

***DEPARTMENT OF CIVIL
ENGINEERING***

***MINUTES OF BOARD OF
STUDIES MEETING, MAY 2022
ALONG WITH ITS ANNEXURES***

DEPARTMENT OF CIVIL ENGINEERING

Summary of Board of Studies Meeting held on 30th May, 2022

COURSES FOCUSING ON EMPLOYABILITY/ENTREPRENEURSHIP/ SKILL DEVELOPMENT

(Session: Jul – Dec 2022)

(Course/subject name)	Course Code	Activities/contents which have a bearing on increasing skill and employability	Item No.	Page No.	Link of relevant documents/minutes
Advanced Geomatics Engineering	110758	Application of GIS, UAV and other Geomatics Engineering tools	4	1,10	https://drive.google.com/file/d/1t8b0nukl9wJhM5u-19A-ubndBQ095t6/view?usp=sharing
Bridge Engineering	1110704	Design of Various Types of Bridges like Prestressed Bridges, Composite Bridges	7	4	https://drive.google.com/file/d/1t8b0nukl9wJhM5u-19A-ubndBQ095t6/view?usp=sharing
Ground Improvement	1110705/800311	Use of Geomembranes in Ground Improvement	7, 21, 1	4, 6, 107	https://drive.google.com/file/d/1t8b0nukl9wJhM5u-19A-ubndBQ095t6/view?usp=sharing
Advanced Structural Design (RCC)	110713	Design of Water Tanks, Prestressed Concrete	1	1, 10, 12	https://drive.google.com/file/d/1t8b0nukl9wJhM5u-19A-ubndBQ095t6/view?usp=sharing
Integrated Waste Management for Smart City	900201	Waste Management, E-waste management, biomedical waste management	5	1,10, 18	https://drive.google.com/file/d/1t8b0nukl9wJhM5u-19A-ubndBQ095t6/view?usp=sharing
Project Planning & Control	900202	Network techniques in project planning & management, resource planning, cost control	5	1,10, 20	https://drive.google.com/file/d/1t8b0nukl9wJhM5u-19A-ubndBQ095t6/view?usp=sharing
Urban Planning & Transportation Systems	900211	planning of urban transportation systems, intelligent systems	5	1,10, 22	https://drive.google.com/file/d/1t8b0nukl9wJhM5u-19A-ubndBQ095t6/view?usp=sharing
Software Application for Solving Civil Engineering Problems	110701	Study on Primavera, STAAD Pro & MATLAB	6	1,10, 28	https://drive.google.com/file/d/1t8b0nukl9wJhM5u-19A-ubndBQ095t6/view?usp=sharing
Creative Problem Solving	110703	Providing engineering solutions of critical problems	6	1,10, 29	https://drive.google.com/file/d/1t8b0nukl9wJhM5u-19A-ubndBQ095t6/view?usp=sharing
Waste Water Treatment & Recycling	110754	Advanced Treatment techniques of Waste water including recycling	4	1,10	https://drive.google.com/file/d/1t8b0nukl9wJhM5u-19A-ubndBQ095t6/view?usp=sharing
Principles of Construction Management	110757	Network techniques in Construction management, resource planning, cost control	4	1,10	https://drive.google.com/file/d/1t8b0nukl9wJhM5u-19A-ubndBQ095t6/view?usp=sharing
Geometric Design of Highways	1110704	Design of highway curves, traffic signals	7	1	https://drive.google.com/file/d/1t8b0nukl9wJhM5u-19A-ubndBQ095t6/view?usp=sharing
Concrete Technology	110654	Mix Design of concrete	8	4,15	https://drive.google.com/file/d/1t8b0nukl9wJhM5u-19A-ubndBQ095t6/view?usp=sharing

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

DEPARTMENT OF CIVIL ENGINEERING

					Mwn-INCinshuBQj0s5t1/view?usp=sharing
Advanced Structural Analysis	110715	Advanced Methods Of Structural Analysis	3	3, 10, 16	https://drive.google.com/file/d/1tsb0nnk1awLj/Mwn-INCinshuBQj0s5t1/view?usp=sharing
Building Materials & Composites	M110501	Building Materials, Admixture uses	7	4	https://drive.google.com/file/d/1tsb0nnk1awLj/Mwn-INCinshuBQj0s5t1/view?usp=sharing
Introduction to Multimodal Urban Transportation Systems	H110504	Planning of urban Transportation systems	7	4	https://drive.google.com/file/d/1tsb0nnk1awLj/Mwn-INCinshuBQj0s5t1/view?usp=sharing
Matrix Method of Structural Analysis	H110502	Application of Matrix Methods in Structural Analysis	7	4	https://drive.google.com/file/d/1tsb0nnk1awLj/Mwn-INCinshuBQj0s5t1/view?usp=sharing
Advanced Concrete Technology	H110506	High Performance Concrete, Fresh & hardened Concrete	7	4	https://drive.google.com/file/d/1tsb0nnk1awLj/Mwn-INCinshuBQj0s5t1/view?usp=sharing
Theory of Elasticity	H110701	Thermoelasticity, Photoelasticity, Solution of boundary value problem	7	4	https://drive.google.com/file/d/1tsb0nnk1awLj/Mwn-INCinshuBQj0s5t1/view?usp=sharing
Plastic Waste Management	800312	Plastic Waste Management practices in road construction, Green alternatives to plastics	23.1	6,7, 108	https://drive.google.com/file/d/1tsb0nnk1awLj/Mwn-INCinshuBQj0s5t1/view?usp=sharing

DEPARTMENT OF CIVIL ENGINEERING

Summary of Board of Studies Meeting held on 30th May 2022

Feedback on curriculum received from stakeholders: Analysis & ATR

Stakeholder	Student	Faculty	Alumni
No of Responses	172	06	09
Link of Analysis	https://drive.google.com/file/d/1HfL_M_EJsd-GwMx0jLhGy3cVBU/Yx3911An/view?usp=sharing	https://drive.google.com/file/d/1HfL_M_EJsd-GwMx0jLhGy3cVBU/Yx3911An/view?usp=sharing	https://drive.google.com/file/d/1HfL_M_EJsd-GwMx0jLhGy3cVBU/Yx3911An/view?usp=sharing
ATR Link	https://drive.google.com/file/d/1k3hvGpK34hgckCulp3OE6X0rnAowvRBU/view?usp=sharing	https://drive.google.com/file/d/1k3hvGpK34hgckCulp3OE6X0rnAowvRBU/view?usp=sharing	https://drive.google.com/file/d/1k3hvGpK34hgckCulp3OE6X0rnAowvRBU/view?usp=sharing
Link showing Excel Sheet of Google form responses details	https://docs.google.com/spreadsheets/d/1t7a-POv973YYCSZYg3QvC2E213-6fkbf/egit?usp=sharing&oid=1073669099074027580801&ripof=true&sd=true	https://docs.google.com/spreadsheets/d/1Hpl7JpCzJGfWNOzphlP53b0f-yx1HxHf/egit?usp=sharing&oid=1073669099074027580801&ripof=true&sd=true	https://docs.google.com/spreadsheets/d/1B20q5z4z7Dm09Ynd19M1D8vNkC31E8C7/egit?usp=sharing&oid=1073669099074027580801&ripof=true&sd=true

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Minutes of Board of Studies Meeting held on 30th May 2022

The meeting of Board of Studies of the Civil Engineering department was held on Monday, 30th May 2022 online through Google meet (Owing to the Covid-19 situation). Following were present:

1. Dr. A. K. Nema (Expert nominated by V.C.)
Professor, Civil Engg., IIT Delhi
2. Dr. P. K. Jain (Subject Expert nominated by Academic Council)
Professor, Civil Engg., MANIT Bhopal
3. Dr. Mahesh Jat (Subject Expert nominated by Academic Council)
Professor, Civil Engg., MNIT Jaipur
4. Dr. M. K. Trivedi (Chairman BoS & Head of the department)
5. Prof. (Mrs.) Archana Tiwari (Member, BOS)
6. Dr. S. K. Jain (Member, BOS)
7. Dr. R. Kansal (Member, BOS)
8. Dr. S. Tiwari (Member, BOS)
9. Prof. A. K. Dwivedi (Member, BOS)
10. Prof. A. K. Saxena (Member, BOS)
11. Prof. G. Bhadoriya (Member, BOS)
12. Prof. Aditya K. Agarwal (Member, BOS)
13. Dr. Hemant Shrivastava (Member, BOS)
14. Dr. Prachi Singh (Member, BOS)
15. Dr. Jayvant Choudhary (Member, BOS)
16. Dr. Chayan Gupta (Member, BOS)
17. Dr. Abhilash Shukla (Member, BOS)
18. Ms. Pratigya Gupta (Student Member BOS)
19. Mr Rohit Rathour (Student Member BOS)

Leave of absence was granted to the two external members who could not attend the meeting.

Following agendas were discussed & deliberated upon

Item No. / CE - 1	To confirm the minutes of previous BoS meeting held in the month of December 2021 Previous Board of Studies meeting minutes dated 22 nd December are confirmed. The agenda in Previous BoS meeting regarding change in Scheme of B.Tech II Semester by splitting Basic Civil Engineering & Mechanics course into two separate courses for students of Civil Engineering was turned down.
Item No. / CE - 2	To prepare and finalize the scheme structure of B.Tech. VII Semester with the provision of Two Departmental Electives (DEs) and Two Open Category (OC) Course (in which one Departmental Elective is to be offered in online mode with credit transfer) for the batch admitted in 2019-20. The finalized scheme structure of B.Tech VII Semester for 2019-20 admitted batch is attached in Annexure - I.



Civil Engineering Department, MITS Gwalior

2

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to M.P.V. Group)

Item No. / CE - 3	<p>To prepare and finalize the syllabus of courses to be offered (for batch admitted in 2019-20) under Departmental Elective (DE) Course (in traditional mode) for B. Tech. VII Semester along with their COs</p> <p>Following courses are finalized as Departmental Elective (DE) courses for VII semester which will be offered in traditional mode under the flexible curriculum for 2019-20 admitted batch.</p> <ol style="list-style-type: none">1. 110713, Advanced Structural Design (RCC)2. 110714, Hydraulic Structure3. 110715, Advanced Structural Analysis <p>The syllabus along with COs for these courses were discussed & finalized. The syllabus is attached in Annexure - II and the same has been incorporated in the syllabus file for 2019 batch.</p>
Item No. / CE - 4	<p>To propose the list of courses which the students can opt from SWAYAM/NPTEL/MOOC based Platforms, to be offered in online mode under Departmental Elective (DE) Course, with credit transfer in the B. Tech. VII Semester under the flexible curriculum (Batch admitted in 2019-20)</p> <p>Following courses are finalized as Departmental Elective (DE) courses for VII semester which will be offered in online mode through SWAYAM/NPTEL/MOOC for credit transfer under the flexible curriculum for 2019-20 admitted batch.</p> <ol style="list-style-type: none">1. 110754, Wastewater Treatment & Recycling2. 110757, Principles of Construction Management3. 110758, Advanced Geomatics Engineering
Item No. / CE - 5	<p>To prepare and finalize the syllabus of courses to be offered (for batch admitted in 2019-20) under the Open Category (OC) Courses (in traditional mode) for B. Tech. VII semester students of other departments along with their COs</p> <p>Following courses are finalized as Open Category (OC) courses for VII semester which will be offered in conventional mode to students of other departments for 2019-20 admitted batch.</p> <ol style="list-style-type: none">1. 900201, Integrated Waste Management for Smart City2. 900202, Project Planning & Control3. 900213, Urban Planning & Transportation Systems.4. Safety & Quality Management <p>The syllabus along with COs for these courses were discussed & finalized. The syllabus is attached in Annexure - III and the same has been incorporated in the syllabus file for 2019 batch.</p>
Item No. / CE - 6	<p>To prepare and finalize the Experiment list/ Lab manual for Departmental Laboratory Course (DLC) to be offered in B. Tech. VII semester (for batches admitted in 2019-20)</p> <p>The existing list of experiments for laboratory courses to be offered in VII semester were reviewed and found to be ok, hence no changes are recommended in this. The list is attached in Annexure - IV.</p>



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

[A Govt. Aided Utd. Autonomous & NAAC Accredited Institute Affiliated to RGPV (Bhopal)]

Item No. / CE - 7	<p>To propose the list of "Additional Courses" which can be opted for getting an</p> <p>(i) <i>Honours (for students of the host department)</i></p> <p>(ii) <i>Minor Specialization (for students of other departments)</i></p> <p><i>[These will be offered through SWAYAM/NPTEL/MOOC based Platforms for the B.Tech. VII semester students (for the batch admitted in 2019-20)] and for B.Tech. V semester (for the batch admitted in 2020-21)]</i></p> <p>Following SWAYAM/NPTEL courses are proposed as additional courses which can be opted for getting Minor Specialization during VII semester for 2019-20 admitted batch</p> <ol style="list-style-type: none">1. Soil Mechanics/Geotechnical Engineering – I (MI10703)2. Geometric Design of Highways (MI10704) <p>Following SWAYAM/NPTEL courses are proposed as additional courses which can be opted for getting Honours during VII semester for 2019-20 admitted batch</p> <ol style="list-style-type: none">1. Theory of Elasticity (HI10701)2. Bridge Engineering (HI10704)3. Ground Improvement (HI10705) <p>Following SWAYAM/NPTEL courses are proposed as additional courses which can be opted for getting Minor Specialization during V semester for 2020-21 admitted batch</p> <ol style="list-style-type: none">1. Building Materials & Composites (MI10501)2. Strength of Materials (MI10503)3. Fluid Mechanics (MI10504) <p>Following SWAYAM/NPTEL courses are proposed as additional courses which can be opted for getting Honours during V semester for 2020-21 admitted batch</p> <ol style="list-style-type: none">1. Integrated Waste Management for Smart City (HI10501)2. Matrix Method of Structural Analysis (HI10502)3. Introduction to Multimodal Urban Transportation Systems (HI10504)4. Advanced Concrete Technology (HI10506)
Item No. / CE - 8	<p>To prepare and recommend the scheme structure of B.Tech. V Semester under the flexible curriculum (Batch admitted in 2020-21)</p> <p>The recommended scheme structure of B.Tech V Semester for 2020-21 admitted batch is attached in Annexure – V</p>
Item No. / CE - 9	<p>To prepare and recommend the syllabi for all Departmental Core (DC) Courses of B. Tech. V Semester (for batch admitted in 2020-21) under the flexible curriculum along with their COs.</p> <p>The syllabi of courses along with their COs which are being offered under DC category for batch admitted in 2020-21 for V semester were finalized and are attached in Annexure – VI and also incorporated in the syllabus file of 2020 admitted batch.</p>
Item No. / CE - 10	<p>To review and finalize the Experiment list/ Lab manual for Laboratory Courses to be offered in V semester (for batch admitted in 2020-21)</p> <p>The list of experiments for laboratory course to be offered in V semester for 2020-21 admitted batch were finalized along with the syllabi of courses offered in B.Tech V Semester as mentioned in agenda Item No. / CE – 9</p>



<p>Item No. / CE - 11</p>	<p>To prepare and recommend the suggestive list of projects which can be assigned under the 'Skill based mini-project' category in various laboratory component based courses to be offered in B.Tech. V Semester (for the batch admitted in 2020-21).</p> <p>A list of projects which can be assigned as 'Skill based mini project' in lab course to be offered in V semester for 2020-21 admitted batch were finalized, the same is attached in Annexure - VII.</p>
<p>Item No. / CE - 12</p>	<p>To propose the list of courses from SWAYAM/NPTEL/MOOC Platforms to be offered (for batch admitted in 2020-21) in online mode under Self-Learning/Presentation, in the B.Tech. V Semester</p> <p>Following courses are finalized as Self Learning/Presentation courses for V Semester through NPTEL platform</p> <ol style="list-style-type: none"> 1. Principles and Application of Building Science 2. Geotechnical Engineering Laboratory 3. Global Navigation Satellite Systems & Applications.
<p>Item No. / CE - 13</p>	<p>To prepare and recommend the Scheme & Syllabi (along with the Course Outcomes) of B.Tech. III semester of the newly started B. Tech. programmes in the emerging areas (AI & ML, AI & DS, CSD) (started from 2021-22 Session)</p> <p>This agenda item is not applicable to the Civil Engineering Department</p>
<p>Item No. / CE - 14</p>	<p>To prepare and recommend the list of experiments and skill based mini projects of B.Tech. III semester of the newly started B. Tech. programmes in the emerging areas (AI & ML, AI & DS, CSD) (started from 2021-22 Session)</p> <p>This agenda item is not applicable to the Civil Engineering Department</p>
<p>Item No. / CE - 15</p>	<p>To review, prepare, finalize and recommend the Scheme & Syllabi (along with the Course Outcomes) of III semester B. Tech. programmes (batch admitted 2021-22 Session)</p> <p>The Scheme & Syllabi for III Semester for B.Tech Civil Engineering for batch admitted in 2021-2022 was discussed and finalized. The scheme as well as syllabus is being attached in Annexure - VIII.</p>
<p>Item No. / CE - 16</p>	<p>To review, prepare, finalize and recommend the list of experiments/ Lab manual and skill based mini projects for various laboratory courses to be offered in III Semester (for the batch admitted in 2021-22).</p> <p>The existing list of experiments for laboratory courses to be offered in III semester were reviewed and found to be ok, hence no changes are recommended in this. The List of Skill based mini projects for various lab courses offered in III Semester (2021-22 batch) is attached in Annexure - IX.</p>
<p>Item No. / CE - 17</p>	<p>To propose the list of courses from SWAYAM/NPTEL/MOOC Platforms to be offered (for batches admitted in 2021-22) in online mode under Self-Learning/Presentation, in the III Semester</p> <p>Following courses are finalized as Self Learning/Presentation courses for III Semester through NPTEL platform</p> <ol style="list-style-type: none"> 1. Water Society & Sustainability 2. GPS Surveying 3. C Programming & Assembly Language

Handwritten signatures and initials in blue ink at the bottom of the page, including names like 'Dhoni' and 'A.K.I.'.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Item No. / CE – 18	<p>To review the Scheme & Syllabi, list of experiments and skill based mini projects of First semester of the B. Tech. programmes (for the batch 2022-23).</p> <p>The existing scheme of I Semester B.Tech Civil Engineering was reviewed, no changes are proposed in the existing scheme for 2022-23 admitted batch, the scheme is attached in Annexure – X.</p>								
Item No. / CE – 19	<p>To review the CO attainments, to identify gaps and to suggest corrective measures for the improvement in the CO attainment levels for (i) I year November 2021 – February 2022 Semester (ii) July-December 2021 Session for II to IV year students</p> <p>CO attainment calculations has been done based upon mathematical model developed by the institute. The gap analysis in CO attainment level for all the courses has been carried on the basis of the set targets. On the basis of this analysis it is observed that in almost all the courses the CO attainment level is found to achieve the set target, however in some of the courses the CO attainment level for some COs is found to be below the set target, for those COs corrective actions to be taken have been suggested. The compiled report is attached in Annexure – XI. The summary of the same is presented below:</p> <table border="1"><thead><tr><th>Total No of Courses</th><th>Total Number of COs</th><th>No. of COs Not attained</th><th>Percentage of COs not attained</th></tr></thead><tbody><tr><td>27</td><td>129</td><td>51</td><td>39.5%</td></tr></tbody></table>	Total No of Courses	Total Number of COs	No. of COs Not attained	Percentage of COs not attained	27	129	51	39.5%
Total No of Courses	Total Number of COs	No. of COs Not attained	Percentage of COs not attained						
27	129	51	39.5%						
Item No. / CE – 20	<p>To review PO attainment of 2017-2021 batch, CO-PO mapping matrix with attainments and gap analysis</p> <p>PO attainment calculations of 2017-2021 batch has been done based upon mathematical model developed by the institute. The gap analysis in PO attainment level has been carried on the basis of the set targets. The compiled report is attached in Annexure – XII.</p>								
Item No. / CE – 21	<p>To review Curricula feedback from various stakeholders, its analysis and impact</p> <p>The curricula feedback was taken from various stakeholders. The compiled report along with its analysis & ATR is attached in Annexure – XIII (a) & (b).</p>								
Item No. / CE – 22	<p>To review course outcomes (COs) feedback of various courses, its analysis and impact</p> <p>The course outcomes (COs) feedback of various courses running in the current semester has been taken by various course coordinators. The compiled analysis is attached in Annexure – XIV.</p>								
Item No. / CE – 23	<p>Any other matter</p> <p>1. Approval of MOOC course for PG 3rd Semester (Batch Admitted in 2021-2022)</p> <p>Following is the list of courses which will be offered as MOOC Course (Through SWAYAM/NPTEL) in the upcoming 3rd Semester of PG programme (Batch admitted in 2021-2022).</p> <p>M.E. C.T.M. 3rd Semester – Ground Improvement M.Tech Environmental Engineering 3rd Semester – Plastic Waste Management</p> <p>In view of the above, the existing schemes of 3rd Semester M.E. C.T.M. &</p>								

[Handwritten signatures and initials are present at the bottom of the page, including names like Ashu, AKS, and others.]

