservation of energy, Principle of virtual work.	07 Hrs.
Unit 2	Principal stresses and strains Concept of principal planes and principal stresses, normal and shear stresses on an oblique plane, magnitude and orientation of principal stresses and maximum shear stress. Mohr's circle for plane stresses.	07 Hrs.
Unit 3	Influence line diagrams Muller-Breslau's principle, influence line diagram for simple and compound beams. Application of influence line diagram to determinate 2D trusses under moving load.	07 Hrs.
Unit 4	Elastic stability of columns: Introduction – Short and long columns, Euler's theory on columns, Effective length slenderness ration, radius of gyration, buckling load, Assumptions, derivations of Euler's Buckling load for different end conditions, Limitations of Euler's theory, Rankine's formula and problems.	07 Hrs.


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Unit 5	Slope and deflection of determinate beams - double integration method and Macaulay's method. Moment area method, Conjugate beam method.	07 Hrs.
Unit 6	Combined direct and bending stresses Combined direct and bending stresses, eccentric load on short columns, kern of a section, eccentricity of load about both axes of section. Chimney subjected to wind pressure, problems on dams and retaining walls.	07 Hrs.

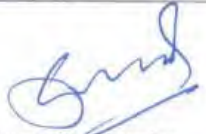
Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Strength of Materials	Subramanyam	Oxford University Press	2 nd	2011
02	Text book of Mechanics of Materials	M.N. Shesha Prakash, G.S.Suresh,	PHI, Learning Pvt. Ltd., New Delhi	-	2011
03	Strength of Materials	Ramamrutham	Dhanapath Rai Publishers, New Delhi.	-	2011
04	Strength of Materials	Bhavikatti S.S	Vikas Publishers, New Delhi.	3 rd	2009
05	Strength of Materials	Punmia B.C., Ashok Jain, Arun Jain	Lakshmi Publications, New Delhi.	-	2011

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Fundamentals of Solid Mechanics	Gambhir. M.L	PHI Learning Private Limited., New Delhi	1 st	2009
02	Mechanics of Materials	Ugural. A.C	Wiley India Pvt. Ltd., New Delhi	-	2013
03	Strength of Material	Timoshenko. S. & Young. D. H,	McGraw Hill Book Company Publication	4 th	2006
04	Mechanics of Material	Beer and Johnston	Mc Graw Hill Publication	3 rd	2004
05	Mechanics of Structures, Vol-I	S.B. Jurnarkar and Dr. H.J. Shah	Charotar Publishing House	6 th	2005


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Course Details:

Class	B. Tech, Sem.-IV
Course Code and Course Title	1CVPC208, Water Resource Engineering
Prerequisite/s	1CVBS102, 1CVBS107
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of the course, the student should be able to

1CVPC208_1	Explain different types of dams. (K^2)
1CVPC208_2	Discuss the processes involved in surface water and groundwater hydrology (K^2)
1CVPC208_3	Describe various irrigation types for different crops. (K^2)
1CVPC208_4	Calculate various surface and ground water hydrology parameters. (K^3)
1CVPC208_5	Solve numerical on determining flood discharge. (K^3)

Course Contents:

Unit 1	Introduction to hydrology Hydrological cycle and its components; Precipitation -types and forms, measurement, analysis of Precipitation data, mass rainfall curves, intensity-duration curves, and concept of depth area duration analysis, frequency analysis. Infiltration - factors affecting and measurement methods. Evaporation and evapotranspiration - factors affecting and measurement methods.	07 Hrs.
Unit 2	Surface water hydrology: Runoff - factor affecting, Rainfall runoff relationship Hydrograph: Component parts of hydrograph, Storm hydrograph, Base flow and Separation of base flow, direct runoff hydrograph, Unit hydrograph, theory, assumptions, limitations and use, S-curve hydrograph, Synthetic unit hydrograph.	07 Hrs.
Unit 3	Stream gauging: Selection of site, discharge measurement by Area velocity method, slope Area method Floods: Estimation of peak flow - empirical equations, rational method, Importance of - Design flood, standard project flood, maximum probable flood, Introduction to flood frequency analysis.	07 Hrs.
Unit 4	Ground water hydrology: Occurrence of ground water Zones of underground water, movement of ground water and its velocity.	05 Hrs.

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Unit 5	Introduction to irrigation: Definition and necessity of irrigation, types and methods of irrigation, Water logging and land drainage. Crop water requirement: Principal crops and crop seasons, Classes and availability of soil water, Duty, delta, base period and their relationship, factors affecting duty, methods of improving duty, Assessment and efficiency of irrigation water. Gross command area, cultural command area and command area calculations based on crop water requirement. Depth and frequency of irrigation.	07 Hrs.
Unit 6	Types of dams, selection of site for dams, selection of type of dam, Control levels. Gravity dam: Component parts, Forces acting on dam, Stability analysis, Earthen dam: Component parts, Construction and types of earthen dam, plotting of phreatic line, Modes of failure, seepage control measures.	09 Hrs.

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Irrigation engineering Vol. I.	S. K. Garg	Khanna Publication, Delhi	2 nd	2012
02	Engineering Hydrology	Dr. K. Subramanya	Tata McGraw Hill, New Delhi	4 th	2017
03	Hydrology	Dr. P Jaya Rami Reddy	Laxmi Publications, New Delhi	3 rd	2016
04	Engineering Hydrology	Dr. H. M. Raghunath	New Age International Publishers	3 rd	2016

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Hydrology and water resources	R. K. Sharma	Dhanpatrai and sons, New Delhi	4 th	2018
02	Irrigation Theory and Practice	A M Michael.	Vikas Publications House	2 nd	2015
03	Theory and design of irrigation structures Vol. I and II and II	Varshney, Gupta and Gupta	Newchand and Brothers	2 nd	2015
04	Fundamentals of hydrology	Savindar Singh	Pravalika Publishers Allahabad	1 st	2015

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SY-CV-27/42

Course Details:

Class	B. Tech, Sem.- IV
Course Code and Course Title	1CVPC209, Building Design and Drawing
Prerequisite/s	1BSES103, 1CVPC205, 1CVPC255
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I /MSE/ ISE II / ESE	10/30/10/50
Duration of ESE	4hrs

Course Outcomes (COs):

Upon successful completion of the course, the student should be able to

1CVPC209_1	Summarize principle of planning and building bye laws for the residential buildings. (K ²)
1CVPC209_2	Describe building permission procedure and phenomenon of energy efficient building (K ²)
1CVPC209_3	Discuss the concept of ventilation, air conditioning, thermal & sound insulation, types of building finishes, Acoustics & Fire resistance phenomenon in building (K ²)
1CVPC209_4	Explain plumbing system and electrification in building.(K ²)
1CVPC209_5	Draw Plan of residential buildings considering Building By-Laws and regulations. (K ³)

Course Contents:

Unit 1	Building Planning and bye laws Site Selection criteria, Principles of Building planning. Orientation of building and factors affecting, , Building Planning Byelaws & regulations as per SP-7, 2005. National Building code of India, Types of buildings	06 Hrs.
Unit 2	Building Permission and techniques of energy efficient building Procedure of Building Permission, significance of commencement, plinth completion or occupancy certificate., Techniques used for low cost housing and energy efficient buildings, Repair and Rehabilitation of Structures.	06 Hrs.
Unit 3	Planning of Residential Building: Understanding of municipal drawings. and working drawing Planning of Residential Building: Bungalows, Row Bungalows, Twin Bungalows and Apartments	10 Hrs.
Unit 4	Plumbing & Electrification : Plumbing: Plumbing system, Materials used for plumbing work. Various types of traps, Fittings, Chambers, Septic Tank, and Concept of Plumbing & Drainage plan. Sizes of pipes in house drainage system service pipes and domestic storage capacity	07 Hrs.

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	Electrification: Types of wiring and materials, Requirements & Location of various points. Concept of Earthing.	
Unit 5	Building Finishes, Acoustics and Fire resistance in building Paints: Different types and application methods. Plastering, Pointing and various techniques. Wall cladding, skirting, dado work with various materials. Miscellaneous finishes such as POP, Gypsum plaster. Acoustics: Conditions for good acoustics Fire resistance in building: Fire resistant construction and fire safety requirements for buildings	07 Hrs.
Unit 6	Ventilation, Air conditioning and Thermal insulation: Ventilation Definition and necessity of Ventilation, various systems. Air conditioning: - Necessity, Classification, Systems & Its various Components Thermal insulation: Materials and Methods.	06 Hrs.

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Building Construction	S.P.Bindra & S.P.Arora	Dhanpat Rai Publications (P)Ltd	5 th	2005
02	Building Construction	Dr. B.C.Punmia & Ashokumar Jain	Laxmi Publications (P)Ltd	10 th	2008
03	Civil Engineering Design & Drawing	D.N. Ghose	CBS Publications, Distributors(P)Ltd	2 nd	2010
04	Building Drawing	M.G.Shah, C.M. Kale, S.Y.Patki	Tata McGraw-Hill Publications (P)Ltd	5 th	2011
04	Civil Engineering Drawing	M.Chakraborty.	Bhaktivedanta book trust	4 th	2015

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Civil Engineering Drawing	V.B.Sikka	S.K.Kataria& Sons	5 th	2008
02	Practical Building Construction & its Management.	Sandeep Mantri	Satya Prakation	10 th	2012
03	Neufert Architects Data	Ernst and Peter Neufert	Willey-Blackwell	4 th	2012

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04	Building Planning and Drawing	N.Kumaraswamy & A.Kameswara Rao	Charotar publishing house	7 th	2013
05	SP 7- National Building Code - 2005 Group 1 to 5	--	B.I.S. New Delhi		
06	I.S. 962 - 1989 Code for Practice for Architectural and Building Drawings	--	B.I.S. New Delhi		

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SY-LV-30/42

Course Details:

Class	B. Tech, Sem.- IV
Course Code and Course Title	1CVPC210, Concrete Technology
Prerequisite/s	1CVPC205
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC210_1	Describe properties of ingredients of concrete. (K^2)
1CVPC210_2	Explain procedure of manufacturing of concrete. (K^2)
1CVPC210_3	Summarize the properties of concrete and different tests on concrete. (K^2)
1CVPC210_4	Discuss different types of special concrete. (K^2)
1CVPC210_5	Calculate the mix proportion for given grade of concrete. (K^3)

Course Contents:

Unit 1	Ingredients of Concrete Cement:- Manufacture of Portland cement, Chemical composition, Hydration of cement, Types of cement-Ordinary Portland, Portland pozzolana, Rapid Hardening Portland Cement, Quick setting cement, Sulphur resisting cement, Super sulphated cement, Expansive cement, Rediset cement, High strength cement, High Alumina, Low heat, White, Coloured, Oil well, Hydrophobic cement. Tests on cement- fineness, soundness, compressive strength, setting time. Aggregate:- Classification, requirements, size, shape, texture, Tests for coarse aggregates: Specific gravity, Grading of aggregate, Flakiness index, Elongation Index, Impact value, Abrasion value, Crushing value, Alkali aggregate reaction. Tests for fine aggregates: Specific gravity, Sieve analysis, Fineness modulus, Bulking of sand. Water: General requirements, Quality of water.	7 Hrs.
Unit 2	Fresh Concrete Process of manufacture of concrete- Batching, Mixing, Transportation, Compaction, Curing of concrete, Curing methods. Workability: factors affecting workability, measurement of workability, different tests for workability, Segregation, Bleeding. Admixtures in concrete: Air entraining agents, plasticizer and super plasticizer, accelerators, retarders, workability agents. Mineral admixtures: Fly ash, silica fumes, Ground Glass Blast Furnace Slag, Metakoline.	8 Hrs.
Unit 3	Properties of Concrete Strength of concrete: w/c ratio, Gel/space ratio, Gain of strength with age, Maturity concept of concrete, Effect of maximum size of aggregate on strength, Relation between compressive and tensile strength, Factors affecting modulus of elasticity, Definition and factors affecting creep and shrinkage.	6 Hrs.

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Unit 4	Concrete Mix Design Objectives of mix design, Different methods of Mix design, Factors affecting mix proportions, Quality control of concrete, Statistical methods, Acceptance criteria. Mix design by IS 10262- 2019, IS 456, Mix design of fly ash concrete by IS 10262 – 2019 and Manufactured sand concrete, Mix design by ACI 211.1-91 for high strength concrete.	8 Hrs.
Unit 5	Durability of concrete Strength and Durability relationship, effect of w/c on durability, different exposure condition as per IS 456 minimum and maximum cement content, Effect of Permeability, Sulphate attack, Methods of controlling sulphate attack, Durability of concrete in sea water. Test on hardened concrete - Flexural strength, Comparison of cube test and cylinder test, Schmidt's rebound hammer, Ultrasonic pulse velocity method.	7 Hrs.
Unit 6	Special concrete Light weight concrete, No-fines concrete, High density concrete, Self-compacting concrete, Cold weather concreting, Hot weather concreting, Fiber reinforced concrete, ferro-cement concrete, High strength concrete High performance concrete, Manufacturing of ready mix concrete.	6 Hrs.

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Concrete Technology	M. S. Shetty	S. Chand & Company Ltd, New Delhi	1 st	2007
02	Concrete Technology	M. L. Gambhir	Tata McGraw-Hill New Delhi	2 nd	2001
03	Concrete Technology	Santakumar A.R.	Oxford University Press.	-	2009
04	Textbook of Concrete Technology	P.D. Kulkarni, R.K. Ghosh	Newage International	3 rd	2007

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Concrete Technology	Neville and Brooks	Pearson Education, New Delhi	3 rd	2003
02	Concrete Technology	Dr. Aminul Islam laskar	Laxmi Publication	1 st	2013
03	IS 456: 2000	-	-	-	2000
04	IS 10262 – 2019, ACI 211.1-91	-	-	-	2019


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Course Details:

Class	B. Tech, Sem.-IV
Course Code and Course Title	1CVMC211, Environmental Studies
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial	02/00
Credits	--
Evaluation Scheme: ISE I /MSE/ ISE II / ESE	--

Course Outcomes (COs):

Upon successful completion of the course, the student should be able to

1CVMC211_1	Explain importance of environmental studies with necessary of acts.(K ²)
1CVMC211_2	Explain importance of public awareness on environmental problems (K ²)
1CVMC211_3	Write a technical report in team regarding course and impacts of environment related issues.(S ²)
1CVMC211_4	Discuss current concern of environment issues.(A ²)
1CVMC211_5	Describe the need of environment protection and ethics.(A ²)

Course Contents:

Unit 1	Nature of Environmental Studies Definition, scope and importance. Multidisciplinary nature of environmental studies, Need for public awareness.	02 Hrs.
Unit 2	Natural Resources and Associated Problems a) Forest resources: Use and over-exploitation, deforestation, dams and their effects on forests and tribal people; b) Water resources: Use and over-utilization of surface and groundwater, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources. d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer-pesticide problems. e) Energy resources: Growing energy needs, renewable and non renewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy, f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.	04 Hrs.
Unit 3	Ecosystems Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristics features, structure and function of the following ecosystem :- a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem d)Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)	04 Hrs.


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Unit 4	Biodiversity and its conservation Introduction- Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. India as a mega- diversity nation. Western Ghat as a biodiversity region. Hot-spots of biodiversity. Threats to biodiversity habitat loss, poaching of wildlife, man- wild life conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	05 Hrs.
Unit 5	Environmental Pollution Definition: Causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution..	04 Hrs.
Unit 6	Social Issues and the Environment Disaster management: floods, earthquake, cyclone, tsunami and landslides Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issue and possible solutions. Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation. Consumerism and waste products.	03 Hrs.
Unit 7	Environmental Protection From Unsustainable to Sustainable development Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Population Growth and Human Health, Human Rights	06 Hrs.
Hand Written project report	Hand Written project report based on : Environmental assets River/Forest/Grassland/Hill/Mountain. OR A local polluted site Urban/Rural/Industrial/Agricultural. OR Study of common plants, insects, and birds. OR Study of simple ecosystems - ponds, river, hill slopes, etc. (Hand Written project report is Mandatory.)	

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Environmental Studies	Dr. B. S. Chauhan	University Science Press, New Delhi	1 st	2008
2	Environmental Studies	Dr. P. D. Raut	S. U. Kolhapur	3 rd	2011

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Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Principals of Environmental Science and Engineering	Raman Sivakumar	Cengage learning Singapore	2 nd	2005
02	Elements of Environmental Science and Engineering	P. Meenakshi	Prentice Hall of India Private Limited, New Delhi	-	2006
03	Environmental Science – working with the Earth	G.Tyler Miller Jr	Thomson Brooks /Cole	11 th	2006


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Course Details:

Class	B. Tech, Sem.-IV
Course Code and Course Title	ICVHS212, Introduction to Psychology
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial	01/00
Credits	01
Evaluation Scheme: ISE	25

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

ICVHS212_1	Discuss importance of learning industrial psychology. (K ²)
ICVHS212_2	Explain relation between attitude, emotions and behavior. (K ²)
ICVHS212_3	Discuss about leadership and collect information about specific one ideal leader. (K ²)
ICVHS212_4	Summarize the theories of motivation. (K ²)
ICVHS212_5	Describe importance of concept personality (K ²)

Course Contents:

Unit 1	Industrial Psychology	01 Hrs.
Unit 2	Attitude, Emotions and Behavior	02 Hrs.
Unit 3	Leadership – Leader Vs Manager Vs Supervisor, Some Theories in Leadership, New Approach to Leadership	04 Hrs.
Unit 4	Motivation - I Importance of Motivation at work, Motivational Theories	02 Hrs.
Unit 5	Motivation - II Modern approach to work motivation and self-efficacy, Practical Issues in Motivation	02 Hrs.
Unit 6	Personality Personality theories, Personality at work	03 Hrs.

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Introduction to Psychology	Clifford T. Morgan	Mcgraw Hill Education	4 th	2004
02	Work in 21 st century An Introduction to industrial and organizational Psychology	Frank J. Landy Jeffrey M. Conte	Willy	4 th	2013


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SY-CV-36/42

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Introduction to Work and organizational Psychology	Nik Chmiel, Franco Fraccaroli and Magnus Sverke	Willy Blackwell	3 rd	2017
02	Introduction to Industrial/organizational Psychology	Ronald E. Riggio	Routledge Taylor & Francis	7 th	2018



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SY-LV-37142

Course Details:

Class	B. Tech, Sem.-IV
Course Code and Course Title	1CVPC256, Building Design and Drawing Laboratory
Prerequisite/s	1BSES103, 1CVPC205, 1CVPC255
Teaching Scheme: Practical	04
Credits	02
Evaluation Scheme: ISE/ ESE	50/25

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC256_1	Make plan elevation and section of existing residential building (K ³)
1CVPC256_2	Draw plan elevation and section of residential building (G+1). (K ³)
1CVPC256_3	Draw plan of foundation, furniture, electrification, water supply and drainage of residential building (K ³)
1CVPC256_4	Independently use AutoCAD as modern tool for drawing sheets (S ³)
1CVPC256_5	Display drawing skill in laboratory work and carry drawing knowledge as lifelong learning. (A ³)

Course Contents:

Expt. No	Title of Experiment
01	Collection of sample documents from licensed civil engineer required for building permission
02.	Measurement drawing of existing residential building consisting of plan, elevation, and section passing through staircase. Site plan. Area statement and brief specifications to a scale of 1:100 on full imperial sheet.
03	Municipal Submission drawing -Planning and design of new residential building (G+1) building, drawing to a scale of 1:100 on full imperial sheet
04	Working Drawing- Foundation / Center Line Drawing of Expt No.3 to be drawn on AutoCAD
05	Working Drawing- Furniture layout plan. of Expt.No.3 to be drawn on AutoCAD
06	Working Drawing- Electrification plan of Expt.No.3 to be drawn on AutoCAD
07	Working Drawing -Water supply and drainage plan of Expt.No.3 to be drawn on AutoCAD
08	Project report on building designed and drawn in above experiment
09	Study of various components of plumbing system
10	Visit to construction site. Prepare site visit report including material used in construction and plumbing system.

Note: Each student should have different building for existing as well as new residential building sheet.

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sy-cv-38/42

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Building Construction	S.P.Bindra & S.P.Arora	Dhanpat Rai Publications (P)Ltd	5 th	2005
02	Building Construction	Dr. B.C.Punmia & Ashokumar Jain	Laxmi Publications (P)Ltd	10 th	2008
03	Civil Engineering Design & Drawing	D.N. Ghose	CBS Publications, Distributors(P)Ltd	2 nd	2010
04	Building Drawing	M.G.Shah, C.M. Kale, S.Y.Patki	Tata McGraw-Hill Publications (P)Ltd	5 th	2011
04	Civil Engineering Drawing	M.Chakraborty.	Bhaktivedanta book trust	4 th	2015

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year
01	Civil Engineering Drawing	V.B.Sikka	S.K.Kataria & Sons	5 th	2008
02	Practical Building Construction & its Management.	Sandeep Mantri	SatyaPrakation	10 th	2012
03	Neufert Architects Data	Ernst and Peter Neufert	Wiley-Blackwell	4 th	2012
04	Building Planning and Drawing	N.Kumaraswamy & A.Kameswara Rao	Charotar publishing house	7 th	2013
05	SP 7- National Building Code -2005 Group 1 to 5	--	B.I.S. New Delhi		
06	I.S. 962 - 1989 Code for Practice for Architectural and Building Drawings	--	B.I.S. New Delhi		


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ST-CV-39/42

Course Details:

Class	B. Tech, Sem.- IV
Course Code and Course Title	1CVPC257, Concrete Technology Laboratory
Prerequisite/s	1CVPC205
Teaching Scheme: Practical	02
Credits	01
Evaluation Scheme: ISE / ESE	50/25

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC257_1	Observe the properties of ingredients of concrete. (K^2)
1CVPC257_2	Calculate the mix proportion for given grade of concrete. (K^3)
1CVPC257_3	Examine the properties of concrete. (K^4)
1CVPC257_4	Use NDT equipments as a modern tool for calculating the strength of concrete. (S^2)
1CVPC257_5	Apply basics of concrete technology for advances in Civil Engineering (A^2)

Course Contents:

Expt. No.	Title of Experiment
01	Determination of fineness of cement by Sieve analysis or Blaine's air permeability method.
02	Determination of the standard consistency of cement using Vicat's apparatus.
03	Determination of soundness of cement by Le-Chatelier's apparatus and Auto Clave.
04	Determination of initial and final setting time of cement using Vicat's apparatus.
05	Determination of compressive strength of cement.
06	Determination of particle size distribution of fine, coarse and all in aggregate by sieve analysis (grading of aggregate and FM).
07	Determination of specific gravity, water absorption of fine and coarse aggregates.
08	Nondestructive test using rebound hammer on concrete.
09	Mix Design of Concrete using IS10262- 2009, IS 456 and making cubes of concrete. Tests for compressive strength of various grades of concrete cubes (IS 10262- 2009 and IS 456).
10	Determination of workability of fresh concrete by using slump cone.
11	Determination of compaction factor for workability of fresh concrete.

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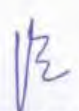
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54-CV-40/42

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Concrete Technology	M. S. Shetty	S. Chand & Company Ltd, New Delhi	1 st	2007
02	Concrete Technology	M. L. Gambhir	Tata McGraw-Hill New Delhi	2 nd	2001
03	Concrete Technology	Santakumar A.R.	Oxford University Press.	-	2009
04	Textbook of Concrete Technology	P.D. Kulkarni, R.K. Ghosh	Newage International	3 rd	2007

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Concrete Technology	Neville and Brooks	Pearson Education, New Delhi	3 rd	2003
02	Concrete Technology	Dr. Aminul Islam laskar	Laxmi Publication	1 st	2013
03	IS 456: 2000	-	-	-	2000
04	IS 10262 – 2019, ACI 211.1-91	-	-	-	2019


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Course Details:

Class	S.Y. B. Tech, Sem.-IV
Course Code and Course Title	1CVHS258, General Proficiency I Laboratory
Prerequisite/s	1CVHS105 Professional Communication
Teaching Scheme: Practical	02
Credits	01
Evaluation Scheme: ISE	25

Course Outcomes:

Upon successful completion of this course, the student will be able to:

1CVHS258_1	Identify the key traits in oneself comprising of attitude skill & knowledge (K ³)
1CVHS258_2	Proficiently apply skills for improving presentations of any format. (S ³)
1CVHS258_3	Professionally communicate in both technical and non-technical terms. (S ⁵)
1CVHS258_4	Display the traits required to improve employability skills. (A ³)
1CVHS258_5	Exhibit effective communication techniques. (A ⁵)

Expt. No.	Title of Activity
1	Self-Awareness: Personality Development
2	Communication Skills & Letter Writing, Email writing
3	Reading a News report
4	Group Discussions
5	Extempore
6	Role-play
7	Presentation Skills
8	Writing Curriculum Vitae
9	Searching Research Papers/Journals
10	Writing research article
11	SWOC Analysis & Decision Making
12	Book Reading & Review*

* indicates a book/novel should be issued by the student from the central library in the first week and its review should be presented at the end of the course.

Note: Any 10 activities from the above should be conducted compulsory.


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SY/CV-42/42

Course Details:

Class	T. Y. B. Tech. Sem. - V
Course Code and Course Title	ICVOE301, Air Pollution and Control
Prerequisite/s	ICVES103
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE-I/MSE/ ISE-II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

ICVOE301_1	Explain the various aspects of air pollution. (K ²)
ICVOE301_2	Summarize the different air pollutants from automobile sources. (K ²)
ICVOE301_3	Explain the standards, legislations about air quality parameters (K ²)
ICVOE301_4	Identify the different meteorological aspects for dispersion of air pollutants (K ³)
ICVOE301_5	Choose the proper equipment according to type of particulate matter (K ³)

Course Contents:

		Hrs.
Unit 1	Introduction to Air Pollution: Scope, significance, Air pollutants – Classification – Natural and Artificial-Primary and Secondary, Point and non-point and Aerial sources of air pollution-Stationary and mobile sources.	07
Unit 2	Effects of Air Pollution: On Human Health, Animals, Plants and Materials. Major environmental air pollution episodes- London Smog, Los Angeles Smog, and Bhopal Gas Tragedy Burning Environmental Issues: Acid rain, Global warming, Ozone depletion in the stratosphere, Indoor air pollution, Climate change.	07
Unit 3	Meteorology: Meteorological variables, Lapse Rate, Inversions, Stability conditions, Wind rose, General characteristics of Stack plumes, Meteorological models.	07
Unit 4	Control of Particulate Matter: Control at source, Process changes, Equipment Modification, Study of air pollution control equipment's – Settling Chambers, Centrifugal separators, Filters dry and wet scrubber, Electrostatic precipitators.	07
Unit 5	Air Pollution Due to Automobiles: Air pollution due to petrol-driven and diesel driven engines, Effects, Direct and Indirect methods of control. Traffic and Environment: Detrimental effect of traffic on the environment- Air pollution, Pollutants due to traffic, Measures to reduce air pollution due to traffic.	07
Unit 6	Ambient Air Quality Monitoring: Air quality networks in Maharashtra, National Air Quality index, State Air Quality Index. Study of AQI of major cities. Standards and Legislation: Air Quality and Emission Standards Legislation and Highlights of Air (prevention and control of pollution) Act, 1981.	07

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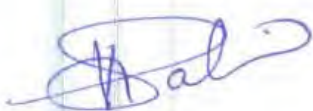
Ty CV-01/83

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Sewage disposal and air pollution engineering	S.K.Garg	Khanna publishers	33 rd	2015
02	Environmental pollution and control	Dr. H. S. Bhatia	Galgotia Publications Pvt. Ltd.	2 nd	2018
03	Air pollution and control	Keshav Kant	Khanna publishing	1 st	2018
04	Air pollution	Rao M. N. and Rao H.V.	Tata McGraw Hill	2 nd	1990

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Environmental Engineering	H.S. Peavy, D.R. Rowe	Tata McGraw Hill	2 nd	1985
02	Chemistry for Environment Engineering	Sawyor and McCarthy	Tata McGraw Hill Publishing Company Ltd.	9 th	1967
03	Air Pollution and Control	K.V.S.G.Murali Krishna	USP	1 st	2017
04	Air Pollution Control: A Design Approach.	C David Cooper	Medtech	4 th	2015
05	Fundamentals of Air Pollution	C. Stern	Academic Press	2 nd	1984


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Course Details:

Class	T. Y. B. Tech, Sem. - V
Course Code and Course Title	1CVOE302, Remote Sensing & GIS Applications
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVOE302_1	Discuss the brief history of Remote Sensing Technology and GIS. (K ²)
1CVOE302_2	Identify the various applications of remote sensing technique in engineering. (K ²)
1CVOE302_3	Explain different photographic elements in aerial photographs. (K ²)
1CVOE302_4	Describe photo interpretation with the help of stereoscope, Parallax bar & Computer. (K ²)
1CVOE302_5	Compare the results from GIS software in engineering field. (K ³)

Course Contents:

		Hrs.
Unit 1	Introduction: Introduction to Remote Sensing: Concepts, Definition, History Development, Types of RS, Types of satellites based upon uses, Satellite Orbits, India's position in Remote Sensing & Space development.	06
Unit 2	Radiation & Spectrum: Basic of solar radiation, Stages in RS-EMR, EMR Spectrum, Theories of EMR, Interaction of EMR: Interaction with Earth's Atmosphere and Atmospheric window, Platforms, Sensors, Orbits: Types of Platform, Types of Sensors, Cameras and films.	08
Unit 3	Satellite Remote Sensing: Introduction to Satellite imageries, Drone photography, RADAR & Lidar, Basic Photogrammetry Measurements: Geometry of Aerial Photographs, Determination of Scale, Height on Aerial Photograph Interpretation of Aerial Photos: Single, Vertical Stereo Pairs. Interpretation of Satellite Imagery	07
Unit 4	Structure of GIS: Introduction to GIS: Definitions, Evolution, Components and Objectives Hardware & Software Requirements: Hardware: Basic Blocks of Computer, Processor, Memory, Secondary Storage Devices, Input/Output Devices, Binary Numbers. Software: Operating System, Application, Compilers, Editors. Overview of GIS Software Packages	08
Unit 5	GPS & Open Source GIS: Concepts of GPS: History, Types, Navigation Systems and Applications Open source GIS: basic concepts, Open source GIS platforms, software, Libraries. Introduction to QGIS, Application of Open source GIS	06
Unit 6	Application of RS and GIS: Geosciences, Water Resources, Forest, Marine and Atmospheric Sciences, Disaster Management, Urban Planning and Development, Agriculture and Soils, Biodiversity, Health Monitoring.	07

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Textbook on remote sensing in natural resources monitoring and management	C. S. Agrawal and P. K. Garg,	Wheeler Publishing, New- Delhi.	1 st	2000
02	Basics of Remote Sensing and GIS	Dr. S. Kumar	Laxmi publications (P) Ltd. New- Delhi	1 st	2005
03	Fundamental of Remote Sensing	Gorge Goseph	University Press (India) Pvt. Ltd.	1 st	2005
04	Remote Sensing Principles and Applications	Dr. B. C. Panda	Viva Books Pvt. Ltd	1 st	2005
05	Remote Sensing And Geographic Information System	Chandra	Narosa Publication	2 nd	2015

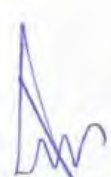
Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	American Society of Photogrammetry.	-	Washington D. C. Manual	1 st	1960
02	Remote Sensing and Image Interpretation.	Lillesand	Wiley Publication	6 th	2011
03	Remote Sensing and GIS.	Basudeb Bhatta	Oxford	2 nd	2011
04	Satellite Remote Sensing.	Nicola Masini	Springer	1 st	2012
05	An Introduction to Geoinformatics.	G. S. Srivastava	McGraw Hills	1 st	2014
06	Photogrammetry and Remote Sensing.	Matt Weilberg	Syrawood Publishing House	2 nd	2016


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TY CV-04/83

Course Details:

Class	T. Y. B. Tech, Sem. - V.
Course Code and Course Title	1CVPC303, Design of Steel Structures
Prerequisite/s	1CVES108, 1CVPC204, 1CVPC207
Teaching Scheme: Lecture/Tutorial	03/01
Credits	04
Evaluation Scheme: ISE-I/MSE/ ISE-II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC303_1	Discuss different methods to design of steel member and failure modes and essential elements of steel structures. (K ²)
1CVPC303_2	Calculate the various parameters of axially and eccentrically loaded welded and bolted connections and different members. (K ³)
1CVPC303_3	Solve various steel truss members as tension and compression members. (K ⁴)
1CVPC303_4	Examine steel column, built up column and column bases. (K ⁴)
1CVPC303_5	Examine laterally supported & unsupported beams, plate girder and gantry girder, roofing system. (K ⁴)

Course Contents:

		Hrs.
Unit 1	Design philosophy and connection: Introduction to Design of steel structures, Design Philosophy, comparison of LSM & WSM, advantages and disadvantages of steel structures, types of steel structures, grades of structural steel, various rolled steel sections, loads and load combinations partial safety factors for load and materials, load calculation for roof trusses. Connection: Types of bolts & welds, analysis and Design of axially and eccentrically loaded bolted and welded connections (subjected to bending and torsion).	06
Unit 2	Tension Members: Common sections, Net area, modes of failure, load carrying capacity, Design of axially loaded tension members, Design of end connections (Bolted and welded).	06
Unit 3	Compression Members as Struts: Common sections, economical sections, effective length, slenderness ratio, modes of failure, classification of cross section, behavior of compression member, load carrying capacity, Design of compression members. Design of column subjected to axial and eccentric loading	07
Unit 4	Column Bases: Design of slab bases & gusseted base subjected to axial and eccentric load and design of concrete pedestal	06
Unit 5	Beams: Types of sections, behavior of beam in flexure, plastic analysis of beam, design of laterally supported, unsupported beams and built up beam using flange plates, curtailment of flange plates, check for deflection, shear, web buckling & web crippling. Secondary and main beam arrangement, beam to beam connections.	08

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TY CV-05/83

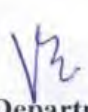
Unit 6	Plate Girder: Introduction to plate girder and design concept. Design of plate girder: design of cross section, curtailment of flange plates, stiffeners and connections. Gantry girder: Forces acting on gantry girder, commonly used sections, design of gantry girder as laterally unsupported beam, connection details. Roofing system: Trusses, Purlins, Analysis and design of truss, Connection of truss to column.	09
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Text Books:

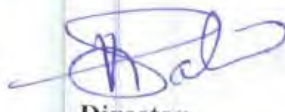
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Design of Steel Structures	S. K. Duggal	Tata McGraw Hill	9 th	2012
02	Design of steel structure by Limit State Method as per IS: 800- 2007	Bhavikatti S. S	I K International Publishing House, New Delhi	4 th	2015
03	Design of Steel Structures.	K.S. Sairam,	Pearson	1 st	2010
04	Limit state design in structural steel	Dr. M. R. Shiyekar.	PHI publications	2 nd	2016
05	Design of Steel Structures	Dr. N. Subramanian	Oxford	9 th Impression	2012

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	IS 800-2007	Indian Standard Code	B.I.S, New Delhi	1	2007
02	IS 875 Part I, II, III	Indian Standard Code	B.I.S, New Delhi	3	1997
03	SP6 (1)	Indian Standard Code	B.I.S, New Delhi	2	1998
04	& SP 6 (6)	Indian Standard Code	B.I.S, New Delhi	2	1995
05	Design of Steel Structures	Edwin H. Gaylord, Charles N. Gaylord James, Stallmeyer	Tata Mc-Graw-Hill	3	2010
06	Design of Steel Structures	Punmia, A. K. Jain and Arun Kumar Jain,	Laxmi Publication	2	2011
07	Design of Steel Structures	Dayaratnam,	Wheeler Publications, New Delhi	2	1998
08	I.S Handbook I(Steel table)	Indian Standard Code	B.I.S, New Delhi		
09	IS: 816 – 1985	Indian Standard Code	B.I.S, New Delhi		
10	IS: 808 – 1995	Indian Standard Code	B.I.S, New Delhi		


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TY CV-06/23

NOTE:

It is necessary to have knowledge of IS Code and Steel Table for Design of Steel Structures. Use of IS800:2007 codes and Steel table is allowed in examination.

List of Tutorials		
Sr. No	Title of Tutorial	Contact Hrs.
1	Analysis and design of bolted connection	01
2	Analysis and design of welded connection	01
3	Analysis and design of tension member	01
4	Analysis and design of compression member ,column	01
5	Analysis and design of Column bases	01
6	Analysis and design of Laterally supported and unsupported beam	01
7	Analysis and design and analysis of gantry girder , plate girder	01
8	Calculation of design forces of roofing system	01
9	Analysis of members of roofing system	01
10	Design of roof truss	01



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TY CV-07/83

Course Details:

Class	T. Y. B. Tech, Sem. - V.
Course Code and Course Title	ICVPC304, Geotechnical Engineering I
Prerequisite/s	ICVES203
Teaching Scheme: Lecture/Tutorial	04/00
Credits	04
Evaluation Scheme: ISE I/ MSE / ISE II/ ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

ICVPC304_1	Illustrate the various phase diagrams and derive various phase relationship of the soil. (K^3)
ICVPC304_2	Compute the vertical stresses in soil mass due to various loading conditions. (K^3)
ICVPC304_3	Calculate bearing capacity of soil with different methods (K^3)
ICVPC304_4	Adapt the concept of permeability & seepage in soil. (K^4)
ICVPC304_5	Compare the process of compaction and consolidation. (K^4)
ICVPC304_6	Determine the shear strength of soil under different drainage condition. (K^5)

Course Contents:

		Hrs.
Unit 1	Properties of Soil: Introduction to Soil Mechanics, formation of soil & soil structure, three phase soil system, weight volume relationships, detail index properties of soil-methods of determination and its significance, particle size analysis, I.S classification of soil, Atterbergs consistency limits, field identification of soils.	10
Unit 2	Permeability and Seepage: Permeability - Darcy's law, Factors affecting permeability, Determination of permeability by constant head and falling head method as per IS-2720, Permeability of layered soils. Seepage - Seepage forces, General flow equation (Laplace equation). Flow net construction and practical applications, Concept of effective neutral & total stress in soil mass. Quick sand condition. Piping phenomenon	09
Unit 3	Compaction and Consolidation: Compaction - Phenomenon. Factors affecting compaction, Dry density and moisture content relationship (MDD & OMC). Zero air voids line. Effect of compaction on soil structure, Standard Proctor test and Modified Proctor test as per IS - 2720. Field compaction equipment and methods, Field control of compaction. Concept of soil-stabilization Compressibility - Definition, compressibility of laterally confined soil, compressibility of sand & clay Consolidation - Spring analogy, Terzaghi's theory of one dimensional consolidation, Lab consolidation test; c_c , c_v , m_v and a_v Determination of coefficient of consolidation-square root of time fitting method and logarithm of time fitting method. normally consolidated and overconsolidated soils,	10
Unit 4	Stress Distribution in Soil: Boussinesq theory - point load, uniformly loaded circular area, pressure distribution diagram on a horizontal and vertical plane, pressure bulb, Westergaard's theory (Concept), equivalent point load method, Newmark Influence chart.	08

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Unit 5	Shear Strength: Concept of shear strength, Coulomb's theory and failure envelope, Principle stress, stress analysis, representation of stresses on Mohr's circle for different types of soil such as cohesive and cohesion less, saturated and partly saturated soil etc. (Mohr's Coulomb Envelope) Application of shear stress parameters in the field Unconsolidated undrained, consolidated untrained and consolidated drained (CU,UU,CD) , type of test-box shear test, triaxial compression test with pore pressure and volume change measurement, unconfined compression test, vane sheartest. Concept for site Exploration, general & detailed, method for site exploration	11
Unit 6	Bearing Capacity Evaluation: Definitions, Modes of failure, Terzaghi's bearing capacity theory with assumptions and limitations, I.S. Code method of bearing capacity evaluation, Effect of various factors on bearing capacity (Size & Shape, Depth, WT, Eccentricity) Introduction to deep foundation: Pile foundation, Well foundations, Caisson, Cofferdam	08

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Soil Mechanics and Foundation Engineering	Dr. K. R. Arora	Standard Publishers and Distributors	2nd	2009
02	Soil Mechanics and Foundations	B. C. Punmia	Laxmi publications Pvt. Ltd.	16th	2005
03	Soil Mechanics and Foundation engineering	V. N. S. Murthy	Saikripa Technical Consultants Bangalore	8th	1991
04	Geotechnical Engineering	S. K. Gulhati	Tata McGraw Hill Delhi	1st	2005
05	Soil Mechanics and Foundations	Muni Budhu	Wiley India Pvt. Ltd.	2nd	2008
06	Geotechnical Engineering	P. Purushottam Raj	Tata McGraw Hill Company Ltd. New Delhi	1st	2005

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Soil mechanics	Terzaghi and Peak	John Willey and Sons, New- York	3rd	2000
02	Foundation Analysis and Design	JE Bowles	McGraw Hill International Edition	5th	1996
03	Foundation Design and Construction	MJ Tomlinson	ELBS	7th	2001
04	Design Aids in Soil Mechanics and Foundation Engineering	S.R. Kaniraj	TMH New Delhi	5th	2004
05	Soil Mechanics and Foundations	Muniram Budhu	John Wiley & Sons Publishers	2nd	2007

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TY CV-09/83

Course Details:

Class	T. Y. B. Tech. Part-I Sem. -V
Course Code and Course Title	1CVPC305, Environmental Engineering
Prerequisite/s	1CVES103
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE-1/MSE/ ISE-II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC305_1	Outline the basics of water supply scheme. (K ²)
1CVPC305_2	Illustrate the various quality parameters of potable water (K ²)
1CVPC305_3	Develop the various units of the water treatment plant (K ³)
1CVPC305_4	Develop the various components related to distribution of water (K ³)
0CVPC303_5	Identify the principles of advances in water treatment (K ³)

Course Contents:

		Hrs.
Unit 1	Basics of Water Supply Engineering: Sources of water supply, quality of Water, and objectives of water quality management, Concept of safe water, Palatable water, wholesome water, and Pure Water. Population forecasting, Design Period, Water demand: Types, Factors affecting, Fluctuations and effect, Estimation of demand. Conveyance of raw water: Intake structures- types, design of intakes, design of rising main. Water Auditing.	07
Unit 2	Water Quality Parameters: A sampling of water for examination. Physical, Chemical, and biological water quality parameters, Drinking water quality standards- BIS.	05
Unit 3	Water Treatment Units: Principle and Operation of following Units – Aeration, Plain Sedimentation, Coagulation, Flocculation, Filtration, and Disinfection Design of following Unit Operations - Plain Sedimentation, Coagulation, Flocculation, Filtration- Rapid Sand Filter and Slow Sand Filter. Sequencing of treatment unit processes for surface water and groundwater treatment.	09
Unit 4	Storage of Treated Water: Reservoirs: Necessity, types, Capacity determination by analytical & graphical method. Transmission of water: Pumping & gravity mains, Different types of pipes, choice of pipe materials, forces acting on pressure pipes, Concept of Thrust block	06
Unit 5	Distribution System: Basic requirements, methods of distribution, layout patterns, Methods of network analysis: Equivalent pipe, Hardy-Cross method, Design problems. Introduction to the software's in network analysis. Appurtenances: Sluice valve, air relief valve, gate valve, non-return valve, scour valve, Fire hydrants, Water meter, Service connections, and Maintenance & Leak detection of the water distribution system.	08

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Unit 6	Advance Water Treatment Methods: Basic concepts of Adsorption, Ion exchange, Membrane filtration, Reverse osmosis, Electrodialysis, and Nano-filtration.	07
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Text Books:

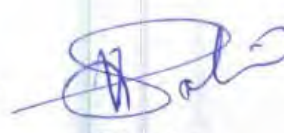
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Water Supply Engineering	S. K. Garg	Khanna Publishers, New Delhi	21st	2012
02	Water Supply Engineering	Dr. B. C. Punmia	Laxmi Publishers, New Delhi	2nd	2011
03	Water Technology	Gray, N. F	Elsevier Science & Technology Books	2nd	2009
04	Water Supply Engineering	Dr. P. N. Modi	Standard Book House, New Delhi	18th	2007
05	Water Supply and Sanitary Engineering,	G.S.Birde	Dhanpat Rai& Sons	2nd	1990

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Water and Waste water Technology	Hammer M.J.	Prentice-Hall of India Private Limited	6th	2011
02	Water Chemistry: An Introduction to the Chemistry of Natural and Engineered Aquatic Systems	Patrick L. Brezonik, William A. Arnold,	Oxford University Press, New York,	2nd	2011
03	Nanotechnology in Water Treatment Applications -	T. Eugene Cloetel, Michele de Kwaadstenietl	Caister Academic Press	2nd	2010
04	Chemistry for Environmental Engineering and Science	C.N. Sawyer, P.L. McCarty and G.F. Parkin	Tata McGraw Hill	5th	2003
05	Water Works Engineering – Planning, Design and Operation	S.R. Qasim, Edward and Motley and Zhu, H.	Prentice Hall, India.	2nd	2002
06	Environmental Engineering	H.S. Peavy, D.R. Rowe	McGraw Hill	2nd	1985


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TY CV-11/83

Course Details:

Class	T. Y. B. Tech, Sem. - V. (Elective)
Course Code and Course Title	1CVPE306, Engineering Geology
Prerequisite/s	High school Geography
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE306_1	Describe the important content related to engineering geology. (K ²)
1CVPE306_2	Explain the different types of geological structures with importance on civil engineering aspects. (K ²)
1CVPE306_3	Summarize the different types of minerals and rocks with their civil engineering significance. (K ²)
1CVPE306_4	Solve numerical problems related to RQD, aquifer parameters. (K ³)
1CVPE306_5	Compare the suitability of site for construction of dams, reservoirs, bridges and tunnels etc. (K ³)

Course Contents:

		Hrs.
Unit 1	Introduction & Physical Geology: Definition, Branches of geology useful to civil engineering, Importance of geology from Civil Engineering point of view, Case studies of case histories of failure of some civil engineering structures due to geological draw backs. Interior of the Earth Weathering - Types and civil engineering significance. River and its action.	07
Unit 2	Mineralogy & Petrology: Classification of minerals, physical properties of minerals, use of minerals in the production of construction material Igneous rocks: Origin, Concordant and discordant forms, Civil Engineering significance. Secondary rocks: Formation, Classification, Civil Engineering significance. Classification of sedimentary rocks, Civil Engineering significance. Metamorphic rocks: Agents and Types of Metamorphism, Civil Engineering significance.	08
Unit 3	Structural Geology: Outcrop, Strike and Dip & Civil Engineering significance. Unconformity - Types & Civil Engineering significance. Fold and Fault - Parameters, Classification, Causes, Civil Engineering significance. Joint - Types, Civil Engineering considerations.	06
Unit 4	Dynamic Geology & Groundwater: Earthquake - Terminology, Causes, Types of earthquakes, Seismic waves, Seismograph, Seismogram, Scale, Effects, RIS. Landslides - Types, Causes, Prevention of Landslides, Applications of engineering geology in landslide preventions. Groundwater - Sources of groundwater, Zones of groundwater, Types of Aquifer, Hydrological properties of aquifers (porosity & permeability) Applications of engineering geology in groundwater prospecting. Building Stones - Important Building Stones from India, Applications of	07

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	engineering geology in identifying good building stones.	
Unit 5	Geological Investigations: Preliminary Geological Investigations, Steps in geological investigations for project site. Exploratory drilling - Observations, Preservation of cores and Core logging, Core recovery, R.Q.D., numerical problems. Geology of Tunnel and Bridge - Difficulties during tunneling Influence of geological conditions on tunneling, Geological consideration while choosing tunnel alignment, Tunnel in folded strata, sedimentary rocks and Deccan traps. Dependence of types of bridges on geological conditions. Applications of engineering geology at foundation purpose for major structures.	07
Unit 6	Geology of Dams and Reservoirs: Influence of geological conditions on Location, Alignment, Design and Type of a dam, Suitable and Unsuitable geological conditions for locating a dam site, Dams on carbonate rocks, sedimentary rocks, folded strata and Deccan traps, Suitable and unsuitable geological conditions for reservoir site.	07

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Geology	S. K. Duggal, H. K. Pandey and Rawat	Tata McGraw Hill	1st	2014
02	Textbook Of Engineering Geology	N Chenna Kesavulu	Laxmi Publications	1st	2013
03	Engineering and General Geology	Prabin Singh, S. K.	Katariya and sons, Delhi	8th	2018
04	A Text book of Applied Engineering Geology.	M. T. Maruthesha Reddy	New Age International Publishers, New Delhi	1st	2016
05	Engineering Geology	A Parthasarathy	John Wiley	1st	2013
06	A Text Book of Geology	G. B. Mahapatra	CBS Publication	2nd	2013

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Geology Basics For Engineers	Parriaux A	Taylor & Francis Ltd	2nd	2019
02	Geological Engineering	Vallejo Luis Gonzalez De Et.Al	Crc Press	1st	2018
03	Principles Of Engineering Geology	Jerome V	John Wiley	2nd	2011
04	Engineering Geology For Civil Engineers	Varghese P. C.	Prentice Hall India Learning Privatelimited	1st	2012
05	Engineering Geology	Anil Kumar Mishra	S. Chand Publication	1st	2013
06	Introduction To Rock Mechanics	Verma B. P.	Khanna Publisher Delhi	3rd	2014

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TY CV -13/23

Course Details:

Class	T. Y. B. Tech, Sem. - V.
Course Code and Course Title	1CVPE307, Advanced Structural Analysis
Prerequisite/s	1CVPC204, 1CVPC207
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I /MSE/ ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE307_1	Explain the concept of statically and kinematically indeterminate structures. (K ²)
1CVPE307_2	Discuss the basic concepts of Influence Line Diagrams. (K ²)
1CVPE307_3	Identify approximate Method for Analysis. (K ²)
1CVPE307_4	Interpret theory of torsion. (K ⁴)
1CVPE307_5	Investigate methods of analysis of Space Trusses. (K ⁴)
1CVPE307_6	Understand the energy principles and energy theorems and its applications. (K ²)

Course Contents:

		Hrs.
Unit 1	Stable and unstable structures: Types of structures, Stable and unstable structures, Indeterminate structures Statically and kinematically. Method of consistent deformation, applications to propped cantilever and fixed beams.	08
Unit 2	Influence Line Diagrams Influence Line Diagrams : Muller Breslau Principle, I.L.D. for Propped Cantilever, Fixed beam, Continuous beam	05
Unit 3	Approximate Method for Analysis Analysis of Portal Frames subjected to lateral loads – Portal Method, Cantilever Method.	08
Unit 4	Torsion Theory of torsion, assumptions, transmission of power, combined bending, torsion and thrust for solid and hollow shafts, Principal stresses, equivalent torque and equivalent moment for circular shafts.	06
Unit 5	Space frame Analysis of Space Trusses by Tension Coefficient Method Analysis of Secondary Stresses in Plane Frames	09
Unit 6	Energy Principles and Energy Theorems Strain energy and complementary strain energy, strain energy due to axial load bending and shear, law of conservation of energy, principles of virtual work, Castiglione's first theorem, Betti's law, Clarke – Max well theorem of reciprocal deflection. Deflection of beams and trusses using strain energy and unit load methods	06

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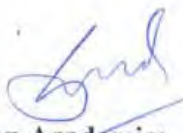
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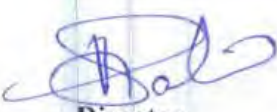
T7 CV -14/83

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year
01	Structures Analysis of Structures Vol. II	Vazirani and Ratwani	Khanna Publishers, Delhi	19 th	2008
02	Advanced Theory of Structures & Matrix Methods	Vazirani and Ratwani	PHI Learning Pvt. Ltd.	4 th	2008
03	Structural Analysis	Negi and Jangid	Tata McGraw Hill Pub. Co. Ltd.	1 st	2004
04	Design of Steel Structures Vol. II	Ramchandra	Standard Book House ,Delhi.	19 th	2016
05	Mechanics of Structures Vol. II & III-	S. B. Junnarkar & Shah	Chartor Pub.House, Anand	24 th	2015
06	Design of Steel Structures	B. C. Punmia and A. K. Jain	Laxmi Publication(p) Ltd. Delhi	3 rd	2005


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TY CV-15/83

Course Details:

Class	T. Y. B. Tech, Sem. - V.
Course Code and Course Title	1CVPE308, Open Channel Flow
Prerequisite/s	1CVPC203
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE308_1	Explain the basic concepts of flow in open channels and flow computations. (K^2)
1CVPE308_2	Choose the type of hydraulic model according to site conditions. (K^3)
1CVPE308_3	Apply the principle and equation for non-uniform, non-linear and non-prismatic flow in open channels. (K^3)
1CVPE308_4	Make use of the principle and equation for pressure flow and momentum analysis in a notch or weir. (K^3)
1CVPE308_5	Analyze the unsteady gradually varied flow in open channels. (K^4)

Course Contents:

		Hrs.
Unit 1	Basic Fluid Flow Concepts: Classification of open channels and O.C.F., Basic equations (Continuity, Energy, Momentum), Energy and Momentum coefficients, Specific energy and Critical depth, Establishment of Uniform flow in open channels, Uniform flow formulae, Section factor and conveyance factor, First and Second hydraulic exponent, Uniform flow computations.	07
Unit 2	Non-Uniform Flow in Open Channel: Types of Non-Uniform flow, Hydraulic jump in non-rectangular channels (Types and characteristics), Jump on sloping floor, Use of jump as Energy Dissipater, Spatially-Variied Flow, Assumptions and equation of Spatially-Variied Flow, Side weirs, Bottom racks.	07
Unit 3	Flow in Non-linear alignment and Non prismatic Channels: Nature of Flow, Spiral Flow, Energy Loss, Super elevation, Cross Waves, Design Considerations for Subcritical and Supercritical flow Transitions and contractions in open channel flow, Subcritical & Supercritical flow through sudden transitions and constrictions, Standing wave flume, flow between bridge piers, flow through culvert.	07
Unit 4	Unsteady Flow in Open Channels: Gradually Varied Unsteady Flow, Waves and their classification, Celerity of a wave, Rapidly Varied Flow, Surges, Positive and negative Surges, Surges in Power Canals, Dam-break problem	07
Unit 5	Notches and Weirs: Types, Derivation of Discharge Equation, Velocity of Approach, Francis Formula, Calibration of Notches, Errors in Measurement of Discharge, Sharp, Broad and Round Crested Weirs, Calibration of Weir, Time of Emptying Tank with notch.	08

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T1 CV-16/83

Unit 6	Hydraulic Models: Fixed bed river models (Distorted and Undistorted), Moveable bed Models, Model materials and construction, Physical model calibration and verification, Special-Purpose models	06
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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	A text book of Fluid Mechanics	R.K. Rajput	Chand Pub.	9 th	2013
02	Engg. Fluid Mechanics	K.L.Kumar	Eurasia Pub.	7 th	2001
03	Fluid Mechanics	S. Ramamurtham	Dhanpat Rai & sons	-	2009
04	Fluid Mechanics and Hydraulic Machines	R.K.Bansal	Khanna Pub.	10 th	2013

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Open Channel Hydraulics	Ven Te Chow	McGraw-Hill International Editions	9 th	2013
02	Open Channel Hydraulics	Richard H. French	McGraw-Hill International Editions	7 th	2001
03	Flow Through Open Channels	K. G. RangaRaju	Tata McGraw Hill Publish. Co. Ltd.	-	2009
04	Flow in Open Channels	K. Subramanyam	Tata McGraw Hill Publish. Co. Ltd.	10 th	2013
05	Open-Channel Flow	M. Hanif Chaudhary	Prentice-Hall International Publications	5 th	2011



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TY CV-17/83

Course Details:

Class	T.Y. B. Tech, Sem.- V.
Course Code and Course Title	1CVPE309, Town Planning & Traffic Engineering
Prerequisite/s	1CVES103, 1CVPC202
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I/ MSE / ISE II/ ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC309_1	Discuss the different theories of town planning and special township (K ²)
1CVPC309_2	Explain elements of Regional Plan (R.P.) and Development Plan(D.P.) (K ²)
1CVPC309_3	Choose the different acts, schemes and rules for township (K ³)
1CVPC309_4	Select feasible solution for traffic related problems using ITS (K ³)
1CVPC309_5	Apply the proper techniques/ methods for solution of traffic behavior (K ³)

Course Contents:

		Hrs.
Unit 1	Town Planning and Township Schemes Introduction; Growth of towns and theories of; Institutional arrangements in Maharashtra (CIDCO, MMRDA, MHADA, SRA, TPVD etc.) Special Townships Special Township Policy, Land requirement, Procedures for locational clearance, Salient feature, Responsibilities of developer. Smart city , Sustainability of town planning.9	07
Unit 2	Regional Plan (R.P) Need, Necessary Steps for process of Regional Planning, Relation with the state plan and surroundings Development Plan (D.P) Goals and objectives, Public Participation, Implementation and Financial Aspects; Delineation, Relation with R.P.; Legal and Administrative process to start D.P	08
Unit 3	Schemes, Acts and Rules Municipal Act, MR and TP Act 1966, LA Act. 1894, MLR code, Environment Act, Bombay Stamp Act, SEZ, DCR; Town Planning Scheme; Central and State Scheme related village development and plans; Special Township Policy	06
Unit 4	Intelligent Transportation Systems (ITS) Definition of ITS and Identification of ITS Objectives, Historical Background, Benefits of ITS - ITS Data collection techniques – Detectors, Automatic Vehicle Location (AVL), Automatic Vehicle Identification (AVI), Geographic Information Systems (GIS), video data collection, Automated Highway Systems.	07
Unit 5	Traffic engineering Traffic Characteristics, Traffic studies: volume, speed and delay studies; Elements of traffic flow theory; LOS; Traffic stream parameters - Fundamental diagram of volume-speed-density surface, critical gaps and their distribution, Shock waves and bottleneck control approach, Application of queuing.	06

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T.Y. CV-18/83

Unit 6	Urban, Public and Freight Transportation Introduction to transportation planning; Travel demand and supply; Study area, Zoning principles, Cordon and screen lines; Four-stage sequential modeling approach: trip generation, trip distribution, modal split, trip assignment; Modes of public transportation and application of each to urban travel needs; Freight Transportation: Modes of shipment, Terms of shipment, Door-to-door shipment.	08
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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Town and country Planning	G.K. Hiraskar & K. G. Hiraskar	Dhanpat Rai Publication (p) Ltd., New Delhi.	19 th	2018
02	Town Planning	S.C. Rangawala	Charotar Publications, Pune	13 th	2015
03	Traffic Engineering and Transportation Planning.	L. R. Kadiyali,	Khanna Publishers,	9 th	2017
04	Principles Of Highway Engineering And Traffic Analysis	Fred Mannering, Walter Kileraski and Scott Washburn	Wiley India	3 rd	2007
05	Perspective on ITS	Sussman, J. M	Artech House Publishers	5 th	2007
06	Urban Transportation Planning	Michael Meyer and Eric J. Miller	Tata McGraw-Hill Publications	2 nd	2000
07	Public Transportation	Gray G. E., and Hoel L. A.,	Prentice Hall	2 nd	1992
08	Urban Transit: Operations, Planning and Economics.	Vuchic Vukan R.,	Prentice Hall,	8 th	2005

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Rural development Planning – Design and method	Misra S.N.	Satvahan Publications New Delhi	8 th	2009
02	Economic development in Third world	Todaro Michael	Orient Longman Publication, New-Delhi	13 th	2013
03	Modeling Transport	Juan De Dios Ort, Luis G Willumsen, and Juan De Dios Ortuzar	John Wiley and Sons	5 th	2011
4	Transportation Engineering and Planning	C. S. Papacostas and P. D. Prevedouros	Prentice-Hall	3 rd	2000
5	Traffic Flow Fundamentals	Adolf May	McGraw-Hill Publications	9 th	2014
6	Accessibility and the Bus System – Concepts and Practice	Tyler N	Thomas Telford	8 th	2002
7	Urban Transport for Growing Cities – High Capacity Bus System	Tiwari G.	MacMillan India Ltd	6 th	2002.