	<p>M.Tech Environmental Engineering is modified to include the list of these courses, the modified schemes are attached in Annexure - XV.</p> <p>2. Syllabi of MOOC's being developed in the department Following MOOC courses are being developed in the department.</p> <ul style="list-style-type: none">(i). Geosynthetics & Soil Reinforcement(ii). Sustainable Materials & Green Buildings <p>The syllabus is being attached in Annexure - XVI.</p> <p>3. Contents of SIP - I & SEP to be held in June 2022 The department is offering four (04) modules in SIP - I (Summer Internship Project - I) and one module in SEP (Skills Enhancement Program).</p> <ul style="list-style-type: none">(i) Application of MATLAB & SPSS in Engineering Problems (CE0322S1)(ii) Introductory Course in Microsoft Office (CE0322S2)(iii) Introduction to Sustainable Engineering (CE0322S3)(iv) Study of Geological Maps & Subsurface Exploration (CE0322S4)(v) Structural Design of Two Storey RC Building (CE0620V3) <p>The contents of these are being attached in Annexure - XVII.</p> <p>4. List of Domain Specific Novel Engaging Courses (NEC) being offered by the faculty of the department Following are the list of domain specific Novel Engaging Courses (NEC) which are being offered by the faculty of the department</p> <ul style="list-style-type: none">(i) Environment Protection - I (2000013)(ii) Signage (2000029)(iii) Basic & Advanced Excel (2000074)(iv) Shilpa Samhita - Philosophy of Ancient Geotechnical Engg. (2000075)(v) Fire Safety & Regulation in Building (2000076)(vi) Development in Pavement Construction: Past to Future (2000077)(vii) SPSS for Data Analysis (2000078) <p>5. List of projects to be assigned in the next semester The tentative list of projects to be assigned to students of B.Tech 5th Semester for upcoming semester is being attached in Annexure - XVIII.</p> <p>6. New Experiments/labs being designed for offering in the next semester At present no new experiments/ labs are being proposed for offering in the coming semester.</p> <p>7. Modification in Syllabus & COs of M.E. CTM 1st Semester courses (Batch to be admitted in 2024) The syllabus of following courses of M.E. CTM 1st Semester: 510114 Maintenance Management, 800109 Safety & Quality Management and 510121 Construction Materials, Machines & Techniques (only COs) are being modified. In view of this the modified syllabus are being attached in Annexure - XIX.</p>
--	---

The meeting ended with vote of thanks to the chair.

Digitally Approved
(Ms. Pratigya Gupta)
Student Member, BoS

Digitally Approved
(Mr. Rohit Rathour)
Student Member, BoS

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

[A Govt. Aided UGC, Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal]



(Dr. Abhilash Shukla)
Member, BoS



(Dr. Chayan Gupta)
Member, BoS



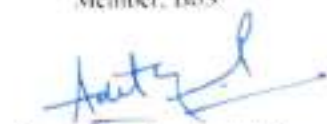
(Dr. Jayvant Choudhary)
Member, BoS



(Dr. Hemant Shrivastava)
Member, BoS

on Maternity leave

(Dr. Prachi Singh)
Member, BoS



(Prof. Aditya K. Agarwal)
Member BoS



(Prof. G. Bhadoriya)
Member BoS



(Prof. A. K. Saxena)
Member BoS



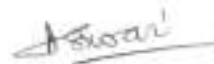
(Prof. A. K. Dwivedi)
Member BoS



(Dr. S. Tiwari)
Member, BoS



(Dr. R. Kansal)
Member, BoS



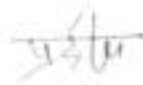
(Prof. (Mrs.) A. Tiwari)
Member, BoS



(Dr. S. K. Jain)
Member, BoS

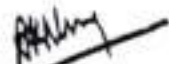


(Dr. Mahesh Jat)



(Dr. P.K. Jain)

Subject Experts Nominated by Academic Council



(Dr. A. K. Nema)
Expert Nominated By V.C.



(Dr. M. K. Trivedi)
Head of Department & Chairman, BoS



DEAN (ACADEMICS)
MITS
GWALIOR

DEAN (ACADEMICS)
MITS
GWALIOR

ANNEXURE – I

(Scheme 7th Sem B.Tech Civil Engineering (2019
Admitted Batch))

Handwritten signatures and marks:

- Top left: Adh
- Top middle: MK P
- Top right: Shank
- Middle left: Myra
- Middle center: HP
- Middle right: 3
- Bottom center: g
- Bottom right: h

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

Scheme of Examination
B. Tech. VII Semester (Civil Engineering)

For batches admitted in academic session 2019 - 20

S. No.	Subject Category Code	Subject Name	Maximum Marks Allotted						Total Marks	Contact Periods per Week			Total Credits
			Theory Slot		Practical Slot		ASSESSMENT			L	T	P	
			End Sem.	Mid Sem.	Quiz / Assignment	End Lab Work / Sem.	Assignment	Exam					
1.	DE	DE-31	70	20	10	-	-	-	100	3	-	-	3
2.	DE	DE-31	-	-	-	-	-	25	75	2	-	-	2
3.	OC	OC-21	70	20	10	-	-	-	100	3	-	-	3
4.	OC	OC-31	70	20	10	-	-	-	100	3	-	-	3
5.	MIC	Intellectual Property Rights (IPR) (MIC)	70	20	10	-	-	-	100	2	-	-	2
6.	DLC	Software Application for Solving Civil Engineering Problems (DLC-4b)	-	-	-	50	50	-	100	-	-	4	2
7.	DLC	Summer Internship Project - III (400 works) (Evaluation) (DLC-2)	-	-	-	50	50	-	100	-	-	4	2
8.	DLC	Creative Problem Solving Evaluation (DLC-4b)	-	-	-	25	25	-	50	-	-	2	1
Total			280	80	40	125	125	25	75	13	-	10	18
9.	Additional Courses for obtaining Honours or Minor Specialization by desirous students												

Permitted to opt for maximum 02 additional courses for the award of Honours or Minor Specialization

At any time of these courses must be done through SWAYAM (NPTTEL, AIDDC)

SEMESTER - VII

DE - 3	DE - 4 (Through SWAYAM/NPTTEL)	OC - 2	OC - 3
110713 Advanced Structural Design (RCC)	110754 Wastewater Treatment & Recycling	900201 Integrated Waste Management for Smart City	900213 Urban Planning & Transportation Systems
110714 Hydraulic Structure	110757, Principles of Construction Management	900202 Project Planning & Control	900226 Safety & Quality Management
110715 Advanced Structural Analysis	110758, Advanced Geomatics Engineering		

DEAN (ACADEMICS)
 MITS
 GWALIOR

ANNEXURE – II

**(Syllabus 7th Sem DE B.Tech Civil Engineering
(2019 Admitted Batch))**

Handwritten signatures and initials in blue ink:
Aad, AKI, Dhaor, and other illegible initials.

ANNEXURE - II

SYLLABUS FOR DEPARTMENTAL ELECTIVE COURSES (DEs) TO
BE OFFERED IN VII SEMESTER

Course Code: 110713

Course Name: Advanced Structural Design (R.C.C.)

L	T	P	Credit
3	0	0	3

Course Objectives:

- 1) To understand the behavior of RC structures like Retaining wall, Water tanks, Highway Bridges and prestressed concrete beams.
- 2) To apply the codal provision for estimation of loads on Retaining wall, Water tanks, Highway Bridges and prestressed concrete beams sections.
- 3) To know analysis of Retaining walls, Water tanks, Highway Bridges and prestressed concrete beam sections subjected to realistic loads.
- 4) To learn design of Retaining walls, Water tanks, Highway Bridges and prestressed concrete beam sections using Codal provisions.

Syllabus:

Unit-I

Design of Water Tanks:

General design requirements; Design of circular tanks resting on ground; Design of rectangular tanks resting on ground; Design of under ground tanks.

Unit-II

Over Head Water tanks and Flat Slabs:

Overhead Tank: Intze type (Membrane analysis only), Design of Staging
Design of Flat slabs: (i) Direct design method and (ii) Equivalent frame method; Design Shear.

Unit-III

Earth Retaining Structures:

Types of retaining walls, Stability of retaining walls, Design of Cantilever type retaining wall; Design of Counterfort type retaining walls.

Unit-IV

Design of Bridges:

IRC loading for highway bridges, Design of Slab bridges for IRC Loads; Design of T-beams bridges for IRC Loads.

Unit-V

Prestressed Concrete:

Prestressing concepts, materials; systems of prestressing; prestress losses. Introduction to working & limit state design method for prestress beam sections.

Course Outcomes:

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

CO1: Explain the structural behaviour of water retaining structures; earth retaining structures; bridges and Prestressed concrete structures.

CO2: Determine design forces in water retaining structures; earth retaining structures; highway bridges;

[Handwritten signatures and initials in blue ink at the bottom of the page.]

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

and Prestressed sections.

CO3: Analyse the water retaining structures; earth retaining structures; highway bridges and Prestressed sections for realistic loadings.

CO4: Design economic and safe water retaining structures; earth retaining structures; highway bridges and Prestressed sections as per Codal provisions.

Reference Books:

1. Plain and Reinforced Concrete by O.P. Jain and Jai Krishna Vol. I & II, Nem Chand & Bros, Roorkee
2. Reinforced Concrete Limit State Design by Ashok K. Jain, Nem Chand & Bros, Roorkee.
3. Reinforced Concrete Design by S. U. Pillai and D. Menon, Tata McGraw-Hill Publishing Company Limited, New Delhi.
4. Essentials of Bridge Engineering by D.J. Victor, Oxford and IBH publishers.
5. Design of Bridges by N.K. Raju, CBS Publishers
6. Prestressed Concrete by N.K. Raju, CBS Publishers
7. Advanced Reinforced Concrete Design by P. C. Varghese, Prentice Hall of India publisher
8. Prestressed concrete by T.Y. Lin & N.H. Burns, Wiley publisher

Handwritten signatures and initials in blue ink:
Row 1: AK, AKS, H, Shaw, SA
Row 2: AK, SA, AK, SA

Course Code: 110714

Course Name: Hydraulic Structure

L	T	P	Credit
3	0	0	3

Course Objectives:

- 1) To study the different aspects of design of hydraulic structures.
- 2) To build the necessary theoretical background for the selection of a suitable site for a dam and a suitable dam for a given site location.
- 3) To emphasize on the basic design principle of the gravity dam & earthen dam
- 4) To carry out the stability & seepage analysis of various types of dams.
- 5) To provide knowledge on various hydraulic structures such as energy dissipaters, spillways & gates & understand their designs.
- 6) To understand the design of cross drainage structures for uninterrupted water supply in natural channels and manmade canals.
- 7) To provide a basic knowledge on various types of hydropower plants and their components.

Syllabus:

Unit-I Gravity dams:

Design Criteria, forces acting on gravity dams, elementary profile, low and high gravity dams, stability analysis, evaluation of profile by method of zoning, practical profile, foundation treatment, construction joints, galleries in gravity dams.

Unit-II Earth and Rock fill dams:

Earth Dams: Types, causes of failure and design criteria, soils suitable for earth dam construction, construction methods, foundation requirements, typical earth dam sections, estimation of seepage through and below the dam, seepage control, stability of slopes by slip circle method, pore pressures, sudden draw down, steady seepage and construction pore pressure condition

Rock fill dams: Types, merits and demerits, conditions favourable for their adoption

Unit-III Cross drainage works:

Types, selection of suitable type, design criteria, fluming of canal- Mitra & Chaturvedi methods. Design of Different types of CD works.

Unit-IV Spillways, Energy dissipators and gates:

Ogee spillway and its design, details of syphon, shaft, chute and side channel spillways, emergency spillways. Principles of energy dissipation, Energy dissipators based on tail water rating curve and jump height curves, Spillway crest gates – vertical lift and radial gates, their design principles and details.

Unit-V Hydropower Plants:

Hydropower development, assessment of power potential, types of hydropower plants, general features of hydro-electric schemes, selection of turbines, draft tubes, surge tanks, penstocks, power house dimensions, development of micro hydel stations, tidal plants, pumped storage plants and their details.

Course Outcomes:

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

CO1: Identify different components of hydraulic structures.

CO2: Explain basic principles of designing hydraulic structures.

CO3: Solve problems of dam analysis, energy dissipators & cross drainage works.

CO4: Evaluate suitability of types of hydraulic structures.

CO5: Design various elements of hydraulic structures.

[Handwritten signatures and initials in blue ink at the bottom of the page]

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A GOVT. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to JECPI, Bhopal)

Reference Books:

1. Engineering for Dams (Volumes I, II & III) by Creager, Justin & Hinds
2. Hydroelectric Hand Book by Creager
3. Hydraulic Structures by Varsiney
4. Irrigation & Water Power Engg. By Punmia & Pandey
5. Water Power Engineering by Dandekar
6. Irrigation Engineering & Hydraulic Structure by S.K. Garg.

Handwritten signatures and marks in blue ink, including checkmarks and initials, are present below the reference list.

Course Code: 110715

Course Name: Advanced Structural Analysis

L	T	P	Credit
3	0	0	3

Course Objectives:

- 1) To understand the analytical procedure related to the analysis of building frame by some classical methods viz. Kani's methods and approximate methods of analysis.
- 2) To study the multi storey frames subjected to gravity loads and lateral loads
- 3) To understand matrix method and its application for computer based analysis of structure.
- 4) To understand the influence line concepts for indeterminate structures
- 5) To develop the skill to deal with the problems of moving loads in the structures & their analysis techniques.

Syllabus:

Unit-I

Moment distribution method in analysis of frames with sway, Analysis of box frames, analysis of beams and frames by Kani's methods.

Unit-II

Analysis of tall frames, Calculation of various loads including wind and earthquake loads, Introduction to Code provisions for lateral loads. Approximate analysis of multistorey frames for vertical and lateral loads.

Unit-III

Force method of structural analysis: Application of force method in analysis of rigid connected and pin connected structures

Unit-IV

Rolling Loads and Influence Lines: Influence Lines for Statically determinate and indeterminate structures, Muller Breslau Principle

Unit-V

Displacement method of structural analysis. Introduction to use of software's for analysis: Modeling, analysis and post processing.

Course Outcomes:

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

- CO 1: Determine response of structures by classical methods
- CO 2: Use approximate methods for analysis of statically indeterminate structures
- CO 3: Determine response of structures by matrix force method
- CO 4: Evaluate and draw the influence lines for reactions, shears, and bending moments in beams and girders due to moving loads
- CO 5: Model and analyze structural systems (building) with the aid of software's

Reference Books:

1. Reddy C.S., Basic Structural Analysis, Tata McGraw Hill Publishing Company, New Delhi.
2. Structural Analysis 5ed. (2015) by Aslam Kassimali, Cengage.
3. Structural Analysis, 10th Edition by Russell C. Hibbeler, 2018, Pearson.
4. Matrix Analysis of Structures, SI Edition, by Aslam Kassimali, 2021 CL Engineering.



Course Code: 110715

Course Name: Advanced Structural Analysis

L	T	P	Credit
3	0	0	3

Course Objectives:

- 1) To understand the analytical procedure related to the analysis of building frame by some classical methods viz. Kani's methods and approximate methods of analysis.
- 2) To study the multi storey frames subjected to gravity loads and lateral loads
- 3) To understand matrix method and its application for computer based analysis of structure.
- 4) To understand the influence line concepts for indeterminate structures
- 5) To develop the skill to deals with the problems of moving loads in the structures & their analysis techniques.

Syllabus:

Unit-I

Moment distribution method in analysis of frames with sway, Analysis of box frames, analysis of beams and frames by Kani's methods.

Unit-II

Analysis of tall frames, Calculation of various loads including wind and earthquake loads, Introduction to Code provisions for lateral loads. Approximate analysis of multistorey frames for vertical and lateral loads.

Unit-III

Force method of structural analysis: Application of force method in analysis of rigid connected and pin connected structures

Unit-IV

Rolling Loads and Influence Lines: Influence Lines for Statically determinate and indeterminate structures, Muller Breslau Principle

Unit-V

Displacement method of structural analysis. Introduction to use of software's for analysis: Modeling, analysis and post processing.

Course Outcomes:

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

- CO 1: Determine response of structures by classical methods
- CO 2: Use approximate methods for analysis of statically indeterminate structures
- CO 3: Determine response of structures by matrix force method
- CO 4: Evaluate and draw the influence lines for reactions, shears, and bending moments in beams and girders due to moving loads
- CO 5: Model and analyze structural systems (building) with the aid of software's

Reference Books:

1. Reddy C.S., Basic Structural Analysis, Tata McGraw Hill Publishing Company, New Delhi.
2. Structural Analysis 5ed. (2015) by Aslam Kassimali, Cengage.
3. Structural Analysis, 10th Edition by Russell C. Hibbeler, 2018, Pearson.
4. Matrix Analysis of Structures, SI Edition, by Aslam Kassimali, 2021 CL Engineering.



ANNEXURE – III

(Syllabus OC 7th Sem B.Tech Civil Engineering (2019
Admitted Batch))

[Handwritten signatures and initials in blue ink, including names like Anil, AKS, and others.]

ANNEXURE – III

SYLLABUS FOR OPEN CATEGORY COURSES (OCs) TO BE
OFFERED IN VII SEMESTER

Course Code: 900201

Course Name: Integrated Waste Management for Smart City

L	T	P	Credit
3	0	0	3

Course Objectives:

- 1) To provide broad knowledge on various aspects of planning & implementation of waste management system in a smart city/town.
- 2) To understand the principles applied in waste management.
- 3) To understand various ways to collect, treat & disposal of waste.
- 4) To understand various methods of energy recovery from waste.
- 5) To understand various aspects of hazardous waste management, E-waste management, biomedical waste management etc.

Syllabus:

Unit I:

Introduction to waste management, classification of solid waste, objective of solid waste management, principles of integrated waste management, 3R policy, various laws & rules of waste management (MSW Rules, hazardous waste management rules, E-waste rules etc.), role of various agencies in planning of waste management system, swachh bharat mission and smart cities program – implementation, current status, challenges and future trend of waste management.

Unit II:

Municipal solid waste – generation, composition, characterization, handling of waste at source, collection of waste – collection system, collection routes, collection equipments, transportation of waste, transfer stations, segregation and recycling of waste, disposal of waste through landfills – types of landfills, planning & operation of landfills, leachate management & control of gases in landfills, environmental monitoring of landfills.

Unit III:

Energy recovery from municipal solid waste - thermal conversion technologies, incineration, pyrolysis, gasification, environmental control system, biological & chemical conversion technologies, aerobic composting, anaerobic digestion, refuse derived fuels, other biological and chemical transformation methods.

Unit IV:

Hazardous waste management – characteristics, source, health effects, physiochemical treatment methods of hazardous waste, disposal of hazardous waste, Biomedical waste management – sources, health effects, issues in India, challenges, handling of biomedical waste.

Civil Engineering Department, MITS Gwalior

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous Institute affiliated to RGPV, Bhopal)

Unit V:

E-waste management – sources, health effects, issues in India, challenges, handling of E-waste. Plastic waste management – types of plastics, sources of plastic waste, impacts of plastic waste, plastic waste management practices. Management of construction & demolition wastes.

Course Outcomes:

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

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

CO 2: Apply various techniques of handling the waste.

CO 3: Apply various techniques of energy recovery from waste.

CO 4: Plan an effective & efficient waste management system.

Text Books:

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

Reference Books:

1. Environmental Engineering, Rowe, Peavy & Tchobanoglous, Tata McGraw Hill Publications, 2017
2. CPHEEO, Manual on Municipal Solid Waste management, Central Public Health and Environmental Engineering organization, Government of India, New Delhi, 2016
3. Solid Waste Engineering, Vesilind P.A., Worrel H. W. and Reinhard, Thomson Learning Inc, 2003



Course Code: 900202

Course Name: Project Planning & Control

L	T	P	Credit
3	0	0	3

Course Objectives:

- 1) To know about techniques of project planning.
- 2) To develop the network of project's activities.
- 3) To understand the precedence network technique.
- 4) To discuss the resource utilization in project.
- 5) To understand the project cost control.

Syllabus:

Unit I:

Project Planning:

Introduction to Project Planning Process, Types of Project Plans-Project feasibility plan, Project preliminary plan. Introduction to network techniques – CPM, PERT and Precedence network.

Project Work Breakdown – Levels of Project work breakdown, Identification of construction activities by work breakdown structure. Activity duration and methods of estimating activity duration – One time estimate three time estimates, trapezoidal distribution estimate. Duration estimation procedure.

Unit - II

Project Network Analysis:

Elements of Network, development of network, Numbering of events, Event times – Earliest events time and latest event time, Slack, critical events, Activity times – Earliest start time, Latest finish time, Float and critical activities, Network critical path and its significance, Network analysis by CPM – Defining scope of work, determining activities, establishing work package logic, preparation of network logic program and draft network. Numerical problems.

Unit-III

Precedence Network Analysis:

Precedence Network Analysis – Modeling procedure analysis of time in PN, Use of PN in repetitive works network, Difference between PN and CPM, Application of Network techniques and their limitations.

Unit-IV

Resource Planning:

Resources, Types of resources – renewable and non-renewable resources, Resource Histogram, Method of Resource allocation – resource smoothing and resource levelling.

Unit-V

Project Cost Control:

Direct and indirect cost, slope of direct cost curve, Total project cost and optimum duration, contracting the network for cost optimization, Escalate & Variation in prices.

Course Outcomes

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

CO 1: Know the project planning and project network.

CO 2: Analyze the network by CPM & PERT.



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous Institute affiliated to RGPV, Bhopal)

CO 3: Analyze the project using precedence network.

CO 4: Analyze the effect of resource planning on project.

CO 5: Evaluate the cost of project during planning.

Recommended Books:

1. Project planning and Control with PERT and CPM by Dr. B.C. Punmia, K.K. Khandelwal
2. CPM & PERT by L.S. Srinath
3. Construction Management by Sen & Gupta
4. CPM & PERT by Weist & Levy

A collection of handwritten signatures and initials in blue ink, scattered across the page. The signatures include 'AKS', 'Shan', 'H.', 'S.', 'A.', and 'B.', some with checkmarks or other marks next to them.

Course Code: 900213

Course Name: Urban Planning & Transportation Systems

L	T	P	Credit
5	0	0	5

Course Objectives:

- 1) To introduce the scope and nature of Urban Planning and Transportation Systems as disciplines.
- 2) To understand the objectives, domains and principles of town planning.
- 3) To study the urbanization trends in India - Issues, concerns and experiences, City planning process and implementation framework in Indian context.
- 4) To differentiate between types of plans and concepts in planning.
- 5) To understand how urbanization and why migration takes place in an urban region.
- 6) To understand the traditional and current planning processes and techniques involved in the urban and transportation planning.
- 7) To understand the urban governance, policies and strategies of the government to tackle issues of an urban environment.
- 8) To understand the impact of technology in both urban and transportation planning.

Syllabus:

Unit-I Introduction to planning discipline

Defining planning as a discipline, it's multidisciplinary nature, role of a planner, Objectives and Principles of Urban planning.

Fields of planning - Urban, regional, environmental, transport and infrastructure.

Evolution of settlements- Settlement size, pattern and structure as a function of sociocultural, economic, military and religious factors in historical cities.

Concepts of different types of cities like garden city, linear city etc.

Contributions of eminent planners: Lewis Mumford, Ebenezer Howard, Patrick Geddes, Sir Arthur Clarence Perry, Charles Correa, Le-Corbusier.

Unit-II Urbanization

Definition of urbanization, rural-urban migration, various definitions of town and country planning, goals and objectives of planning, socio-economic impacts of growth of urban areas, significance of Census and Demographics, impacts of urbanization, impact of Government Policies on urbanization, urban structure and form - land use distribution, different Land use planning norms.

Overview of Urban Governance Definition, concepts, components, government and governance, hierarchy and structure, forms of governance, process of inclusion and exclusion, 73rd and 74th Constitution Amendment Acts.

Unit-III Transportation Systems

Evaluation of urban structure: Transport system, infrastructure and management, transport systems and their types, urban road hierarchy, planning, and management criteria for road and junction improvements, arterial improvement techniques.

Transport survey and studies: study area definitions, survey and their types, sampling methods, survey techniques.

Transportation Planning Process and analytical techniques: Techniques for urban structures analysis, Urban travel characteristics,

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous Institute affiliated to RGPV, Bhopal)

Transport and environment: Traffic noise, factor affecting noise statement measures, standards, air pollution standards, traffic safety, accident reporting and recording systems, factors affecting road safety, transport planning for different target groups.

Unit-IV Planning in Indian Context

Introduction to types of plans with choice of appropriate scale- development plans, master plan, city development plan, structure plan, district plan, action area plan, subject plan, comprehensive planning, zonal plans etc., hierarchy of plans: regional plan, sub-regional plan, sector plans and spatial plans, town planning schemes, contents of base maps at various scales, notations, measurement of areas.

Database for planning and socio - economic surveys: data requirements for urban and regional planning, sources of primary and secondary data, questionnaire design, measurement scale and their application, sampling techniques; Objectives, types, and significance of planning surveys.

Role of URDPFI guidelines in Town planning, Urban Development Policies and Programmes at various levels.

Graphic presentation of statistical and spatial data.

Unit-V Current trends in urban planning and transportation systems

Indian scenario - Issues and Policies, Global scenario, Future trends of urbanization.

Review of existing traffic management schemes in Indian cities.

Impact of technology on urban forms and planning, role of disruptive innovations and disaster mitigation in urban planning, advanced transportation systems with their merits and demerits, Intelligent transport system (ITS) its types and applications.

Course Outcomes:

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

CO1: Explain the concepts for planning a city and land-use patterns.

CO2: Differentiate various theories used in urban planning.

CO3: Analyse various requirements for transportation systems.

CO4: Design approaches in addressing the issues and concerns of urban environment through planning.

CO5: Plan strategies for any project with an urban planning perspective as a member and/or leader in a team of planning projects.

Text Books:

1. A.B. Gillion and Simon Eisner, "The Urban Pattern", CBS Publishers and Distributors, Delhi.
2. Rishma A., "Town Planning in Hot Cities", Mir Publishers, Moscow.
3. Ward S (2002), "Planning the 20th Century City" John Wiler & Sons.
4. R. Ramachandran, "Urbanisation and Urban Systems in India", Oxford Publications.
5. K. C. Shivrama Krishnan, "Revisioning Indian Cities", Sage Publications.
6. ITPI reader
7. Bruton, M.J., "Introduction to Transportation Planning," Hutchinson Publication, London.
8. Kadiali, L.R., "Traffic and Transportation Planning", Khanna Publishers, Delhi.

Reference Books:

1. Broadbent, Geoffery: "Emerging Concepts in Urban Space Design". Van Nostand Reinhold, 1990.
2. Edmund Bacon, "Design of Cities", Penguin, 1976.
3. Francis Tibbalds, "Making people-friendly towns: improving the public environment in towns and cities", Longman, 1992.



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous Institute affiliated to RGPV, Bhopal)

1. Rob Krier, "Urban Space". Random House Incorporated, 1979.
2. Jonathan Barnett, "Urban design as public policy: practical methods for improving cities". Architectural Record Books, 1974.
3. Papacoster, C.S. And Prevedors, "Transportation Engineering and Planning". Prentice Hall of India.
4. Introduction to transport planning by Michael J Bruton
5. Principal of Urban transport system planning by Hutchinson

Handwritten signatures and initials:
A set of handwritten signatures and initials in blue ink, including names like "Anand", "NK", "P", "Shan", and "AS", along with various symbols and marks.

Course Code: 900226

Course Name: Safety & Quality Management

L	T	P	Credit
3	0	0	3

Course Objectives:

1. To study the basics of quality and safety management.
2. To learn the code of practice in design and construction for quality standards.
3. To understand and evaluate quality and safety management principles and best practices in construction.
4. To understand and evaluate safety management principles in construction.
5. To acquire good basic practices for quality system and progress for quality assurance and quality improvement for construction companies.

Syllabus:

Unit – I

Quality Management: Introduction – Definitions and objectives, Factors influencing construction quality; Responsibilities and authority; Quality plan; Quality Management Guidelines; Quality circles; cost of quality and safety; Quality transition - quality control and inspection; quality assurance; total quality management-principles, tools and techniques; Planning and control of quality during design of structures; Tools and techniques for quality management.

Unit – II

Quality Systems: Introduction - Quality system standard, ISO 9000 family of standards; Requirements-Preparing Quality System Documents; Quality related training; Implementing a Quality system; Third party Certification; Concepts of quality control- Objectives, definitions, and systems.

Unit – III

Quality Planning: Quality Policy, Objectives and methods in Construction industry; Consumers satisfaction, Ergonomics, Time of Completion, Statistical tolerance, Taguchi's concept of quality; Inspection procedures-Processes and products (materials and machinery); Total cost implication.

Quality Assurance and Quality Improvement Techniques:

Evolution of quality assurance, Objectives of quality assurance; Methods, Techniques and needs of quality assurance; Different aspects of quality Appraisals: Quality assurance in construction. Role of quality assurance in TQM process, Quality assurance standards. Developing and implementing quality assurance system, Quality Improvement Tools and Techniques, work study, method study and time study.

Unit – IV

Safety management : Planning for safety provisions, budgeting for safety, safety policy, Safety audit, safety management practices, safety survey, safety inspection, safety sampling, evaluation of performance of supervisors on safety; Construction hazards and safety guidelines; Overall accident investigation process; Risk management; Prevention techniques for construction accidents; Site management with regard to safety recommendations, Training for safety awareness and implementation; Construction safety and health manual.

Unit-V

Recent trends and Case studies: Quality and safety issues in steel construction, concrete construction (including pre-cast, and pre-stressed), computer aided hazard analysis

Course Outcomes:

After this course, students will be able to:

- CO 1:** Explain the quality management systems and utilize the ISO 9000 family of standards.
- CO 2:** Improve the quality of the project through tools and techniques.
- CO 3:** Perform the environmental impact assessment (EIA) for construction projects towards quality.
- CO 4:** Analyse the quality assurance and quality control, quality improvement tools and techniques;
- CO 5:** Evaluate the contract and inspection procedures.
- CO 6:** Identify the safety management practices in construction industry.

Reference Books:

1. B. G. Dale, Managing quality, 4th ed., Blackwell Publishing, Oxford, 2003.
2. D. Reese and J. V. Eidson, Handbook of OSHA construction safety and health, 2 nd ed., CRC Press, Bocaaton, 2006.
3. F. Harris, R. McCaffer and F. Edum-Fotwe, Modern construction management, 6 th ed., Blackwell Publishing, Oxford, 2006
4. K. Knutson, C. J. Schexnayder, C. M. Fiori and R. Mayo, Construction management fundamentals, 2 nd ed., McGraw Hill, New York, 2008.
5. S. J. Holt, Principles of construction safety, Blackwell Publishing, Oxford, 2008.
6. The Management and Control of Quality: Sixth edition: James R.Evans, William M.Lindsay.
7. Safety management by John V.Grimaldi Rollin H.Simonds.
8. ISO 9000 family of standard



ANNEXURE – IV

(List of Experiment of DLC courses offered in B.Tech VII
Semester (2019 Admitted Batch))

(Handwritten signatures and initials in blue ink)

Signature 1: Adarsh
Signature 2: Sh
Signature 3: AKIP
Signature 4: SB
Signature 5: KK
Signature 6: Shan
Signature 7: hi
Signature 8: g
Signature 9: g
Signature 10: h

ANNEXURE – IV

List of Experiment of DLC courses offered in B.Tech VII Semester (2019 Admitted Batch)

Course Code: 110701

Course Name: Software Application for Solving Civil Engineering Problems

L	T	P	Credit
0	0	4	2

Course Objectives:

- 1) To practice various software's used in civil engineering design & analysis.
- 2) To practice MATLAB & QGIS.
- 3) To practice various other software's and its applications in civil engineering works.

List of Experiments:

1. Design and analysis of reinforced concrete beam using STADD software.
2. Design and analysis of reinforced concrete slab using STADD software.
3. Design MATLAB code to develop load-response curve for different load conditions for a beam designed of experiment 1.
4. Application of QGIS in preparation of vector map of major city and preparation of land use and land cover maps.
5. Determination of critical network for a construction project using PRIMEVERA/ MS-Project.
6. To prepare an estimation of Multi-storey building and Road using MS-Excel.
7. Design water supply networks through Hardy Cross method. (Loops, EPANET and other software's).
8. Design Sewer networks using Hidra software.
9. Development of Geo-contour map by total station.
10. Estimation of axel load (msa) through IRC 37: 2015 using MS Excel.
11. Design and analysis of multi-storey building using E-tabs software.

Course Outcomes

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

CO 1: Design various beams, slabs & multistorey building's using various software's.

CO 2: Design water supply & sewer networks using various software's.

CO 3: Practice MS Excel in estimation works.

CO 4: Produce land use land cover maps and geo contour maps using various software's.

CO 5: Practice Primavera and MS-Project softwares.

Handwritten signatures

Handwritten signature

Handwritten signature

Handwritten signature

Handwritten signature

Handwritten signature

Course Code: 110703

Course Name: Creative Problem Solving

L	T	P	Credit
0	0	2	1

Course Objectives:

- 1) To create an interest in students to provide solutions to various on field problems of civil engineering.
- 2) To provide solutions to various on field problems of civil engineering.

List of Experiments

1. Traffic Survey of Major Road's in the city.
2. Design of Traffic Signal.
3. Performance evaluation of new building materials.
4. Determination of residual life of structure.
5. Identification of occupational diseases.
6. Identification of solid waste collection problems in a locality and subsequent proposal of the solutions to those problems.
7. Determination of surface roughness index of road.
8. Use of waste materials for construction of pavement layers.
9. Creation of data bank of water resources in the city.
10. Industrial visit and joint solution of problems in industry.

Course Outcomes

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

CO 1: Identify various on field problems.

CO 2: Practice various methods to solve problems.

CO 3: Produce solutions to various problems.

CO 4: Demonstrate various problems solving skills.

ANNEXURE – V

(Scheme of B.Tech Civil Engg. Vth Semester (for
2020-2021 admitted batch))

[Handwritten signatures and initials]

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute affiliated to RG/PV, Bhopal)

DEPARTMENT OF CIVIL ENGINEERING

Scheme of Evaluation

B. Tech. V Semester (Civil Engineering)

For batches admitted in academic session 2020-21 onwards

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allowed						Total Marks	Contact Hours per week			Total Credits	Mode of Teaching (Offline/Online)	Mode of Exam		
				Theory Slot				Practical Slot			Total	T	L				P	
				End Term Evaluation		Continuous Evaluation		End Sem Exam	Continuous Evaluation									
				End Sem Exam	Pficiency in subject/course	Mid Sem	Quiz/Assignment		Lab Work & Seasonal									Skill Based Mini Project
1.	110520	DC	Data Science	50	10	20	20	60	20	20	200	1	0	2	4	Blended (2:1)	MCQ	
2.	110511	DC	Water Supply Engineering (II) - (10)	50	10	30	20	60	20	20	200	2	0	2	4	Blended (2:1)	PP	
3.	110512	DC	Theory of Structure - II (10) - (20)	50	10	20	20	-	-	100	2	1	-	3	Blended (2:1)	PP		
4.	110513	DC	Structural Design & Drawing (RCC) (10)	50	10	20	20	-	-	100	2	1	-	3	Blended (2:1)	PP		
5.	110514	DC	Fluid Mechanics - II (10) - (10)	50	10	30	20	-	-	100	2	1	-	3	Blended (2:1)	PP		
6.	110515	DEC	Minor Project - I (10) - (10)	-	-	-	-	60	40	100	-	-	4	2	Offline (2:0)	PP		
7.	110516	DEC	Self-learning/Presentation (SWAYAM/NPTEL/MOOC) (10)	-	-	-	-	-	40	-	40	-	-	2	0	Online - Monitoring	MCQ	
8.	200XXX	DC	Naval Engaging Course (10) - (10)	-	-	-	-	50	-	50	-	-	2	1	Face-to-face	MCQ		
9.	110517	DEC	Summer Internship Project-II (10) - (10)	-	-	-	-	60	-	60	-	-	4	2	Offline (2:0)	MCQ		
Total				250	50	100	100	290	120	40	950	11	4	16	23	-	-	
10.	1000006	DC	Discrete Mathematics	50	10	30	20	-	-	100	2	-	-	2	Grade	Online	MCQ	
11.	1000005	DC	Project Management & Planning	50	10	20	20	-	-	100	2	-	-	2	Grade	Online	MCQ	

Additional Courses for Straining Honours or Minor Specialization Permitted to opt for **maximum 02 additional courses** for the award of Honours or Minor Specialization


(Courses to be selected by the student based on SWAYAM/NPTEL/MOOC evaluation through attendance, assignments and presentation)

Practicals in course subject - include the weightage towards ability/skill/competence/knowledge level/cognitive attitude/attendance etc. in that particular course/subject

MCQ - Multiple Choice Questions, PP - Pen paper Mode, A+O - Assignment + Oral, SO - Submission + Oral

The Minor Project-I may be evaluated by an internal committee for awarding internal marks.

Mode of Teaching						Mode of Examination						
Theory		Blended		Lab	Seminar	Theory		Theory		Lab	SIP/SP/NEC	
Offline	Online	Offline	Online	Offline	Online/Monitoring	Interactive	PP	A+O	MCQ	SO	SO	SO
-	-	10	5	4	1	1	12	-	3	4	4	4
-	-	43%	22%	27%	4%	4%	52%	-	14%	17%	17%	17%


DEAN (ACADEMICS)
MLITS GWALIOR

Civil Engineering Department, MLITS Gwalior

DEPARTMENT OF CIVIL ENGINEERING

SYLLABUS B.Tech Civil Engineering

**2020 ONWARDS ADMITTED
BATCHES**



SEMESTER-V

Handwritten signatures and marks:
A series of handwritten signatures and marks in blue ink, including a checkmark, a signature, and several other illegible signatures.

Course Code: 110511
Course Name: Water Supply Engineering

L	T	P	Credit
2	1	2	4

Courses Objectives:

Students will be able to understand

- 1) The structure of drinking water supply systems, including water transport, treatment and distribution.
- 2) Water quantity and water quality criteria and standards, and their relation to public health.
- 3) Operation and maintenance of water supply system components.
- 4) How to estimate water requirement of a city
- 5) How to design water treatment plant for urban & rural areas
- 6) How to design water distribution network including pipe & appurtenances.

Syllabus:

Unit-I

Water demand (types variation, factors affecting it), Design period, population forecasting methods, estimation of water requirement of cities, Sources of Water, Source selection, underground water quality & quantity, characteristics of water (laboratory method & effects), water borne diseases, standards for drinking water.

Unit-II

Water treatment flow diagram, design, construction, working of (Aerators, screens, plain sedimentation tank, tube settlers), coagulants & coagulation, flocculation, feeding and mixing of coagulants, optimum dose of coagulants, design & working of clarifloculator, filtration (Theory & types), Design, operation & construction of slow sands & Rapid sand gravity filters, pressure filters.

Unit-III

Disinfectants (types) & disinfection method of disinfection, chlorine & chlorine compounds, types of chlorination, Hardness (Causes & types), various methods of softening, Recarbonation, calculation of chemical requirements, Removal of colour, odor, Taste, Iron & manganese, algae removal, fluoridation / defluoridation, desalination, latest treatment techniques.

Unit-IV

Intake structures (location, types & design), conduits for transporting water, forces on conduits, types of pressure pipe, joints, corrosion of pipe (causes & control), pipe appurtenances (design), pumping of water (numerical problems), types of pumps, Economical diameter of rising main (numerical), pumping stations.

Unit-V

Requirement of good distribution system, layout of distribution, methods of distribution, Distribution reservoir and calculation of its capacity, fixing size of pipe, Analysis of pipe networks (Hardy cross method, Equivalent pipe method), appurtenances used in distribution networks, water supply & pumping system in building, Rural water supply.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Courses Outcomes:

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

- CO 1: **Explain** the concepts of water supply engineering.
- CO 2: **Determine** the requirements for safe supply of water.
- CO 3: **Apply** suitable water treatment technique based upon the available data.
- CO 4: **Analyse** a given water supply scheme.
- CO 5: **Design** a water supply system based upon the needs of society.