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Department of Civil Engineering

8	Intermediate Public Transport Manuals.
9	MRTP Act 1966
10	Land Acquisition Act – 1894
11	Highway Capacity Manual 2000, MORTH Codes, All relevant IRC codes

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T1 CV-20183

Course Details:

Class	T. Y. B. Tech, Sem. - V.
Course Code and Course Title	1CVPE310, Safety Aspects In Construction
Prerequisite/s	0CVPC205
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE310_1	Discuss about the importance of safety management in construction.(K ²)
1CVPE310_2	Describe various safety standards and act. (K ²)
1CVPE310_3	Adapt safety culture, safety assurance in construction project. (K ³)
1CVPE310_4	Classify different causes of accident and safety precautions in various construction activities. (K ⁴)
1CVPE310_5	Recommend various safety activities for different construction work. (K ⁵)

Course Contents:

		Hrs.
Unit 1	Introduction: Safety, Importance of safety, Safety and productivity- Role of Government- National Safety Council, National safety awards.	06
Unit 2	Safety Standards and Legislation: Standards: ILO model code of safety regulation/legislation, factors Act, Boiler Act, Electricity Act, Workman's Compensation Act. National Safety Council.	07
Unit 3	Planning for Safety: Purpose for planning, planning procedure, range of plans, safety policies, Elements of safety policy, implementation, Safety training, various safety equipment's, occupational hazards	07
Unit 4	Accidents: Types, Classification of Accidents, Causes, direct and indirect cost of accidents, objective of accident programs. Precautionary measures, accident investigation, emergency preparedness, Hazard Identification And Control, Hazard Assessment, Inspections And Monitoring Worksites	07
Unit 5	Safety in various construction Activities: Excavation, Scaffolding, Construction Equipment, False work, Roof work, Safety in Tunneling, Safety in work over water, Demolition, Explosives, Fire Extinguisher- training And use, Self-Inspection Checklist, Safety in various fields- Manufacturing, Design, Execution, Transportation, Workplace Hazardous Information System (WHMIS)	08
Unit 6	Safety Management: SMS (Safety Management system), Safety culture, Fire Audit, Safety Audit, Safety Assurance, Safety Promotion, Employer's insurance Act, Preventive Measures Factory Act.	07

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TY CV - 21/83

Text Book:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Industrial Safety and Environment	Anupama prashar & Bansal	S.K. Kataria & Sons, New Delhi	4 th	2015
02	Construction Planning & Management	P.S. Gahlot & B.M. Dhir	New Age International (P) Ltd.	6 th	2010
03	Total Quality in construction projects	Ron Baden	Thomas Telford , London	8 th	2005
04	Concerned ISI for Safety in Construction	Bureau of Indian Standards, 2015.			
05	Major Safety Control: A practical Manual	National Safety Council, India 1993			

Reference Book:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Hand book of OSHA Construction safety & Health	Charles D.Reese & James V. Edison.	CRS Press	3 rd	2006
02	Safety Management in Construction Industry	A Manual for Project Managers NICMAR, Mumbai.	NICMAR, Mumbai.	--	2013
03	Safety – health and working condition	Training Manual, National Safety Council, Mumbai, 2000.			
04	Safety Health & Welfare Manual	International Labour Organization, 1999			
05	Concerned ISI for safety in construction	Bureau of Indian Standards.			


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TY-CV - 22183

Course Details:

Class	T. Y. B. Tech, Sem. - V.
Course Code and Course Title	1CVPC351, Geotechnical Engineering –I Laboratory
Prerequisite/s	1CVPC203
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	01
Evaluation Scheme: ISE / ESE	25/25

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC351_1	Compute the various index properties of given soil. (K^3)
1CVPC351_2	Calculate Engineering Properties of soil. (K^3)
1CVPC351_3	Demonstrate the shear strength test (K^3)
1CVPC351_4	Communicate effectively about laboratory work both orally and in writing journals. (S^2)
1CVPC351_5	Practice professional and ethical behavior to carry forward in their life. (A^2)

Exp. No.	Title of Experiments (Any 8)
1	Determination of water content by oven drying.
2	Specific gravity determination by pycnometer / density bottle.
3	Particle size distribution-Dry Mechanical sieve analysis
4	Determination of consistency limits (LL & PL) and its use in soil classification.
5	Field density test by Core Cutter Method and Sand Replacement Method
6	Determination of coefficient of permeability by constant head method & variable head method
7	Standard proctor compaction test
8	Calculation of $C-\phi$ value of various soil samples by direct shear test
9	Demonstration of Unconfined Compression Test
10	Demonstration of Triaxial shear test
11	Demonstration of One dimensional consolidation test

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Soil Mechanics and Foundation Engineering	Dr. K. R. Arora	Standard Publishers and Distributors	2nd	2009
02	Soil Mechanics and Foundations	B. C. Punmia	Laxmi publications Pvt. Ltd.	16th	2005
03	Soil Mechanics and Foundation engineering	V. N. S. Murthy	Saikripa Technical Consultants Bangalore	8th	1991
04	Geotechnical Engineering	S. K. Gulhati	Tata McGraw Hill Delhi	1st	2005
05	Soil Mechanics and Foundations	Muni Budhu	Wiley India Pvt. Ltd.	2nd	2008

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TY CV-23/83

Course Details:

Class	T. Y. B. Tech, Sem. - V.
Course Code and Course Title	1CVPC352, Building Planning and Drawing Laboratory
Prerequisite/s	1CVPC205, 1CVPC209
Teaching Scheme: Lecture/Tutorial/Practical	00/00/04
Credits	02
Evaluation Scheme: ISE/ESE	25/25

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC352_1	Draw the line plan of public buildings. (K ³)
1CVPC352_2	Draw the municipal drawing of public building considering the design aspect. (K ³)
1CVPC352_3	Make the various working drawings of public building. (K ³)
1CVPC352_4	Use AutoCAD software for drawing of public building. (S ²)
1CVPC352_5	Practice professional and ethical behavior to carry forward in their life. (A ²)

Course Contents: Drawing using Auto CAD software. (Except Exp. No. 1)

Exp. No.	Title of Experiment
1	Prepare parallel and angular perspective of simple Civil Engineering objects.
2	Prepare a visit report of at least three existing public buildings. (Write merit and demerit points in planning the same)
3	Prepare a line plan of above visited buildings.
4	Prepare line plan for proposed public buildings. (Minimum 3) Note- It is an individual activity.
5	Draw Municipal Drawing of proposed public building G+1 (Area of Building 300-1000 m ²) Note- It is an individual activity.
6	Working drawing for building proposed in Exp.No.4 – Foundation Plan
7	Working drawing for building proposed in Exp.No.4 - Furniture layout
8	Working drawing for building proposed in Exp.No.4 - Electrification layout
9	Working drawing for building proposed in Exp.No.4- Details of water supply and drainage system


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T7 CV-24/83

Text Book:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Civil Engineering Design & Drawing	D. N. Ghose	CBS Publications, Distributors (P) Ltd	2 nd	2010
02	Building Drawing	M. G. Shah, C. M. Kale, S. Y. Patki	Tata McGraw-Hill Publications (P) Ltd	5 th	2011 (Reprint)
03	A Course in Civil Engineering Drawing	V.B.Sikka	S.K.Kataria and Sons	7 th	2013
04	Building Construction	S.P.Bindra & S.P.Arora	Dhanpat Rai Publications (P) Ltd	5 th	2005
05	Building Design and Drawing	Y. S. Sane	Allied Book Stall, Pune	2 nd	1966
06	Building Construction	Dr. B. C. Punmia Ashokkumar Jain	Laxmi Publications (P) Ltd	10 th	2008

Reference Book:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Practical Building Construction & its Management.	Sandeep Mantri	Satya Prakashan	10 th	2012
02	Civil Engineering Drawing	V. B. Sikka	S. K. Kataria & Sons.	5 th	2018
03	SP 7- National Building Code Group 1 to 5		B. I. S. New Delhi		
04	I.S. 962-1989 code for practice for Architectural and Building Drawing		B. I. S. New Delhi		


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TY CV -25/83

Course Details:

Class	T. Y. B. Tech, Sem. - V. (Elective)
Course Code and Course Title	1CVPE353, Engineering Geology Laboratory
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	01
Evaluation Scheme: ISE/ ESE	25

Course Outcomes (CO):

On successful completion of laboratory practice, student will be able to,

1CVPE353_1	Identify engineering properties in mineral and rocks. (K ²)
1CVPE353_2	Draw sections of geological structural maps. (K ³)
1CVPE353_3	Distinguish different physical properties in common rock forming and ore Minerals. (K ⁴)
1CVPE353_4	Communicate effectively about laboratory work both orally and in writing Journals. (S ²)
1CVPE353_5	Practice professional and ethical behavior to carry forward in their life. (A ²)

Sr. No.	Title of Experiment
1	Megascopic study of Rock forming minerals
2	Megascopic study of Ore forming minerals
3	Megascopic study of Igneous rocks
4	Megascopic study of Secondary rocks
5	Megascopic study of Metamorphic rocks
6	Study of geological maps a) Single horizontal series b) Single inclined series c) One horizontal and one inclined series d) Both series are inclined with sill e) Both series are inclined with dyke
7	Study tour to the places of Engineering Geological importance
8	Compulsory activity based on engineering geology.



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TY CV-26/83

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Geology	S. K. Duggal, H. K. Pandey and Rawat	Tata McGraw Hill	1 st	2014
02	Textbook Of Engineering Geology	N Chenna Kesavulu	Laxmi Publications	1 st	2013
03	Engineering and General Geology	Prabin Singh, S. K.	Katariya and sons, Delhi	8 th	2018
04	A Text book of Applied Engineering Geology.	M. T. Maruthesha Reddy	New Age International Publishers, New Delhi	1 st	2016
05	Engineering Geology	A Parthasarathy	John Wiley	1 st	2013
06	A Text Book of Geology	G. B. Mahapatra	CBS Publication	2 nd	2013

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Geology Basics For Engineers	Parriaux A	Taylor & Francis Ltd	2 nd	2019
02	Geological Engineering	Vallejo Luis Gonzalez De Et.Al	Crc Press	1 st	2018
03	Principles Of Engineering Geology	Jerome V	John Wiley	2 nd	2011
04	Engineering Geology For Civil Engineers	Varghese P. C.	Prentice Hall India Learning Privatelimited	1 st	2012
05	Engineering Geology	Anil Kumar Mishra	S. Chand Publication	1 st	2013
06	Introduction To Rock Mechanics	Verma B. P.	Khanna Publisher Delhi	3 rd	2014



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TY CV - 27/83

Course Details:

Class	T. Y. B. Tech, Sem. - V.
Course Code and Course Title	1CVPE354, Advanced Structural Analysis Laboratory
Prerequisite/s	1CVPC204, 1CVPC207
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	02
Evaluation Scheme: ISE	50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE354_1	Draw Influence Line Diagrams. (K ²)
1CVPE354_2	Identify approximate Method for Analysis. (K ²)
1CVPE354_3	Solve the indeterminate structure. (K ⁴)
1CVPE354_4	Communicate effectively about laboratory work both orally and in writing. (S ²)
1CVPE354_5	Practice professional and ethical behavior to carry forward in their life. (A ²)

Sr. No.	Assignments based on
1	Assignment on Stable and unstable structures
2	Assignment on Influence Line Diagrams
3	Assignment on Approximate Method for Analysis
4	Assignment on Torsion
5	Assignment on Space frame
6	Assignment on Unsymmetrical Bending and Shear Center

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year
01	Structures Analysis of Structures Vol. II	Vazirani and Ratwani	Khanna Publishers, Delhi	19 th	2008
02	Advanced Theory of Structures & Matrix Methods	Vazirani and Ratwani	PHI Learning Pvt. Ltd.	4 th	2008
03	Structural Analysis	Negi and Jangid	Tata McGraw Hill Pub. Co. Ltd.	1 st	2004
04	Design of Steel Structures Vol. II	Ramchandra	Standard Book House, Delhi.	19 th	2016
05	Mechanics of Structures Vol. II & III-	S. B. Junnarkar & Shah	Chartor Pub.House, Anand	24 th	2015
06	Design of Steel Structures	B. C. Punmia and A. K. Jain	Laxmi Publication(p) Ltd. Delhi	3 rd	2005


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Course Details:

Class	T. Y. B. Tech, Sem. - V.
Course Code and Course Title	1CVPE355, Open Channel Flow Laboratory
Prerequisite/s	1CVPC203, 1CVPC308
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	02
Evaluation Scheme: ISE	25

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE355_1	Illustrate the depth energy relationship in open channels. (K ³)
1CVPE355_2	Distinguish various types of notches and weirs. (K ⁴)
1CVPE355_3	Develop models of various hydraulic structures. (K ⁶)
1CVPE355_4	Professionally communicate in both technical and non-technical terms. (S ⁵)
1CVPE355_5	Exhibit professional behavior during the industrial visit. (A ⁵)

Course Contents:

The experiments will be divided based on the below contents:

1	Calibration of triangular notch
2	Calibration of rectangular notch
3	Calibration of weirs (rectangular, ogee)
4	Open book assignment on non-uniform flow in open channels
5	Presentation on non-linear channels
6	Presentation on non-prismatic channels
7	Presentation on unsteady flow in open channels
8	Creating various models of open channels like canals, weirs, dams, spillways etc.
9	Report on visit to a canal or weir.

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	A text book of Fluid Mechanics	R.K. Rajput	Chand Pub.	9 th	2013
02	Engineering Fluid Mechanics	K. L. Kumar	Eurasia Pub.	7 th	2001
03	Fluid Mechanics	S. Ramamurtham	Dhanpat Rai & sons	5 th	2009
04	Fluid Mechanics and Hydraulic Machines	R. K. Bansal	Khanna Pub.	10 th	2013


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TY CV-29/83

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Open Channel Hydraulics	Ven Te Chow	McGraw-Hill International	9 th	2013
02	Open Channel Hydraulics	Richard H. French	McGraw-Hill International	7 th	2001
03	Open-Channel Flow	M. Hanif Chaudhary	Prentice-Hall International	5 th	2011
04	Flow in Open Channels	K. Subramanyam	Tata McGraw Hill Publish. Co. Ltd.	10 th	2013



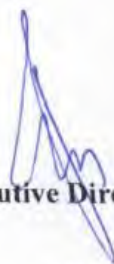
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TY CV-30/83

Course Details:

Class	T.Y. B. Tech, Sem.- V.
Course Code and Course Title	1CVPE356, Town Planning & Traffic Engineering Lab
Prerequisite/s	IBSES104, 1CVPC251
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	01
Evaluation Scheme: ISE	50/25

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE356_1	Identify signal system and rotary intersection using software (K ³)
1CVPE356_2	Outline the different parameters of existing well planned city (K ³)
1CVPE356_3	Examine traffic volume and its behavior for feasible traffic solution (K ⁴)
1CVPE356_4	Function effectively as a individual and team member during traffic studies (S ²)
1CVPE356_5	Use knowledge of contemporary issues relevant to traffic engineering for society (A ³)

Course Contents:

Traffic studies (Any three)

1	Traffic Studies: Traffic volume count I (along state highway)
2	Traffic Studies: Traffic volume count II (At intersection)
3	Traffic studies : Parking study
4	Traffic Studies: Origin and Destination study
5	Traffic Studies: Speed study : Manual method, Classification of IRC
6	Study of Traffic Signs and Markings

Design and Simulation

7	Simulation of un-signalized intersection using Software
8	Design of signalized intersection and actual load on road
9	Simulation of signalized intersection using Software
10	Design of rotary intersection
11	Simulation of rotary intersection using Software
12	Case study of planned city

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Town and country Planning	G.K. Hiraskar & K. G. Hiraskar	Dhanpat Rai Publication (p) Ltd., New Delhi.	19 th	2018
02	Town Planning	S.C. Rangawala	Charotar Publications, Pune	13 th	2015
03	Traffic Engineering and Transportation Planning.	L. R. Kadiyali,	Khanna Publishers,	9 th	2017
04	Principles Of Highway Engineering And Traffic Analysis	Fred Mannering, Walter Kileraski and Scott Washburn	Wiley India	3 rd	2007
05	Perspective on ITS	Sussman, J. M	Artech House Publishers	5 th	2007

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06	Urban Transportation Planning	Michael Meyer and Eric J. Miller	Tata McGraw-Hill Publications	2 nd	2000
07	Public Transportation	Gray G. E., and Hoe L. A.,	Prentice Hall	2 nd	1992
08	Urban Transit: Operations, Planning and Economics.	Vuchic Vukan R.,	Prentice Hall,	8 th	2005

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Rural development Planning – Design and method	Misra S.N.	Satvahan Publications New Delhi	8 th	2009
02	Economic development in Third world	Todaro Michael	Orient Longman Publication, New-Delhi	13 th	2013
03	Modeling Transport	Juan De Dios Ort, Luis G Willumsen, and Juan De Dios Ortuzar	John Wiley and Sons	5 th	2011
4	Transportation Engineering and Planning	C. S. Papacostas and P. D. Prevedouros	Prentice-Hall	3 rd	2000
5	Traffic Flow Fundamentals	Adolf May	McGraw-Hill Publications	9 th	2014
6	Accessibility and the Bus System – Concepts and Practice	Tyler N	Thomas Telford	8 th	2002
7	Urban Transport for Growing Cities – High Capacity Bus System	Tiwari G.	MacMillan India Ltd	6 th	2002.
8	Intermediate Public Transport Manuals.				
9	MRTP Act 1966				
10	Land Acquisition Act – 1894				
11	Highway Capacity Manual 2000, MORTH Codes, All relevant IRC codes				


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Course Details:

Class	T. Y. B. Tech, Sem. - V
Course Code and Course Title	1CVPE357, Safety Aspects In Construction Laboratory
Prerequisite/s	1CVPC205
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	01
Evaluation Scheme: ISE	25

Lab Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE357_1	Identify current practices followed on site related with safety management.(K ²)
1CVPE357_2	List different safety equipment and safety acts in construction project. (K ²)
1CVPE357_3	Recommend suitable site safety management system for a construction project. (K ⁵)
1CVPE357_4	Professionally present site safety scenario both verbally and with the help of poster. (S ³)
1CVPE357_5	Practice professional and ethical behavior while collecting data from site. (A ²)

Lab contents-

1	Make a presentation on current scenario of construction site related with accidents and safety.
2	Study a case study of safety action taken out in construction project
3	List out and explain different act used in safety management.
4	Make a presentation on safety precaution for different construction activities.
5	Collect information of accidents happened on construction site and list out the causes of accidents and cost associated with it.
6	Make a suitable safety management system for any construction site.
7	List out and give importance of safety equipment used on site by poster presentation.
8	Design of safety management system for any one civil construction project.
9	Safety Awareness Camp in nearby area.(Construction site)

Text Book:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Industrial Safety and Environment	Anupama prashar & Bansal	S.K. Kataria & Sons, New Delhi	4 th	2015
02	Construction Planning & Management	P.S. Gahlot & B.M. Dhir	New Age International (P) Ltd.	6 th	2010
03	Total Quality in construction projects	Ron Baden	Thomas Telford, London	8 th	2005
04	Concerned ISI for Safety in Construction	Bureau of Indian Standards, 2015.			
05	Major Safety Control: A practical Manual	National Safety Council, India 1993			

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TY CV-33/83

Reference Book:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Hand book of OSHA Construction safety & Health	Charles D.Reese & James V. Edison.	CRS Press	3 rd	2006
02	Safety Management in Construction Industry	A Manual for Project Managers NICMAR, Mumbai.	NICMAR, Mumbai.	--	2013
03	Safety – health and working condition	Training Manual, National Safety Council, Mumbai, 2000.			
04	Safety Health & Welfare Manual	International Labour Organization, 1999			
05	Concerned ISI for safety in construction	Bureau of Indian Standards.			


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CV-34/83

Course Details:

Class	T.Y.B. Tech, Sem.-V
Course Code and Course Title	1CVPC358, Environmental Engineering Laboratory
Prerequisite/s	1CVPC305, Basic Chemistry Laboratory
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	01
Evaluation Scheme: ISE	25

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC358_1	Interpret the various physical, chemical parameters of water. (K ²)
1CVPC358_2	Summarize various units of the water treatment plant. (K ²)
1CVPC358_3	Develop a complete water treatment plant for a small community. (K ³)
1CVPC358_4	Independently use of EPANET software as a modern tool for designing of pipe network. (S ³)
1CVPC358_5	Practice education of water supply system in an environmental and societal context. (A ²)

Sr. No.	Title of Experiment
1	Determination of various physicochemical parameters of water- pH, Turbidity, TDS.
2	Determination of various physicochemical parameters of water- Acidity, Alkalinity, Hardness, Chlorides, Dissolved Oxygen
3	Determination of Total Solids, Dissolved Solids, and Suspended Solids
4	Determination of Optimum Alum dose (Jar Test) of a water sample from selected community
5	Determination of Residual chlorine in the water.
6	The study, use, and application of software in network analysis
7	Visit the water treatment plant.
8	Design of complete water treatment plant for a small community (Not more than 5000 population)

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Water Supply Engineering	S. K. Garg	Khanna Publishers, New Delhi	21st	2012
02	Water Supply Engineering	Dr. B. C. Punmia	Laxmi Publishers, New Delhi	2nd	2011
03	Water Technology	Gray, N. F	Elsevier Science & Technology Books	2nd	2009
04	Water Supply Engineering	Dr. P. N. Modi	Standard Book House, New Delhi	18th	2007
05	Water Supply and Sanitary Engineering,	G.S.Birde	Dhanpat Rai & Sons	2nd	1990

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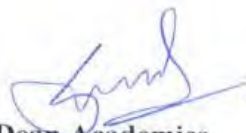
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Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Water and Waste water Technology	Hammer M.J.	Prentice-Hall of India Private Limited	6th	2011
02	Water Chemistry: An Introduction to the Chemistry of Natural and Engineered Aquatic Systems	Patrick L. Brezonik, William A. Arnold,	Oxford University Press, New York,	2nd	2011
03	Nanotechnology in Water Treatment Applications -	T. Eugene Cloetel, Michele de Kwaadstenietl	Caister Academic Press	2nd	2010
04	Chemistry for Environmental Engineering and Science	C.N. Sawyer, P.L. McCarty and G.F. Parkin	Tata McGraw Hill	5th	2003
05	Water Works Engineering – Planning, Design and Operation	S.R. Qasim, Edward and Motley and Zhu, H.	Prentice Hall, India.	2nd	2002
06	Environmental Engineering	H.S. Peavy, D.R. Rowe	McGraw Hill	2nd	1985



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TYCV-36/23

Course Details:

Class	T. Y. B. Tech, Sem.-V
Course Code and Course Title	1CVAC359, Professional Skill Practices
Prerequisite's	1CVPC202, 1CVPC205, 1CVPC252, 1CVPC255
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	--
Evaluation Scheme: ISE	Grade

Course Outcomes (COs):

1CVAC359_1	Explain the latest developments to improve the civil engineering knowledge. (K ²)
1CVAC359_2	Use various tools and equipment's required for construction. (K ³)
1CVAC359_3	Demonstrate various construction activities on field. (K ³)
1CVAC359_4	Function effectively as an individual and as a team member while performing various construction activities. (S ²)
1CVAC359_5	Practice various construction activities. (A ²)

Sr. No.	Title of Experiment
1	To study the document required for municipal permission of building from Competent authority
2	To study the process of licensing and submission of drawing using BPMS software
3	To carry out Lineout activity for G+1 R.C.C. residential building.
4	To study the various tools and equipment's on site required for construction
5	To carry out various procedures adopted for different construction work (Footing, Column, Brickwork, RCC wall, Beam, Plaster, Flooring, Formworks)
6	To carry out 230 mm thick brickwork activity for wall of size 1m X 1m.
7	To prepare model of various civil engineering works.
8	To do measurements of various construction work and Retaining Wall.
9	To do actual bar bending on site as per the drawing provided.



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TY CV - 37/83

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Building Construction	B.C.Punmia, A.K Jain	Laxmi Publications	11 th	2017
02	Basic Civil Engineering A Text Book of Building Construction	G. K. Hiraskar	Dhanpat Rai Publications	5 th	2010
03	Building Construction	S.P. Arora, S.P. Bindra	Dhanpat Rai Publications	7 th	2010
04	Engineering Materials	R.K.Rajput	S. Chand	3 rd	2012
05	A Course in Civil Engineering Drawing	V.B.Sikka	S.K.Kataria and Sons	7 th	2013

Reference Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	SP 7- National Building Code Group 1 to 5		B.I.S. New Delhi		
02	I.S. 962 - 1989 Code for Practice for Architectural and Building Drawngs		B.I.S. New Delhi		



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TY CV-38/83

Course Details:

Class	T. Y. B. Tech, Sem.-V
Course Code and Course Title	1CVPR360, Seminar
Prerequisite's	----
Teaching Scheme: Lecture/Tutorial/Practical	00/01/00
Credits	01
Evaluation Scheme: ISE	25

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPR360_1	Describe recent trends in Civil Engineering. (K ²)
1CVPR360_2	Apply acquired knowledge in the field of Civil Engineering. (K ³)
1CVPR360_3	Develop technical knowledge in the field of Civil Engineering (K ⁶)
1CVPR360_4	Function effectively as an individual and as a team member while steel structural design. (S ²)
1CVPR360_5	Engage in lifelong learning structural drawing and design. (A ²)

Course Contents:

The lab work shall consist of distinct units from various fields of Civil Engineering. Each student is allotted with one unit based on his/her choice of interest. Two faculties will be allotted as guide for each unit. The guide will assess their knowledge by any assessment tools at the end of Sem.