Text Books:

1. Water Supply Engg., B. C. Punmia, Laxmi Publication (P) Ltd, New Delhi, 2016
2. Water Supply Engg., S. K. Garg, Khanna Publishers New Delhi, 2017

Reference Books:

1. Water Supply & Sanitary Engg., G.S. Birdie, Dhanpat Rai Publishing Company, 2014
2. Water & Waste Water Technology, Mark J Hammer, Prentice Hall of India, 6th edition, 2008
3. Environmental Engineering, Peavy, Rowe & Tchobanoglous, McGraw Hill Publication, 2017
4. Manual of Water Supply and Treatment by CPHEEO, GOI, 2009

List of Experiments:

1. Determination of pH of a given water sample.
2. Determination of Total Solids, Dissolved Solids and Suspended Solids of water sample.
3. Determination of Chloride concentration in water sample.
4. Determination of turbidity of water sample using turbidity meter.
5. Determination of acidity of the water sample.
6. Determination of alkalinity of the water sample.
7. Determination of Hardness of the water sample.
8. Determination of D.O concentration of a given water sample.
9. Determination of optimum dose of coagulants required for the treatment of a given water sample.
10. Determination of MPN of the given water sample.
11. Determination of Sulphate of a given water sample.
12. Determination of Nitrate of a given water sample.

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

- CO 1: **Follow** sampling procedure & other guidelines for sampling & analysis of water samples.
- CO 2: **Check** various water quality parameters.
- CO 3: **Improve** the water quality by suggesting suitable corrective measures.
- CO 4: **Train** others on various ways of improving the quality of water.



Course Code: 110512

Course Name: Theory of Structure - II

L	T	P	Credit
2	1	0	3

Course Objectives:

- 1) To understand the analytical procedure related to the analysis of building frame by some classical methods viz. Kani's methods and approximate methods of analysis.
- 2) To study the multi storey frames subjected to gravity loads and lateral loads
- 3) To understand matrix method and its application for computer based analysis of structure.
- 4) To understand the influence line concepts for indeterminate structures
- 5) To develop the skill to deal with the problems of moving loads in the structures & their analysis techniques.
- 6) To understand the concepts of plastic analysis of structures.

Syllabus:

Unit - I

Moment distribution method in analysis of frames with sway, Analysis of box frames, analysis of beams and frames by Kani's methods.

Unit - II

Analysis of tall frames, Calculation of various loads including wind and earthquake loads, Introduction to Code provisions for lateral loads, Approximate analysis of multistorey frames for vertical and lateral loads.

Unit - III

Matrix Method of Structural Analysis: Force method and displacement method.

Unit-IV

Rolling Load and Influence Lines

Maximum SF & BM curves for various types of Rolling loads, EUDL, Influence Lines for determinate structural beams, Trusses, Three Hinged Arches.

Unit-V

Plastic analysis of beams & frames

Course Outcomes:

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

- CO 1: Explain various methods for analysis of structures and frames.
- CO 2: Analyse various loads on framed structures using codal provisions.
- CO 3: Analyse different type of structures for various load conditions by different methods.
- CO 4: Draw influence line diagrams for statically determinate & indeterminate structure.
- CO 5: Analyse beams & frames using plastic analysis.

Text Books:

1. Intermediate structural analysis, Wang C.K., McGraw Hill, New York, 1984
2. Basic Structural Analysis, Reddy C. S., Tata McGraw Hill Publishing Company, 2017
3. Theory of Structures, S. Ramamrutham, R. Narayanan, Dhanpat Rai Publications, 9th edition, 2014

Reference Books:

1. Elementary Structural Analysis, Norris C.H., Wilbur J.B. McGraw Hill International
2. Structural Analysis, Aslam Kassimali, C. I. Publisher, 2014
3. Structural Analysis, R. C. Hibbler, Pearson Publication, 2017
4. Indeterminate Structural Analysis, Kinney Sterling J., Addison Wesley
5. Matrix Methods of Framed Structures, Weaver W & Gere J. M., CBS Publishers, Delhi

Handwritten signatures and initials in blue ink, including "AD", "db", "NK", "PP", "A", "mya", "K", "S", "A", and "Z".

Course Code: 110513

Course Name: Structural Design & Drawing (RCC)

L	T	P	Credit
2	1	0	3

Course Objectives:

- 1) To understand various design philosophies for RC components.
- 2) To study the desired properties of steel and concrete for use in Reinforced concrete.
- 3) To learn design of RC elements for flexure and deflection.
- 4) To learn design of RC elements for shear and bond as per relevant IS codes.
- 5) To learn design of RC elements subjected to compression.

Syllabus:

Unit-I

Design principles: Materials; Introduction to IS 456; Design philosophies: Working stress, Ultimate load and Limit state design

Singly reinforced beam sections: Analysis and design of singly reinforced rectangular beams; Lintel, Cantilever, Simply supported beams; Design for deflection.

Unit-II Design of Beams:

Design for Shear; Design for bond; Doubly-reinforced and Flanged sections; Design of Continuous beams

Unit-III Design of Slabs:

Slabs spanning in one direction: Cantilever, Simply supported and Continuous slabs; Slabs spanning in two directions; Circular slabs

Unit-IV Columns & Footing:

Design of short columns subjected to axial loads, axial load and bending moments (section with no tension); Design of long columns; Introduction to IS 13920; Design of isolated and combined footings.

Unit-V Staircases:

Design of Staircases with waist slab: straight flight, dog legged, and open well staircase with different support conditions; Design of Tread-riser (without waist slab) staircase.

Course Outcomes:

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

CO1: **Apply** the concepts of different design philosophies for deriving basic expressions used in RC design.

CO2: **Determine** the capacity of RC elements using IS456 guidelines.

CO3: **Analyze** the RC elements for determining design variables as per IS456 & IS875 recommendations.

CO4: **Design** the RC elements as per IS 456 provisions.

CO5: **Develop** the design sketches for RC elements as per IS456, IS13920 and SP34 provisions.

Text Books:

1. Reinforced Concrete Limit State Design, A.K. Jain, Nem Chand Pub., 7th edition, 2012
2. Reinforced Concrete, Pillai & Menon, Tata McGraw Hill, New Delhi, 3rd edition, 2017.
3. Limit State Design, P.C. Varghese, Prentice Hall of India, New Delhi, 2nd edition, 2008
4. RCC Design, Neelam Sharma, Katson Publishers, 2014

Reference Books:

1. Reinforced Cement Concrete, P. Dayaratnam, Medtech Publishers, 5th edition, 2017
2. Reinforced Concrete Design, S.N. Sinha, Tata McGraw Hill, 3rd edition, 2017
3. Plain and Reinforced Concrete, O.P. Jain and Jai Krishna, Nem Chand Pub, 8th edition, 2008
4. Reinforced Cement Concrete, Winter & Nelson, McGraw Hill, 11th edition, 1991

Handwritten signatures and initials in blue ink, including names like 'Aad', 'AKS', 'Prasad', 'S', 'B', 'H', and 'H'.

Course Code: H0514

Course Name: Fluid Mechanics – II

L	T	P	Credit
2	1	0	3

Course Objectives:

- 1) To develop an understanding of fluid flows patterns and learn to use boundary layer theory and drag.
- 2) To apply theories of laminar & turbulent flow to solve typical pipe flow problems in the field.
- 3) To apply boundary layer theory to estimate drag & lift for various shapes of the objects.
- 4) To classify the types of flows in open channel and also to design open channel sections in a most economical fashion with minimum wetted perimeter and learn about critical flows.
- 5) To study about non uniform flows in open channel and longitudinal slopes in open channel and also to learn about the characteristics of hydraulic jump.
- 6) To understand design philosophy of various types of pumps & turbines.

Syllabus:

Unit-I

Turbulent Flow: Laminar and turbulent boundary layers and laminar sub layer, hydro dynamically rough boundaries, velocity distribution in turbulent flow, Resistance of smooth and artificially roughened pipes, Commercial pipes, aging of pipes.

Pipe Flow Problems: Losses due to sudden expansion and contraction, losses in pipe fittings and valves, Concepts of equivalent length, Hydraulic and energy gradient lines, Siphon, Pipes in series, in parallel, Branching of pipes (Hardy Cross method)

Pipe Network: Water hammer (only quick closure case) transmission of power.

Unit - II Forces on immersed bodies:

Introduction, Force Exerted by a flowing fluid on a stationary body, Expression for Drag & Lift, Drag on a sphere, Terminal velocity of a Body, Drag on a cylinder, Introduction to Development of Lift on a Circular Cylinder and an Airfoil

Unit – III Uniform Flow in open Channels:

Channel geometry and elements of channel section, Velocity distribution, Energy in open channel flow, Specific energy, Types of flow, Critical flow and its computations, Uniform flow and its computations, Chezy's and Manning's formulae, Determination of normal depth and velocity, Normal and critical slopes, Economical sections.

Unit - IV Gradually varied flow

Basic assumptions and dynamic equations of gradually varied flow, characteristics analysis and computations of flow profiles, rapidly varied flow-hydraulic jump in rectangular channels and its basic characteristics, Surges in open channels.

Unit - V Introduction to Fluid Machinery: Turbines & Pumps

Turbines: Classifications, definitions, Similarity laws, Specific speed and unit quantities, Pelton turbine – their construction and settings, Speed regulation, Dimensions of various elements, Action of jet, Torque, Power and efficiency for ideal case, Characteristics curves, Reaction turbines construction & setting, Draft tube theory, Runaway speed, Simple theory of design and characteristic curves, Cavitation.

Pumps: Principle of working & criteria for selection of different types of pump, viz. Centrifugal, Reciprocating

(Handwritten signatures and initials in blue ink)

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Course Outcomes:

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

- CO 1: Differentiate different types of fluid flow & fluid machines.
- CO 2: Describe principles of analysis of fluid flow problem.
- CO 3: Explain basic principles for measurement of different forces acting on fluid body.
- CO 4: Analyze pipe flow, open channel flow problems & various characteristics of hydraulic machines.
- CO 5: Design open & closed conduit systems.

Text Books:

1. Fluid Mechanics, Modi & Seth, Standard Book house, Delhi, 21st edition, 2017
2. Open Chanel Flow, K. Subramanya, Tata McGraw Hill, New Delhi, 5th edition, 2019

Reference Books:

1. Open Channel Flow, Rangaraju, Tata Mc Graw Hill Publishing Comp. Ltd., New Delhi, 1st edition, 2001
2. Fluid Mechanics, A.K. Jain, Khanna Publishers, Delhi, 1988
3. Fluid Mechanics, Hydraulics & Hydraulic Mechanics, K.R. Arora, Standard Publishers, 2009
4. Open Channel Hydraulics, Chow V.T., McGraw Hill, New York, 5th edition, 2009

Handwritten signatures and initials in blue ink, including names like 'AKP', 'Shan', 'K. As', and 'Sri'.

Madhav Institute of Technology and Science, Gwalior

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

DATA SCIENCE (COURSE CODE 110520)

COURSE OBJECTIVES:

- To provide the fundamental knowledge of Data Science.
- To present the basic representation and exploratory data analysis used in Data Science.
- To understand the working of techniques used in Data Science.

Unit 1

Need for data science, benefits and uses, facets of data, data science process, Introduction of basics python tool, Setting working Directory, Creating and saving a script file, File execution, removing variables from environment, clearing environment, Commenting script files, Variable creation, Data types and associated operations, Arithmetic and logical operators.

Unit 2

Control structures, loop, Functions, data structures: Lists, Arrays, Tuples, Dictionary, Sets, NumPy library, Data Collection: Getting to know your data, Types of Data, Data collection strategies, Data Pre-processing, Feature engineering, Exploratory Data Analytics.

Unit 3

Descriptive Statistics, Mean, Standard Deviation, Skewness and Kurtosis, inferential statistics: hypothesis testing, probability: probability theory, conditional probability, Pandas library, dataframe and dataframe related operations, Reading files.

Unit 4

Data Cleaning and Preparation, Handling Missing Data, Data Transformations using pandas and sklearn library, Removing Duplicates, Replacing Values, Detecting Outliers, Data visualization on different dataset using matplotlib and seaborn libraries, Scatter plot, Line plot, Bar plot, Histogram, Box plot, Pair plot.

Unit 5

Supervised learning: Regression, classification, Linear regression, logistic regression, decision tree, tree creation with entropy and information gain, ID3 algorithm, random forest, naïve bayes theorem, K-nearest neighbor and ensemble methods for solving real world problems. Unsupervised learning: Clustering, Reinforcement learning.

(Handwritten signatures and initials)

BOOKS AND REFERENCES

1. Mastering python for data science, Samir Madhavan
2. Introduction to linear algebra - by Gilbert Strang
3. Applied statistics and probability for engineers - by Douglas Montgomery
4. Pattern Recognition and Machine Learning, Christopher M. Bishop

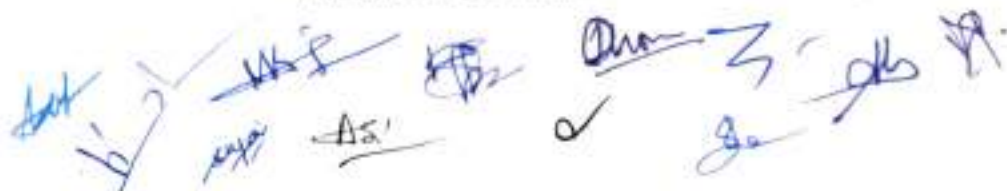
COURSE OUTCOMES:

After completing the course, the student will be able to

- CO1: define different Data Science techniques.
- CO2: illustrate various tools used for Data Science technique.
- CO3: apply data visualization techniques to solve real world problems.
- CO4: build exploratory data analysis for Data Science methods.
- CO5: apply Data Science techniques for solving real world problems.
- CO6: evaluate the performance of algorithms in data science.

List of Programs

1. Perform creation, indexing, slicing, concatenation and repetition operations on Python built-in data types: Strings, List, tuples, dictionary, set
2. Solve problems using decision and looping statements.
3. Apply python built-in data types: Strings, List, tuples, dictionary, set and their methods to solve any given problem.
4. Handle numerical operations using math and random number functions
5. Manipulation of NumPy arrays – Indexing, Slicing, Reshaping, Joining and Splitting.
6. Computation on NumPy arrays using universal functions and mathematical methods.
7. Import a CSV file and perform various statistical and comparison operations on rows/columns.
8. Create Pandas series and data-frame from various inputs.
9. Import any CSV file to Pandas data-frame and perform the following –
 - Visualize the first and last 10 records
 - Get the shape, index and column details
 - Select / Delete the rows / columns based on conditions
 - Perform ranking and sorting operations
 - Do required statistical operations on given columns
 - Find the count and uniqueness of the given categorical values
 - Rename single / multiple files
10. Import any CSV file to Pandas data-frame and perform the following –
 - Handle missing data by detecting and dropping / filling missing values.
 - Transform data using different methods
 - Detect and filter outliers
 - Perform vectorized string operations on Pandas series
 - Visualize data using line plots, bar plots, histograms, density plots and scatter plots
11. Use the scikit-learn package in python to implement the regression model and its related methods



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous Institute affiliated to RGPV, Bhopal)

Course Code: 1000005

(For batches admitted in 2021-2022 & onwards)

Course Name: Project Management and Financing

L	T	P	Credit
2	0	0	GRADE

Course Objectives:

- 1) To know about project, its attributes and essentials of project planning
- 2) To develop the project network
- 3) To take rational decisions using project networks for successful completion of the projects
- 4) To decide about about rational utilization of resources in project.
- 5) To have an elementary idea of finances involved in a project and managing it

Unit I:

Project Planning:

Introduction to Project Management. Difference between Project and Production. Attributes of a Project. Time, Cost, Quality and Safety. Stakeholders of a Project, Project life cycle. Project Planning: Types of Project Plans and feasibility.

Unit-II:

Project Network logic: Project Networking and work flows. Activity duration and methods of estimating activity duration – One time estimate three time estimates, Duration estimation procedure. Use of Bar Charts, Mile stone charts and networks, Network representation schemes: Activity on Arrow and Activity on Node Networks (A-o-A & A-o-N). Logic behind developing project network and simple network calculations. Critical paths and floats.

Unit-III:

Decision making through networks: CPM, PERT & PDM:

Use of network in Decision Making: Importance of critical path, Monitoring the progress and updating the project plan. Use of floats in Resource smoothening. Introduction to Precedence Diagramming Method (PDM), Different lag and lead relations in terms of SS(Start to Start), SF(Start to Finish), Finish to Start(FS), and Finish to Finish(FF) and composite relations.

Unit-IV:

Project Cost Control: Breakeven analysis in planning stage, Direct and indirect cost, slope of direct cost curve, Total project cost and optimum duration, contracting the network for cost optimization. Escalation & Variation in prices.

Unit-V:

Projects Financing:

Introduction to project financing: Role of governments in financing projects. Funder and Concessionaire: Economic multiplier effects of Projects; Means of financing-public finance and private finance, Granting authority; World Bank Group, IMF,ADB, Micro and Small Enterprises Funding Scheme (MSME). Elementary understanding of Procurement of infrastructure projects through Public Private Partnership (PPP) route, Build Operate Transfer (BOT), Build Operate Own & Transfer (BOOT); Stakeholders' perspectives. Lifecycle of PPP projects, Micro & Macro economics concepts and its application in Project Financing.

Civil Engineering Department, MITS Gwalior

48

[Handwritten signatures and initials in blue ink are present at the bottom of the page.]

Course Code: 1000006

Course Name: Disaster Management

L	T	P
2	-	-

Course Objectives:

- i) To understand basic concepts in Disaster Management
- ii) To understand Definitions and Terminologies used in Disaster Management
- iii) To understand Types and Categories of Disasters
- iv) To understand the Challenges posed by Disaster
- v) To understand Impact of Disasters key skills

Syllabus:

Unit 1: Introduction to disaster management, concepts and definitions: disaster, vulnerability, risk severity, frequency and details, capacity impact, prevention, mitigation.

Unit 2: Disasters – Disasters classification, demographic aspects (gender, age, special needs); hazard locations; global and national disaster trends, hazard and vulnerability profile of India.

Unit 3: Disaster Impacts – Disaster impact (environmental, physical, social, ecological, economic, political, etc.); health, psycho-social issues, impact of natural disasters (floods, draught, cyclones, volcanoes, earthquakes, tsunami, landslides etc.), impact of manmade disasters (industrial pollution, artificial flooding in urban areas, urban disasters, transportation accidents etc.).

Unit 4: Disaster Risk Reduction (DRR)- Disaster management cycle- its phases; prevention, mitigation, preparedness, relief and recovery; structural and non- structural measures; risk analysis, vulnerability and capacity assessment; early warning systems, Post disaster environmental response. Roles and responsibilities of government, community, local institutions, NGOs and other stakeholders; Policies and legislation for disaster management. DRR programmes in India and the activities of National Disaster Management Authority.

Unit 5: Disasters, Environment and Development – Factors affecting vulnerability such as impact of development projects and environmental modifications (including of dams, land use changes, urbanization etc.), sustainable and environmental friendly recovery; reconstruction and development methods.

Course Outcomes:

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

- CO1: Identify disaster prevention and mitigation approaches.
- CO2: Classify global and national disasters, their trends and profiles.
- CO3: Determine the impacts of various disasters.
- CO4: Apply Disaster Risk Reduction in management.
- CO5: Infer the linkage between disasters, environment and development.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Text Books:

1. Pradeep Sahni, 2004, Disaster Risk Reduction in South Asia, Prentice Hall.
2. Ghosh G.K., 2006, Disaster Management, APH Publishing Corporation
3. Srivastava H.H. & Gupta G.D., Management of Natural Disasters in developing countries, Daya Publishers Delhi, 2006.

Reference Books:

1. <http://ndma.gov.in> (Home page of National Disaster Management Authority)
2. <http://www.ndmindia.nic.in/> (National Disaster Management in India)
3. Singh B.K., 2008, Handbook of Disaster Management: Techniques & Guidelines, Rajat Publication.
4. National Disaster Management Policy, 2009, GOI.
5. Inter Agency Standing Committee (IASC) (Feb. 2007), IASC Guidelines on Mental Health and Psychosocial Support in Emergency Setting. Geneva: IASC



ANNEXURE – VII

(Suggestive List of Skill Based Mini Projects for
B.Tech Vth Semester Civil)

[Handwritten signatures and initials in blue ink]

ANNEXURE – VII

Suggestive List of Skill Based Mini Projects for B.Tech Vth Semester

110511. Water Supply Engineering:

1. Estimation of drinking water requirement for various locations including new upcoming localities in and around Gwalior city.
2. Design of water supply & distribution layout system for various new upcoming localities in and around Gwalior city.
3. Study of existing water supply & distribution scheme available for Gwalior city and suggest improvement in it.
4. Study of existing water supply sources and determination of water quality of those sources.
5. Determination of water quality characteristics of various localities in and around Gwalior city.
6. Draw a water quality map for various localities in and around Gwalior city.
7. Comparative analysis of water quality between Municipal Corporation supplied water in city & R.O. treated water.
8. Study of new water treatment plant in the city.
9. Design of water treatment system for new upcoming localities in and around Gwalior city.
10. Performance evaluation of existing water treatment plants in city.