Distinct Units are: (NPTEL Courses of 8 weeks)

- 1) Energy efficiency, acoustics & day lighting in building.
- 2) Digital Land Surveying and Mapping (DLS&M).
- 3) Plastic Waste Management.
- 4) Geosynthetics & Reinforced soil structures.
- 5) Infrastructure planning and management.

Note: Students can select any civil engineering NPTEL course other than this. But it must be of minimum 8 weeks.



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TY CV-39/83

Course Details:

Class	T. Y. B. Tech. Sem.-VI
Course Code and Course Title	1CVOE310, Operation Research
Prerequisite/s	1CVES209
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I/ MSE / ISE II/ ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVOE310_1	Explain the concept behind Decision theory and Decision Tree. (K ²)
1CVOE310_2	Solve various engineering problems by Transportation and Assignment Approach. (K ³)
1CVOE310_3	Apply the Queuing theory & Game theory in practice. (K ³)
1CVOE310_4	Use Replacement policy for equipment, group & individual. (K ³)
1CVOE310_5	Analyze detailed idea about LPP and methods to solve LPP by various methods. (K ⁴)
1CVOE310_6	Interpret various inventory control technique adopted in Engineering. (K ⁴)

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Introduction: Importance of operation research, Scope & application of Operation research, Linear programming: Formulation, graphical solution, simplex method, Duality, Sensitivity analysis.	07
Unit 2	Assignment & Transportation Problem: Transportation problem: North west corner method, least cost method, vogel's approximation method. Degeneracy transportation, Unbalanced problem, profit maximization problem, Assignment Problem	07
Unit 3	Decision theory & Decision Tree: Introduction , decision under certainty, decision under uncertainty, Laplace criterion, MaxiMin criterion, MiniMax criterion, Decision Tree & Problem	07
Unit 4	Inventory control: Inventory classification, different cost associated to inventory, Economic order quantity, ABC analysis, Inventory model with deterministic demands & probabilistic model, simulation application	07
Unit 5	Queuing theory & Game Theory: Queuing theory : Element of Queuing theory, kendall's notation, operating characteristic of a queuing system, classification of queuing model Game Theory: Introduction, characteristics of game theory, two person zero sum games, pure strategy, mixed strategies, dominance theory.	07
Unit 6	Replacement Theory: Introduction, Replacement of capital equipment which depreciated with time, replacement by alternative equipment, group or individual replacement policy, Forecasting techniques,	07

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TY CV-40/83

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Operation Research	H.A.Taha	Mac-Millan	2nd	2009
02	Operation Research	Wagner	Wiley Eastern Ltd	6th	2005
03	Operation Research	R. Panneerdelvam	Prentice-Hall India, New Delhi.	8th	1991
04	Optimization Technique	S.S. Rao	Wiley Eastern Ltd	1st	2005
05	Project Management	Lick D.	Gower Publication, England	-	2012

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Operation Research	D.S. Hira	S. Chand	2nd	1985
02	Introduction to Operation Research	Gupta & Kamboj Aarti	McGraw- Hill	3th	1967
03	Operation Research	A.M. Natarajan	Pearson Education India	4th	2017


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T7 CV 41183

Course Details:

Class	T. Y. B. Tech. Sem.-VI
Course Code and Course Title	ICVOE311, Economics & Management
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

ICVOE311_1	Discuss importance of management and various techniques used for Material Management. (K ²)
ICVOE311_2	Identify various techniques used in Quality Management. (K ³)
ICVOE311_3	Apply the various Quantitative Techniques in practice. (K ³)
ICVOE311_4	Apply the various methods of Engineering Economy in industry. (K ³)
ICVOE311_5	Identify various techniques used in Human Resource Management.(K ³)

Course Contents:

		Hrs.
Unit 1	Elements of Management Principle of management (Henry Fayol), Functions of management, Decision Making: Process, Decision Tree.	06
Unit 2	a) Quantitative Techniques Linear Programming – Simple LP model, Graphical Method, Transportation Problem, Assignment Problem. b) Material Management Objectives, Need for Inventory Control, EOQ Analysis, ABC analysis, Safety Stock, Purchase Procedure, Stores Record.	10
Unit -3	Economics: Importance, Time Value of Money, Equivalence Economic Comparison Methods: Present Worth Method, EUAC method.	06
Unit-4	Economic Comparison Methods: Linear Break Even Analysis. Capitalized Cost method, Net Present Value, Rate of Return, Benefit- Cost Ratio, Payback Period Method, and Linear Break Even Analysis, BIM, Kaizen. b) Financial management: Introduction to standard forms of financial statements, ie. Balance-sheet, profit and loss, and income statement.	07
Unit-5	Quality Management: Quality Circle, difference between Quality control & Quality Assurance (QA/QC), Total quality control (TQC) and Total Quality Management (TQM), Need for TQM, monitoring for quality - PDCA Cycle, 360° feedback for quality, Concept of Six Sigma and just in time(JIT).	06
Unit-6	Human Resource Management Introduction, Nature & scope of HRM, HRM: functions and objectives of HRM, HRM model, evaluation of HRM, need of HRD in the context of globalization. Human Resource Planning: Nature and importance of HRP, Factors affecting HRP, Planning process	07

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TY CV-42183

Text Books:

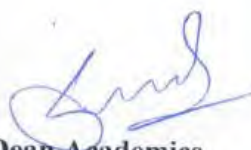
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Management	Stoner	Pearson Education	6 th	2003
02	Operation Research	S. H. Deshpande	Mcgraw Hill Publishing Ltd.	3 rd	2014
03	Engineering economics and financial accounting	Prasanna Chandra	Tata Mcgraw Hill Publishing Ltd., ,	4 th	2005
04	Management information system	K. C. and J. P. Laudon	Prentice Hall	4 th	2011
05	Human Resource Management	Aswathappa K	Tata McGraw Hill	5 th	2018
06	Total Quality Management	Subbura	Tata McGraw Hill	1 st	2017

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Material Management	Gopal Krishnan, Sdueshan	McGraw Hill Education	1 st	2001
02	Engineering Management	A K gupta	Chand publication	4th	2007
03	Principles of Management	Charles W. L. Hill, Steven Mcshane	McGraw Hill Education	1st	2017
04	Management and Engineering Economics	G.A.Taylor.	Van Nostrand	3 rd	1980



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TY CV-43/83

Course Details:

Class	T. Y. B. Tech. Sem.-VI
Course Code and Course Title	1CVPC312, Theory of Structures
Prerequisite/s	1CVPC204, 1CVES207
Teaching Scheme: Lectures / Tutorial	03/01
Credits	04
Evaluation Scheme: ISE I / MSE / ISE II/ ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC312_1	Calculate static and kinematic indeterminacy of structures. (K^3)
1CVPC312_2	Examine the statically indeterminate structure by using appropriate Force method. (K^4)
1CVPC312_3	Interpret kinematically indeterminate structure by using appropriate Displacement method. (K^4)
1CVPC312_4	Interpret statically indeterminate structure by Flexibility matrix method. (K^4)
1CVPC312_5	Investigate kinematically indeterminate structure by Stiffness matrix method. (K^4)

Course Contents:

		Hrs.
Unit 1	Introduction to Structures: Types of structures, Stable and unstable structures, Indeterminate structures Statically and kinematically with problems. Consistent Deformation Method: Applications to propped cantilever and fixed beams, beams with varying M.I. (Degree ≤ 2)	08
Unit 2	Strain Energy Method: Strain energy due to various forces, Unit load method and Castigliano's theorems - Applications to statically indeterminate structures- Portal Frame. (Degree ≤ 2). Analysis of indeterminate trusses, Analysis of three hinged arches	08
Unit 3	Flexibility Matrix Methods: Introduction to Flexibility. Flexibility coefficients, Development of Flexibility matrix, Analysis of simple beams (Degree ≤ 2)	05
Unit 4	Stiffness Matrix Methods: Introduction to Stiffness method, Stiffness coefficients, Development of Stiffness matrix, Analysis of simple beams (Degree ≤ 2)	05
Unit 5	Slope Deflection Method: Slope deflection equations, Application to beams, Portal frames without sway. Sinking of supports, Modified slope deflection method (Degree ≤ 2)	08
Unit 6	Moment Distribution Method: Relative and absolute stiffness, Distribution factors, Sinking of supports, Applications to beams, Portal frames with and without sway (Degree ≤ 2)	08

Tutorials:

One hour per week tutorial is to be utilized for problem solving to ensure that students have properly learnt the topics covered in the lectures. This shall include Software applications (STADD PRO & E-TABS) / Assignments / Tutorials / Quiz / Surprise test. The teacher may add any of the other academic activity to evaluate student for his/her in semester performance. It consists small investigations are as follows:

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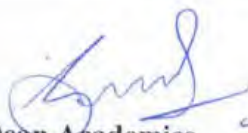
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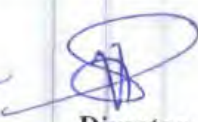
List of Tutorials:	
Sr. No.	Title of Tutorial
1	Computation of static and kinematic indeterminacy
2	Investigate statically indeterminate structure by consistent deformation method.
3	Solve statically indeterminate structure by strain energy method.
4	Solve indeterminate structure by flexibility matrix methods.
5	Analyze indeterminate structure by stiffness matrix methods.
6	Interpret kinematically indeterminate structure by slope deflection method.
7	Investigate kinematically indeterminate structure by moment distribution method.
8	Solve indeterminate structure by any software and compare it with manual investigation.

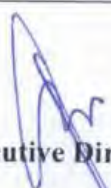
Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Basic Structural Analysis	Reddy C. S.	Tata McGraw Hill Publication Company Ltd.	2nd	2001
02	Structural Analysis – Matrix approach	Pandit and Gupta	Tata McGraw Hill Publication Company Ltd.	4th	2004
03	Mechanics of Structures (Vol. II)	S.B. Junnarkar	Charator Book Publishing House.	24th	2015
04	Structural Analysis	R.C. Hibbeler	Pearson Prentice Hall	8th	2011
05	Structural Analysis Vol-1	S. S. Bhavikatti	Vikas Publishing House	4th	2010

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Theory of Structures	Timoshenko & Young	Tata McGraw- Hill Publishing Company Ltd.	2nd	1965
02	Modern Methods in Structural Mechanics - I	B.N. Thadani	Asia Publishing House, New Delhi.	1st	1964
03	Indeterminate Structural Analysis	C. K. Wang	Tata McGraw Hill Publication Company Ltd.	1st	1983
04	Structural Analysis Vol-2	S. S. Bhavikatti	Vikas Publishing House	4th	2013
05	Advanced Structural Analysis	Devdas Menon	Alpha Science International Ltd	1st	2009


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TY CV - 45/83

Course Details:

Class	T. Y. B. Tech. Sem.-VI
Course Code and Course Title	1CVPC313, Infrastructure Engineering
Prerequisite/s	1CVES103, 1CVPC202
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I/ MSE / ISE II/ ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC313_1	Discuss the various aspects of airport engineering.(K ²)
1CVPC313_2	Explain design parameters of railway engineering and it's component parts.(K ²)
1CVPC313_3	Summaries the different off shore structures for dock and harbors.(K ²)
1CVPC313_4	Apply the knowledge of geometric design in road construction.(K ³)
1CVPC313_5	Identify the quality parameters of pavement materials and various methods of road construction.(K ³)
1CVPC313_6	Discuss the various aspects of airport engineering.(K ²)

Course Contents:

		Hrs.
Unit 1	Highway Planning Introduction: Classification of roads, Brief history of road development in India, Present status of roads in India, NHAI, NHDP, PMGSY, MSRDC; Geometric Design of Highways: Terrain classification, Design speed, Highway cross-section elements, Analysis of safe sight distance, Analysis of overtaking sight distance, Intersection sight distance; Design of Horizontal Alignment: Horizontal curves, Design of super elevation and its provision, Radius at horizontal curves, Widening of pavements at horizontal curves, Methods of extra widening; Design of vertical alignment: Different types of gradients, Grade compensation on curves, Analysis of vertical curves, summit curves, valley curves.	08
Unit 2	Pavement Materials Importance and properties of Subgrade; Stone aggregates: Desirable properties, Requirements of aggregates for different types of pavements; Bituminous Materials: Types, Tests on bitumen, Desirable properties, Selection of grade of bitumen; Bituminous Mix Design: Principle, Methods, Modified binders; Marshall Stability test.	07
Unit 3	Highway construction Types of Pavement (Flexible and Rigid); Types of Roads: WBM, WMM, DBM, SDBC, SMA, PQC, DLC; Highway Drainage: Necessity, sub surface and surface drainage; PPP in Transport Sector	06
Unit 4	Airport Engineering Introduction: Advantage and limitation of air transportation, Aeroplane component parts, Important terms in Airport planning, Aircraft characteristics; Survey and drawings to be prepared for airport planning; Functional Relationships of Terminal Components; Airport layout: Characteristics of good layout, Runway configuration, Imaginary surfaces, location Zoning requirements regarding permissible heights of construction and landing within the airport boundary, Runway Location and	08

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	orientation, Basic runway length, Use of wind rose diagram, Airport Lighting and Markings.	
Unit 5	Railway Engineering: History of Indian Railways; Recent development in railways specifically w.r.t. track structure; Permanent Way; Component parts of railway track; Railway lines classification based on speeds such as A, B, C, D, E, Q, R and S routes; Geometric Design: Alignment, Gradient, Horizontal Curves, Superelevation; Points, Crossing and Turnouts; Signaling and Interlocking; Control of train movements and monitoring, Types of signals, Principal of interlocking; Modernization in Railway and Railway Tracks	08
Unit 6	Dock and Harbor Engineering: Introduction, Planning and layout of ports, Classification, Site Selection, Breakwater, Jetties, Locks, Shore protection works.	05

Text Books:

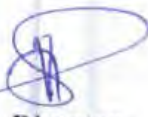
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Highway Engineering	Khanna and Justo	Nemchand Bros, Roorkee	8 th	2015
02	Highway Engineering	L R Kadiyali	Khanna Publisher	5 th	2019
03	A textbook of Railway Engineering	S.C. Saxena & S.P. Arora	Dhanpatrai publications	6 th	2011
04	Airport Engineering	Ashford	Wiley India	4 th	2009
05	Airport Planning & Design	Khanna and Arora,	Nemchand Bros, Roorkee	6 th	2012

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Transportation Engineering – An Introduction	Nemchand & Bros., Roorkee, Khistry, C.J.	Prentice Hall of India Ltd., New Delhi	2 nd	2001
02	Principles of Transportation Engineering	Partha Chakraborty and Animesh das	Prentice Hall of India Ltd., New Delhi	1 st	2004
03	A Course in Railway Engineering	Saxena and Arora	Dhanpatrai & Sons, New Delhi	6 th	2011


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Course Details:

Class	T. Y. B. Tech. Sem.-VI
Course Code and Course Title	1CVPE314, Repair & Rehabilitation of Structures
Prerequisite/s	1CVPC210
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE314_1	Explore the causes of deterioration of structures. (K ²)
1CVPE314_2	Distinguish the methods of assessment of structures. (K ²)
1CVPE314_3	Discuss methods and techniques of repairing of structures. (K ²)
1CVPE314_4	Adopt different methods for retrofitting of structures. (K ³)
1CVPE314_5	Categorize the methods for repair of structures. (K ³)

Course Contents:

		Hrs.
Unit 1	Introduction: Aging of structures, assessment procedure, Deterioration and its types, causes of deterioration, need for repair and rehabilitation, performance of structures, Inspection, Maintenance	06
Unit 2	Distress in load bearing, RCC, steel structures: Damage, source, cause, effects of damage, case studies. Effects of climate, temperature, Corrosion of steel reinforcement and its causes, Mechanism and prevention, Strength, Durability and Thermal properties of building materials.	08
Unit 3	Damage assessment and Evaluation methods: Damage testing methods, Non- destructive Testing Techniques (NDT), Semi destructive testing (SDT), destructive testing method and Core samples.	07
Unit 4	Repairing methods and techniques: Guniting and Shotcreting, grouting, Types of cracks, Crack ceiling, Polymer concrete, Repairing materials and their effectiveness, Types of Repairing materials, Carbon Fiber, Glass Fiber, Basalt Fiber, Fiber wrapping techniques, steel plate flitching, Shoring and Underpinning, Case studies.	08
Unit 5	Retrofitting methods: Seismic Retrofitting of reinforced concrete buildings, Flow of retrofitting process, Considerations in retrofitting of structures; Source of weakness in RC frame building, Structural damage due to discontinuous load path, Quality of workmanship and materials, Jacketing.	07
Unit 6	Repair and maintenance of buildings: IS standards, Bridge repairs, Seismic strengthening, Maintenance and its types, Importance, Inspection periods, Estimation and costing of Repairing techniques such as jacketing, grouting, polymer mortar etc.	06

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Concrete Technology	M.L.Gambhir	Tata McGraw-Hill Education,	3 rd	2013
02	Reinforced Concrete Structures – Vol. II	Dr B. C. Punmia, Ashok Kumar Jain & Arun Kumar Jain	Laxmi Publications	2 nd	2005
03	Maintenance and Repairs of Buildings	P.K. Guha	New Central book Agencies	2 nd	2003
04	Maintenance Engineering For Civil Engineers	Nayak B. S.	Khanna Publication	3 rd	2009
05	Diagnosis and treatment of structures in distress	R.N.Raikar	R&D Centre of Structural Designers & Consultants Pvt. Ltd., Mumbai	2 nd	1994
06	Structural Health Monitoring, Repair and Rehabilitation of Concrete Structures	Ravishankar K., Krishnamoorthy	Allied Publishers	1 st	2004
07	Repairs and rehabilitation of concrete structures	P. I. Modi & C. N. Patel	PHI Publication.	2 nd	2009

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Deterioration, Maintenance and Repair of Structures	Johnson	Tata McGraw-Hill publishing Company Ltd, New Delhi	2 nd	2011
02	Concrete Structures: Repairs, water proofing and protection	Philip H. perkins	Applied sciences publications Ltd., London,	1 st	2007
03	Durability of concrete structure: Investigation, Repair, Protection	Geoffmang, E. & FN SPON	An imprint of Chapman & Hall,	1 st	2006
04	Building Failures – Diagnosis and Avoidance	W H Ransom.	E and F. N. Span.	2 nd	2004
05	Repairs and rehabilitation of concrete structures	P. I. Modi & C. N. Patel	PHI Publication.	2 nd	2009
06	Handbook on Repair and Rehabilitation of RCC buildings	CPWD, Govt. of India		1 st	2002

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TY CV-49/83

Course Details:

Class	T. Y. B. Tech. Sem.-VI
Course Code and Course Title	1CVPE315, Solid Mechanics
Prerequisite/s	1CVPC204, 1CVES207, 1CVPC312
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE315_1	Explain stress strain behavior at a point in material. (K^2)
1CVPE315_2	Draw Mohr's circle for different stress conditions. (K^3)
1CVPE315_3	Apply theory of failure to isotropic materials. (K^3)
1CVPE315_4	Analyze of circular and non-circular section for torsion. (K^4)
1CVPE315_5	Investigate plastic behavior of beam member. (K^4)

Course Contents:

		Hrs.
Unit 1	Stress and strain: Concept of stress at a point, stress tensor, stress on inclined plane, stress equilibrium equations, stress invariants. The state of strain at a point, strain displacement relations, strain compatibility condition and stress compatibility conditions.	08
Unit 2	Principal stresses and strains: Principal stresses and strains, stress and strain invariants, Mohr's circle representation.	06
Unit 3	Plane stress and strain: Constitutive Relationship Generalized Hook's law for Isotropic, Orthotropic materials, plane stress, plane strain Concepts, Airy's stress function and application problems.	07
Unit 4	Theories of failures: Theories of failures for isotropic materials. Maximum principal stress theory (Rankine's theory) Maximum shear stress theory (Coulomb, Tresca and Guest's theory) Distortion energy theory (Huber von Mises and Hencky's theory) Maximum strain theory (St. Venant's theory) Maximum total strain energy theory (Haigh's theory)	07
Unit 5	Torsion: Torsion Assumptions and Torsion equation for general prismatic solid bars, warping of non-circular sections. Prandtl's stress function approach. Torsion of various cross-section bars.	07
Unit 6	Plastic Analysis: Plastic Bending of Beams Elastic, perfectly plastic materials, plastic behavior of straight beams in bending, depth of plastic zone, residual stresses	07

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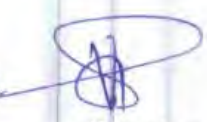
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Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Mechanics of solid	E. P. Popov	Prentice Hall	1 st	1998
02	Mechanics of Material	F. P. Beer, E. R. Johnston (Jr.) and J.T. DeWolf	McGraw Hill,	1 st	2005
03	Strength of Materials	Timoshenko and Youngs	East West Press	1 st	1940
04	Strength of Materials	Pytel and Singer	Harper Collins	4 th	1950
05	Mechanics of Materials	Hibbeler, Pearson	Pearson	4 th	1980

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	An introduction to the mechanics of solid,	S. H. Crandall, N. C. Dahl, and T. J. Lardner	Tata McGraw Hill,	2 nd	2008.
02	Strength of Materials, Vols. 1 & 2,	S. P. Timoshenko	CBS Publishers,	2 nd	1986.
03	Introduction to Solid Mechanics	H. Shames and J. M. Pitarresi	Prentice Hall of India	3 rd	2003
04	Mechanics of Materials	J. M. Gere	Thomson Brooks/Cole,	4 th	2006


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TY CV - 51183

Course Details:

Class	T. Y. B. Tech. Sem.-VI
Course Code and Course Title	1CVPE316, Disaster Management
Prerequisite/s	---
Teaching Scheme:	Lecture/Tutorial 03/00
Credits	03
Evaluation Scheme: ISE-I/MSE/ ISE-II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE316_1	Outline disaster and disaster management cycle. (K ²)
1CVPE316_2	Summarize disaster preparedness and response activities for various types of Disaster. (K ²)
1CVPE316_3	Apply various advanced techniques for disaster management. (K ³)
1CVPE316_4	Examine the Physical and Socio-economic Impacts of Disasters. (K ⁴)
1CVPE316_5	Dissect the disaster management scenario in India. (K ⁴)

Course Contents:

		Hrs.
Unit 1	Understanding of Disasters : Meaning, Factors and Significance, Distinguishing between an emergency and A disaster situation. Understanding Disasters- Causes and Effects, Types of natural and non-natural disasters.	06
Unit 2	Disaster management cycle: Introduction to Disaster Management Cycle, Mitigation, Preparedness, Response and Recovery. Disaster Mitigation, Mitigation strategies, Hazard Identification and vulnerability analysis, Mitigation strategies or measures.	06
Unit 3	Disaster Preparedness & Response to Disaster: Introduction to Disaster Preparedness, Disaster Risk Reduction (DRR), The Emergency Operation Plan (EOP), Developing and Writing the EOP. Aims and Introduction to Disaster Response, Disaster Response Activities. Disaster Recovery, The Recovery Plan. Disaster and Development, Disasters as opportunities for development initiatives. Impact of disasters on development programs.	09
Unit 4	Disaster events and their management Earthquake, Flood and drainage, Cyclone, Flood and famine, Fire and Forest Fire, Industrial and technological disaster, Epidemics and Landslide. Disasters -A Global View, Disaster Profile of India- Regional, and Seasonal. National Disaster management Plan.	07
Unit 5	The Role of Technology in Disaster Management: Geographic Information Systems (GIS) and Disaster Management, GIS Applications. Global Positioning System (GPS) and Disaster Management, Application of GPS to Disaster Management. Remote Sensing and its significance in Disaster Management.	07
Unit 6	Physical and Socio-economic Impacts of Disasters : Disaster impacts environmental, physical, social, ecological, economic, political, etc. health, psycho-social issues, demographic aspects (gender, age, and special needs), and climate change.	07

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year
01	Disaster risk reduction in south asia	Pardeep Sahni, Madhavimalalgoda and ariyabandu	PHI Punblication	6 th	2013
02	Understanding earthquake disasters	Amitasinvhal	TMH Publication	5 th	2010
03	Disaster mitigation: Experiences and reflections	Pardeepsahni, AlkaDhameja and Uma medury	PHI Publication	8 th	2014
04	Handbook of Disaster Management: Techniques & Guidelines	Singh B.K Rajat Publication	Rajat Publication	6 th	2008
05	Disaster Management Concepts And Approached	Mondal D.	PPS Publishers and Distributors	4 th	2020

Reference Books :

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Disaster Management - Future Challenges and Opportunities	Jagbir Singh	Wiley	1 st	2010
02	Disaster Management And Preparedness	Nidhi G Dhawan	CRS Publishers and Distributors	1 st	2012
03	Disaster Management	R Subramanian	Vikas	1 st	2018
04	Disaster Management IGNOU study Material	IGNOU			


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TY CV - 53/83

Course Details:

Class	T. Y. B. Tech. Sem.-VI
Course Code and Course Title	1CVPE317, Ground Improvement Technique
Prerequisite/s	1CVPC304, 1CVPE318
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I/ MSE / ISE II/ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE317_1	Explain concept of ground improvement techniques. (K ²)
1CVPE317_2	Describe earth reinforcement and their stability analysis. (K ²)
1CVPE317_3	Apply geo-synthetics techniques to different civil engineering structures. (K3)
1CVPE317_4	Illustrate phenomenon of stone column. (K ³)
1CVPE317_5	Classify different ground techniques with their suitability. (K ⁴)

Course Contents:

		Hrs.
Unit 1	Introduction to ground improvement techniques: Definition of ground improvement, objectives, classification of ground improvement techniques, suitability of different techniques, preloading: need, preloading without vertical drain, preloading with vertical drain, dynamic consolidation	07
Unit 2	Stone Column: Stone column, Design of stone column: unit cell concept, area replacement ratio, spacing and diameter, depth, stress ratio, Load bearing capacity of individual stone column, settlement of stone column, Failure mechanism	07
Unit 3	Ground Anchors: Ground anchors, components, load transfer mechanism, rock anchors, anchors in granular soil, anchors in cohesive soil, Rock bolt, types, action of rock bolt, Soil nailing, analysis of nailed soil	07
Unit 4	Soil Stabilization: Soil stabilization: cement, lime, fly ash, factors affecting. Grouting: classification, types of grouts, equipments, grouting design and layout, applications, case histories Landslide: Landslide, various causes of landslide, prevention by advanced techniques	07
Unit 5	Earth Reinforcement: Earth reinforcement, mechanism and concept, stress strain relationship of reinforced soil, design theories, stability analysis of retaining wall: tie back analysis, coherent gravity analysis, application areas of earth reinforcement	07
Unit 6	Geo-synthetics: Geo-synthetics – Types, functions, Application of geo- synthetics: reinforcement, separator, filter, drainage, Selection of geo- synthetics; Damage and durability of geo-synthetics.	07

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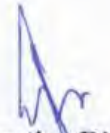
Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Principles of Ground Modifications,	Hausmann, M. R.	McGraw Hill publications	----	1990
02	Ground Improvement	Klaus Kirsch	--	5 th	2004
03	Ground Improvement Techniques	Purushothama Raj	Laxmi Publications, India	----	1995
04	Ground Improvement Techniques,	Patra, N.R.	Vikas Publications	----	2012

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Soil Mechanics and Foundation Engineering	Dr. K. R. Arora	Standard Publishers and Distributors	2 nd	2009
02	Soil Mechanics and Foundation	B. C Punmia	Laxmi Publications	16 th	2005
03	Selection of ground improvement techniques for foundation in weak	Bureau of Indian Standards	Bureau of Indian Standards, New Delhi.	1 st	2006
04	Foundations Geosynthetics and ground improvement,	Civil Engineering and Construction Review, New Delhi.	Civil Engineering and Construction Review, New Delhi.	1 st	2009
05	Ground Control and Improvement,	K. Kirsch & F. Kirsch	John Wiley & Sons	1 st	1994
06	Soil Improvement and Ground Modification methods	Nicholson, P.G	Elsevier Publishers.	1 st	2015


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TY CY - 55183

Course Details:

Class	T. Y. B. Tech. Sem.-VI
Course Code and Course Title	ICVPE318, Geotechnical Engineering II
Prerequisite/s	ICVES103, ICVPC304
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I/ MSE / ISE II/ ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

ICVPE318_1	Summarize the methods of soil exploration. (K^2)
ICVPE318_2	Compute various dimensions of shallow foundation. (K^3)
ICVPE318_3	Calculate effect of Earth pressure on retaining structure. (K^3)
ICVPE318_4	Interpret capacity of deep foundations by various methods. (K^4)
ICVPE318_5	Examine slope failures by different methods. (K^4)

Course Contents:

		Hrs.
Unit 1	Soil & Rock Exploration: Necessity, Planning, No & depth of bore holes, Exploration Methods- auger boring, and wash boring, rotary drilling. Soil sampling, Rock drilling and sampling, Site investigation report with bore log analysis Plate load test, S.P.T. (By I.S. Code method) and pressure meter tests with detailed procedure	07
Unit 2	Earth Pressure: Lateral Earth Pressure - Concept, Area of application, and earth pressure at rest, active and passive condition. Earth Pressure theory - Rankines and Coulomb's theory of earth pressure, horizontal backfill with surcharge, backfill with inclined surcharge	07
Unit 3	Stability of Slope & Foundation Techniques: Slope classification, slope failure, modes of failure. Infinite slope in cohesive and cohesion less soil, Taylor's stability number, Swedish slip method and Friction circle method.	07
Unit 4	Shallow Foundation & Settlement: Types and their selection, minimum depth of footing, Assumptions, & limitations of rigid design analysis. Design of Isolated, combined, strap footing (Rigid analysis), Raft foundation (elastic analysis). Immediate settlement- computations from I.S.8009-1976 (Part I) approach, consolidation settlement computations, Concept of total settlement, differential settlement and angular distortion.	08
Unit 5	Pile Foundation: Classification and their uses, single pile capacity evaluation by static and dynamic methods, pile load test. Negative skin friction, Group action piles, spacing of piles in group, Group efficiency. Under reamed pile	08
Unit 6	Well foundations, Caisson, Cofferdam: Element of wells, types, methods of construction, tilt and shift, remedial measures. Pneumatic caissons: sinking method- Sand island method, Caisson disease, Cofferdam, Common types of cofferdam	05

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Soil Mechanics and Foundation Engineering	Dr. K. R. Arora	Standard Publishers and Distributors	2nd	2009
02	Soil Mechanics and Foundations	BC Punmia	Laxmi publications Pvt Ltd	16th	2005
03	Soil Mechanics and Foundation engineering	VNS Murthy	Saikripa Technical Consultants Bangalore	8th	1991
04	Geotechnical Engineering	SK Gulhati	Tata McGraw Hill Delhi	1st	2005
05	Soil Mechanics and Foundations	Muni Budhu	Wiley India Pvt Ltd	2nd	2008

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Foundation Analysis and Design	JE Bowles	McGraw Hill International Edition	5th	1996
02	Foundation Design and Construction	MJ Tomlinson	ELBS	7th	2001
03	Design Aids in Soil Mechanics and Foundation Engineering	S.R. Kaniraj	TMH New Delhi	5th	2004
04	Soil Mechanics and Foundations	Muniram Budhu	John Wiley & Sons Publishers	2nd	2007
05	Geotechnical Engineering	P. Purushottm Raj	Tata Mcgraw Hill Company Ltd. New Delhi	1st	2005


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TY CV-57183

Course Details:

Class	T. Y. B. Tech. Sem.-VI (Elective)
Course Code and Course Title	ICVPE319, Site Investigations Methods & Practices
Prerequisite/s	ICVPC304, ICVPE306
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

ICVPE319_1	Discuss scope of site investigation and its applications in Civil Engineering. (K ²)
ICVPE319_2	Explain subsurface exploration techniques with its suitability. (K ²)
ICVPE319_3	Use geophysical methods and its interpretation techniques. (K ³)
ICVPE319_4	Apply basic concepts site investigation in field. (K ³)
ICVPE319_5	Recommend site suitability by preparing site investigation report. (K ⁴)

Course Contents:		Hrs.
Unit 1	Introduction to Site investigation: Introduction, the Importance of Site Investigation, Purposes of a Site Investigation, Objectives, Need for Site investigation, Advantages of Site Investigation, Phases in site investigation process, Approach to site investigation.	07
Unit 2	Methodology of site investigation: Preliminary site investigation: Preliminary desk study, Topographical maps, Geological records, Mining records, Air photo interpretation, Drone Surveying, Importance of GPS in site investigation, Site walk-over survey, Reconnaissance of site works.	07
Unit 3	Site Investigation using Non-Destructive Tests: Introduction, Electrical Methods, Magnetic Methods, Gravity Methods, Acoustic Emission Methods, Seismic Methods	07
Unit 4	Site investigation using drilling & core logging: Introduction, Exploratory drilling: Observations, Preservation of cores and Core logging, Core recovery, R.Q.D., numerical problems.	07
Unit 5	Sampling: Introduction, Sample sizes, Soil Disturbance, Soil disturbance during drilling, Soil disturbance during sampling, Disturbance after sampling, Undisturbed sampling techniques, Sand Sampling, Preparation of disturbed samples for testing, Preparation of undisturbed samples for testing.	07
Unit 6	Field Instrumentation: Rollers, Pressure meters, Piezometer, Pressure cells, Sensors, Inclinometers, Strain gauges etc. Technical Report writing- Standard format for a site investigation report	07

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TY CV-58183

Text Book:

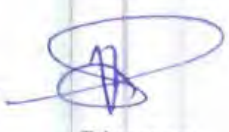
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Site Investigation Practice	Clayton, Mathews and Simons	Halsted Press	2nd	2004
02	A short course in Geotechnical site investigation	Simons, Menzies, Matthews	Thomson Telford Ltd. London	1 st	2002
03	Site Investigation Practice	Joyce, M.D.	ESFN. SPON Publishers	2nd	2012
04	Fundamentals of Geophysics	William Lowrie, Andreas Fichtner	Cambridge University Press	3rd	2017
05	Advanced Surveying	Satheesh Gopi	Pearson Education	2nd	2006

Reference Book:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Geotechnical Engineering Investigation Handbook	R.E. Hunt	CRC Press	2nd	2005
02	Geotechnical and Geophysical Site Characterization	An-Bin Huang, Paul W Mayne	CRC Press	1 st	2008
03	Principles of Soil Dynamics	Braja M. Das and Zhe Luo	Cengage	1 st	2017
04	Advances in site investigation practice	Proceedings of the international conference practice	ICE Virtual Library	1 st	1996
05	Effective Site Investigation	C.R.I. Clayton and D.M. Smith	ICE Virtual Library	1 st	2013


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TH CV - 59183

Course Details:

Class	T. Y. B. Tech. Sem.-VI
Course Code and Course Title	1CVPE320, Structural Masonry
Prerequisite/s	1CVPC304, 1CVPE306
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (COs):

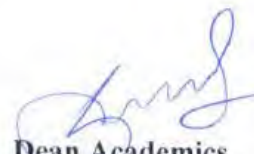
Upon successful completion of this course, the student will be able to:

1CVPE320 _1	Explain engineering properties and uses of masonry units, defects and crack in masonry. (K ²)
1CVPE320 _2	Select suitable design considerations for masonry structures. (K ²)
1CVPE320 _3	Explain design criteria as per IS: 1905 and SP-20. (K ³)
1CVPE320 _4	Design different masonry walls. (K ⁴)
1CVPE320 _5	Explain different types of masonry structures with behavior under different kind of loadings. (K ³)

Course Contents:

		Hrs.
Unit 1	Masonry structures Introduction, Materials for masonry, Strength of Masonry, Elastic properties of Masonry, parameter influencing Masonry properties, Defects in Masonry.	06
Unit 2	Design Considerations for Masonry structures Effective height of walls and columns, openings in walls, effective length, effective thickness, slenderness ratio, eccentricity, load dispersion, arching action in lintels. Problems on design considerations for solid walls, cavity walls, wall with pillars.	08
Unit 3	Structural design of masonry buildings Introduction, Wall layout in multi-storey buildings, Plain and reinforced masonry, Limit state design of masonry, Derivation of partial safety factors, Analysis of masonry structures, Movement and durability considerations.	07
Unit 4	Masonry Arches, Shells Introduction, Types of Masonry, Arches and Shells, Behaviour under Static and Dynamic load, Modes of Failure,	08
Unit 5	Stone Masonry Introduction, Types, Modes of Failure, Behaviour under Static and Dynamic load.	07
Unit 6	Reinforced Masonry Introduction to reinforced brick masonry, lintels and slabs. In-filled frames: Types – modes of failures	06


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TT CV - 60183

Text Book:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Structural Masonry	Henry, A.W	Macmillan Education Ltd.	2 nd	1990
02	Brick and Reinforced Brick Structures,	Dayaratnam P,	Oxford & IBH,	3 rd	1987
03	Building and Construction Materials ,	M. L. Gambhir,	Mc-Graw Hill education Pvt. Ltd.	3 rd	1980

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	IS 1905-1987 Code of practice for structural use of un-reinforced masonry- BIS,	BIS, New Delhi, 1987			
02	SP 20 (S&T) – 1991, Hand book on masonry design and construction	BIS, New Delhi.			


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TT CV - 61/83

Course Details:

Class	T. Y. B. Tech. Sem.-VI
Course Code and Course Title	1CVPE321, Waste Treatment & Pollution Control
Prerequisite/s	1CVES103, 1CVPC305
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE321_1	Explain the sources, characteristics, and methods of wastewater collection. (K ²)
1CVPE321_2	Illustrate the standards and legislations for pollution Control. (K ²)
1CVPE321_3	Summarize the various low-cost wastewater treatment units. (K ²)
1CVPE321_4	Apply the knowledge of effluent standards for wastewater disposal as per MPCB norms. (K ³)
1CVPE321_5	Develop the primary and secondary wastewater treatment units. (K ³)

Course Contents:

		Hrs.
Unit 1	Wastewater Treatment: Necessity of treatment, methods of sewage disposal, types of sewerage systems, and their suitability. Wastewater sources and flow rate, Components of wastewater flow, Variations in flow rates and strength and constituents, Characteristic of Municipal wastewater, Problems on B.O.D. calculations	07
Unit 2	Design of Sewerage System: Dry weather flow, factors affecting dry weather flow, Estimation of stormwater flow, rational method and empirical formulae of design of stormwater drain, hydraulic formulae for velocity, effects of flow variations on velocity, self-cleansing and non-scouring velocities, design of hydraulic elements for circular sewers flowing full and for partially full. Introduction to software in sewer network design	07
Unit 3	Treatment of Sewage: Principle, application, and design of following unit operations: Primary Treatments: screening, grit chambers, skimming tanks, primary sedimentation tank. Secondary Treatments: Activated sludge process, principle, and flow diagram, Modifications, design of ASP, Trickling filter, Novel treatment and Spent wash treatment.	07
Unit 4	Sludge Treatment: Characteristics, Treatment and disposal, Concept of anaerobic digestion, Fundamental concept of reactors. Sludge drying beds, sludge digestion and filter beds. Low Cost Treatments: Waste stabilization pond, Oxidation pond. Wetland and aquatic treatment systems; Types, application. Aerated Lagoon, Oxidation ditch, Sewage Farming Anaerobic Treatment Units- Anaerobic digester, UASB, Anaerobic Lagoons, Design of Septic tank.	07

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Unit 5	Stream pollution: Stream Classification, Concept of Self Purification and DO sag curve. Streeter Phelp's Equation. Disposal of wastewater: methods, Effluents standards for stream and land disposal as per MPCB standards and legislation.	07
Unit 6	Recent Advances and Pollution Control: Water (Prevention and Control of Pollution) Act, 1947, Concept of Environmental Impact Assessment, Air pollution control strategies, Soil Pollution control Strategies	07

Text Book:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Sewage disposal and air pollution engineering	S.K.Garg	Khanna publishers	33 rd	2015
02	Water Supply & Sanitary Engineering	G. S. Birdie	Dhanpat Rai & Sons, New Delhi	18 th	2007
03	Waste Water Treatment, Disposal and Reuse	Metcalf and Eddy Inc.	Tata McGraw Hill Publications	2 nd	2000
04	Wastewater Engineering	B.C. Punmia, Jain	Laxmi Publications (P) Ltd	2 nd	1998
05	Air pollution	Rao M. N. and Rao H.V.	Tata McGraw Hill	2 nd	1990

Reference Book:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Environmental Engineering	Peavy, Rowe and Tchobanoglous	McGraw-Hill	2 nd	2015
02	Industrial Wastewater Treatment, Recycling and Reuse.	Bhandari and Ranade	Elsevier	2 nd	2014
03	Water and Waste water Technology	Hammer M.J.	Prentice-Hall of India Private Limited	6 th	2011
04	Water supply & sanitary engineering	E.W.Stee	Khanna Publishes	2 nd	2008
05	Wastewater Treatment for Pollution Control	Arcievala, S.J.	Tata McGraw Hill.	2 nd	2000
06	Environmental Engineering	H.S.Peavy, D. R. Rowe	McGraw Hill	2 nd	1985
07	Introduction to Environmental Engineering and Science	Masters, G.M.	Prentice Hall of India.	2 nd	1998


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Course Details:

Class	T. Y, B. Tech. Sem.-VI
Course Code and Course Title	1CVPE322, Advanced Construction Techniques
Prerequisite/s	1CVPC205, 1CVPC210
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (CO):

On successful completion of laboratory practice, student will be able to,

1CVPE322_1	Summarize construction technique for different underwater constructions (K ²)
1CVPE322_2	Explain prefabricated and Girder launching construction techniques. (K ²)
1CVPE322_3	Identify different advanced formwork system used in construction (K ³)
1CVPE322_4	Select advanced construction techniques used in construction industries (K ³)
1CVPE322_5	Apply various grouting method for different site condition. (K ³)
1CVPE322_6	Identify different advanced methods of pile construction (K ³)

Course Contents:

		Hrs.
Unit 1	Formwork: Material for formwork, special types of formwork – Aluminum forms, Tunnel Formwork System, Ganged Forming System, Flying Formwork Systems, Vertical Slip formwork, failure of formwork, safety, formwork economy.	09
Unit 2	Construction Techniques Roller – compacted concrete, slip form in pavement construction, vacuum dewatering in concrete slab construction, reinforced earth construction, advanced method of diaphragm wall construction. Trenchless technology - Box jacking- pipe jacking	06
Unit 3	Grouting Methods: Cement grouting, chemical grouting, – grouts for injection of fine sands, resin grouting polymerisation technique, clay grouting, Asphalt Grouts Grouting Procedures – Pre grouting site investigation, grout holes pattern, grouting plant and equipment, injection methods, Grout injection measurement and monitoring- field procedure, applications and limitations.	08
Unit 4	Underwater Construction Problems Encountered, Underwater drilling, blasting, concreting and welding, Underwater structural concrete walls. Protection of structures against attack by ground water.	06
Unit 5	a) Pre-fabricated Construction: Types, Sizes and Economy, Fabrication techniques, Transportation, Erection, Jointing of Components, Light Weight Panels and Standardization of Components. b) Girder launching for bridges: Launching Girder Slightly Longer Than One Span, Launching Girder Slightly Longer Than Two Spans, Balanced Cantilever Construction, Progressive Placement Method, Incremental Launching, Span-By-Span Erection, False work – Stationary, Traveling.	07
Unit 6	Pile Construction – Pile driving equipment - Types, pile driving hammers, single acting and double acting, differential acting hammers, hydraulic and diesel hammers, vibratory drivers.	06

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TT CV-64/83

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Formwork for Concrete Structures	Garold (Gary) Oberlender, Robert Peurifoy	McGraw-Hill Education	4 th	2010
02	Wells and Caissons	Vijaya Singh,	New Chand & Bros, Roorkee	2 nd	1981
03	Bridge engineering	Raina	Shroff Publishers and Distributors Pvt. Ltd	3 st	2007
04	Concrete Technology	M. S. Shetty	S. Chand	1 st	2005
05	Construction of Marine and Offshore Structures	Ben C. Gerwick Jr.	CRC Press	3 rd	2007

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Grouts and Drilling Mud in Engineering Practice.	Symposium by Inst. of Engineers	Butter Worth's	1 st	1963
02	Formwork design and construction	Wynn	Cement & Concrete Assn	6 th	1974
03	Modem Foundations.	N.P. Kurion	Tata McGraw, Hill pub, co. Ltd	1 st	2006
04	Prefab Architecture: A Guide to Modular Design and Construction	Ryan E. Smith	Wiley Publication	1 st	2010
05	Pile Foundations Design and Construction	Mittal	CBS Publication	1 st	2008


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TY CV - 65183

Course Details:

Class	T. Y. B. Tech. Sem.-VI
Course Code and Course Title	1CVPE323, Structural Auditing
Prerequisite/s	1CVPC210
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE323_1	Discuss the basic concepts of Structural Audit and its legal aspects. (K ²)
1CVPE323_2	Identify parameters of visual inspection for Structural Audit. (K ²)
1CVPE323_3	Describe NDT and SDT techniques. (K ²)
1CVPE323_4	Summarize methods of interpretation of testing reports. (K ²)
1CVPE323_5	Explain various schemes of Repairs and Rehabilitation. (K ²)

Course Contents:		Hrs.
Unit 1	Introduction to structural audit Definition, necessity of structural audit, structural failures: buildings, bridges, public transport systems, and industries etc., design life, insurance schemes.	07
Unit 2	Legal Aspects and Awareness Government acts and circulars, awareness about safety, precautions, guidelines for public and private participation, identifying and sharing risks, structural auditor registration procedures	06
Unit 3	Defect Mapping and Accessibility to Records Structural condition: visual inspection, reason of distress, safety & quality, availability of drawings, maintenance records, inspection records	08
Unit 4	Testing Visual inspection, Nondestructive testing: Rebound hammer test, semi destructive testing: UPSV test, Carbonation test, Half-cell potentiometer test, Cover meter test, Interpretation of tests, destructive testing, Computerized Testing	09
Unit 5	Audit Report Drawings, Specifications, Tenders for repairs, Structural audit reports	07
Unit 6	Repairs and Rehabilitation schemes Technicality of repairs, structural repairs and paintings, waterproofing work, treatment for vegetation, rehabilitation scheme, estimation of remedial measures	05

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Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year
01	Repair and Rehabilitation of Concrete Structures	Poonam I. Modi	PHI Learning Pvt. Ltd.	1 st	2016
02	Maintenance, Repair and Rehabilitation works of buildings	P. C. Verghese	PHI Learning Pvt. Ltd.	1 st	2014
03	Handbook on Repair and Rehabilitation of R. C. C. Buildings	Director General Works	CPWD, New Delhi, India	1 st	2019
04	Nondestructive testing of materials and structures	Buyukozturk, O. and Tasdemir, M. A.	Springer Pvt. Ltd. New Delhi.	1 st	2013
05	Structural Health Monitoring of long	You-Lin Xu and Yong Xia	CRC Press	1 st	2017


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Course Details:

Class	T. Y. B. Tech, Sem.-VI
Course Code and Course Title	1CVMC324, Constitution of India
Prerequisite/s	---
Teaching Scheme:	Lecture/Tutorial 02/00
Credits	02
Evaluation Scheme: ISE-I/MSE/ ISE-II /ESE	ISE (Grade)

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVMC324_1	Illustrate about law depiction and importance of Constitution. (K ²)
1CVMC324_2	Summarize Fundamental Rights and Fundamental Duties of the Indian Citizen to instill morality, social values, honesty, dignity of life and their social Responsibilities. (K ²)
1CVMC324_3	Outline the National Emergency, Financial Emergency and their impact on Economy of the country. (K ²)
1CVMC324_4	Plan for suitable solutions while keeping rights and duties of the citizen keeping in mind. (K ³)
1CVMC324_5	Identify powers and functions of Local Self Government. (K ³)

Course Contents:

		Hrs.
Unit 1	Constitution – Structure and Principles Meaning and importance of Constitution, Making of Indian Constitution Sources, Salient features of Indian Constitution	04
Unit 2	Fundamental Rights and Directive Principles Fundamental Rights, Fundamental Duties, Directive Principles	04
Unit 3	Government of the Union President of India – Election and Powers, Prime Minister and Council of Ministers, Lok Sabha – Composition and Powers, Rajya Sabha – Composition and Powers	09
Unit 4	Government of the States Governor – Powers, Chief Minister and Council of Ministers, Legislative Assembly – Composition and powers, Legislative Council – Composition and powers	07
Unit 5	The Judiciary Features of judicial system in India, Supreme Court –Structure and jurisdiction, High Court – Structure and jurisdiction	07
Unit 6	Administrative organization and constitution Federalism in India – Features, Local Government -Panchayats –Powers and functions; 73rd and 74th amendments, Election Commission –Organization and functions. Citizen oriented measures – RTI and PIL –Provisions and significance.	07

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TY CV - 68/83

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Disaster risk reduction in south asia	Pardeep Sahni, Madhavi malalgoda and ariyabandu	PHI Punblication	6 th	2013
02	Understanding earthquake disasters	Amita sinvhal	TMH Publication	5 th	2010
03	Disaster mitigation: Experiences and reflections	Pardeepsahni, Alka Dhameja and Uma medury	PHI Publication	8 th	2014
04	Handbook of Disaster Management: Techniques & Guidelines	Singh B.K Rajat Publication	Rajat Publication	6 th	2008
05	Disaster Management Concepts And Approached	Mondal D	PPS Publishers and Distributors	4 th	2020

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Disaster Management - Future Challenges and Opportunities	Jagbir Singh	Wiley	1 st	2010
02	Disaster Management And Preparedness	Nidhi G Dhawan	CRS Publishers and Distributors	1 st	2012
03	Disaster Management	R Subramanian	VIKAS	1 st	2018
04	Disaster Management IGNOU study Material		IGNOU		


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T7 CV-69183

Course Details:

Class	T. Y. B. Tech, Sem.-VI
Course Code and Course Title	1CVPC361, Infrastructure Engineering Laboratory
Prerequisite/s	1CVES152, 1CVPC252
Teaching Scheme: Practical	02
Credits	01
Evaluation Scheme: ISE	50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC361_1	Compute the quality parameters of Subgrade, Aggregate and Bitumen a per IRC recommendations. (K ²)
1CVPC361_2	Demonstrate methods and techniques used for highway construction (K ³)
1CVPC361_3	Observe the advanced techniques adopted in railways for highspeed rail (K ³)
1CVPC361_4	Communicate effectively about laboratory work orally while performing experiments. (S ²)
1CVPC361_5	Practice professional and ethical behavior to carry forward in their life. (A ²)
1CVPC361_6	Compute the quality parameters of Subgrade, Aggregate and Bitumen a per IRC recommendations. (K ²)

Course Contents:

Sr. No.	Title of Experiment
Tests on Subgrade	
1	California Bearing Ratio Test
Tests on Aggregate	
2	Los Angeles Abrasion Test
3	Specific Gravity Test
Tests on Bitumen (Any 5)	
4	Bitumen penetration Test
5	Softening point of bitumen
6	Flash and fire point of bitumen
7	Ductility test of bitumen
8	Viscosity of bitumen
9	Marshall Stability Test
10	Stripping Value Test
11	Report based on High speed rail: Case study
12	Visit to highway construction (rigid or flexible pavement), Railway (station and track)

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TY CV - 70183

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Highway Engineering	Khanna and Justo	Nemchand Bros, Roorkee	8 th	2015
02	A textbook of Railway Engineering	S.C. Saxena & S.P. Arora	Dhanpat rai publications	6 th	2011
03	Principles of Transportation Engineering	Partha Chakraborty and Animesh das	Prentice Hall of India Ltd., New Delhi	1 st	2004

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Transportation Engineering – An Introduction	Nemchand & Bros., Roorkee, Khistry, C.J.	Prentice Hall of India Ltd., New Delhi	2 nd	2001
02	Principles of Transportation Engineering	Partha Chakraborty and Animesh das	Prentice Hall of India Ltd., New Delhi	1 st	2004
03	A Course in Railway Engineering	Saxena and Arora	Dhanpatrai & Sons, New Delhi	6 th	2011


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TY CV-71183

Course Details:

Class	T. Y.B. Tech, Sem.- VI
Course Code and Course Title	1CVPE362, Site Investigations Methods and Practices Laboratory
Prerequisite/s	1CVPC353
Teaching Scheme: Practical/Tutorial	2/0
Credits	01
Evaluation Scheme: ISE / ESE	25/00

Course Outcomes:

Upon successful completion of the course, the student should be able to

1CVPE362_1	Explain subsurface exploration techniques with its suitability. (K ²)
1CVPE362_2	Apply knowledge geophysical methods and its interpretation techniques. (K ³)
1CVPE362_3	Compare various test results of soil samples for site investigation. (K ³)
1CVPE362_4	Communicate effectively about laboratory work both orally and in writing Journals. (S ²)
1CVPE362_5	Practice professional and ethical behavior to carry forward in their life. (A ²)

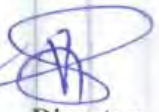
Sr. No.	Title of Experiment
1.	Geological and topographical study of selected site.
2.	Measurement of length, area, elevation of site with the help of Bhuvan Map.
3.	Tests on Soil samples from site: Minimum 6 soils from selected site
4.	Electrical Resistivity Survey of the site
5.	Preparation of subsurface lithological map of the site.
6.	Site visit for core logging
7.	Preparation of detail site investigation report of site.

Text Books :

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Site Investigation Practice	Clayton, Mathews and Simons	Halsted Press	2nd	2004
02	A short course in Geotechnical site investigation	Simons, Menzies, Matthews	Thomson Telford Ltd. London	1st	2002
03	Site Investigation Practice	Joyce, M.D.	ESFN. SPON Publishers	2nd	2012
04	Fundamentals of Geophysics	William Lowrie, Andreas Fichtner	Cambridge University Press	3rd	2017
05	Advanced Surveying	Satheesh Gopi	Pearson Education	2nd	2006


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Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Geotechnical Engineering Investigation Handbook	R.E. Hunt	CRC Press	2 nd	2005
02	Geotechnical and Geophysical Site Characterization	An-Bin Huang, Paul W Mayne	CRC Press	1 st	2008
03	Principles of Soil Dynamics	Braja M. Das and Zhe Luo	Cengage	1 st	2017
04	Advances in site investigation practice	proceedings of the international conference on advances in site investigation practice	ICE Virtual Library	1 st	1996
05	Effective Site Investigation	C.R.I. Clayton and D.M. Smith	ICE Virtual Library	1 st	2013



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TY CV-72183

Course Details:

Class	T. Y. B. Tech, Sem.-VI (Elective)
Course Code and Course Title	ICVPE363, Structural Masonry Laboratory
Prerequisite/s	ICVPC304, ICVPE306
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

ICVPE356_1	Explain engineering properties, uses, defects and cracks in masonry structures. (K ²)
ICVPE356_2	Select suitable design considerations for masonry structures. (K ³)
ICVPE356_3	Select proper masonry structure for different loadings conditions. (K ³)
ICVPE356_4	Communicate effectively about laboratory work both orally and in writing Journals. (S ²)
ICVPE356_5	Practice professional and ethical behavior to carry forward in their life. (A ²)

Course Contents:

1	Assignment on Masonry structures.
2	Assignment on Design Considerations for Masonry structures.
3	Assignment on Structural design of masonry buildings.
4	Assignment on Masonry Arches, Shells.
5	Assignment on Stone Masonry, old buildings and temples.
6	Assignment on Reinforced Masonry.

Text Book:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Structural Masonry	Henry, A.W	Macmillan Education Ltd.	2 nd	1990
02	Brick and Reinforced Brick Structures,	Dayaratnam P,	Oxford & IBH,	3 rd	1987
03	Building and Construction Materials ,	M. L. Gambhir,	Mc-Graw Hill education Pvt. Ltd.	3 rd	1980

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	IS 1905-1987 Code of practice for structural use of un-reinforced masonry- BIS,	BIS, New Delhi. 1987			
02	SP 20 (S&T) – 1991, Hand book on masonry design and construction	BIS, New Delhi.			