Handwritten signatures and initials in blue ink, including names like AKF, ASR, and others, along with checkmarks and scribbles.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
 [A Govt. Aided UGC Autonomous & NAAC Accredited Institute affiliated to RGPV, Bhopal]

DEPARTMENT OF CIVIL ENGINEERING
Scheme of Evaluation
B. Tech. III Semester (Civil Engineering)

For batches admitted in academic session 2021-22 onwards

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted							Total Marks	Contact Hours per week			Total Credits	Mode of Teaching (Offline/Online)	Mode of Exam
				Theory Slot				Practical Slot				L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem Exam	Continuous Evaluation								
				End Sem Exam	Proficiency in subject/course	Mid Sem	Quiz Assignment		Lab Work & Seminars	Skill Based Mini Project							
1.	100025	BSC	Engineering Mathematics – II (101) (30)	30	30	20	20	-	-	-	100	2	1	-	3	Offline (30)	PP
2.	110311	DC	Building Materials & Construction (10) (20)	30	30	20	20	40	30	20	200	2	1	2	4	Blended (2:1)	PP
3.	110312	DC	Fluid Mechanics - I (101) (30)	30	30	20	20	40	20	20	260	2	1	2	4	Blended (2:1)	PP
4.	110313	DC	Surveying (10) (30)	30	30	20	20	-	-	-	100	2	1	-	3	Blended (2:1)	PP
5.	110314	DC	Strength of Materials (10) (30)	30	30	20	20	60	20	20	210	2	1	2	4	Blended (2:1)	PP
6.	110315	DI-C	Survey Practise Lab (101) (20)	-	-	-	-	60	20	20	100	-	-	2	1	Offline (1:3)	SA
7.	110316	DI-C	Scheduling (Presentation) (SW AS/MS/PEP/MS/OC)	-	-	-	-	-	40	-	40	-	-	2	1	Online - Assignment	SA
8.	200AAA	-	Novel Engaging Course	-	-	-	-	30	-	-	30	-	-	2	1	Interactive	SA
9.	110317	DI-C	Summer Internship Project-I	-	-	-	-	60	-	-	60	-	-	4	2	Offline (2:0)	SA
Total				290	50	100	100	350	120	80	1650	10	5	10	23	-	-
10.	1000005	-	-	60	10	20	20	-	-	-	100	2	-	-	Grade	Online	MCQ

Grading is done for all courses except for the SA (Skill Based) courses. Evaluation through assignments, assignments and presentation. Performance in course/subject includes the weighting marks (theory/skill/competence/knowledge level) respective afforded attendance etc. in that particular course/subject.
 MCQ - Multiple Choice Questions, PP - Pen paper Mode, A+O - Assignment + Oral, SA - Submission + Oral

Mode of Teaching										Mode of Examination			
Theory				Lab/SIP	Seminar	NEC	Theory			Lab	SIP/SE/NEC		
Offline	Online	Blended		Offline	Online Mentoring	Interactive	PP	A+O	MCQ	SA	SA		
3	1	5	4	0	1	1	15	-	4	1	1		
11%	3%	16%	13%	0%	3%	3%	45%	-	13%	3%	3%		

Handwritten signatures and stamps:
 - Signatures: Anil, NKS, etc.
 - Stamp: CIVIL ENGINEERING DEPARTMENT, MITS GWALIOR
 - Stamp: DEAN (ACAD/DCS), MITS GWALIOR

DEPARTMENT OF CIVIL ENGINEERING

SYLLABUS B.Tech Civil Engineering

2021 ONWARDS ADMITTED BATCHES



Course Code: 110311

Course Name: Building Materials & Construction

L	T	P	Credit
2	1	2	4

Course Objectives:

1. To study the properties of concrete ingredients i.e. cement, Sand and coarse aggregate by conducting different tests.
2. To select of different types of admixtures to improve the properties of concrete for different field applications.
3. To conduct the field and laboratory tests on concrete in fresh and hardened state.
4. To provide knowledge about various types of bricks, stones, woods & timber, ferrous & nonferrous construction material & their applications.
5. To provide knowledge on design of foundation, including selection of appropriate foundation.
6. To understand laying & construction of brick & stone masonry and various methods of damp proofing etc.
7. To provide knowledge about stairs, floors & roofs in various types of buildings.

Syllabus:

Unit-I

Types of Foundation & its design: masonry construction, masonry classification, stone vs brick masonry, joints in stone masonry, brick masonry (bonds in brick masonry, characteristics of bonds, type of bonds), typical structures in brickwork, Damp prevention (causes, effects, control & prevention techniques, material used for damp proofing), Anti termite treatment, water proofing treatment, Arches & lintels, stair & stair case, (types & design of stair case), Types of floor & flooring, Roof & roof covering.

Unit – II

Ingredients of Concrete: Portland cement Chemical composition of cement, Hydration of cement, setting of cement, tests on physical properties of cement. Types of Portland cement – Ordinary Portland cement – Rapid Hardening Portland cement – low heat Portland cement- Sulphate Resisting cement – Portland Blast furnace cement- Super Sulphated cement- Portland Pozzolana cement and Pozzolanas: Fly ash; use of pozzolanas, white cement, Expansive cements – High alumina cement.

Aggregates: General classification of aggregates, natural and artificial aggregates, particle shape and texture, bond of aggregate, strength of aggregate, Mechanical properties of aggregate, specific gravity, Bulk density, porosity and absorption of aggregate, moisture content of aggregate, Bulking of sand deleterious substances in aggregates, organic impurities. Soundness of aggregates, Alkali-aggregate reaction, Alkali carbonate reaction, sieve analysis – Grading curves, Fineness modulus, Grading requirements, Grading of fine and coarse aggregates and Gap graded aggregates. Thermal properties of aggregates.

Admixtures: Introduction, functions of admixtures, classification of admixtures, Accelerators, Retarders, Water Reducing Agents, Super plasticizers.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Unit-III

Fresh and Hardened Concrete Fresh Concrete, Workability of concrete, factors affecting workability, measurement of workability using slump test, Compaction factor test, Flow test, Vee-Bee Test, Ball penetration test, Nasser's 'K' probe test, Segregation and Bleeding of concrete. Mixing of concrete, Vibration of concrete. Different types of mixers and vibrators. Concreting in Hot weather and Cold weather.

Hardened Concrete: Compressive & Flexural strength of concrete, Stress and strain characteristics of concrete, drying shrinkage of concrete, Creep of concrete, Permeability and durability of concrete, Fire resistance of concrete, Thermal properties of concrete. Micro-cracking of concrete, methods of curing, Influence of temperature on strength, Fatigue & Impact strength of concrete.

Unit IV

Bricks (classification, characteristics, manufacturing, testing, and types). Stones (classification, Quarrying, seasoning characteristics, testing, selection & uses, preservation), Wood & Timber (Classification, Structure & characteristics, seasoning and its methods, defects & diseases, preservation & various treatment testing), wood products and their applications

Unit V

Mortar (Classification, characteristics, functions of ingredients). Types of mortar and their uses grout, gunting, ferrous material (Pig iron, CI, Mild steel, wrought iron, stainless steel, compositions & proposition). Reinforced steel bars (classification, types, designation), Aluminium (its alloys & uses). Copper (its alloys & uses), Ceramics (classification, properties, commercial forms), Paint varnishes & enamels (types, composition, method of application, defects)

Course Outcomes:

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

CO1: Explain the basic elements of buildings, engg. materials & construction.

CO2: Evaluate the properties of various materials like cement, aggregate, concrete, admixture, brick, stone etc.

CO3: Distinguish the suitability of building materials in the construction of elements of buildings.

CO4: Evaluate various types of concrete in building construction accordingly.

CO5: Apply various techniques for finishing & protection works of various elements of building.

Text Books:

1. Concrete Technology, M. L. Gambhir, Tata McGraw Hill education Pvt. Ltd., 5th edition 2013
2. Concrete Technology, M.S. Shetty, S. Chand Publications, 2006
3. Building Materials, M.L. Gambhir, Tata McGraw Hill education Pvt. Ltd., 2017
4. Building Construction, B.C. Punmia, A.K. Jain, Laxmi Publishers New Delhi, 2016

Reference Books:

1. Properties of Concrete, Neville, ELBS, Pearson Education, 5th edition 2012
2. Building Material, S.K. Duggal, New Age Publishers, 4th revised edition 2012

List of Experiments:

1. Determination of properties of cement.
2. Determination of properties of sand.
3. Determination of properties of aggregate.

Civil Engineering Department, MITS Gwalior

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

4. Determination of Fineness of cement.
5. Determination of consistency of cement.
6. Determination of workability of concrete by slump test.
7. Determination of workability of concrete by compacting factor apparatus.
8. Determination of workability by Vee Bee consistometer.
9. Determination of water absorption of bricks.
10. Determination of efflorescence of brick.
11. Field testing on bricks.
12. Determination of crushing strength of bricks.

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

CO 1: Determine the properties of cement, sand & aggregate as per IS code.

CO 2: Determine the workability of concrete for suitability of concrete mix in different construction works.

CO 3: Evaluate compressive strength of various concrete mixes.

CO 4: Determine physical properties of brick by experiment and practice accordingly.

CO 5: Examine the properties of the cement mortar for various elements of the buildings.

Handwritten signatures and initials in blue ink, including names like Ad, db, a, AS, and others.

Course Code: 110312
Course Name: Fluid Mechanics - I

L	T	P	Credit
2	1	2	4

Course Objectives:

- 1) To understand fluid properties and concept of fluid continuum.
- 2) To understand the concepts of kinematics & dynamics of fluid flow.
- 3) To apply fluid flow principles to various fluid flow problems.
- 4) To understand the mechanism of fluid measurement.
- 5) To understand the method of simulation & dimensional analysis.
- 6) To understand the concepts of laminar flow.

Syllabus:

Unit I

Review of Fluid Properties: Engineering units of measurement, density, specific weight, specific volume, specific gravity, surface tension, capillary, viscosity, bulk modulus of elasticity, pressure and vapour pressure.

Fluid Statics: Pressure at a point, pressure variation in static fluid, Absolute and gauge pressure, manometers, Forces on plane and curved surfaces (Problems – gravity dams and Tainter gates), buoyant force, Stability of floating and submerged bodies, Relative equilibrium.

Unit II

Kinematics of Flow: Types of flow-ideal & real, steady and unsteady, uniform & non-uniform, one, two and three dimensional flow, path lines, streamlines, streamlines and stream tubes, continuity equation for one and three dimensional flow, rotational & irrotational flow, circulation, stagnation point, separation of flow, sources & sinks, velocity potential, stream function, flownets-their utility & method of drawing flownets.

Unit III

Dynamics of Flow: Euler's equation of motion along a streamline and derivation of Bernoulli's equation, application of Bernoulli's equation, energy correction factor, linear momentum equation for steady flow, momentum equation, forces of fixed and moving vanes, velocity triangles.

Fluid Measurements: Velocity measurement, flow measurement (Orifices, nozzles, mouth pieces, orifice meter, Nozzle meter, venturimeter, weirs and notches).

Unit IV

Dimensional Analysis and Hydraulic Similitude: Dimensional analysis- dimensional homogeneity, use of Buckingham-pi theorem, calculation of dimensionless numbers, similarity laws, specific model investigations (submerged bodies, partially submerged bodies, weirs, spillways, etc.).

Unit V

Laminar Flow: Introduction to laminar, transition & turbulent flow, Reynolds experiment & Reynolds number, relation between shear & pressure gradient, laminar flow through circular pipes, laminar flow between parallel plates, laminar flow through porous media, stokes law, Bach wash processing, Instability of laminar flow to turbulent flow.

Course Outcomes:

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

- CO 1: Define various fluid properties & states of fluid.
- CO 2: Apply principles of fluid flow & dimensional analysis.
- CO 3: Solve fluid flow problems.
- CO 4: Analyze characteristics of fluid at rest, fluid at motion & dimensionless numbers.
- CO 5: Discriminate different types of fluid flow, measurement techniques & principles.
- CO 6: Apply the concepts of laminar flow in solving various fluid flow problems.

Text Books:

1. Fluid Mechanics, Modi & Seth, Standard Book House, Delhi, 21st edition, 2018.
2. Fluid mechanics, Girde & Mirazgaonkar, SCI Tech Publishers, 2019
3. Fluid Mechanics, R.K. Bansal, Laxmi Publishers, 2015

Reference Books:

1. Fluid Mechanics, A.K. Jain, Khanna Publishers, Delhi, 2014
2. Fluid Mechanics, Streeter, McGraw Hill Publishers, 9th edition, 2017

List of Experiments:

1. Determination of viscosity of fluid by redwood viscometer
2. Determination of metacentric height of floating body
3. Calibration of Venturimeter
4. Determination of C_c, C_d, C_v of Circular Orifice
5. Calibration of Mouthpiece
6. Calibration of Orifice Meter
7. Reynolds experiment for demonstration of stream lined & turbulent flow
8. Determination of Friction Factor for a pipe
9. Verification of Stoke's law.

Course Outcomes:

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

- CO 1: Differentiate between different flow measurements devices.
- CO 2: Notice flow through pipes & fall velocity of particle.
- CO 3: Correct the instrumental errors.
- CO 4: Apply Stoke's law to calculate terminal velocity.



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided U.G.C. Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V., Bhopal MP)

Course Code: 110313

Course Name: Surveying

L	T	P	Credit
2	1	0	3

Course Objectives:

- 1) To understand the working of theodolite.
- 2) To understand the determination of heights & distances by tacheometry.
- 3) To understand various types of curves used in practice.
- 4) To provide knowledge on setting out civil engineering works & detailed field surveying.
- 5) To understand the concepts of hydrographic & photographic surveying.

Syllabus:

Unit I

Traversing by theodolite, Fieldwork checks, traverse computations, latitude and departures, computations of co-ordinates, plotting & adjustment of traverse, Omitted measurements, Trigonometrical levelling, precise levelling.

Unit II: Tacheometry

Tacheometric systems and principles, stadia system, uses of anallactic lens, tangential system, substance system, instrument constant, field work reduction, direct reading tacheometers, use of tacheometry, accuracy.

Unit III: Curves:

Classification and use, elements of circular curves, setting out curves by offsets and by theodolites, obstacles and special problems, compound curves, reverse curves, transition curves, cubic spiral and lemniscate, vertical curves, computation and setting out.

Unit IV: Control Surveys:

Providing frame work of control points, triangulation principle, forms of framework, reconnaissance survey, selection and making of stations, Control line, baseline measurement & corrections, flexible apparatus and corrections, computation of sides, precise traversing.

Unit V: Photographic & Hydrographic Surveying:

Principles of photographic surveying - aerial photography, tilt and height distortions, uses. Hydrographic Surveying - Methods, Elements of Hydrographic Surveying.

Course Outcomes:

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

CO1: Explain the techniques used for linear & angular measurements in surveying.

CO2: Analyse different geodetic methods of survey such as triangulation, trigonometric levelling, tachometry, photographic & hydrographic surveying.

CO3: Apply methods in control surveys.

CO4: Apply tachometry in traverse computations.

CO5: Apply various methods for setting curves, area & volume computations.

Text Books:

1. Surveying Vol. I, II, III, B.C. Punmia, Laxmi Publications New Delhi, 2016
2. Fundamentals of surveying, S.K. Roy, Prentice Hall of India New Delhi, 2nd edition 1999

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Reference Books:

1. Surveying theory & Practice, R.E. Devis, McGraw Hill, New York, 4th revised edition 2001
2. Plane & Geodetic surveying Vol. I & II, David Clark & J Clendinning, Constable & C. London, 2017
3. Surveying Vol. I & II, K.R. Arora, Standard book House, New Delhi, 13th edition 2016



Handwritten signatures and initials in blue ink, including 'Jal', 'Sb', 'Ar', 'c', 'myar', 's', and 'h'.

Course Code: 110314

Course Name: Strength of Materials

L	T	P	Credit
2	1	2	4

Course Objectives:

- 1) To understand the concepts of simple and compound stresses and strains.
- 2) To understand the behaviour of elastic materials in bending, shear and torsion.
- 3) To understand the stability behaviour of long columns under axial load.
- 4) To understand the power transmission by shaft.
- 5) To understand stresses & strain developed in storage vessels.
- 6) To calculate stresses & strain in statically indeterminate structures.

Syllabus:

Unit-I

Stress and Strains: Concept of Elastic body, stress and strain, Hooke's law various types of stress and strains, Elastic constants and their relation Stresses in compound bars, composite and tapering bars, temperature stresses.

Two-dimensional stress system. Normal and tangential stresses, Principal Planes, Principal Stresses and strains, Mohr's circle of stresses, Strain energy and theories of failure.

Unit - II

Theory of simple bending: Concept of pure bending and bending stress, equation of bending, Neutral axis, Section-Modulus, Bending stress distribution across a section, Shear Stresses in Beams, beams of uniform strength, shear centre.

Unit-III

Torsion of Shafts: Concept of pure torsion, Torsion equation, Determination of shear stress and angle of twist of shafts of circular section, Hollow circular shafts, Combined bending and torsion, Open and closed springs, leaf spring and spiral spring.

Pressure Vessels: Thin cylinders and spheres, Stress due to internal pressure, Change in diameter and volumes.

Unit-IV

Columns and Struts: Euler's buckling load for uniform section, various end conditions, Slenderness Ratio, Merchant Ranking formulae, Eccentric loading on columns.

Unit-V

Deflection of statically determinate structure by Geometrical methods & Introduction of method of virtual work.

Course Outcomes:

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

CO1: Explain the concepts of stress, strains, bending, deflection, buckling & torsion.

CO 2: Explain various theories for determining stress, buckling of columns & deflections of structures.

CO 3: Apply various theories for determining stress, buckling of columns & deflections of structures.

Civil Engineering Department, MITS Gwalior

65

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

CO4: Evaluate the stresses in bending, shear and torsion.

CO5: Analyse various sections for stresses, strain, bending, torsion, buckling & deflections.

Text Books:

1. Strength of Materials, Sadhu Singh, Khanna Publishing, 1st edition 2016
2. Strength of Materials, S. Ramamrutham, R. Narayanan, Dhanpat Rai Publishing Company, 18th edition 2014
3. Strength of Materials, R. K. Bansal, Laxmi Publication, 6th edition 2018

Reference Books:

1. Strength of Materials, Timoshenko, Publisher CBS, 3rd edition 2004
2. Strength of Materials, HigdonStyle, Publisher Wiley, 3rd edition 1978
3. Strength of Materials Vol. I& II, B.C. Punmia, Laxmi Publication, 10th edition 2018
4. Mechanics of Materials, R.C. Hibbler, Pearson Publication, 2016
5. Mechanics of Materials, J. M. Gere & B.J. Goodno, Cengage Publisher, 8th edition 2014

List of Experiments:

1. Impact Test
2. Brinell Hardness Test
3. Behaviour of columns with Different End Conditions
4. Tensile test
5. Compression test
6. Flexure test
7. Shear test
8. Spring test
9. Torsion test
10. Verification of Maxwell's Reciprocal Theorem.
11. Bending of Beam (One Point loading only).
12. Bending of Beam (Two Point loading only).

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

CO1: Evaluate properties of material by impact test

CO2: Evaluate properties of material by hardness test.

CO3: Evaluate properties of material by tensile test.

CO4: Determine compressive & flexural strength of materials.



Course Code: 110315
Course Name: Survey Practice Lab

L	T	P	Credit
0	0	2	1

Syllabus:

List of Experiments:

1. Measurement of horizontal and vertical angle by Vernier Theodolite.
2. Theodolite traversing.
3. Determination of R.L. of a point whose base is accessible & inaccessible by Trigonometrical levelling.
4. Determination of tachometric contents in field.
5. Determination of height & distance by using Stadia method & Tangential tachometry
6. Measurement of base line by using Substance Bar.
7. Setting out of a simple circular curve by using Rankine's method.
8. Setting out of a simple circular curve by using Offset from the chord produced or deflection distance.
9. Profile Levelling & Cross Sectioning of Road
10. Prepare Contour map by using Grid Pattern & Tachometric Method.
11. Resection by Two point problem & Three point problem.
12. Determination of horizontal & vertical position of a point by Total Station.
13. Traversing by Total Station.