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TY CV -74183

Course Details:

Class	T. Y. B. Tech, Sem.-VI
Course Code and Course Title	1CVPE364, Waste Treatment and Pollution Control Laboratory
Prerequisite/s	1CVBS106
Teaching Scheme: Practical	02
Credits	01
Evaluation Scheme: ISE	25

Lab Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE364_1	Calculate the level of pollution in wastewater. (K^2)
1CVPE364_2	Observe various units of wastewater treatment plant. (K^2)
1CVPE364_3	Compute various units of wastewater treatment Plant. (K^3)
1CVPE364_4	Use of software for designing of sewer network. (S^2)
1CVPE364_5	Practice education of water supply system in environmental and societal context. (A^3)

Lab contents-

1	To determine Solids in Sewage: Total Solids, Suspended Solids, and Volatile
2	Determination of DO of wastewater
3	Determination of BOD of wastewater
4	Determination of COD of wastewater
5	To determine the Sodium and Potassium using Flame Photometer.
6	Applications of software in sewer network design.
7	Visit the sewage treatment plant.
8	Design of complete Wastewater Treatment Plant for a small community.

Text Book:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Sewage disposal and air pollution engineering	S.K.Garg	Khanna publishers	33 rd	2015
02	Water Supply & Sanitary Engineering	G. S. Birdie	Dhanpat Rai & Sons, New Delhi	18 th	2007
03	Waste Water Treatment, Disposal and Reuse	Metcalf and Eddy Inc.	Tata McGraw Hill Publications	2 nd	2000
04	Wastewater Engineering	B.C. Punmia, Jain	Laxmi Publications (P) Ltd	2 nd	1998
05	Air pollution	Rao M. N. and Rao H.V.	Tata McGraw Hill	2 nd	1990

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Reference Book:					
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Environmental Engineering	Peavy, Rowe and Tchobanoglous;	McGraw-Hill	2 nd	2015
02	Industrial Wastewater Treatment, Recycling and Reuse.	Bhandari and Ranade	Elsevier	2 nd	2014
03	Water and Waste water Technology	Hammer M.J.	Prentice-Hall of India Private Limited	6 th	2011
04	Water supply & sanitary engineering	E.W.Stee	Khanna Publishes	2 nd	2008
05	Wastewater Treatment for Pollution Control	Arcievala, S.J.	Tata McGraw Hill.	2 nd	2000
06	Environmental Engineering	H.S.Peavy, D. R. Rowe	McGraw Hill	2 nd	1985
07	Introduction to Environmental Engineering and Science	Masters, G.M.	Prentice Hall of India.	2 nd	1998



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TY CV -76/83

Course Details:

Class	T. Y. B. Tech, Sem.-VI
Course Code and Course Title	1CVPE365, Advanced Construction Techniques Laboratory
Prerequisite/s	1CVPC205, 1CVPC210
Credits	02
Evaluation Scheme: ISE	25
Class	T. Y. B. Tech, Sem.-VI

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE365_1	Discuss various construction techniques. (K ²)
1CVPE365_2	Explain prefabricated construction techniques. (K ²)
1CVPE365_3	Illustrate the different types of formwork systems, grouting, pilling. (K ³)
1CVPE365_4	Proficiently apply skills for improving presentations of any format. (S ³)
1CVPE365_5	Professionally communicate in both technical and non-technical terms. (S ⁵)

Sr. No.	Title of Activity.
1	Case study presentation and report submission on different types of formwork systems.
2	Case study presentation and report submission on different types of slip formwork in pavement construction.
3	Case study presentation and report submission on vacuum dewatering method in construction.
4	Case study presentation and report submission on different types of grouting materials and methods.
5	Case study presentation and report submission on pilling construction methods
6	Case study presentation and report submission on underwater construction methods.
7	Case study presentation and report submission on prefabrication methods
8	Case study presentation and report submission on retaining structure construction methods.

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Formwork for Concrete Structures	Garold (Gary) Oberlender, Robert Peurifoy	McGraw-Hill Education	4 th	2010
02	Wells and Caissons	Vijaya Singh,	New Chand & Bros, Roorkee	2 nd	1981
03	Bridge engineering	Raina	Shroff Publishers and Distributors Pvt. Ltd	3 st	2007
04	Concrete Technology	M. S. Shetty	S. Chand	1 st	2005
05	Construction of Marine and Offshore Structures	Ben C. Gerwick Jr.	CRC Press	3 rd	2007

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Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Grouts and Drilling Mud in Engineering Practice.	Symposium by Inst. of Engineers	Butter Worth's	1 st	1963
02	Formwork design and construction	Wynn	Cement & Concrete Assn	6 th	1974
03	Modern Foundations.	N.P. Kurion	Tata McGraw, Hill pub, co. Ltd	1 st	2006
04	Prefab Architecture: A Guide to Modular Design and Construction	Ryan E. Smith	Wiley Publication	1 st	2010
05	Pile Foundations Design and Construction	Mittal	CBS Publication	1 st	2008



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TY CV-78183

Course Details:

Class	T. Y. B. Tech, Sem.-VI
Course Code and Course Title	1CVPE366, Structural Auditing laboratory
Prerequisite/s	0CVPC210, 0CVPC257
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	01
Evaluation Scheme: ISE / ESE	50

Course Outcomes (COs):

1CVPR366_1	Identify reinforcement position in the concrete. (K ²)
1CVPR366_2	Calculate strength of concrete by different equipment. (K ²)
1CVPR366_3	Report of visual inspection and structural audit of structure. (K ²)
1CVPR366_4	Communicate effectively about laboratory work both orally and in writing journals. (S ²)
1CVPR366_5	Practice professional and ethical behavior to carry forward in their life. (A ²)

Sr. No.	Title of Experiment
01	Assess the quality and strength of concrete by using Rebound Hammer Test
02	Assess the quality and strength of concrete with help of Ultrasonic Pulse Velocity Test.
03	Study the Reinforcement Locating in the concrete
04	Study the quality and strength of concrete with help of Concrete Core Extraction
05	Study the Half Cell Potential Meter for concrete
06	Visual Inspection and Structural audit report for brick Masonry Building
07	Visual Inspection and Structural audit report for Stone Masonry Building
08	Visual Inspection and Structural audit report for RCC Building/ framed structure
09	Preparation of site visit report

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year
01	Repair and Rehabilitation of Concrete Structures	Poonam I. Modi	PHI Learning Pvt. Ltd.	1 st	2016
02	Maintenance, Repair and Rehabilitation works of buildings	P. C. Verghese	PHI Learning Pvt. Ltd.	1 st	2014
03	Handbook on Repair and Rehabilitation of R. C. C. Buildings	Director General Works	CPWD, New Delhi, India	1 st	2019
04	Nondestructive testing of materials and structures	Buyukozturk, O. and Tasdemir, M. A.	Springer Pvt. Ltd. New Delhi.	1 st	2013
05	Structural Health Monitoring of long	You-Lin Xu and Yong Xia	CRC Press	1 st	2017

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TY CV-79/83

Course Details:

Class	T. Y.B. Tech, Sem.-VI
Course Code and Course Title	1CVPR367, Structural Design And Drawing - I
Prerequisite/s	1CVPC303
Teaching Scheme: Practical	02
Credits	02
Evaluation Scheme: ISE/ ESE	25/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPR367_1	Explain different types of methods used for steel design. (K ²)
1CVPR367_2	Solve and draw the various components of the industrial shed with roof truss or portal frame or gable frames. (K ⁴)
1CVPR367_3	Calculate and draw the various components of building frames/ footbridge/welded plate girder. (K ⁴)
1CVPR367_4	Function effectively as an individual and as a team member while steel structural design. (S ²)
1CVPR367_5	Engage in lifelong learning the structural drawing and design. (A ²)

Course Contents:

The term work shall consist of detailed structural design and drawing of the following steel structure along with necessary drawings.

1	INDUSTRIAL SHED Design of industrial shed including roof truss (Roof truss: assessment of dead load, live load and wind load, design of purlin, design of members of a truss, detailing of typical joints and supports), purlin, gantry girder (Design of gantry girder: Selection of gantry girder, design of cross section, check for moment capacity, buckling resistance, bi-axial bending, deflection at working load and fatigue strength.), roof and gantry columns, bracing system, column bases and Connections.
2	ANY ONE OF THE FOLLOWING: a) WELDED PLATE GIRDER: Design of welded plate girder, the design of cross section, curtailment of flange plates, stiffeners and their connections. b) FOOTBRIDGE Influence lines, cross beam, main truss, Raker, joint Details, support details c) BUILDING FRAMES Building with Secondary and main beams, column and column bases, beam-to-beam connection, column-beam-connection, the design of typical members. Secondary and main beam arrangement for the floor of a building, design of beam to beam and beam to column connections using bolt / weld.

Term work will consist of the following.

Four full imperial size drawing sheet showing structural detailing of sketches based on the syllabus.

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A	Design of industrial building including roof truss, purlin, bracings, gantry girder, column, column base, and connections. Three full imperial size drawing sheets.
B.	Design of welded plate girder the design of cross section, curtailment of flange plates, stiffeners and connections. One full imperial size drawing sheets.
OR	
B.	Design of foot Bridge including Influence lines, cross beam, main truss, Raker, joint Details, support details. One full imperial size drawing sheets.
OR	
B.	Design of Building Frame including Secondary and main beams, column and column bases, beam-to-beam connection, column-beam-connection, the design of typical members. Secondary and main beam arrangement for the floor of a building, design of beam to beam and beam to column connections using bolt / weld. One full imperial size drawing sheets.

Note:

1. Sample verification of analysis results shall be made by using **software** for any one problem.
2. For drawing sheets use Auto –Cad software , if necessary wherever use hand drawing sheets
3. A maximum number of students in a group not more than **two (02)** for design
4. **Two site visits** on selected design: Report should contain structural details with the sketch

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Design of Steel Structures	S. K. Duggal	Tata McGraw Hill	9 th	2012
02	Design of steel structure by Limit State Method as per IS: 800- 2007	Bhavikatti S. S	I K International Publishing House, New Delhi	4 th	2015
03	Design of Steel Structures.	K.S. Sairam,	Pearson	1 st	2010
04	Limit state design in structural steel	Dr. M. R. Shiyekar.	PHI publications	2 nd	2016
05	Design of Steel Structures	Dr. N. Subramanian	Oxford	9 th	2012

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	IS 800-2007	Indian Standard Code	B.I.S, New Delhi	1	2007
02	IS 875 Part I, II, III	Indian Standard Code	B.I.S, New Delhi	3	1997
03	I.S Handbook I (Steel table)	Indian Standard Code	B.I.S, New Delhi		
04	SP6 (1)	Indian Standard Code	B.I.S, New Delhi	2	1998
05	& SP 6 (6)	Indian Standard Code	B.I.S, New Delhi	2	1995
06	IS: 816	Indian Standard Code	B.I.S, New Delhi		1985
07	IS: 808	Indian Standard Code	B.I.S, New Delhi		1995
08	Design of Steel Structures	Edwin H. Gaylord, Charles N. Gaylord James, Stallmeyer	Mc-Graw-Hill	3	2010

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09	Design of Steel Structures	Punmia, A. K. Jain and Arun Kumar Jain,	Laxmi Publication	2	2011
10	Design of Steel Structures	Dayaratnam,	Wheeler Publications, New Delhi	2	1998



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TT CV-82/83

Course Details:

Class	T. Y. B. Tech, Sem.-VI
Course Code and Course Title	ICVES368, Software training in Civil Engineering
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	01
Evaluation Scheme: ISE	25

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

ICVES368_1	Adopt software skills in the field of Civil Engineering. (K ³)
ICVES368_2	List various commands for implementation of software. (K ³)
ICVES368_3	Compute various technical parameters with the help of software. (K ³)
ICVES368_4	Communicate effectively about software work both orally and in writing journals. (S ²)
ICVES368_5	Practice professional and carry forward in their life as lifelong learning. (A ³)

Course Contents:

1	The lab work shall consist of Software training. List of Software training floated by Department will be in the field of: 1. Structural Design 2. Construction Planning and Management 3. Transportation Engineering 4. Environmental Engineering 5. Quantity Estimation 6. Geospatial Data Management and Analysis
2	1. Structural Design (Staad Pro, E-Tab etc.) Analysis & design of structural members and System by any design software. 2. Construction Planning and Management (MSP, Primavera, etc.) Planning of all construction activity and management of them by any software. 3. Transportation Engineering (IIT pave, VISSIM, etc.) Analysis and Design of pavement by any Software. 4. Environmental Engineering (EPANET, etc.) Pipe network analysis. 5. Quantity Estimation (Estimator, etc.) Estimate the various quantities required in the construction field. 6. Geospatial Data Management and Analysis (QGIS etc.)

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**Annasaheb Dange College of
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An Autonomous Institute**

B. Tech. Structure

CIVIL ENGINEERING

SEM VII

w. e. f. Academic Year-2022-2023



**Annasaheb Dange College of
Engineering and Technology, Ashta
An Autonomous Institute**

B. Tech. Structure

CIVIL ENGINEERING

SEM VIII

w. e. f. Academic Year-2022-2023

Teaching and Evaluation Scheme
B. Tech Civil Engineering: VII Semester

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for Passing	Max	Min. for Passing	
1##OE###	Open Elective III	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50	20	--	--	
1CVPC403	Design of Reinforced Concrete Structures	4	--	--	4	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50	20	--	--	
1CVPE4**	Professional Elective IV	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50	20	--	--	
1CVPC409	Earthquake Resistant Structures	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50	20	--	--	
1CVPC410	Quantity Surveying & Valuation	4	--	--	4	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50	20	--	--	
1CVPC451	Quantity Surveying & Valuation Laboratory	--	--	2	1	ISE	--	--	25	10	
						ESE	--	POE	25	10	
1CVPR452	Structural Design & Drawing II	--	--	4	2	ISE	--	--	25	10	
1CVPR453	Project Phase – I	--	--	4	4	ISE	--	--	50	20	
						ESE	--	OE	25	10	
1CVHS454	General Proficiency II Laboratory	--	--	2	1	ISE	--	--	25	10	
1CVPC455	Field Training	--	--	--	1	ISE	--	--	25	10	
Total		17	--	12	26	--	500	--	200	--	
Total Contact Hours/Week: 29 hrs						Total-500+200=700					

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	01	00	00	13	03	03	06
Cumulative Sum	11	20	24	67	14	09	09



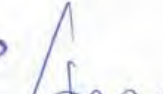
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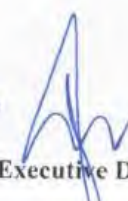
Sr. No.	Course Code	Professional Elective IV
1	1CVPE404	Entrepreneurship
2	1CVPE405	Hydraulic Structures
3	1CVPE406	Pavement Design & Analysis
4	1CVPE407	Advanced Design of Concrete Structures
5	1CVPE408	Design of Foundation

Open Elective III		
Course Code	Course Name	Course Offered by
1MEOE401	Total Quality Management	Mechanical Engineering
1MEOE402	Reliability Engineering	
1MEOE403	Renewable Energy Engineering	
1CSOE401	Introduction to image processing and computer vision	Computer Science and Engineering
1CSOE402	Introduction to machine learning	
1EEOE401	Electric Vehicles	Electrical Engineering
1EEOE402	Wind and Solar Energy Systems	
1CVOE401	Structural Auditing	Civil Engineering
1CVOE402	Disaster Management	
1AUOE401	Vehicle maintenance and safety	Automobile Engineering
1AUOE402	Vehicle Aerodynamics	
1AEOE421	Air Traffic Control and Airport Management	Aeronautical Engineering
1AEOE422	Aircraft General Engineering Maintenance	
1AEOE423	Design of Fixed wing unmanned aerial vehicles	
0FTOE411	Process Optimization	Food Technology
0FTOE412	Cold Storage and Supply Chain Management	


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Teaching and Evaluation Scheme
B. Tech Civil Engineering: VIII Semester

Course Code	Course	Teaching Scheme			
		L	T	P	Credits
1CVPE**	Professional Elective V	3	--	--	3
1CVPC416	Project & Finance Management	3	--	--	3
1CVPR456	Project Phase – II + Internship	--	--	8	8
Total		6	--	8	14
Total Contact Hours/Week: --14 hrs					

Evaluation Scheme					
Scheme	Theory (Marks)		Practical (Marks)		
	Max	Min. for Passing	Max	Min. for Passing	
ISE I	10	--	40	--	--
MSE	30			--	--
ISE II	10			--	--
ESE	50	20	--	--	
ISE I	10	--	40	--	--
MSE	30			--	--
ISE II	10			--	--
ESE	50	20	--	--	
ISE	--	--	--	250	100
ESE	--	--	OE	250	100
--	200	--	--	500	--
Total – 200+500=700					

Sr. No.	Course Code	Professional Elective V
1	1CVPE411	Design of Bridges
2	1CVPE412	Management Information System
3	1CVPE413	Advanced Engineering Geology & Rock Mechanics
4	1CVPE414	Industrial Waste Water Treatment
5	1CVPE415	Human Resources Development

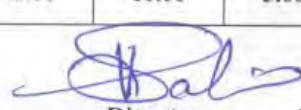
Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	00	00	03	03	00	08
Cumulative Sum	11	20	24	70	17	09	17

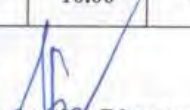
Comparison of AICTE & Institute Curriculum

Course Category	HS	BS	ES	PC	PE	OE	PR	Total
AICTE	12	25	24	48	18	18	15	160
Civil Department	11	20	24	70	17	09	17	168
AICTE (%)	8.00	16.00	15.00	30.00	11.00	11.00	9.00	100
Civil Department (%)	7.00	12.00	14.00	42.00	10.00	5.00	10.00	100


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ST-CV-02/02

Course Details:

Class	B. Tech, Sem.-VII
Course Code and Course Title	1CVOE401, Structural Auditing
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I /MSE/ ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVOE401_1	Discuss the concept of smart materials, sensor materials and structural health monitoring.
1CVOE401_2	Choose the appropriate procedure for structural health monitoring of concrete and steel structures.
1CVOE401_3	Identify different methods, equipment's, sensors and materials used in structural audit.
1CVOE401_4	Explain condition survey and Non-Destructive Evaluation of the different concrete and steel structures.
1CVOE401_5	Select appropriate method of NDT for the purpose of structural audit.
1CVOE401_6	Make use of structural audit data for audit report writing.

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Introduction to Structural Health Monitoring (SHM) : Definition & motivation for SHM, SHM - a way for smart materials and structures, SHM and bio mimetic - analog between the nervous system of a man and a structure with SHM, SHM as a part of system management, Passive and Active SHM, NDE, SHM and NDECS, basic components of SHM, materials for sensor design.	07
Unit 2	Application of SHM in Engineering: Introduction to capacitive methods, capacitive probe for cover concrete, SHM of a bridge, applications for external post tensioned cables, monitoring historical buildings.	06
Unit 3	Introduction to NDT - Situations and contexts, where NDT is needed, classification of NDT procedures. Basics of Sensors , Transducers & Actuators, Classification of Sensors, Characteristics & Working Principles of Various Types of Sensors like Strain Gauges, LVDT, Accelerometers etc. Concept of Smart Materials & Smart Structures with SHM, Basics of Smart Materials like Piezoelectric, Shape Memory Alloys, ER & MR Fluids etc.	09
Unit 4	Condition Survey & NDE of Structure: Definition and objective of Condition survey, stages of condition survey (Preliminary, Planning, Inspection and Testing stages), possible defects in structures, quality control of structures - Definition and need, Quality control applications in structures, NDT as an option for Non-Destructive Evaluation (NDE) of structures, case studies of a few NDT procedures on structures.	06
Unit 5	Non Destructive Testing: Introduction to NDT - Situations and contexts, where NDT is needed, classification of NDT procedures, visual Inspection, half-Cell electrical potential methods, Schmidt rebound hammer Test, resistivity measurement, electromagnetic methods, radiographic testing, ultrasonic testing, infra-red thermography, ground penetrating radar, radio isotope gauges, other methods.	09

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B-Tech 1000-1100

	methods.	
Unit 6	Audit Report Drawings, Specifications, Structural audit reports on different civil engineering structures.	05

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Structural Health Monitoring	Alfredo Güemes, Claus-Peter Fritzen, Daniel Balageas	Wiley	1st	2006
02	Structural Health Monitoring of Large Civil Engineering Structures	Hua-Peng Chen	Wiley	1st	2018
03	Building: Structural Audit, Repairs and Restoration	Arun Kelkar	Majestic Publishing House	1st	2018
04	Smart Sensors for Structural Health Monitoring	Jian Li and Simon Laflamme	MDPI	1st	2019
05	Non-Destructive Testing Techniques	Ravi Prakash	New Age International Private Limited	1st	2010

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Repair and Rehabilitation of Concrete Structures	Poonam I. Modi	PHI Learning Pvt. Ltd.	1st	2016
02	Maintenance, Repair and Rehabilitation works of buildings	P. C. Verghese	PHI Learning Pvt. Ltd.	1st	2014
03	Handbook on Repair and Rehabilitation of R. C. C. Buildings	Director General Works	CPWD, New Delhi, India	---	2019
04	Nondestructive testing of materials and structures	Buyukozturk, O. and Tasdemir, M. A.	Springer Pvt. Ltd. New Delhi.	1st	2013
05	Structural Health Monitoring of long	You-Lin Xu and Yong Xia	CRC Press	1st	2017


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Course Details:

Class	B. Tech. Sem.-VII
Course Code and Course Title	1CVOE402, Disaster Management
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE-I/MSE/ ISE-II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVOE402_1	Interpret disaster and disaster management cycle.
1CVOE402_2	Explain types, trends, causes and consequences of disasters
1CVOE402_3	Develop a disaster management plan considering the disaster management cycle.
1CVOE402_4	Plan the initiatives necessary to be undertaken for efficient disaster management in Indian Scenario.
1CVOE402_5	Choose the advanced techniques in Geo-Informatics for disaster management.

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Understanding Disaster Understanding the concepts and definitions of disaster, hazard, vulnerability, risk, capacity – disaster and development, and disaster management; Understanding disasters-causes and effects, types of natural and human induced disaster	05
Unit 2	Natural and Manmade Disaster Geological disasters (earthquakes, landslides, tsunami, mining); Hydro-meteorological disasters (floods, cyclones, lightning, thunder-storms, hail storms, avalanches, droughts, cold and heat waves); Biological disasters (epidemics, pest attacks, forest fire); Technological disasters (chemical, industrial, radiological, nuclear); Manmade disasters (building collapse, rural and urban fire, road and rail accidents, nuclear, radiological, chemicals and biological disasters) and climate change; Disaster global view, Disaster Profile of India- regional and seasonal.	09
Unit 3	Pre Disaster Phase Introduction to disaster management cycle –mitigation, preparedness, response and recovery, Paradigm shift in disaster management; Pre-disaster – risk assessment and analysis, risk mapping, zonation and micro zonation, prevention and mitigation of disasters, preparedness, capacity development;	07
Unit 4	Post Disaster Phase During disaster – evacuation, disaster communication, search and rescue, emergency operation center, incident command system, relief and rehabilitation; Post-disaster – damage and needs assessment, restoration of critical infrastructure, early recovery, reconstruction and redevelopment;	06
Unit 5	Disaster management Indian Scenario: Yokohama Strategy; Hyogo Framework of Action 2005-2015; Sendai Framework for disaster risk reduction 2015–2030; Institutional framework of disaster management in India; Role of various agencies in disaster management; Disaster warning system in India; National disaster management plan 2019.	09

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Unit 6	Applications of Science and Technology for Disaster Management: Geo-informatics in Disaster Management (Remote sensing, GIS and GPS); Disaster Communication System (Early Warning and Dissemination); Disaster management, Electrical Safety procedures and accident preventions Cyber security and increasing National Cyber resilience.	06
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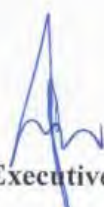
Text Books					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Disaster risk reduction in south asia	Pardeep Sahni, Madhavimalalgoda and ariyabandu	PHI Punblication	6	2013
02	Understanding earthquake disasters	Amitasinvhal	TMH Publication	5	2010
03	Disaster mitigation: Experiences and reflections	Pardeepsahni, AlkaDhameja and Uma medury	PHI Publication	8	2014
04	Handbook of Disaster Management: Techniques & Guidelines	Singh B.K Rajat Publication	Rajat Publication	6	2008
05	Disaster Management Concepts And Approached	MONDAL D	PPS Publishers and Distributors	4	2020

Reference Books					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Disaster Management – Future Challenges and Opportunities	Jagbir Singh	Wiley	1	2010
02	Disaster Management And Preparedness	Nidhi G Dhawan	CRS Publishers and Distributors	1	2012
03	Disaster Management	R Subramanian	VIKAS	1	2018
04	Disaster Management Act 2005	--	Govt of India	--	--
05	National Disaster Management Plan 2019	--	Govt of India	--	--


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Course Details:

Class	B. Tech. Sem.-VII
Course Code and Course Title	1CVPC403, Design of Reinforced Concrete Structures
Prerequisite/s	1CVPC204, 1CVPC210, 1CVPC312.
Teaching Scheme: Lecture/Tutorial	04/00
Credits	04
Evaluation Scheme: ISE-I/MSE/ ISE-II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC403_1	Identify the different parameters used in limit state method.
1CVPC403_2	Analyse shear parameters of different structural members by limit state method.
1CVPC403_3	Determine the reinforcement details of slab and staircase.
1CVPC403_4	Evaluate various design parameters of beams by limit state method.
1CVPC403_5	Estimate sectional properties of column and footing by limit state method.

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Limit State Method: Introduction- Stress strain behaviour of concrete and steel, Behaviour of RCC, Permissible stresses in steel and concrete, Different design philosophies, various limits states, Characteristic strength and Characteristic load, Load factor, Partial safety factors.	08
Unit 2	Limit State of Collapse & Serviceability: a) Limit state of collapse (shear and bond): Shear failure, Types of Shear reinforcement, Design of Shear reinforcement, Bond-types, Factors affect in bond Resistance, Anchoring reinforcing Bars in Tension and Compression, Check for development length. b) Limit state of serviceability: Significance of deflection, IS recommendations, Cracking-classification and Types of Cracks, Cause, IS recommendations.	10
Unit 3	Slab & Staircase: a) Design of slabs: Cantilever Slab, Simply supported One way slab, Two way slab with different support conditions as per IS: 456-2000. Continuous slab Design. b) Design of Simply Supported single flight and Dog legged staircase, Introduction of Open folded Staircase.	09
Unit 4	Beam: Limit state of collapse (flexure): Stress in Compression reinforcement, Analysis and Design of Singly and Doubly Reinforced rectangular sections, Cantilever beam, Design of Continuous beam by IS coefficient method	09
Unit 5	T & L Beam: Analysis of singly reinforced T and L beams, Design of singly reinforced T and L beams.	09
Unit 6	Column & Footing: Analysis and Design of axially loaded circular and rectangular columns, Circular column with helical reinforcement, Interaction diagram, Introduction to Un-axial loading Column, Design of Column for Biaxial Loading. Design of isolated rectangular & Square column footing with constant depth subjected to axial load	09

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Reinforced Concrete Structural element	Purushotaman. P	McGraw Hill Publication Co.Ltd.	4 th	2019
02	Reinforced Concrete VOL.II (Advanced Reinforced Concrete)	H.J Shah	Charotar Publishing House Pvt. Ltd	7 th	2018
03	R.C.C Design & Drawing	Neelam Sharma	Charotar Publishing House Pvt. Ltd	3 rd	2019
04	Reinforced Concrete VOL.I	H.J Shah	Charotar Publishing House Pvt. Ltd	7 th	2019

NOTE: It is necessary to have knowledge of IS Code, Use of 456:2000 and SP-16.