Course Outcomes:

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

- CO 1: Follow the guidelines for field surveying.
- CO 2: Follow the working principles of survey instruments for measurements.
- CO 3: Measure horizontal & vertical angle by theodolite for traversing and levelling.
- CO 4: Determine tachometric constants for linear measurements by tachometry.
- CO 5: Create a simple circular curve by using Rankine's method for alignment
- CO 6: Develop contour map by using tachometer & total station.

Handwritten signatures and initials in blue ink:
A large signature on the left, a checkmark, and several other signatures and initials scattered across the bottom of the page.

Course Code: 110316

Course Name: Self Learning / Presentation

L	T	P	Credit
0	0	2	1

Course Objectives:

- 1) To encourage students to read, study & understand different topics of civil engineering published in articles, literatures.
- 2) To help in presenting different topics of civil engineering and related subjects to supplement theoretical knowledge gained in class.
- 3) To make student acquire good oral & written communication skills
- 4) To promote the habit of lifelong learning.
- 5) To prepare students develop adequate soft skills to be able to present their topic effectively to listeners.

Syllabus:

1. Any relevant topic related to civil engineering from within or beyond the syllabus through Swayam / NPTEL / MOOC.

Course Outcomes:

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

- CO1: **Analyze** contemporary issues in civil engineering & its allied areas through literature survey.
- CO2: **Distinguish** state of art & relevance of the topic in national & international arena.
- CO3: **Demonstrate** good oral & written communication skills.
- CO4: **Develop** poster and power point presentations for effective communication.
- CO5: **Display** lifelong learning.

Course Code: 110317

Course Name: Summer Internship Project - I

L	T	P	Credit
0	0	4	2

Course Objectives:

- 1) To encourage students to read, study & understand different topics of civil engineering.
- 2) To make student acquire good oral & written communication skills.
- 3) To promote the habit of lifelong learning.

Syllabus:

Each candidate shall have to undergo 15 days in-house summer internship at the institute after the completion of their 2nd Semester exams (in summer vacations). Candidate can choose from various modules which are offered by the institute and after successful completion of internship they have to submit detailed report.

Course Outcomes:

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

CO1: Observe various activities in field.

CO2: Examine the utility of general and specific equipments for construction.

CO3: Differentiate the construction projects individually and in team.

CO4: Develop the writing and communication skills for various engineering problems.

CO5: Adapt lifelong learning for benefit of society.



Course Code: 1000005

(For batches admitted in 2021-2022 & onwards)

Course Name: Project Management and Financing

L	T	P	Credit
2	0	0	GRADE

Course Objectives:

- 1) To know about project, its attributes and essentials of project planning
- 2) To develop the project network
- 3) To take rational decisions using project networks for successful completion of the projects
- 4) To decide about about rational utilization of resources in project.
- 5) To have an elementary idea of finances involved in a project and managing it

Unit I:

Project Planning:

Introduction to Project Management, Difference between Project and Production, Attributes of a Project: Time, Cost, Quality and Safety, Stakeholders of a Project, Project life cycle. Project Planning: Types of Project Plans and feasibility.

Unit-II:

Project Network logic: Project Networking and work flows, Activity duration and methods of estimating activity duration – One time estimate three time estimates, Duration estimation procedure. Use of Bar Charts, Mile stone charts and networks, Network representation schemes: Activity on Arrow and Activity on Node Networks (A-o-A & A-o-N), Logic behind developing project network and simple network calculations, Critical paths and floats.

Unit-III:

Decision making through networks: CPM, PERT & PDM:

Use of network in Decision Making: Importance of critical path, Monitoring the progress and updating the project plan. Use of floats in Resource smoothing, Introduction to Precedence Diagramming Method (PDM), Different lag and lead relations in terms of SS(Start to Start), SF(Start to Finish), Finish to Start(FS), and Finish to Finish(FF) and composite relations.

Unit-IV:

Project Cost Control: Breakeven analysis in planning stage, Direct and indirect cost, slope of direct cost curve, Total project cost and optimum duration, contracting the network for cost optimization, Escalation & Variation in prices.

Unit-V:

Projects Financing:

Introduction to project financing; Role of governments in financing projects, Funder and Concessionaire: Economic multiplier effects of Projects; Means of financing-public finance and private finance, Granting authority: World Bank Group, IMF,ADB, Micro and Small Enterprises Funding Scheme (MSME), Elementary understanding of Procurement of infrastructure projects through Public Private Partnership (PPP) route, Build Operate Transfer (BOT), Build Operate Own & Transfer (BOOT); Stakeholders' perspectives, Lifecycle of PPP projects, Micro & Macro economics concepts and its application in Project Financing.

Civil Engineering Department, MITS Gwalior

70

Handwritten signatures and initials in blue ink, including 'Asi', 'AKP', 'b', and others, scattered across the bottom of the page.

Course Outcomes

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

- CO 1: **Know** the attributes of project and its different phases
- CO 2: **Develop** the project network based on work breakdown structure and estimation of activity durations
- CO 3: **Analyze** the project network and make **decide** the various alternates.
- CO 4: **Evaluate** the optimum cost of project for assigned deadlines.
- CO 5: **Understand** the different options to arrange the finances to complete it within stipulated time

Recommended Text-Books:

- 1. Project Management Scheduling PERT and CPM by Dr. B.C. Punmia, K.K. Khandelwal
- 2. PERT & CPM Principles and Applications by L.S. Srinath, Affiliated EWP Pvt. Ltd
- 3. Project Planning and Control by Albert Lester, Fourth Edition Elsevier Butterworth-Heinemann

Recommended Reference Books:

- 1. A Management Guide to PERT/CPM With GERT/PDM/DCPM and Other networks by Jerome D. Wiest, Ferdinand K. Levy, Prentice Hall.
- 2. Project Management with CPM and PERT by Joseph J. Moder, Cecil R. Phillips, Van Nostrand Reinhold Company



ANNEXURE – IX

**(Suggestive List of Skill Based Mini Projects for
B.Tech IIIrd Semester Civil)**

Handwritten signatures and initials in blue ink, including names like MKR, FB, and others.

ANNEXURE – IX

Suggestive List of Skill Based Mini Projects for B.Tech IIIrd Semester

110311, Building Materials & Construction:

1. Mix Design – (M20 & M25)
2. Fresh & Hardened Concrete Design.
3. Development of Innovative Building Materials like brick etc using waste materials.

110312, Fluid Mechanics - I:

1. Determination of Metacentric height of different shapes
2. Comparison of velocity measurement by orifice & pitot tube
3. Verification of Bernoulli's theorem for pipe flow & tank
4. Verification of Stoke's law for different liquid
5. Determination of Reynold's Number for different fluid.

110314, Strength of Materials:

1. Unsymmetrical bending & shear center.
2. Beam Deflection
3. Stress Strain curve for steel.

110315, Survey Practice Lab:

1. Development of contour map using Total Station.
2. Setting out of Horizontal Curve using Total Station & Theodolite.
3. Area Volume calculations using Total Station.

Handwritten signatures and initials in blue ink, including names like AK, AN, and others, along with some scribbles.

ANNEXURE – X

(Scheme 1st Sem B.Tech Civil Engineering (2021-2022 onwards Admitted Batch))



Handwritten signatures and initials in blue ink, including a checkmark, a signature, and several initials.

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

DEPARTMENT OF CIVIL ENGINEERING
Scheme of Evaluation

B. Tech. I Semester (Civil Engineering)

For batches admitted in academic session 2022-23 onwards

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Teaching (Offline/ Online)	Mode of Exam	
				Theory Slot				Practical Slot			Exam	L	T				P
				End Term Evaluation		Continuous Evaluation		End Sem Exam	Continuous Evaluation								
				End Sem Exam	Proficiency in subject (course)	Mid Sem	Quiz/Assign ment		Lab Work & Seasonal		Skill Based Mini Project						
1.	100011	BSC	Engineering Mathematics – I (100) (1)	30	30	20	20	-	-	-	100	3	1	-	4	Offline (40)	PP
2.	100012	BSC	Engineering Chemistry (100) (2)	50	10	20	20	40	20	20	200	2	0	2	4	Blended (2/1)	MCO
3.	100014	ESC	Engineering Graphics (100) (1)	50	10	20	20	-	-	-	100	1	2	-	3	Offline (100)	A+O
4.	100015	HSMC	Energy, Environment, Ecology & Society (100) (2)	50	10	20	20	-	-	-	100	3	-	-	3	Online (60)	MCO
5.	100016	HSMC	Technical Language (100) (2)	50	10	20	20	-	-	-	100	1	-	-	3	Blended (2/1)	PP
6.	100017	HSMC	Language Lab (100) (1-2)	-	-	-	-	60	20	20	100	-	-	2	1	Offline (100)	SO
7.	100018	ESC	Engineering Graphics Lab (100) (1)	-	-	-	-	60	20	20	100	-	-	2	1	Offline (100)	SO
Total				250	50	100	100	240	80	80	900	12	4	6	19	-	-

Induction programme of three weeks (10) – Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to be of Areas, Familiarization to Dept./Branch & Institutions.

* Proficiency in course/subject includes the weightage towards ability/skill/competence/knowledge level/expertise attained etc. in that particular course/subject.

MCQ – Multiple Choice Questions, PP – Pen paper Mode, A+O – Assignment + Oral, SO – Submission + Oral

Mode of Evaluation				Mode of Examination				
Theory		Lab		Theory		Lab		
Offline	Online	Offline	Blended	Offline	PP	A+O	MCQ	SO
3	3	4	2	3	3	3	4	3
10%	10%	11%	10%	10%	10%	10%	11%	10%

Civil Engineering Department, MLTS Gwalior

DEAN (ACADEMICS)
MLTS
GWALIOR

ANNEXURE – XI

(CO Attainment for July Dec 2021 & November –
February 2022 Session)



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

ANNEXURE – XI

CO Attainment & Gap Analysis July – Dec 2021 (II to IV year) & November – February 2022
(I year) Session

Course Code & Name	Course Outcomes	Direct CO Attainment Level	Indirect CO Attainment Level	Overall CO Attainment	Target Attainment	Gap in Attainment	Status of CO Attainment	Action Taken*
100025: Energy Environment, Ecology & Society	CO 1	3.00	3.00	3.00	2.50	-0.50	Attained	Rubrics for the level can be modified
	CO 2	3.00	3.00	3.00	2.50	-0.50	Attained	
	CO 3	2.92	3.00	2.94	2.50	-0.44	Attained	
	CO 4	2.78	3.00	2.82	2.50	-0.32	Attained	
	CO 5	3.00	3.00	3.00	2.50	-0.50	Attained	
	CO 6	3.00	3.00	3.00	2.50	-0.50	Attained	
100111: Building Materials & Construction	CO 1	3.00	3.00	3.00	2.50	-0.50	Attained	Rubrics for the level can be modified
	CO 2	3.00	3.00	3.00	2.50	-0.50	Attained	
	CO 3	3.00	3.00	3.00	2.50	-0.50	Attained	
	CO 4	3.00	3.00	3.00	2.50	-0.50	Attained	
	CO 5	3.00	3.00	3.00	2.50	-0.50	Attained	
100112: Fluid Mechanics - I	CO 1	3.00	3.00	3.00	2.50	-0.50	Attained	Rubrics for the level can be modified
	CO 2	3.00	3.00	2.28	2.50	0.24	Not Attained	More problems related to Fluid Properties will be given
	CO 3	2.64	3.00	2.64	2.50	-0.14	Attained	Rubrics for the level can be modified
	CO 4	3.00	3.00	3.00	2.50	-0.50	Attained	
	CO 5	2.29	3.00	2.43	2.50	0.07	Not Attained	Measurement techniques & principles on fluid flow discussed more
	CO 6	1.07	3.00	1.46	2.50	1.04	Not Attained	More assignments will be given related to laminar flow

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

110313: Surveying	CO 1	2.06	3.00	2.25	2.50	0.25	Not Attained	More quiz and assignment, also extra remedial classes will be conducted. Problems related to triangulation, etc. need to be given more.
	CO 2	1.95	3.00	2.16	2.50	0.34	Not Attained	
	CO 3	1.98	3.00	2.18	2.50	0.32	Not Attained	
	CO 4	2.21	3.00	2.41	2.50	-0.11	Attained	
	CO 5	3.00	3.00	3.00	2.50	-0.50	Attained	
110314: Strength of Materials	CO 1	1.76	3.00	2.01	2.50	0.49	Not Attained	More assignment related to stress & strain properties of materials will be conducted.
	CO 2	1.88	3.00	2.10	2.50	0.40	Not Attained	
	CO 3	1.49	3.00	1.79	2.50	0.71	Not Attained	
	CO 4	1.80	2.99	2.04	2.50	0.46	Not Attained	
	CO 5	1.65	3.00	1.92	2.50	0.58	Not Attained	
110311: Building Materials & Construction (Practical)	CO 1	3.00	3.00	3.00	2.50	-0.50	Attained	Rubrics for this level can be modified.
	CO 2	3.00	3.00	3.00	2.50	-0.50	Attained	
	CO 3	3.00	3.00	3.00	2.50	-0.50	Attained	
	CO 4	3.00	3.00	3.00	2.50	-0.50	Attained	
	CO 5	3.00	3.00	3.00	2.50	-0.50	Attained	
110312: Fluid Mechanics - I	CO 1	3.00	1.83	2.77	2.50	-0.27	Attained	Rubrics for this level can be modified.
	CO 2	3.00	1.99	2.40	2.50	-0.30	Attained	
	CO 3	3.00	2.01	2.81	2.50	-0.31	Attained	
	CO 4	3.00	2.79	2.96	2.50	-0.46	Attained	
	CO 5	3.00	2.79	2.96	2.50	-0.46	Attained	
110315: Survey Practice Lab	CO 1	2.70	3.00	2.76	2.50	-0.26	Attained	Rubrics for this level can be modified.
	CO 2	2.70	3.00	2.76	2.50	-0.26	Attained	
	CO 3	2.70	3.00	2.76	2.50	-0.26	Attained	
	CO 4	2.70	3.00	2.76	2.50	-0.26	Attained	
	CO 5	2.70	3.00	2.76	2.50	-0.26	Attained	
	CO 6	2.70	2.72	2.70	2.50	-0.20	Attained	
110314: Strength of Materials (Practical)	CO 1	2.10	2.26	2.13	2.50	0.37	Not Attained	More hands on material characteristics will be conducted.
	CO 2	3.00	2.13	2.83	2.50	-0.31	Attained	Rubrics for this level can be modified.
	CO 3	2.30	2.29	2.14	2.50	0.34	Not Attained	More hands on material characteristics will be conducted.

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

110307: Self Learning Presentation	CO-4	1.00	2.25	2.85	2.50	-0.35	Attained	Rubrics for the level can be modified	
	CO-1	1.00	3.00	3.00	2.50	-0.50	Attained		
	CO-2	1.00	2.65	2.94	2.50	-0.44	Attained		
	CO-3	3.00	3.00	3.00	2.50	-0.50	Attained		
	CO-4	3.00	2.69	2.94	2.50	-0.44	Attained		
110501: Estimating, Costing & Contracting	CO-1	2.15	3.00	2.52	2.50	0.18	Not Attained	Problems related to quantity estimation, costing will be discussed more.	
	CO-2	3.00	2.85	2.94	2.50	-0.48	Attained	Rubrics for the level can be modified	
	CO-3	0.00	2.92	0.58	2.50	1.92	Not Attained	Quantity estimation session will be improved by taking more quiz and assignment	
	CO-4	1.79	2.73	1.97	2.50	0.53	Not Attained		
	CO-5	1.46	2.67	1.70	2.50	0.80	Not Attained		
110502: Structural Design & Drawing (R.C.C.)	CO-1	0.00	2.34	0.43	2.50	2.03	Not Attained	More design problems to be solved	
	CO-2	1.15	2.40	1.58	2.50	0.92	Not Attained		
	CO-3	2.39	2.40	2.55	2.50	-0.05	Attained	Rubrics for the level can be modified	
	CO-4	1.87	2.19	1.30	2.50	1.20	Not Attained	More design problems to be solved	
110503: Fluid Mechanics - II	CO-1	1.96	2.73	2.11	2.50	0.39	Not Attained	Numerical of OCF, pipe flow analysis needs to be practiced more	
	CO-2	0.00	2.42	0.48	2.50	2.02	Not Attained		
	CO-3	1.61	2.73	1.84	2.50	0.66	Not Attained		
	CO-4	0.00	2.42	0.48	2.50	2.02	Not Attained		
	CO-5	3.00	2.73	2.95	2.50	-0.45	Attained		
110505: Transportation Engineering	CO-1	3.00	3.00	3.00	2.50	-0.50	Attained	Rubrics for the level can be modified	
	CO-2	1.75	3.00	1.94	2.50	0.52	Not Attained	More problems based	

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

IA Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal

	CO 3	2.14	2.93	2.38	2.50	0.20	Not Attained	traffic systems, transportation materials & design will be conducted	
	CO 4	2.67	2.63	2.66	2.50	-0.16	Attained		
	CO 5	1.56	2.78	1.80	2.50	0.70	Not Attained		Topics of highway maintenance needs to be discussed more
110509: Environmental Engineering	CO 1	3.00	3.00	3.00	2.50	-0.50	Attained	Rubrics for the level can be modified	
	CO 2	2.74	3.00	2.79	2.50	-0.29	Attained		
	CO 3	2.75	3.00	2.80	2.50	-0.30	Attained		
	CO 4	2.80	3.00	2.84	2.50	-0.34	Attained		
	CO 5	3.00	3.00	3.00	2.50	-0.50	Attained		
110713: Advanced Structural Design (RCC) (DE-3)	CO 1	2.74	2.96	2.78	2.50	-0.28	Attained	Rubrics for the level can be modified	
	CO 2	3.00	3.00	3.00	2.50	-0.50	Attained		
	CO 3	2.99	2.78	2.95	2.50	-0.45	Attained		
	CO 4	1.88	2.78	2.06	2.50	0.44	Not Attained		More design problems will be conducted
110714: Hydraulic Structure (DE-3)	CO 1	1.80	2.56	2.91	2.50	-0.41	Attained	Rubrics for the level can be modified	
	CO 2	3.00	2.56	2.91	2.50	-0.41	Attained		
	CO 3	1.79	2.11	1.86	2.50	0.65	Not Attained		Problems related with cross drainage works and design of various elements of hydraulic structure will be conducted more
	CO 4	0.00	2.56	0.51	2.50	1.99	Not Attained		
	CO 5	2.43	2.78	2.58	2.50	0.08	Not Attained		
110715: Advanced Structural Analysis (DE-3)	CO 1	0.00	2.78	0.56	2.50	1.94	Not Attained	Analysis of statically indeterminate structures (SASTI AD) hand done with software will be discussed more	
	CO 2	0.00	2.78	0.56	2.50	1.94	Not Attained		
	CO 3	1.60	2.78	1.84	2.50	0.66	Not Attained		
	CO 4	1.53	2.78	1.62	2.50	0.88	Not Attained		

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

900201: Integrated Waste Management for Smart City (OC - 2)	CO 5	1.60	2.78	1.84	2.90	0.56	Not Attained	Rubrics for the level can be modified.	
	CO 1	1.00	2.50	2.90	2.50	-0.40	Attained		
	CO 2	2.74	2.50	2.69	2.50	-0.19	Attained		
	CO 3	2.41	2.50	2.43	2.50	0.07	Not Attained		Waste energy recovery techniques will be discussed more.
	CO 4	2.57	2.74	2.69	2.50	-0.10	Attained		
900202: Project Planning & Control (OC - 2)	CO 1	1.91	3.00	2.15	2.50	0.35	Not Attained	Rubrics for the level can be modified.	
	CO 2	2.31	3.00	2.45	2.50	-0.05	Not Attained		Analysis of planning and project network by CPM & PERT methods will be discussed more.
	CO 3	2.47	3.00	2.58	2.50	-0.08	Attained		
	CO 4	1.09	2.86	1.97	2.50	-0.47	Attained		
	CO 5	1.00	2.86	1.97	2.50	-0.47	Attained		
900213: Urban Planning & Transportation Systems (OC - 3)	CO 1	2.92	2.92	2.92	2.50	-0.42	Attained	Rubrics for the level can be modified.	
	CO 2	2.85	2.64	2.81	2.50	-0.31	Attained		
	CO 3	2.34	2.64	2.72	2.50	-0.22	Attained		
	CO 4	2.90	2.92	2.50	2.50	-0.40	Attained		
	CO 5	3.00	2.90	2.90	2.50	-0.40	Attained		
110503: Fluid Mechanics-II (Practical)	CO 1	2.40	2.23	2.05	2.50	0.45	Not Attained	More Practical related hands on based on turbines & pumps properties will be taken during practical's performing.	
	CO 2	2.00	2.12	2.02	2.50	0.48	Not Attained		
	CO 3	2.20	2.35	2.23	2.50	0.27	Not Attained		
110509: Environmental Engineering (Practical)	CO 1	2.90	2.88	2.90	2.50	-0.40	Attained	Rubrics for the level can be modified.	
	CO 2	2.90	3.00	2.92	2.50	-0.42	Attained		
	CO 3	2.90	2.27	2.77	2.50	-0.27	Attained		
	CO 4	2.90	2.58	2.84	2.50	-0.34	Attained		

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

110505: Transportation Engineering (Practical)	CO 1	5.00	3.00	3.00	2.50	-0.50	Attained	Rubrics for the level can be modified.
	CO 2	3.00	3.00	3.00	2.50	-0.50	Attained	
	CO 3	3.80	2.62	2.92	2.50	-0.42	Attained	
	CO 4	3.00	3.80	3.80	2.50	-0.50	Attained	
110508: Self Learning Presentations	CO 1	2.10	2.71	2.22	2.50	0.28	Not Attained	For improving effective communication, more PPT's and Poster presentations on civil engineering related areas will be performed from students.
	CO 2	2.40	2.68	2.46	2.50	0.04	Not Attained	
	CO 3	2.30	2.77	2.23	2.50	0.27	Not Attained	
	CO 4	3.00	2.98	3.00	2.50	-0.50	Attained	
	CO 5	1.80	2.80	2.60	2.50	0.50	Not Attained	
110701: Software Application for Solving Civil Engineering Problems	CO 1	2.30	2.18	2.28	2.50	0.22	Not Attained	More hands on based on building elements such as beams, slabs by using various software's such as MATLAB, MS Excel will be given to solve.
	CO 2	2.30	1.41	2.12	2.50	0.58	Not Attained	
	CO 3	2.30	2.18	2.28	2.50	0.22	Not Attained	
	CO 4	2.30	1.67	2.17	2.50	0.33	Not Attained	
	CO 5	2.30	1.92	2.22	2.50	0.28	Not Attained	
110702: Creative Problem Solving	CO 1	2.90	3.00	2.92	2.50	-0.42	Attained	Rubrics for the level can be modified.
	CO 2	2.90	3.00	2.92	2.50	-0.42	Attained	
	CO 3	2.90	3.00	2.92	2.50	-0.42	Attained	
	CO 4	2.90	3.00	2.92	2.50	-0.42	Attained	

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

								techniques 2. Students are encouraged to participate in national level conferences for paper presentations
PO 5	2.77	2.16	2.65	2.5	-0.15	Attained	1. Students are asked to perform the experiments and projects using simulation software's like Virtual Lab, AutoCAD, STAAD Pro, MATLAB 2. The students get acquainted with modern tools which are added to the lab like Roadbox V7 meter, Noise level meter, Total Station etc.	
PO 6	2.76	2.29	2.67	2.5	-0.17	Attained	1. Industry visits are conducted to understand the various safety and legal issues and expand their practical knowledge. 2. Information about safety facilities available in lab/warehouses was given to students. Demonstration of safety equipments like fire extinguisher was given to understand personal and equipment safety.	
PO 7	2.76	2.23	2.66	2.5	-0.16	Attained	1. Students gain knowledge in environmental and sustainable issues through industry visits conducted to Water Treatment and Sewage Treatment Plants in the city. 2. Students undertake projects based on environmental and sustainability issues. 3. Students study various courses on Environmental Engineering like Water Supply, Waste Water, Waste Management.	
PO 8	2.89	2.35	2.78	2.5	-0.28	Attained	1. Courses like Human Values and Professional Ethics, and Professional Communication are included in the curriculum. 2. Students are motivated to write the project, seminar reports and lab write-ups in their own words avoiding "copy-paste" practices by using Turnitin software.	
PO 9	2.80	2.21	2.68	2.5	-0.18	Attained	1. Students are encouraged to work in team during practical classes in course of Surveying. 2. Students are encouraged to work in team during practicals like SPT test, Triaxial test, Plate load test etc.	

ANNEXURE – XIII

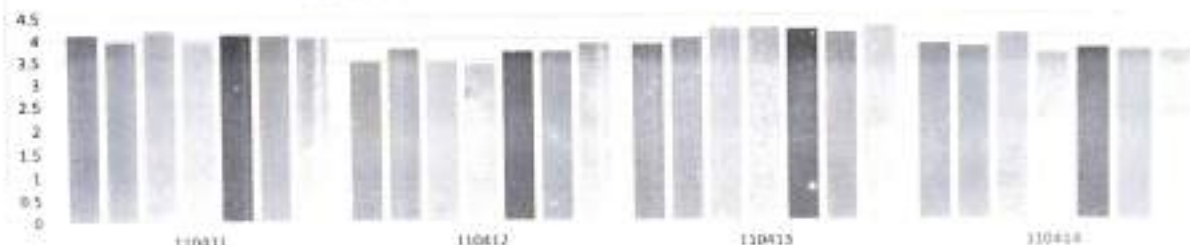
(Curriculum Feedback Analysis)

Handwritten signatures and initials in blue ink, including names like 'Ajay', 'AKP', 'SB', 'V.V.', 'A.Z.', 'S', and 'P'.

CURRICULUM FEEDBACK ANALYSIS FROM STAKEHOLDERS

AI. CURRICULUM FEEDBACK ANALYSIS FROM STUDENTS – (UG Second Year) – May 2022

Course Curriculum Feedback UG- Second Year



- 1. The course is well designed
- 2. The syllabus units are balanced
- 3. The learning material was available to you
- 4. The content was clear and easy to understand
- 5. The course was relevant and updated for present needs
- 6. The course meets your career expectations
- 7. The course will be useful to meet your higher studies/future aspirations.

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

CIVIL ENGINEERING DEPARTMENT

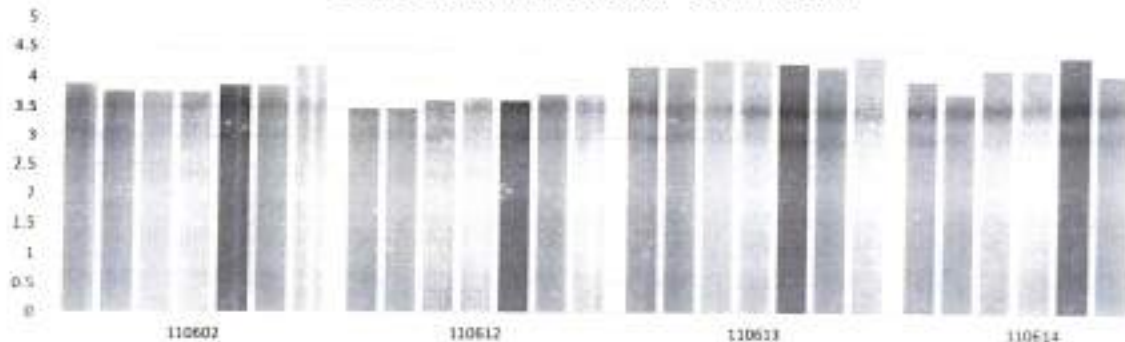
	110411: Geotechnical Engineering-I 4.119048	110412: Theory of Structures-I 3.481481	110413: Transportation Engineering 3.857143	110414: Water Resource Engineering 3.833333
1. The course is well designed	3.952381	3.777778	4	3.777778
2. The syllabus units are balanced	4.214286	3.481481	4.214286	4.055556
3. The learning material was available to you	3.952381	3.407407	4.214286	3.615111
4. The content was clear and easy to understand	4.119048	3.703704	4.178571	3.722222
5. The course was relevant and updated for present needs	4.095238	3.703704	4.107143	3.686667
6. The course meets your career expectations	4.047619	3.888889	4.25	3.666667
7. The course will be useful to meet your higher studies/future aspirations.				

Subjects	Mention the course / contents which in your opinion is outdated & needs to be removed.	Name course / contents which needs to be updated.	Is any new course required to meet current needs?
110412: Theory of Structure - I	None. Course is updated	None	None

Handwritten signatures and initials in blue ink on the left margin, including a large signature at the top and several smaller ones below.

A2. CURRICULUM FEEDBACK ANALYSIS FROM STUDENTS – (UG Third Year) – May 2022

Course Content Feedback - UG Third Year



- 1. The course is well designed
- 2. The syllabus units are balanced
- 3. The learning material was available to you
- 4. The content was clear and easy to understand
- 5. The course was relevant and updated for present needs
- 6. The course meets your career expectations
- 7. The course will be useful to meet your higher studies/future aspirations.

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

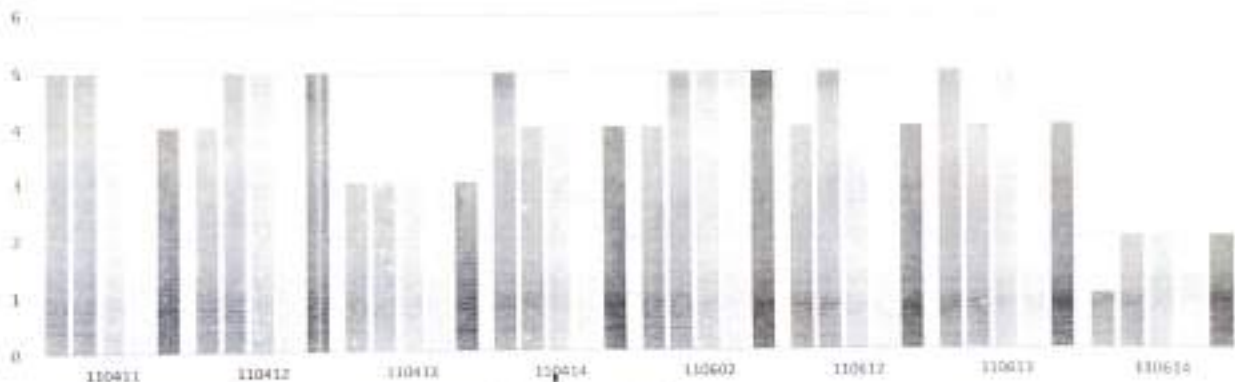
CIVIL ENGINEERING DEPARTMENT

	110602: Structural Design & Drawing (Steel)	110612: Solid Waste Management	110613: Construction Planning & Management	110614: Railway, Airport & Tunnel Engineering
1. The course is well designed	3.888889	3.5	4.235294	4
2. The syllabus units are balanced	3.777778	3.5	4.235294	3.8
3. The learning material was available to you	3.777778	3.666667	4.352941	4.2
4. The content was clear and easy to understand	3.777778	3.722222	4.352941	4.2
5. The course was relevant and updated for present needs	3.888889	3.866667	4.294118	4.4
6. The course meets your career expectations	3.888889	3.777778	4.235294	4.1
7. The course will be useful to meet your higher studies/future aspirations.	4.222222	3.777778	4.411765	4.33

Mention the course / contents which in your opinion is outdated & needs to be removed.	Name course / contents which needs to be updated.	Is any new course required to meet current needs?	Choices for Honor/Minor/DE (SWAYAM)
None	None	No	Bridge Engineering (Honor) Wastewater Treatment & Recycling (DE) Principles of Construction Management (DE) Pavement Materials (DE-Honor) Project Planning & Control (DE) Advanced Concrete Technology (Honors) Advanced Design of Steel Structures (Honors)

B. FACULTY FEEDBACK ANALYSIS ON COURSE CONTENT – May 2022

Course Content/Curriculum Faculty Feedback



- The availability of books & E-learning material in the institute is good.
- The Courses and content are up to date.
- The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends.
- The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present.
- The curriculum is capable of inculcating the long learning abilities in students.

Handwritten notes in blue ink on the left margin, including the word "After" and several checkmarks and scribbles.

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

CIVIL ENGINEERING DEPARTMENT

Select your course	Select your Subject	1. The availability of books & E-learning material in the institute is good.	2. The Courses and content are up to date.	3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends.	4. The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present.	5. The curriculum is capable of inculcating life-long learning abilities in students.
B. Tech	110411- Geotechnical Engineering-I	5	5	4	4	4
B. Tech	110412- Theory of Structures-I	4	5	5	4	5
B. Tech	110413- Transportation Engineering	3	3	3	3	3
B. Tech	110414- Water Resource Engineering	5	4	4	4	4
B. Tech	110602- Structural Design & Drawing (Steel)	4	5	5	5	5
B. Tech	110612- Solid Waste Management	4	5	4	4	4
B. Tech	110613- Construction Planning & Management	5	4	5	4	4
B. Tech	110614 - Railway, Airport & Tunnel Engineering	1	2	2	2	2

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

CIVIL ENGINEERING DEPARTMENT

Inputs received from Faculty:

Course level	Course	1. The availability of books & E-learning material in the institute is good. (Please give your opinion)	2. The Courses and content are up to date. Please suggest if you feel any new course(s) need to be introduced to meet current needs & technological changes?	3. The course curriculum/syllabi are helpful in meeting the higher studies/placement requirements according to present global trends.	4. The course / contents in your domain/area are well designed and frequently updated, hence need no changes at present. (If you feel some changes (new content to be added or outdated content to be removed) are needed)	5. The curriculum is capable of inculcating life-long learning abilities in students.	6. The environment of department/institute is conducive for innovative teaching and research.	7. The institute supports you in your initiatives for updating your knowledge/skills and in achieving career growth.
B. Tech	110411- Geotechnical Engineering-I						Yes	Yes
B. Tech	110414- Water Resource Engineering						Very conducive	Yes
B. Tech	110612- Solid Waste Management	More e books are required in library		Specially the work done under SRM and smart city.				

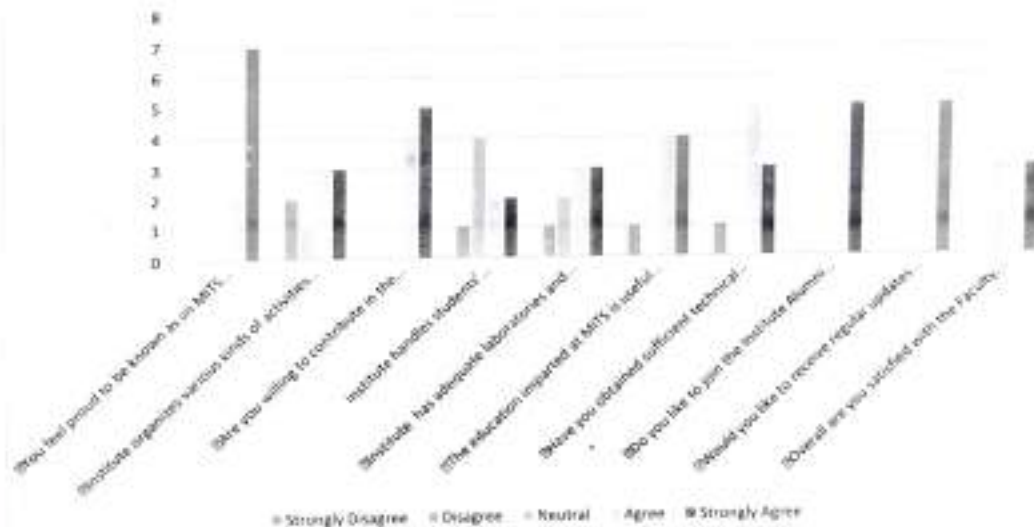
(i) Honours:	(ii) Minor specialization:	(iii) Departmental electives:	(iv) Open electives:
Dynamics of Structures	Strength of Materials, Building Science, Project Management	Wastewater Treatment, Project Management, Housing Planning	Integrated Waste Management, Project Planning Control, Urban Planning, Plastic Waste Management
Bridge Engineering, Pavement material	Energy Efficient Building	Earthquake Resistant Design of Foundations	
Building Services and Maintenance.		New construction materials	

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

CIVIL ENGINEERING DEPARTMENT

C. ALUMNI SATISFACTION SURVEY – May 2022

Alumni Satisfaction Survey



Handwritten signatures and initials in blue ink on the left margin, including names like 'Anil', 'Mishra', and 'B.P.'.

CIVIL ENGINEERING DEPARTMENT

ALUMNI SATISFACTION SURVEY

ALUMNI SATISFACTION SURVEY							
Sample Size : 9							
S. No.	Parameter	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Alumni Satisfaction Index
1	You feel proud to be known as an MITS Alumnus ?	0	0	0	2	7	4.555555556
2	Institute organizes various kinds of activities for the overall development of students.	0	2	1	1	5	4.222222222
3	Are you willing to contribute in the development of the Institute	0	0	0	4	5	4.555555556
4	Institute handles students' grievances properly	0	1	4	2	2	3.555555556
5	Institute has adequate laboratories and equipment for practical exposure to students.	0	1	2	3	3	3.888888889
6	The education imparted at MITS is useful and relevant in your career and present job	0	1	0	4	4	4.222222222
7	Have you obtained sufficient technical knowledge (both in theory and practical) at MITS	0	1	0	5	3	4.111111111
8	Do you like to join the Institute Alumni Association	0	0	0	4	5	4.555555556
9	Would you like to receive regular updates from the Institute through Mails/Calls/SMS?	0	0	0	4	5	4.555555556
10	Overall are you satisfied with the Faculty, Staff and Administration during Program	0	0	1	3	5	4
Alumni Satisfaction Index PSI (on a scale 5) 5: Strongly Agree, 4: Agree, 3: Neutral, 2: Disagree, 1: Strongly Disagree							

Handwritten notes in blue ink:
 Add
 Dr. M.S.P.
 Dr. P.S.P.
 Dr. D.S.P.
 Dr. A.S.P.

CIVIL ENGINEERING DEPARTMENT

ANNEXURE – XIII (b)

Action Taken Report based on Curriculum Feedback Received
 from Stakeholders

A. Action taken based on Curriculum Feedback received from Students

S. No.	Comments /Suggestions Received during Feedback	Action Taken
1	Opinion regarding courses to be included as DE (Through SWAYAM) - Waste water Treatment & Recycling - Principles of Construction Management - Pavement Materials - Project Planning & Control	The opinions of students were taken into consideration while finalizing the list of DE courses (SWAYAM)
2	Opinion regarding courses to be included as Honors (Through SWAYAM) - Bridge Engineering - Advanced Concrete Technology - Pavement Materials	The opinions of students were taken into consideration while finalizing the list of Honor courses (SWAYAM)

B. Action taken based on Curriculum Feedback received from Faculty

S. No.	Comments /Suggestions Received during Feedback	Action Taken
1	Opinion regarding courses to be included as DE (Through SWAYAM) - Waste water Treatment & Recycling - Principles of Construction Management - Housing Planning - Project Management - New Construction Material	The opinions of faculty members were taken into consideration while finalizing the list of DE courses (SWAYAM)
2	Opinion regarding courses to be included as Honors (Through SWAYAM) - Bridge Engineering - Pavement Materials - Building Services - Dynamics of Structures	The opinions of faculty members were taken into consideration while finalizing the list of Honor courses (SWAYAM)
3	Opinion regarding courses to be included as Minor (Through SWAYAM) - Building Science - Strength of Materials - Project Management - Waste Management	The opinions of faculty members were taken into consideration while finalizing the list of Minor courses (SWAYAM)



CIVIL ENGINEERING DEPARTMENT

C. Action taken based on Feedback received from Alumni

S. No.	Comments /Suggestions Received during Feedback	Action Taken
1	Institute should have tie up with the industry for suitable employment of the students in time to come	MoU are already done with some of the Research Organizations like CRRI, NHAI and efforts are being done to get students placed in them after their internship and more MoU are planned in future specially with leading Industry like L&T etc.
2	More industry Academia interaction	A team is already constituted in the department to plan programs for student industry interaction etc.
3	More industry oriented courses to be added	Already 2 Industry collaborative courses are planned in the coming semester and also in future some more industry oriented courses/ courses which have content which makes student Industry ready will be planned.

ANNEXURE – XIV

(CO Feedback Analysis)

Handwritten signatures and initials in blue ink, including names like AKI, P. D. Z, and others, with checkmarks.