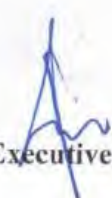
Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Design of Reinforced Concrete Structures	S. Ramamrutham	Dhanpat Rai Publishing Company	16 th	2017
02	Limit State Design	B. C. Punmia, A. K. Jain	Laxmi Publications Ltd.	1 st	2019
03	R.C.C Designs	B.C.Punmia, A.K.Jain, Arun K Jain	Charotar Publishing House Pvt. Ltd	7 th	2020
04	Illustrated Design of R. C. Buildings	V. L. Shah, S. R. Karve	Structures Publisher	8 th	2020
05	IS 456-2000	Indian Standard Code	B. I. S., New Delhi	4 th	2016
06	SP16	Design Aids For Reinforced Concrete	B. I.S., New Delhi	2 nd	1999


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Course Details:

Class	B. Tech, Sem.-VII
Course Code and Course Title	1CVPE404, Entrepreneurship
Prerequisite/s	1CVHS206
Teaching Scheme: Lecture/Tutorial	3/0
Credits	03
Evaluation Scheme: ISE I / MSE / ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE404_1	Illustrate the sickness in small business and plans for succession
1CVPE404_2	Make use of entrepreneurial skills, SWOT analysis for selection of business
1CVPE404_3	Identify industry developing agency and procedure to start a small scale industry
1CVPE404_4	List the market surveying techniques for selection of a product
1CVPE404_5	Assess the financial and accountancy aspect of running a business
1CVPE404_6	Create project profiles and detailed project report

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Introduction to entrepreneurship: Definition entrepreneur and enterprise, need and scope of entrepreneurship, traits of an entrepreneur, present scenario of Indian industry and the place of SSI with respect to entrepreneurship, SWOT analysis for selection of business opportunities, Barriers for self-growth.	08
Unit 2	Small scale industries: Latest policy resolutions, procedure to start a SSI, Infrastructure of SSI, whom to approach for what, Government policies and facilities for small enterprise, liaisoning for entrepreneurs. Introduction to industries developing agencies: Financial, technical, marketing such as DST, DIC, SFC, SIDBI, SSICD, SISI, ICICI export promotion councils, banks, technical consultancy organizations etc. and their role.	07
Unit 3	Selection of product: Criteria for selection of product for SSI, market survey techniques, marketing viability of the product, typical areas of civil engineering.	06
Unit 4	Finance and accountancy: Working capital and fixed capital assessment, sources of finance, incentives from financial institutions and government, financial ratios, their significance, taxation systems, financial statements.	08
Unit 5	Project report: Preliminary and final project report preparation, financial technical commercial and economic viability project implementation process project profiles.	07
Unit 6	Support to Enterprises: Sickness in small business: concept, symptoms, causes, consequences, corrective measures. Selling your venture: Planning for succession, valuation of business.	06

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Planning and industrial unit	Jay narayan vyas	Ahmedabad Allied Publishers Ltd.	5th	2014
02	The practice of entrepreneurship	Geofferey Meredith	International Labour Office	4 th	1982
03	Entrepreneurship	Gordon Baty	Beardbooks	3 rd	2003
04	Small scale industry handbook	Jay narayan vyas	Sapna Industrial & Allied Publications	4 th	1999

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Entrepreneurship development vol I, II, III	Vasant desai	Himalaya Publishing House	6 th	2011
02	Self made impact making entrepreneurs	Govt of India	EDI, India	-	-
03	Entrepreneurship	Govt of India	Govt of India publications	-	-
04	Entrepreneurship reports	Govt of India	EDI, Ahmedabad	-	-



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Course Details:

Class	B. Tech. Sem.-VII
Course Code and Course Title	1CVPE405, Hydraulic Structures
Prerequisite/s	1CVPC208
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE-I/MSE/ ISE-II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE405_1	Explain various concepts and components used in reservoirs and dams.
1CVPE405_2	Illustrate the working and design procedure of canals and allied hydraulic structures.
1CVPE405_3	Select a suitable type of spillway and energy dissipation method according to given site condition.
1CVPE405_4	Analyze the stability of gravity and earthen dam.
1CVPE405_5	Compare various theories for diversion head work design.

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Introduction to dams: Types of dams, selection of site for dams, selection of type of dam, Storage Calculations using mass curves, Area elevation curve & Elevation capacity curve, Control levels, silting of reservoirs, control of Losses in reservoirs	06
Unit 2	Gravity Dams: Forces acting on dam, Design Criterion-theoretical and practical profile, high and low dam, fixing section of dam, stability analysis, and methods of construction, galleries and joints in dams. Arch dams-Introduction & types only. Introduction to instrumentation in dams.	08
Unit 3	Earthen dam: Types of earthen dams, Components and their functions, methods of construction of earthen dam, Design criterion, plotting of phreatic line, Modes of failure, seepage control measures-Drainage & filters, stability of slopes for sudden drawdown & steady seepage.	07
Unit 4	Spillway: Necessity and function components of spillway, different types, factors affecting choice of type of spillway. Elementary hydraulic design, types of energy dissipation arrangements, gates for spillway.	06
Unit 5	Diversion Head Works: component parts & their functions, types of weir and barrages, Causes of failure and remedies, Introduction to Theory of seepage-Bligh's creep theory, critical exit gradient, Khosla's theory	08
Unit 6	Canals: Types, alignment, typical sections of canals, balancing depth Kennedy's and Lacey's silt theories, canal lining-purpose, types, selection and economics. C.D.Works: Necessity, Types. Canal Regulatory Works: Head regulator, cross regulator, canal fall, canal escape, standing wave flume.	07

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Irrigation and water power	Priyani	Charotar Publication	3rd	2007
02	Irrigation and water power engineering	B. C.Punmia	Standard Publications, New Delhi.	1st	1962
03	Design of small dams manual	--	U.S.B.R, Oxford and IBH Publ. Co	--	--
04	Hydraulic Structures	A.I.B Moffat, C. Nalluri, P. Novak, R. Narayanan	CRC Press	2nd	2004
05	Irrigation Engineering and Hydraulic Structures	Santosh Kumar Garg	Khanna publisher	1st	2006

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Hydrology and water resources	R.K.Sharma	Dhanpatrai and sons, New Delhi	4th	2018
02	Irrigation Theory and practice	A. M. Michael.	Vikas Publications House	2nd	2012
03	Theory and design of irrigation structures vol. I and II and II	Varshney, Gupta and Gupta	Newchand and Brothers	2nd	2015
04	Hydraulic structures	Sheng-Hong Chen	Springer	3rd	2005


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Course Details:

Class	B. Tech. Sem.-VII
Course Code and Course Title	1CVPE406, Pavement Design & Analysis
Prerequisite/s	1CVPE309, 1CVPC313
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE-I/MSE/ ISE-II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE406_1	Illustrate different stresses and deflections in flexible pavements.
1CVPE406_2	Calculate different stresses and deflections in rigid pavements.
1CVPE406_3	Design flexible and rigid pavement using various methods.
1CVPE406_4	Utilize the method of overlay over flexible and rigid pavements.
1CVPE406_5	Evaluate the distress condition of flexible pavements using various techniques.

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Stresses and Deflections in Flexible Pavements: Types and component parts of pavements, Factors affecting design and performance of pavements. Comparison of highway and airfield pavements. Stresses and deflections in homogeneous masses. Burmister's two layer theory, three layer and multi-layer theories; wheel load stresses, various factors in traffic wheel loads; ESWL of multiple wheels. Repeated loads and EWL factors; sustained loads.	08
Unit 2	Design of Flexible Pavement Methods: Empirical, semi-empirical and theoretical approaches, development, principle, design steps, advantages and application of the different pavement design methods McLeod Method, CBR Method, including IRC: 37-2019.	06
Unit 3	Stresses in Rigid Pavements: Types of stresses and causes, factors influencing the stresses; general considerations in rigid pavement analysis, Westergaard's Analysis, EWL; wheel load stresses, warping stresses, frictional stresses, combined stresses	07
Unit 4	Design of Rigid Pavements: Design of CC pavement for roadway, Types of joints in cement concrete pavements and their functions, joint spacing; design of joint details for longitudinal joints, contraction joints and expansion joints, design of dowel bars, IRC:58-2015 method of design, Design of continuously reinforced concrete pavements.	07
Unit 5	Pavement Evaluation: Visual rating, Pavement Serviceability Index, Roughness, Skid resistance and Deflection measurements, crack pattern analysis, Use of modern equipment for pavement surface condition measurements-Analysis of data, interpretation and application, Functional evaluation, joint failure analysis, Structural evaluation of flexible pavements by rebound deflection method, analysis of data, interpretation and applications, FWD, and Benkelman Beam Deflection Technique (IRC:81-1997).	08

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Unit 6	Pavement overlay: Choice and Design of overlay type and pavement materials over existing flexible and rigid, pavements with different, degrees of distress, types of recent overlay material, Rehabilitation and Recycling of bituminous pavement.	06
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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Principles and Practice of Highway Engineering (Including Expressways and Airport Engineering)	Kadiyali L.R. and N.B. Lal	Khanna Publishers, New Delhi	8 th	2004
02	Pavement Design	Yoder and Witzech	McGraw-Hill	2 nd	1982
03	Functional Designing of Pavements	Teng	Mc Graw - Hill	1 st	1980
04	Pavement Analysis and Design	Yang H. Huang	Pearson Prentice Hall	7 th	2004
05	Highway Engineering	Khanna and Justo	Nemchand Bros, Roorkee	8 th	2015
06	Principles of Pavement Design	Yoder E.J. and Witczak M.W	John Wiley & Sons, Inc., New York	1 st	1975

References: IRC Codes:

Sr. No	IRC No.	Title	Year
01	IRC-58	Guidelines for the Design of Rigid Pavements for Highways	2002
02	IRC-15	Guidelines for the Design of Rigid Pavements for Highways	2002
03	IRC-37	Guidelines for the Design of Flexible Pavements for Highways	2012
04	IRC-82	Code of Practice for Accelerated Strength Testing and Evaluation of Concrete Road and Air field Constructions	1983
05	IRC-76	Tentative Guidelines for Structural Strength Evaluation of Rigid Airfield Pavement	1979


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Course Details:

Class	B. Tech. Sem.-VII
Course Code and Course Title	1CVPE407, Advanced Design of Concrete Structures
Prerequisite/s	1CVPC204, 1CVPC312
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE-I/MSE/ ISE-II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE407_1	Analyze different types of retaining walls.
1CVPE407_2	Examine losses in prestressed members.
1CVPE407_3	Evaluate various design parameters of water tank by working stress method.
1CVPE407_4	Determine suitable dimensions of beam for limit state of collapse in flexure.
1CVPE407_5	Decide appropriate section for post tensioned slab and beam.
1CVPE407_6	Design rectangular and trapezoidal combined footing.

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Design of Water Tank: Introduction to working stress method for water tank design, Design criteria, permissible stresses, design of water tank resting on ground using IS code method, circular and rectangular water tanks with flexible and rigid joint between wall and floor	08
Unit 2	Design of Elevated Water Tank: Introduction to elevated water tank, Design of elevated water tank.	06
Unit 3	Combined Footing: Design of rectangular and Trapezoidal combined footing.	07
Unit 4	Retaining Wall: Analysis and Design of cantilever, counter fort and buttress retaining wall with horizontal and Inclined Surcharge.	07
Unit 5	Prestressing: Basic concept of pre-stressing, Historical development, Types and systems of pre-stressing, Analysis of rectangular and symmetrical I sections, Different cable profiles, Losses of prestress in Pre & Post tensioned members.	06
Unit 6	Design of Prestressed Concrete Members: Rectangular and Symmetrical I sections for following criteria: (i) Design of section for the limit state of collapse in flexure, (ii) Design of post tensioned slab and beam.	08


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Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Reinforced Concrete Structural element	Purushotaman.P	McGraw Hill Publication Co. Ltd.	4th	2010
02	Reinforced Concrete VOL.II (Advanced Reinforced Concrete)	H.J Shah	Charotar Publishing House Pvt. Ltd	7th	2014
03	R.C.C Design & Drawing	Neelam Sharama	S.K.Kataria	3rd	2013
04	Reinforced Concrete VOL.I	H.J Shah	Charotar Publishing House Pvt. Ltd	7th	2014
05	Advance R.C.C Design (R.C.C Volume II)	S.S.Bhavikatti	New Age International	2nd	2014
06	Design of Reinforced Concrete Structures	S.Ramamrutham	Dhanpat Rai Publishing Company	16th	2010
07	Limit State Design	B.C.Punmia, A.K.Jain,	Laxmi Publications Ltd.	1st	2017
08	R.C.C Designs	B.C.Punmia, A.K.Jain, Arun K Jain	Charotar Publishing House Pvt. Ltd	7th	2015

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Prestressed Concrete	N Krishna Raju	McGraw Hill Publication Co. Ltd.	5th	2010
02	IS 456-2000	Indian Standard Code	B.I.S, New Delhi	4th	2000
03	SP16	Design Aids For Reinforced Concrete	B.I.S, New Delhi	2nd	1998
04	IS:1343	Indian Standard Code	B.I.S, New Delhi	4th	2009
05	IS:3370	Indian Standard Code	B.I.S, New Delhi	1st	2009


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Course Details:

Class	B. Tech. Sem.-VII
Course Code and Course Title	1CVPE408, Design of Foundation
Prerequisite/s	1CVPE304
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE-I/MSE/ ISE-II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE408_1	Analyze the machine foundation for static and dynamic loading condition.
1CVPE408_2	Examine the forces acting on well and remedial measure to sinking of well.
1CVPE408_3	Determine the reinforcement for retaining wall.
1CVPE408_4	Design the pile and raft type of foundation in structural point of view.
1CVPE408_5	Solve the problems on slab type and slab beam type of combined footing.

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Design of Combined footings: Introduction, necessity and types of combined footings, design of slab type and slab-beam type of combined footing	07
Unit 2	Design of Pile foundation: Types of pile, design and placement, Design of pile caps for 3, 4 and 6 piles group.	06
Unit 3	Design of Raft foundation: Introduction, necessity and types of raft or mat foundation, Analysis and Design of raft foundation	08
Unit 4	Design of Machine Foundation: Static and dynamic design criteria-permissible amplitude of vibrations for different types of machines, foundations for reciprocating machines- design criteria, Analysis and design of simple foundation using I.S. code, Vibration Isolation	08
Unit 5	Design of Well foundation: Elements, forces acting on well, lateral stability analysis, problems in sinking of wells and remedial measures.	06
Unit 6	Design of Retaining Wall : Introduction, Functions and types of retaining walls. Analysis and design of RCC cantilever type of retaining wall for various types of backfill conditions	07


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B-Tech - CV - 15/42

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Foundation Engineering HandBook	Winterkorn H.F. and Fang H.Y	Van Nostand Reinhold Compan	2 nd	2013
02	Foundation Engineering	B.J. Kasmalkar	Pune Vidyarthi Griha Prakashan	-	-
03	Foundation Design Manual	N. V .Naik	Dhanpat Rai and sons	7 th	2019
04	Foundation Analysis and Design	J.E. Bowles	Tata McGraw Hill Book Company	2 nd	1990
05	IS 456: 2000 : Plain and Reinforced Concrete - Code of Practice				
06	IS : 2974 (Part I) – 1982 Code of Practice for Design and Construction of Machine Foundations				

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Pile Foundation Analysis and Design	Poulos, H.G. and Davis, E.H.	John Wiley and Sons, New York	3 rd	1980
02	Pile Foundations	Mohan, Dinesh	Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi	2 nd	2018
03	Soil Dynamics and machine foundation	Swami Saran	Galgotia Publications Pvt. Ltd., New Delhi	1 st	1990
04	Foundation Design	W. C. Teng	Prentice Hall of India Pvt.Ltd., New Delhi	1 st	1962
05	Hand Book of Machine Design	P. Shrinivasu	Tata McGraw Hill Book Company	2 nd	2017



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B-Tech - CV - 16/42

Course Details:

Class	B. Tech. Sem.-VII
Course Code and Course Title	1CVPC409, Earthquake Resistant Structures
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE-I/MSE/ ISE-II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC409_1	Explain various elements of seismology.
1CVPC409_2	Summarize earthquake resistant modern techniques.
1CVPC409_3	Classify various retrofitting and strengthening techniques for masonry structures.
1CVPC409_4	Examine dynamic properties of a SDOF system.
1CVPC409_5	Analyze and design earthquake resistant structures as per IS code provisions.

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Seismology: Elements of seismology – terminology, structure of earth, causes of an earthquake, plate tectonic theory, continental drift theory, elastic rebound theory, seismic waves, magnitude and intensity, methods of measurement, energy released, seismograph, strong motion earthquakes, accelogram, prominent earthquakes of India.	06
Unit 2	Fundamentals of theory of vibration: Earthquake response of SD of system, Spring parallel and series theory, free and forced vibrations (harmonic loading) of single degree of freedom systems. Undamped and viscously damped vibrations, equation of motion and solution. Duhamel's Integration, Introduction to Multi Degrees of Freedom	09
Unit 3	Masonry structure: Masonry Structures: Behavior of unreinforced masonry and reinforced masonry, RC bands, vertical reinforcement, openings, Provisions of I.S. 4326, Repairs and strengthening of masonry and RC members.	06
Unit 4	Earthquake resistant modern techniques: Introduction to Earthquake resistant modern techniques – Base Isolation – Elastomeric, Sliding, Combined. Seismic Dampers - Friction Dampers, TMD, Visco-elastic dampers	06
Unit 5	Response spectrum method: Response spectrum theory: Earthquake response spectrum, seismic coefficient method, tripartite spectrum, construction of design response spectrum, effect of foundation soil and structural damping on design spectrum, evaluation of lateral loads due to earthquake on multistory buildings as per IS 1893 Part I – 2016. Introduction to response spectra, Time history analysis, P – Delta Analysis, Push over analysis.	08
Unit 6	Conceptual Design: Planning aspects, Load path, Stiffness and strength distribution, different structural system, liquefaction, and settlement. Earthquake Resistance Design Principles: Design philosophy, Behavior of RC building, ductility and ductile detailing of beam and columns using IS 13920.	07

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Dynamics of Structures-Theory and Applications to Earthquake	A. K. Chopra	Prentice Hall Publications	3 rd	2007
02	Earthquake Resistance Design of Structure	S. K. Duggal	Oxford University Press	4 th	2007
03	Earthquake Resistance Design of Structure	Manish Shrikhande and Pankaj Agarwal	Prentice Hall of India Pvt. Ltd. Publications New Delhi	5 th	2006
04	Structural Dynamics	Mario Paz	CBS Publications	4 th	2003

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Earthquake Resistant Structures	D. J. Dowrick John	Wiley Publications	2 nd	2009
02	Dynamics of Structures	R. M. Clough and Penzine	McGrow Hill Co., New Delhi	2 nd	2015
03	Elements of Earthquake Engineering	Jai Krishna	South Asian Publication, New Delhi	2 nd	2000
04	Earthquake Resistance Design of Structures	Vinod Hosur	Wiley Publication	3 rd	2012
05	Indian Standards IS 1893 – Part I		Bureau of Indian Standards	5 th	2016
06	Indian Standards IS 13920		Bureau of Indian Standards	3 rd	2016
08	Indian Standards IS 4326		Bureau of Indian Standards	3 rd	2013


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Course Details:

Class	B. Tech. Sem.-VII
Course Code and Course Title	1CVPC410, Quantity Surveying and Valuation
Prerequisite/s	1CVPC205, 1CVPC209, 1CVPC210
Teaching Scheme: Lecture	04
Credits	04
Evaluation Scheme: ISE-I/MSE/ ISE-II /ESE	10/30/10/50
ESE Exam Duration	4 Hrs.

Course Outcomes:

Upon successful completion of this course, the student will be able to:

1CVPC410_1	Describe the estimate, specifications, and their types.
1CVPC410_2	Compare the different terms related to valuation and its type.
1CVPC410_3	Evaluate value of existing properties by various valuation methods.
1CVPC410_4	Estimate the quantities and rates for various items of construction.
1CVPC410_5	Categorize different types of contract and essential study of legally valid contract.

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Elements of Estimating: Purpose and types of estimate, Units and mode of measurement, IS 1200, Schedule of rates (SSR), Administrative approval and technical sanction, Various items to be included in estimates, Measurement sheet and abstract sheet, Use of excel spread sheets for estimating. Specifications: Purpose and basic fundamentals of general and detailed specifications, Specification of road, canal, etc civil engineering structures.	08
Unit 2	Quantity Surveying: Prime cost, Provisional sum, Provisional quantities, Taking out quantities by long wall - short wall method and center line method, Preparation of schedule for steel as reinforcement. Rate Analysis: Factors affecting, Material required, Task work, Labour required, Plant and equipment cost, Overhead charges, Rates for various items of work, Price escalation	10
Unit 3	Detailed Estimate: Detailed estimate of residential building, Road, Earthwork for canal etc. Approximate Estimate: Purpose, Various methods used for buildings and other civil engineering works such as bridge, water supply, drainage, road project, school buildings, industrial sheds	09
Unit 4	Contracts: Necessity, Essentials of legally valid contract, Types of contracts, Various conditions of contract, Earnest money, Security deposit, PWD procedure of execution of civil engineering work, Rights of parties and responsibilities of contracts Introduction to non-conventional contract such as BOT, BOOT, BOLT, as well as Indian Arbitration and conciliation act 1996. (Introduction to FIDIC Contract) Tender:	09

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B-Tech-CV-19/42

	Tender, Types of tenders, tender notice, concept of e-tendering, application of e-tendering, invitation of tender notice, documents, methods of preparation and submission of tenders by two envelop method	
Unit 5	Elements of Valuation: Definition of value, price and cost, Different types of values, valuation, Necessity of valuation, factors affecting valuation, Landed properties- free hold and leasehold properties, different types of lease, Valuation from yield and from life, gross yield and net yield, outgoing, capitalized value, Year's purchases, Sinking fund.	10
Unit 6	Valuation Methods: Rental method of valuation- Form of rent, different types of rent, standard rent, Belting method of valuation, Development method of valuation for building estate, Valuation on profit base, Depreciation, different methods of calculating depreciation – straight line method, declining balance method, sinking fund method, quantity survey method, Obsolescence.	10

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Estimating, Costing and Specification in civil engineering	M. Chakraborti	Monojit Chakraborti Pvt. Ltd.	27 th	2016
02	A textbook of estimating and costing.	G.S. Birde	Dhanpat Rai & Sons	7 th	2008
03	Estimating and Costing	B.N.Dutta	UBS Publisher	25 th	2002
04	Elements of Estimating and Costing	S. C. Rangwala.	Charotar Publishing house	4 th	1998
05	Civil Engineering Contracts & Estimates	B. S. Patil,	Orient Langman Ltd	7 th	2015

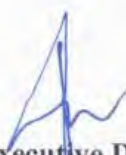
Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Professional Practices (Estimating & Valuation)	Roshan Namavati	LBD Publishers	4 th	1984
02	Estimating and Costing for Building and Civil Engineering Works Based on Indian Standard Method of Measurement (I.S.1200)	P. L. Bhasin	Chand Publisher	5 th	2002
03	Standard Specification Vol. I & II	—	PWD, Maharastra	—	—
04	Standard Schedule of Rates- Recent SSR	—	PWD, Maharastra	—	—
05	Indian Standard 1200 (Part 1 To 10)	—	—	—	—


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B-Tech - CV-20/42

Course Details:

Class	B. Tech. Sem.-VII
Course Code and Course Title	1CVPC451, Quantity Surveying and Valuation Laboratory
Prerequisite/s	1CVPC205, 1CVPC209, 1CVPC210
Teaching Scheme: Lecture/Tutorial/Practical	0/0/02
Credits	01
Evaluation Scheme: ISE / ESE	50/25

Course Outcomes:

Upon successful completion of this course, the student will be able to:

1CVPC451_1	Make schedule of reinforcement of various RCC elements.
1CVPC451_2	Evaluate the value of land and existing properties.
1CVPC451_3	Create detailed estimate and rate analysis of various construction items.
1CVPC451_4	Describe detailed specification of various construction item.
1CVPC451_5	Estimate various quantities of sub structure and super structure of a building.

Sr. No.	Title of Exercise
01	Prepare detailed specification of any five civil engineering items. (Data should be collected from construction site)
02	Prepare detailed estimate of various civil engineering construction work. (Any two) (Canal, Water tank, Road etc)
03	Collect G+1 municipal drawing of residential building ,Prepare detailed estimate of this residential framed building (Sub structure & Super structure) Note: Use excel spreadsheet for preparation of measurement & abstract sheet
04	Prepare rate analysis of any ten civil engineering items of work.
05	Prepare schedule of reinforcement – Column and column footing.
06	Prepare schedule of reinforcement – Slab, Retaining wall etc.
07	Collect tender document of any one civil engineering work, by reference of this prepare one tender document for any one civil engineering construction work.(Including Tender Notice)
08	Prepare valuation report of residential building.


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B-Tech - cv - 21/42

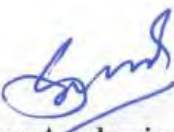
Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Estimating, Costing and Specification in civil engineering	M. Chakraborti	Monojit Chakraborti Pvt. Ltd.	27 th	2016
02	A textbook of estimating and costing.	G.S. Birde	Dhanpat Rai & Sons	7 th	2008
03	Estimating and Costing	B.N.Dutta	UBS Publisher	25 th	2002
04	Elements of Estimating and Costing	S. C. Rangwala.	Charotar Publishing house	4 th	1998
05	Civil Engineering Contracts & Estimates	B. S. Patil,	Orient Langman Ltd	7 th	2015

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Professional Practices (Estimating & Valuation)	Roshan Namavati	LBD Publishers	4 th	1984
02	Estimating and Costing for Building and Civil Engineering Works Based on Indian Standard Method of Measurement (I.S.1200)	P. L. Bhasin	Chand Publisher	5 th	2002
03	Standard Specification Vol. I & II	—	PWD, Maharastra	—	—
04	Standard Schedule of Rates- Recent SSR	—	PWD, Maharastra	—	—
05	Indian Standard 1200 (Part 1 To 10)	—	—	—	—


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B-Tech - cv - 22/42

Course Details:

Class	B. Tech. Sem.-VII
Course Code and Course Title	1CVPR452, Structural Design and Drawing
Prerequisite/s	1CVPC204, 1CVPC312.
Teaching Scheme: Lecture/Tutorial/Practical	04/00
Credits	02
Evaluation Scheme: ISE	25

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPR452_1	Choose primary and combination design loads on building consulting appropriate standards and handbooks
1CVPR452_2	Examine the detailing of design data on sheet
1CVPR452_3	Determine the design parameters for Retaining Wall.
1CVPR452_4	Design the component parts of the building manually
1CVPR452_5	Develop model and analyze building using any standard software

Course Contents:

The experiments will be divided based on the below contents:

01	This course deals with design of various structural elements such as R.C. beams, slabs, stairs columns & footings using modern Limit State Method. Design of these elements is made using guidelines of I.S. 456:2000, a code of practice for plain & reinforced cement concrete. Analysis and design of RCC framed building- manually and using any standard software, sketching the detailing of the reinforcement. Residential G+2 storied building. (Minimum 150 sq. mt.) Drawings prepared shall indicate ductility details as per the provision in IS: 13920. Drafting of all Designed sections using Autocad as per ductility Provisions.
02	Retaining wall (cantilever or counter fort type)
03	Analysis and design of RCC framed structure using software for G+2 Storied building
04	At least one site visit to be conducted to show the onsite detailing. (Report on site visit)

Note: 1. Project should be done individually.
2. Drawing details should be on full empirical drawing sheets drawn by hand.

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Reinforced Concrete Structural element	Purushotaman.P	McGraw Hill Publication Co.Ltd.	4 th	2010
02	Reinforced Concrete VOL.II (Advanced Reinforced Concrete)	H.J Shah	Charotar Publishing House Pvt. Ltd	7 th	2014
03	R.C.C Design & Drawing	Neelam Sharma	Charotar Publishing House Pvt. Ltd	3 rd	2013
04	Reinforced Concrete VOL.I	H.J Shah	Charotar Publishing House Pvt. Ltd	7 th	2014

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B-Tech - CV - 23/42

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Design of Reinforced Concrete Structures	S. Ramamrutham	Dhanpat Rai Publishing Company	9 th	2010
02	Limit State Design	B. C. Punmia, A. K. Jain	Laxmi Publications Ltd.	7 th	2017
03	R.C.C Designs	B.C.Punmia, A.K.Jain, Arun K Jain	Charotar Publishing House Pvt. Ltd	9 th	2015
04	Illustrated Design of R. C. Buildings	V. L. Shah, S. R. Karve	Structures Publisher	10 th	2015
05	IS 456 : 2000	Indian Standard Code	B.I.S. New Delhi	7 th	2016



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B.Tech - CV - 24/42

Course Details:

Class	B. Tech. Sem.-VII
Course Code and Course Title	1CVPR453, Project Phase -I
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial/Practical	00/00/04
Credits	04
Evaluation Scheme: ISE/ESE (OE)	50/25

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPR453_1	Identify the real life institutional, social, local industrial problems relevant to the societal and environmental issues for sustainable development.
1CVPR453_2	Analyze complex engineering problems and give cost-effective, optimal solution considering societal, health, legal, safety and cultural issues.
1CVPR453_3	Design system components or processes that meet the specified needs by using advance tools/ techniques/ resources.
1CVPR453_4	Function effectively as an individual or as a team for understanding of the engineering and management principles and apply these to manage projects maintaining professional and ethical principles.
1CVPR453_5	Discuss on complex engineering activities, write effective reports, design documentation and make effective presentations.

Course Contents:

The experiments will be divided based on the below contents:

01	The students should finalize their research topic in consultation with the project supervisor.
02	Students should collect the relevant literature pertaining to the topic for understanding what the current progress of research in the selected area.
03	Prepare the proposal for the project work that will be done in VII and VIII semester and divide the work in 3-4 time bound phases.
04	Make preparations for experimentation, or any study visit.
05	Write one review paper, by referring to various published work in National, International journals, thesis and projects. This will give the students an exposure to the process of technical report writing.
06	Students are required to report their project supervisor every week and brief about the work done for that week. Maintain the project diary for this purpose.


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B-Tech - CV-25/42

Course Details:

Class	B. Tech. Sem.-VII
Course Code and Course Title	1CVHS454, General Proficiency Laboratory II
Prerequisite/s	1CVHS258
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	02
Evaluation Scheme: ISE	50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVHS454_1	Solve aptitude problems within given time and with relevant logic.
1CVHS454_2	Show skills needed for approaching different types of interviews.
1CVHS454_3	Prepare a resume that describes the education, skills, experience and measurable achievements with proper grammar and format.
1CVHS454_4	Demonstrate behavior and communication skills required for group discussion and debate.
1CVHS454_5	Identify the component of selection process and evaluate the skills need to develop in order to improve employment prospect.

Course Contents:

The experiments will be divided based on the below contents:

01	Resume Writing
02	Group Discussion
03	Technical Aptitude
04	Verbal Aptitude : Basic English grammar and vocabulary
05	Quantitative Aptitude –I
06	Quantitative Aptitude –II
07	Data interpretation and Logical reasoning
08	Interview Skills : Technical Interview
09	Interview Skills : HR Interview

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Quantitative aptitude	Abhijit Guha	McGraw Hill	7 th	2020
02	Professional communication skills	Alok Jain Pravin Bhatia A.M.Sheikh	S. Chand Publishing	4 th	2008
03	Personality Development and soft skills	Barun Mitra	Oxford university press	7 th	2012
04	Test of Reasoning	Edgar Thorpe	McGraw Hill	7 th	2020
05	Quantitative aptitude and reasoning	R.V.Praveen	Eastern Economy	3 rd	2013


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B-Tech-CV-26/42

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Mental ability and quantitative aptitude	Edgar Thorpe	Mcgraw hill education	3 rd	2013
01	Quantitative Aptitude for Competitive Examinations	R.S Aggarwal	S. Chand Publishing	9 th	2017
03	Understanding Organizational Behavior	Udai pareek	Oxford university press	3 rd	2011
04	Quicker Maths	M.tyra	BSC publishing	3 rd	2018



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B.Tech - CV - 27/42

Course Details:

Class	B. Tech. Sem.-VII
Course Code and Course Title	1CVPC455, Field Training
Prerequisite/s	ICVES103, 1CVPC202, 1CVPC205, 1CVPC209, 1CVPC210, 1CVPC303, 1CVPC303
Teaching Scheme: Lecture/Tutorial	00/00
Credits	01
Evaluation Scheme: ISE	25

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC455_1	Summarize the importance of ethical and professional responsibility and practices as civil engineer.
1CVPC455_2	Adapt optimum use of resources in the context of environmental sensitivity, sustainable development and occupational safety.
1CVPC455_3	Demonstrate necessary knowledge, skills and attitudes required to become an entrepreneur in civil engineering related business.
1CVPC455_4	Organize and manage civil engineering project related activities /practices/ resources effectively.
1CVPC455_5	Plan , design, construct and maintain civil engineering structures and buildings.

The students are required to undergo rigorous field training in Civil Engineering at least for 30 days after end of VIth semester. Field training work will be evaluated in the VIIth semester. Student shall contact to supervisor and site for field training to be given by department. Students shall submit the report of the field training taken and necessary certificate from the organization where such training is completed.

The Site Work shall consist of:

1. Survey and Layout
2. Actual Site measurement
3. Quality control on site
4. Evaluation of Specification for Building materials.

The report shall consist of:

1. Company/Project details.
2. Site layout
3. Building materials details
4. Bar chart of work done
5. Daily material consumption and Work progress report
6. Knowledge & Skills acquire from field training.

Evaluation of field work report will be done by the Departmental Committee.


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B-Tech-CV-28/42

Course Details:

Class	B. Tech, Sem.-VIII
Course Code and Course Title	1CVPE411, Design of Bridges
Prerequisite/s	1CVPE402
Teaching Scheme: Lecture/Tutorial	3/0
Credits	03
Evaluation Scheme: ISE I/ MSE / ISE II/ ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE411_1	Describe various construction techniques of bridges.
1CVPE411_2	Explain type's bearings and expansion joints.
1CVPE411_3	Discuss basics of pre-stress bridges
1CVPE411_4	Illustrate various types of bridges and its specification.
1CVPE411_5	Design of R.C.C. and P.S.C. component bridges.

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Introduction of Bridges Introduction & brief history of bridges, Classification, Importance of bridges, Components of bridges, Investigation for Bridges.	06
Unit 2	Design loads for Bridges Standard specification for road bridges. I.R.C. bridge code, width of carriage way, clearances, loads to be considered i.e. D.L., L.L., impact load, wind load, earthquake load, longitudinal force, centrifugal force, buoyancy, Earth pressure, water current force, thermal force etc.	08
Unit 3	Design of Bridges General design considerations for R.C.C. & P.S.C. bridges. Traffic aspects for highway bridges. Aesthetics of bridge design, Relative costs of bridge components, Pigeaud's theory, Courbon's theory. Design of abutments.	07
Unit 4	Construction Techniques Construction of sub structure footing, piles, cassions, construction of reinforced earth retaining wall and reinforced earth abutments, super structure – erection method for bridge deck construction by cantilever method.	07
Unit 5	Bridge Bearings Different types of bridge bearing and expansion joints – forces on bearings –Types of bearings, elastomeric bearings, expansion joints. Numerical on bearings	06
Unit 6	Pre-stress Bridge Introduction to Pre-stress Bridges, Pre-stress T- beam type bridge, Pre-stress Box-type, Losses of Pre-stress of Bridges , Torsional Analysis of bridges, Transverse and Longitudinal Analysis, Introduction to post tensioned girder bridges.	08



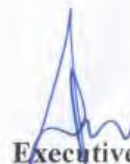
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B-Tech - CV - 29/42

Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Reinforced Concrete Structures – Vol. II	Dr. B. C. Punmia and Jain	Laxmi Publications New Delhi	4 th	1992
02	Concrete Bridge Practice, Analysis, Design and Economics	Dr. V.K. Raina	Tata McGraw- Hills Publishing Company Limited.	2 nd	2004
03	Bridge Engineering	S. Ponnuswamy	Tata McGraw-Hills Publishing	2 nd	2007
04	Design of Bridges	N. Krishna Raju	Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi	4 th	2009

Reference Books / Handbooks

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Design of bridge structures	T. R. Jagadeesh	PHI Learning Pvt. Ltd.	2 nd	2010
02	Essential of Bridge engineering	D. Johnson Victor	Oxford & IBH Publishing Co. Pvt. Ltd.	6 th	2007
03	Design of concrete bridges	M. G. Aswani	Khanna	3 rd	2001
04	Design & construction of highway bridges	K. S. Rakshit	NCB Pvt. Ltd	2 nd	1992
05	Handbook on Repair and Rehabilitation of R. C. C. Buildings	Director General Works	CPWD, New Delhi, India	2 nd	1992



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B-Tech-CV-30/42

Course Details:

Class	B. Tech. Sem.-VIII
Course Code and Course Title	1CVPE412, Management Information System
Prerequisite/s	1CVHS206, 1CVPE404
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE-I/MSE/ ISE-II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE412_1	Explain management information systems used in organizations.
1CVPE412_2	Utilize computer programming for decision making.
1CVPE412_3	Select and design appropriate MIS systems to meet management requirements.
1CVPE412_4	Make use of management information systems for various organizations.
1CVPE412_5	Examine the cases related to application of MIS in different organizations.

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Introduction to Management Information System: MIS concept, Definition, Need, Role, Impact, Evolution, Structure of MIS in organization.	06
Unit 2	Decision Making: Programmed and Non programmed decisions, Stages in decision making, Concepts of Information, Systems Theory, Decision Support System, Artificial Intelligence system, Knowledge-based expert system, Enterprise Management System and MIS.	09
Unit 3	Information Technology in MIS: Hard ware, Software, Communication networks Office automation.	06
Unit 4	Data Management: Information-Concept, classification, Collection and analysis of data, Database Management system, Database design, Conceptual and physical model, MIS and RDBMS, Real time systems and design, Object-oriented Technology (OOT), Client-server architecture.	08
Unit 5	Applications of MIS: Applications in manufacturing sector-Personnel management, Financial management, Production management, Materials management, Marketing management, Service sector application.	07
Unit 6	Implementation and Maintenance of MIS: Socio-technical approach, Factors of success and failure, Quality assurance of MIS, Case studies.	06

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B-Tech-(CV-31/42

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Management Information System	Jawadekar W. S.	Tata McGraw Hill, New Delhi	3 rd	2015
02	Management Information System	Dr. A.K.Gupta	S. Chand & Company Ltd	5 th	2013
03	Information System For Modern Management	Robert G. Murdick, Joel E Ross, Janes R. Claggeett	PHI Learning Private, New Delhi	3 rd	2010
04	Management Information system	Jerome Kanter	Englewood Cliffs, N.J. Prentice-Hall	3 rd	1984
05	Operations management	Barry Shore	Tata McGraw Hill, New Delhi	2 nd	1980

Reference Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	The Management Information System	Gary W. Dickson, Janes C. Weatherbe	McGraw Hill	2 nd	2018
02	Information systems theory & Practice	Burch and strarter	Wiley, New York	4 th	1994
03	Management Information Systems	Gordon B davis, Margethe H. Olson	Tata McGraw Hill	2 nd	1998
04	Management Information Systems	Girdhar Joshi	Oxford University Press	2 nd	2013
05	Introduction to data processing	F.R. Grawford	Englewood Cliffs, N.J. Prentice-Hall	2 nd	1973



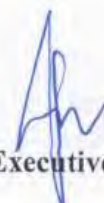
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B-Tech - CV - 32/42

Course Details:

Class	B. Tech. Sem.-VIII
Course Code and Course Title	ICVPE413, Advanced Engineering Geology and Rock Mechanics
Prerequisite/s	1CVPE306
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE-I/MSE/ ISE-II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

ICVPE413_1	Discuss the behavior of subsurface water, natural resources and environmental impact in civil engineering structures.
ICVPE413_2	Compute the knowledge of tectonic activities in evolution of Deccan traps.
ICVPE413_3	Illustrate knowledge of the preliminary geological investigations for civil engineering projects.
ICVPE413_4	Classify the stratigraphic sequence of India.
ICVPE413_5	Apply skills of geophysical methods for geological investigation of civil engineering sites.

Course Contents:

Unit No.	Title	Hrs
Unit 1	Stratigraphy and Indian Geology Scope, Geological Time scale, Physiographic divisions of India, General study of important geological formations of India and its Civil engineering significance.	05
Unit 2	Seismic Activity of Deccan Trap Region Seismic zones of world, Seismic activity of Deccan trap region, Theories on origin of the seismic activity, Reservoir induced seismicity. Nature and characteristics of seismic activity. Tectonic nature of seismic activity of Deccan trap region.	07
Unit 3	Subsurface Exploration Various steps in the geological studies of project site, Engineering consideration of structural features. Exploratory drilling—observations, preservation and limitations, core logging, Graphical representation, Problems on width of outcrop. Subsurface Water Groundwater—aquifer parameters, water bearing capacity of common rocks, springs, cone of depression and its significance in civil Engineering, Natural and artificial recharge of aquifers, Saline water intrusions - control and prevention. Interpretation of groundwater quality based on Piper trilinear, Gibbs, Wilcox and USSSL diagrams.	09
Unit 4	Engineering Geology Of Deccan Traps Types of basalts and their engineering characteristics, Compact and amygdaloidal basalt as construction material, Tail channel erosion problem in Deccan Trap region, Suitability of basalts from tunneling point of view. Problems due to columnar basalt, dykes and fractures, red bole, tachylitic basalt and Volcanic breccia. Laterites-Origin, occurrence and engineering aspects. Occurrence of groundwater in Deccan Trap region, Geological conditions suitable and unsuitable for construction of percolation tanks. Nature of alluvium and sand of Deccan Trap region, Scarcity of sand in Deccan Trap area.	09

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Unit 5	Geophysics Geophysical methods--- Basic principles of seismic, magnetic gravitational and electrical resistivity methods. Application of electrical resistivity method using Wenner configuration in Civil Engineering aspects such as--i) Finding out the thickness of over burden and depth of hard rock, ii) Locating the spot for ground water.	06
Unit 6	Rock Mechanics Physical properties of intact rocks; stresses and strains; thermal, hydraulic and mechanical properties of rocks and rock masses; applications of theory of elasticity in rock mechanics; visco-elasticity; rock discontinuities; rock slope engineering and underground excavations in rock. Slope protection methods for weak rocks. Rock fall prevention by innovative products and technologies	06

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Geology for Civil Engineers -	Dr. D. V. Reddy.	Vikas Publishing House Pvt. Ltd.	1 st	2010
02	A Text Book of Engineering Geology	R. B. Gupte	Vidyarthi Griha Prakashan, Pune	1 st	2009
03	A Text book of Applied Engineering Geology.	M. T. Maruthesha Reddy	New Age International Publishers, New Delhi	1 st	2007
04	Engineering and General Geology	Prabin Singh, S. K.	Katariya and sons, Delhi	8 th	2008
05	Engineering Rock Mechanics: An Introduction to the Principles	John A. Hudson and John P. Harrison	Pergamon Publication	4 th	2005

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Geology of India and Burma	M. S. Krishnan,	Higginbothams Pvt Ltd	6 th	2009
02	Groundwater Hydrology	Tood D. K	John Wiley & Son, New York	3 rd	2005
03	India's Mineral Resources	S. Krishnaswamy	Oxford & I.B.H. Co	3 rd	1988
04	Introduction to Rock Mechanics	Verma B. P.	Khanna Publisher Delhi	3 rd	2014
05	Rock mechanics for underground mining	Brady BHG, Brown ET.	AZ Dordrecht, The Netherlands: Kluwer Academic Publishers	3 rd	2004
06	Principles of Engineering Geology and Geotechnics	D. P. Krynine & W. R. Judd	CBS Publishers & Distributors, New Delhi	4 th	2017

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B-Tech-CV-34/42

Course Details:

Class	B. Tech, Sem.-VIII
Course Code and Course Title	1CVPE414, Industrial Waste Water Treatment
Prerequisite/s	0CVPC303, 0CVPC309.
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I /MSE/ ISE II / ESE	10/30/10/50

Course Outcomes:

Upon successful completion of the course, the student should be able to:

1CVPE414_1	Explain basics of industrial waste water and need for treatment
1CVPE414_2	Classify various industrial waste water and manufacturing processes
1CVPE414_3	Discuss various effluent quality standards for industrial waste water.
1CVPE414_4	Describe various industrial waste water treatment techniques
1CVPE414_5	Explain recent developments in industrial waste water treatment

Course Contents:

Unit No.	Title	Hrs
Unit 1	Basics of industrial waste water : Difference between municipal waste water and Industrial waste water, Water use in industry, Industrial water quality requirements, Deterioration of water quality, Classification and characterization of Industrial wastewater, Monitoring of wastewater flow in industries, Quality and quantity variations in waste discharge, Water budgeting. Common Effluent Treatment Plant: Location, Need, Design, Operation & Maintenance Problems	08
Unit 2	Classification of Industrial Waste: Water usage, Sources, Quantities, and characteristics of effluents, Pollution effects, Methods of treatment, utilization and disposal, in industries viz. sugar, distillery, dairy, pulp and paper mill, fertilizer, tanning, steel industry, textile, petroleum refining, chemical and power plant.	07
Unit 3	Effluent Quality Standard: Treatability aspects of raw industrial wastewater with domestic sewage, Partially treated industrial wastewater with domestic sewage, and Completely treated industrial wastewater with domestic sewage. Stream and Effluent standards, National River action plan.	07
Unit 4	Treatment Processes: Waste volume reduction, Waste strength reduction, Neutralization, Proportioning, Equalization. Reuse and recycling concepts.	07
Unit 5	Industrial waste water treatment techniques: Removal of specific pollutants in industrial , wastewaters, e.g., oil and grease, cyanide, fluoride, calcium, magnesium, toxic organics, heavy metals, radioactivity.	07
Unit 6	Recent developments in industrial waste water treatment: Biofilm Reactors for Final Treatment of Industrial Wastewater, High Rate Anaerobic Treatment Processes, Polymer Application.	06



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B-Tech - CV - 35/42

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Theories and Practices of Industrial waste treatment	Nelson Nemerow	Addison-Wesley	1st	1963
02	Waste Water Treatment	M.N.Rao	CBS Publishers and distributors Pvt. Ltd	3rd	2011
03	Industrial Waste Water	A.D. Patwardhan	Prentice Hall India Learning Private Limited	2nd	2017
04	Wastewater Engineering: Treatment and Reuse	Metcalf and Eddy	McGraw Hill Publication Education.	4th	2017

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Industrial Waste Water	Joseph D. Edwards	CRC Press	1st	1995
02	Industrial Waste Water Pollution Control	W. Eckenfelder	McGraw Hill Publication Education.	3rd	1999
03	The Industrial Waste Water Systems Handbook	Ralph L. Stephenson James B. Blackburn Jr.	CRC Press	1st	1997
04	Water and Waste Water Engineering	Mackenzie L. Davis	McGraw Hill Publication Education.	1st	2017



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B-Tech-CV-36/42

Course Details:

Class	B. Tech, Sem.-VIII
Course Code and Course Title	1CVPE415, Human Resources Development
Prerequisite/s	1CVHS206
Teaching Scheme: Lecture/Tutorial	03/00
Credits	03
Evaluation Scheme: ISE I /MSE/ ISE II / ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPE415_1	Discuss organization design, strategies significance objective and function of human resources management.
1CVPE415_2	Make use of human resource planning for construction sector.
1CVPE415_3	Identify the different methods for Employee Benefits and also explain the concept of Management Information System.
1CVPE415_4	Select appropriate trainings and performance appraisals systems for employees.
1CVPE415_5	Apply proper technique of recruitment for selection procedure of employees.
1CVPE415_6	Utilize of different motivation theory and SWOT analysis techniques in construction industries.

Course Contents:

Unit No.	Title	Hrs
Unit 1	Introduction: Definition, history of human resource management, Objectives, HRD in construction industry, Status of construction labour in India.	06
Unit 2	Human Resource Planning: Formulating human resource plans, various methods, job analysis, job specifications and job design in construction projects, forecasting personal needs and supply in construction sector.	05
Unit 3	Recruitment & selection: Selecting project manager & project team, external & internal recruitment. Data gathering methods, Various HRD parameters -functional skills, supervisory skills, Entrepreneurship skill requirement in construction industries.	09
Unit 4	Training & Development: The training Process, Individual and organizational development, performance appraisal, use of performance appraisal information establishing the evaluation system, Performance Management / Encouragement, Rewarding Employees.	06
Unit 5	Motivation and Perspective: Motivation, importance of motivation, Theories of Motivation and their comparison, Motivation as an incentive. SWOT analysis, promotion, HRM and IHRM. Managing international HR activities.	07
Unit 6	Employee Benefits: Employee health and safety, wage and salary administration, incentive system, wages of construction industry, retirement and pensions. Introduction to Management Information System: MIS concept, Definition, Need, Role, Impact, Evolution, Structure of MIS in organization.	09

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B.Tech. in C.E. 2016-20

Text Books::

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Human Resource Development and Management	Biswanath Ghosh	Vikas Publishing House Pvt. Ltd.	3 rd	2007
02	Human Resource Management	S.C. Agarwal	Dhanpat Rai Publications	2 nd	2006
03	Personnel & Human resource Management	C.B. Mamoria	Himalaya Publishing House	4 th	2015
04	Essentials of HRM and Industrial relation	Subba Rao	Himalaya Publishing house	4th	2010
05	Human Resource Development	Jon M. Werner	Cengage Learning India Private Limited	6 th	2016

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Human Resource Management	Durai, P.	Pearson Education	4th	2010
02	Human resource Management	Snell/ Bohlander	Cengage Learning	4th	2010
03	Human Resource Management	Dessler, G. & Varkkey B.	Pearson Education	12th	2011
04	Essentials of HRM and Industrial relation	Subba Rao	Himalaya Publishing house	4th	2010
05	The HR Answer Book: An Indispensable Guide for Managers and Human Professionals Resources	Shawn Smith	AMACOM	2 nd	2011



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B-Tech - CV-38/42

Course Details:

Class	B. Tech, Sem.-VIII
Course Code and Course Title	1CVPC416, Project & Finance Management
Prerequisite/s	1CVHS206
Teaching Scheme: Lecture/Tutorial	3/0
Credits	03
Evaluation Scheme: ISE-I/MSE/ ISE-II /ESE	10/30/10/50

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1CVPC416_1	Describe the basic concept of project management.
1CVPC416_2	Explain the concept of finance of project and preparation of accounting records.
1CVPC416_3	Correlate the risk Management with safety engineering in construction projects.
1CVPC416_4	Draw network diagram and identify the critical path by using CPM technique.
1CVPC416_5	Calculate various time estimates by the use of PERT technique.

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Introduction to Project Management : Objectives, Agencies, Phases; Work Breakdown Structure. Construction project management and relevance, Construction project organization: structure, qualities of project manager, project coordinator. Project Planning - Bar Chart, Mile Stone Chart.	07
Unit 2	CPM Network CPM: Time Estimates, Floats, Critical Path. Network Compression, Resource Allocation, Network Updating.	07
Unit 3	PERT Network : Concept of Probability, Normal and Beta Distribution, Time Estimates, Slack, Probability of Project Completion. Introduction to Precedence Network.	06
Unit 4	Earth moving equipment: Introduction – Mechanical v/s manual construction, Earth Work Operations Equipment- Bulldozers, Scrappers. Power Shovel, Hoes, scrapper, clamshell and dragline. Simple Numerical problems on cycle time and production rates.	06
Unit 5	Risk Management: Risk in Construction: Identification, Classification, Sources of risk in construction, Risk Mitigation- Risk Reduction, Risk Acceptance, Risk Avoidance. Safety Engineering : Importance of Safety, Classification of Accidents, Causes of Accidents, Safety Policy, Safety Organization, Safety Plan, Safety Training, and Various Safety Equipment used on site.	07
Unit 6	Financing Projects: Sources of finance, equity, debit, securities, borrowings, debentures, Working capital requirement, Financial institutes, Direct and indirect financial assistance. Accounting: Site Accounts - preparation, reporting, Accounting records, Depreciations, Classification of construction costs, Standard budgeting and control.	09


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2020-21

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Project Planning and Control with PERT and CPM	Dr. B. C. Punmia and K. K. Khandelwal.	Laxmi Publications	4 th	2016
02	PERT and CPM: Principles and Applications	L. S. Srinath	Affiliated East-West Press (Pvt.) Ltd.	3 rd	2001
03	Construction Project Management	Kumar Neeraj Jha	Pearson Education India,	1 st	2011
04	Heavy Construction – Planning Equipment, Methods	Jagman Singh	CRC Press	3 rd	2009
05	Engineering Economics and financial accounting	Prasanna Chandra	Tata Mcgraw Hill Publishing Ltd.	4 th	2015

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Construction Project Management : Planning, Scheduling and Controlling.	Chitkara K. K.	Tata McGraw - Hill Education	2 nd	2010
02	Construction Equipment and Management.	Sharma S.C.	Khanna Publishers New Delhi,	2 nd	2017
03	Construction planning, equipment, and methods.	Robert Peurifoy.	McGraw-Hill,	8 th	2010
04	Construction Planning and Management	P.S. Gahlot, B. M. Dhir	New Age International Publishers	2 nd	2018
05	Management and Engineering Economics	G.A.Taylor.	Van Nostrand	3 rd	1980



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B-Tech-CV-40/42

Course Details:

Class	B. Tech. Sem.-VIII
Course Code and Course Title	1CVPR456, Project Phase II + Internship
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial/Practical	00/00/08
Credits	08
Evaluation Scheme: ISE/ESE (OE)	250/250

Course Outcomes (COs): Project

Upon successful completion of the project, the student will be able to:

1CVPR456_1	Design system components or processes that meet the specified needs by using advance tools/ techniques/ resources.
1CVPR456_2	Function effectively as an individual or as a team for understanding of the engineering and management principles and apply these to manage projects maintaining professional and ethical principles.
1CVPR456_3	Communicate effectively on complex engineering activities, write effective reports, design documentation and make effective presentations.
1CVPR456_4	Engage in independent and life-long learning in the broadest context of technological change

Course Outcomes (COs): Internship

Upon successful completion of the internship, the student will be able to:

1CVPR456_5	Examine the functioning of the company on the terms of inputs, transformation process and the outputs (products and services) 3
1CVPR456_6	Develop an attitude to adjust with the company culture, work norms, code of conduct and safety norms.
1CVPR456_7	Demonstrate the ability to observe, analyze and document the details as per the industry practices.
1CVPR456_8	Interpret the processes, systems and procedures and to relate to the theoretical concepts- studies.

Course Contents:

01	PROJECT :
	1. The student group should continue the project work on the selected topic as per the formulated methodology under the same supervisor.
	2. Students are permitted to execute major part of their project work at the premises of identified industry.
	3. Students should develop and implement an original research or a creative project with the ability to explain the conceptual viability of the project and describe the major components involved.
	4. At the end of the semester, after completing the work to the satisfaction of the supervisor and review committee, a detailed report should be prepared and submitted to the department.


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B-Tech-CV-41/42

02

INTERNSHIP:

This course aims to familiarize the students to the working culture in the industry and imbibe in them the competencies required to work in the industry. It is a 10 week long course where the students are expected to work as interns the company. The student learning progress will be monitored by both industry mentor and the institute co-ordinator.

Conditions for students:

1. Student should be ready to move to the place where industry assignment is allotted.
2. The student has to go through the selection process of the company.
3. Maximum number of students will be decided based on the policy guidelines prepared from time to time.
4. Once the student is allotted to the company (after selection process), it will be binding on the student to complete the assignment in that company. No changes will be allowed thereafter.

Criteria for selection of company:

1. It should be a medium or large scale industry having functional departments and facilities to design develop and manufacture the product or offer services and potential to recruit engineers after training.
2. Company should extend their facilities and guidance to the students for learning and also provide access to data and information for completing the assigned project.
3. Company should be able to keep record of attendance and provide a mentor to monitor the project and help the students to sort out problems if any.

Assignment:

1. After joining the industry students should learn all the departments and their workings. Furthermore, student should understand how each department of industry is interlinked with one another.
2. Student should correlate the theoretical aspects learned in academics with industry practices.
3. Students should gain knowledge about new technologies which industries use.
4. Students should follow the professional codes and ethics.
5. Students should follow all rules and regulations of industry. Special care should be taken regarding safety.

Work Diary:

1. Work Diary will be provided to each student, which contains details regarding internship, do's and don'ts and evaluation scheme.
2. Student is required to write the diary regularly and get it signed by the industry guide periodically.
3. During the visit of institute mentor, the student should be able to produce the same for writing the remarks/ instruction.
4. At the end of internship, student should submit the duly completed diary to the department.

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