ANNEXURE – XIV

Course Outcome Feedback Analysis & Impact (Jan – June 2022)

Review, Analysis, Impact & Action taken Report (ATR) of Course Outcome Feedback of JAN – JUNE 2022

Index Scale: 1 = 2 (Satisfactory), 2 = 2.5 (Good), 3 = 2.5 (Very Good) & 3 (Excellent)

Semester	S. No.	Name of the Course & Code	Course Outcomes	Responses				Index (Scale of 1-3)	Comments/Impact & Action to be taken
				Strongly Agree	Agree	Average	Total		
Semester IV	1	Geotechnical Engineering - I (110411)	CO1 Evaluate different properties of rocks & soil and its classification	24	19	1	44	2.52	Very Good (Students have grasped the CO)
			CO2 Examine the flow and shear parameters & their effects on various types of soil.	24	18	2	44	2.50	Very Good (Students have grasped the CO)
			CO3 Determine the stress distribution & shear failure by various methods.	23	19	2	44	2.48	Good (Students have grasped the CO)
			CO4 Evaluate the shear strength parameter of soil by various methods.	20	21	3	44	2.39	Good (Students have grasped the CO)
			CO5 Analyse the stability of slopes using various methods.	23	18	3	44	2.41	Good (Students have grasped the CO)
	2	Geotechnical Engineering - 1 (Practical) (110411)	CO1 Check physical properties of soil.	52	30	3	55	2.53	Very Good (Students have grasped the CO)
			CO2 Check strength properties of soil.	56	17	2	55	2.62	Very Good (Students have grasped the CO)
			CO3 Differentiate the flow properties and stresses of soil.	26	26	3	55	2.42	Good (Students have grasped the CO)
			CO4 Check shear strength of soil.	29	23	3	55	2.47	Good (Students have grasped the CO)

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

3	Theory of Structure – I (110412)	CO1	Classify different type of structures based on support conditions.	11	11	1	25	2.32	Good (Students have grasped the CO)
		CO2	Explain various methods & principles for analysis of structures.	9	12	4	25	2.20	Good (Students have grasped the CO)
		CO3	Apply various methods & principles for structural analysis.	12	10	3	25	2.36	Good (Students have grasped the CO)
		CO4	Analyse various structures using various methods, principles & theorems.	10	10	5	25	2.20	Good (Students have grasped the CO)
		CO5	Evaluate different methods of structural analysis.	12	7	6	25	2.24	Good (Students have grasped the CO)
4	Transportation Engineering (110413)	CO1	Explain the principles of highway planning & their geometrical design.	18	11	3	32	2.47	Good (Students have grasped the CO)
		CO2	Evaluate physical properties of suitable highway engineering materials with drainage provisions.	17	10	5	32	2.38	Good (Students have grasped the CO)
		CO3	Apply the concepts of traffic engineering in transportation planning.	17	14	1	32	2.50	Very Good (Students have grasped the CO)
		CO4	Design pavements as per regulations.	19	10	3	32	2.50	Very Good (Students have grasped the CO)
		CO5	Formulate the layers of pavement along with provisions of its drainage & maintenance.	18	11	3	32	2.47	Good (Students have grasped the CO)
5	Transportation Engineering Practical (110413)	CO1	Select suitable aggregate material by testing the physical properties.	10	5	1	16	2.56	Very Good (Students have grasped the CO)
		CO2	Determine properties of bitumen and its grade.	8	8	1	16	2.31	Good (Students have grasped the CO)
		CO3	Determine CBR value of material for subgrade and subsequent layers of pavement.	8	7	1	16	2.44	Good (Students have grasped the CO)

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

Semester VI	6	Water Resource Engineering (110414)	CO4	Design job mix formula for bituminous surface using Marshal Stability test	8	5	3	16	2.31	Good (Students have grasped the CO)
			CO1	Explain the concept of hydrology and hydrograph	5	11	2	18	2.17	Good (Students have grasped the CO)
			CO2	Apply basic principles for measurement & forecasting of rainfall & runoff	7	10	1	18	2.33	Good (Students have grasped the CO)
			CO3	Analyse runoff hydrograph by various methods	9	10	1	18	2.33	Good (Students have grasped the CO)
			CO4	Analyse various requirements for an efficient irrigation project	8	7	3	18	2.28	Good (Students have grasped the CO)
			CO5	Design different components of irrigation system using different theories	8	7	3	18	2.28	Good (Students have grasped the CO)
	7	Civil Engineering Drawing (110415)	CO1	Attempt to draw different components of a building.	21	13	1	35	2.57	Very Good (Students have grasped the CO)
			CO2	Produce plan, elevation & section of various components of a residential and institutional building.	19	13	3	35	2.46	Good (Students have grasped the CO)
			CO3	Use AutoCAD software in civil engineering drawing.	23	8	4	35	2.54	Very Good (Students have grasped the CO)
			CO4	Prepare drawing sheets of various types of buildings like residential, institutional.	24	8	3	35	2.60	Very Good (Students have grasped the CO)
	8	110602: Structural Design & Drawing II (R.C.C.)	CO1	Explain the principles of steel structural design using relevant IS Codes.	2	5	2	7	2.00	Good (Students have grasped the CO)
			CO2	Evaluate structural behaviour of different steel structural elements.	2	3	2	7	2.00	Good (Students have grasped the CO)
			CO3	Analyse a given section of steel structural element using IS codes.	2	3	2	7	2.00	Good (Students have grasped the CO)

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

2	110612: Solid Waste Management	CO4	Design different elements of steel structure under various loading conditions using relevant IS codes.	2	3	2	7	2.00	Good (Students have grasped the CO)
		CO5	Design a structure/ component to meet desired needs within realistic constraints such as economy, safety, viable construction & its sustainability as per code provisions.	2	3	2	7	2.00	Good (Students have grasped the CO)
		CO1	Explain the principles & concepts of waste management.	3	10	1	14	2.14	Good (Students have grasped the CO)
		CO2	Apply various techniques in collecting the waste.	2	10	2	14	2.00	Good (Students have grasped the CO)
		CO3	Apply various techniques of reducing the waste.	3	10	1	14	2.14	Good (Students have grasped the CO)
3	110613: Construction Planning & Management	CO4	Apply various techniques in disposal of waste.	2	11	1	14	2.07	Good (Students have grasped the CO)
		CO5	Plan an effective & efficient waste management system.	3	10	1	14	2.14	Good (Students have grasped the CO)
		CO1	Explain the concepts of construction planning & management process.	11	5	0	16	2.69	Very Good (Students have grasped the CO)
		CO2	Describe various techniques used in construction planning & management.	11	5	0	16	2.69	Very Good (Students have grasped the CO)
		CO3	Apply techniques of project planning & management.	9	7	0	16	2.56	Very Good (Students have grasped the CO)
		CO4	Analyze various problems of time & cost optimization using network techniques like CPM & PERT.	10	6	0	16	2.63	Very Good (Students have grasped the CO)
		CO5	Plan effectively for manpower & material management in a project along with suitable safety measures.	10	6	0	16	2.63	Very Good (Students have grasped the CO)

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

4	110614: Railway, Airport & Tunnel Engineering	CO1	Explain the elements of airport planning, bridges & tunnels	5	3	1	7	2.29	Good (Students have grasped the CO)
		CO2	Design runway & taxiway system as per regulations.	3	3	1	7	2.29	Good (Students have grasped the CO)
		CO3	Explain various elements of railway tracks, signaling, yards, bridges & tunnels.	3	3	1	7	2.29	Good (Students have grasped the CO)
		CO4	Illustrate various gauge, signals, fasteners, turnouts, crossing etc.	3	3	1	7	2.29	Good (Students have grasped the CO)
		CO5	Apply construction methods of railway tunnels.	3	3	1	7	2.29	Good (Students have grasped the CO)
5	900121: Sustainable Materials & Green Buildings	CO1	Apply the concepts of sustainability in the context of building and conventional	6	4	0	14	2.43	Good (Students have grasped the CO)
		CO2	Explain the Concepts of VOC and indoor air quality	8	6	0	14	2.57	Very Good (Students have grasped the CO)
		CO3	Apply the concepts of embodied, Operational and Life Cycle Energy, Minimizing Energy consumption by optimal design, use of BIPV.	6	4	0	14	2.43	Good (Students have grasped the CO)
		CO4	Apply the guidelines of ECBC, LEED, GREENA while planning a building.	6	7	1	14	2.36	Good (Students have grasped the CO)
		CO5	Use renewable energy sources in buildings.	4	0	0	14	2.36	Good (Students have grasped the CO)
6	900120: Building Services & Maintenance	CO1	Identify various services required in a building.	4	4	3	11	2.09	Good (Students have grasped the CO)
		CO2	Carry out planning of fire fighting system for a building	4	4	3	11	2.09	Good (Students have grasped the CO)

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

		CO3	Develop a management strategy for maintenance of building services in a building	4	4	3	11	2.09	Good (Students have grasped the CO)
		CO4	Design a sustainable building services plan for a building.	4	4	3	11	2.09	Good (Students have grasped the CO)
7	100007: Disaster Management	CO1	Identify disaster prevention and mitigation approaches.	5	8	1	14	2.29	Good (Students have grasped the CO)
		CO2	Classify global and national disasters, their trends and profiles.	5	8	1	14	2.29	Good (Students have grasped the CO)
		CO3	Determine the impacts of various disasters.	4	8	1	14	2.29	Good (Students have grasped the CO)
		CO4	Apply Disaster Risk Reduction in management.	4	8	1	14	2.29	Good (Students have grasped the CO)
		CO5	Infer the linkage between disasters, environment and development.	5	8	1	14	2.29	Good (Students have grasped the CO)
		CO1	Recognize various engineering problems and techniques to solve them.	2	2	2	6	2.00	Good (Students have grasped the CO)
8	110607: Minor Project - II	CO2	Reproduce the solution of the problems upon the need of society.	2	1	3	6	1.83	Satisfactory (Students have not grasped much about the CO) Action: Skill based project to be given.
		CO3	Cooperate to work within group.	2	2	2	6	2.00	Good (Students have grasped the CO)
		CO4	Develop the writing and communication skills for various engineering problems.	2	3	1	6	2.17	Good (Students have grasped the CO)
		CO5	Display lifelong learning	2	2	2	6	2.00	Good (Students have grasped the CO)

ANNEXURE – XV

(Modified Scheme PG Programme 3rd Semester)

-

[Handwritten signatures and marks in blue ink]

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

Master of Engineering in Construction Technology & Management (Semester – III)

For batch admitted in academic session 2021 – 22

Scheme of Examination

S. No.	Subject Code	Subject Name	Maximum Marks Allotted							Total Marks	Contact Hours per week			Total Credits
			Theory Slot			Practical Slot		MIDC's			L	T	P	
			End Sem.	Mid Sem.	Quiz/ Assignment	End Sem. /Practical Viva	Sessional Work/ Practical Record/ Assignment/ Quiz/ Presentation	Assignment	Exam					
1.	510311	Dissertation Part-I (Literature Review/ Problem Foundation/ Synopsis/survey paper, etc.)	-	-	-	150	100			250	-	-	00	10
2.	800311	MIDC Course	-	-	-	-	-	25	75	100	02	-	-	02
		Total	-	-	-	150	100	25	75	350	-	-	12	12

*MIDC Course: Ground Improvement

Handwritten signatures and initials in blue ink, including a large signature that appears to be "R" and another that looks like "Q. N." with a checkmark.

DEAN (ACADEMICS)
MLTS
GWALIOR

Master of Technology in Environmental Engineering (Semester - III)

For batch admitted in academic session 2021 - 22

Scheme of Examination

S. No.	Subject Code	Subject Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	
			Theory Slot			Practical Slot		MIDDC's		L	T	P		
			End Sem.	Mid Sem.	Quiz/ Assignment	End Sem. /Practical Viva	Sessional Work/ Practical Record/ Assignment/ Quiz/ Presentation	Assignment						Exam
1	530311	Dissertation Part-I (Literature Review/ Problem Foundation/ Synopsis/survey paper, etc.)	-	-	-	150	100	-	-	-	10	10		
2	800312	MIDDC Course	-	-	-	-	-	25	75	100	02	-	02	
		Total	-	-	-	150	100	25	75	350	-	-	12	12

*MIDDC Course - Plastic Waste Management

ANNEXURE – XVI

(Syllabus of MOOC developed)

[Handwritten signatures and initials in blue ink, including 'Aad', 'WKS', 'P.P.', 'A.P.', 'S', 'A', 'B', and 'Q']

ANNEXURE - XVI

SYLLABUS FOR MITS MOOC COURSE DEVELOPED IN
INSTITUTE

Course Name: Geosynthetics and Soil Reinforcement

L	T	P	Credit
3	0	0	3

Course Objectives:

1. To understand the emerging trends of geosynthetics in geotechnical engineering
2. To evaluate the different properties of including different tests
3. To analyze the functions of geosynthetics and its suitability
4. To design different structures using geosynthetics according to various applications.

Syllabus:

Unit I

Introduction to Geosynthetics: Historical developments, Definitions and classification, Basic functions and selection, Use in India.

Unit- II

Manufacturing: Materials and Process: Raw materials and manufacturing processes, Different types of bonding process.

Unit- III

Properties & Functions of Geosynthetics: Various properties of geosynthetics & their testing, Functions of geosynthetics: Reinforcement, Separation, Filtration, Drainage, Barrier Functions, and Confinement.

Unit- IV

Applications of Geosynthetics: Application areas: Retaining walls, Embankments, Shallow foundations, Unpaved roads, Paved roads, Airport, Railway tracks, Slopes, Landfills, Earth dams, Containment ponds, Reservoirs, Ponds, Canals, Pipeline and drainage systems, Tunnels.

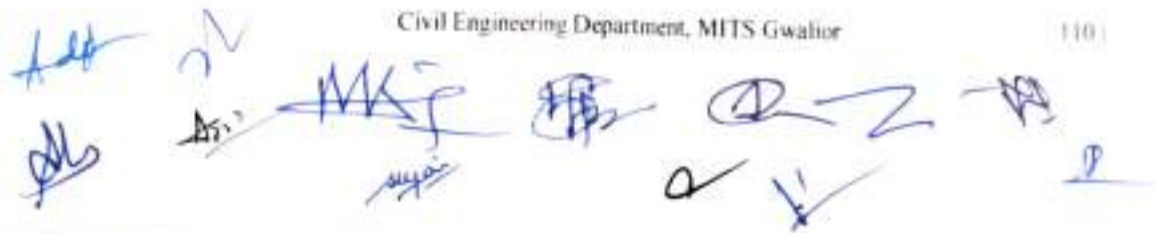
Unit- V

Principles of Soil Reinforcement: Principles of soil reinforcement; Design and construction of geosynthetic reinforced soil retaining structures – walls and slopes, Codal provisions.

Course Outcomes:

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

- CO1: **Identify** the different types of geosynthetics and their importance in geotechnical field.
- CO2: **Understand** the mechanism of formation of different geosynthetics
- CO3: **Analyze** and compute different properties of geosynthetics
- CO4: **Apply** the knowledge to appropriate field situation.



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous Institute affiliated to RGPV, Bhopal)

Suggestive Readings:

1. Geosynthetics and Their Applications by S. K. Shukla and J.H Yin, CRC Press.
2. Reinforced Soil Engineering: Advances in Research and Practice by Hoe I. Ling, Dov Leshchinsky, Fumio Tatsuoka, Marcel Dekker, Inc.
3. Earth Reinforcement and Soil Structures by Colin John Francis Phillip Jones, Butterworths & Co.

[Handwritten signatures and initials in blue ink, including names like AKP, AS, and others.]

Course Name: Sustainable Materials & Green Buildings

L	T	P	Credit
3	0	0	3

Course Objectives:

1. To expose the students to the concepts of sustainability in the context of building and conventional engineered building materials, such as Concrete, Bricks, and achieving the same through lower Carbon cements, Superior brick kilns and Recycled aggregate minimizing consumption of natural resources including water
2. To study the concepts of VOC and indoor air quality.
3. Exposing the student to concepts of embodied, Operational and Life Cycle Energy, Minimizing Energy consumption by optimal design, use of BIPV.
4. The course also intends to make student aware of ECBC, LEED, GRIHA etc.

Syllabus:

Unit I

Embodied energy, Operational energy in Building and Life cycle energy Ecological footprint, Bio-capacity and calculation of planet equivalent.

Unit- II

Role of Material: Carbon from Cement, alternative cements and cementitious material, Alternative fuel for cements for reduction in carbon emission, Sustainability issues for concrete, Role of quality, minimization of natural resource utilization, High volume fly ash concrete, geo-polymer concrete etc, concrete with alternative material for sustainability.

Unit- III

Reduction in water consumption in concrete, Recycled aggregate, Energy for grinding crushing of cement aggregate etc. and reduction, Operational energy in building role of materials and thermal conductivity, Clay Bricks, Types kilns, Comparative energy performance emission performance and financial performance, Indoor air quality.

Unit- IV

ESE Aspects of Sustainability and Climate Change Mitigation, Current National and International Scenario of SD and Dependence on Energy, Impact of Pollutions and Design Processes with Alternative Solutions for Health of Ecosystem

Unit- V

Environmental Impact Assessment and Lifecycle Analysis, Policy, Growth, Development and 3R's for Consumption, NBC, ECBC, and SA Methods such as GRIHA, UN SDG and System Design tools such as SPSS, MSDS by LeNS, Vernacular and Responsive Design using Net- Zero Energy, Lighting, Ventilation, Views, etc., for Human Comfort, Design for Sustainability and Nature as Inspiration

Course Outcomes:

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

CO 1: Apply the concepts of sustainability in the context of building and conventional engineered building materials.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous Institute affiliated to RGPV, Bhopal)

CO 2: Explain Concepts of VOC and indoor air quality.

CO 3: Apply the concepts of embodied, Operational and Life Cycle Energy, Minimizing Energy consumption by optimal design, use of BIPV.

CO 4: Apply guidelines of ECBC, LEED, GRIHA.

CO 5: Plan & use of renewable energy sources in buildings.

Text Books:

1. Sustainable Construction: Green Building Design and Delivery, John Wiley & Sons, 2005.

2. Building Reuse: Sustainability, Preservation, and the Value of Design by Kathryn Rogers Merlino, University of Washington Press, 2018.

Reference Books:

1. Natural Design, Organic Architecture: Lessons for Building Green by Frank Lloyd Wright, Rizzoli, Illustrated edition



ANNEXURE – XVII

(Contents of SIP & SEP Modules)



ANNEXURE - XVII

CONTENTS OF SIP & SEP MODULES

SIP (Summer Internship Project - I) Modules

Name of Module - Application of MATLAB & SPSS in Engineering Problems

Module Code - CE0322S1

Module Contents -

Introduction and Basics of MATLAB, Interactive Computation and Programming in MATLAB, Graphics, MATLAB Toolbox-I, MATLAB Toolbox-II, Introduction to Basics of SPSS, Frequency and Descriptive Analysis of Data using SPSS, Hypothesis Testing using SPSS, Artificial Neural Network in SPSS, Application of MATLAB to Engineering Problems

Name of Module - Introductory Course in Microsoft Office

Module Code - CE0322S2

Module Contents -

MS Word: Text Formatting and Saving file, Working with Objects, Header & Footers, Working with bullets and numbered lists, Tables, Printing, MS Power Point: Setting Up PowerPoint Environment, Creating slides and applying themes, Working with bullets and numbering, Working with Objects, Working With Videos, Using Smart Art and Tables, Animation and Slide Transition, MS Excel: Introduction to Excel, Formatting excel work book, Perform Calculations with Functions, Create Effective Charts to Present Data Visually, Printing.

Name of Module - Introduction to Sustainable Engineering

Module Code - CE0322S3

Module Contents -

Introduction to Sustainability, Sustainable development concepts and challenges, Nexus between Technology and Sustainability, Multilateral agreements and Protocols - CDM, Environment legislations in India, Air Pollution, Water pollution, Sustainable wastewater treatment, Solid waste, Zero waste concepts, 3 R concept, Global environmental issues, Climate change, Global warming, Ozone layer depletion, Carbon credits and carbon trading, carbon foot print, Life Cycle Analysis (LCA), Bio-mimicking, Environment Impact Assessment (EIA), Concepts of sustainable habitat, Green buildings, green materials for building construction, Methods for increasing energy efficiency of buildings, Sustainable cities, Sustainable transport, Energy sources, Conventional and non-conventional, Solar energy, Fuel cells, Wind energy, Small hydro plants, bio-fuels, Energy derived from oceans, Geothermal energy, Green Engineering, Sustainable Urbanization, industrialization and

poverty reduction, Social and technological change. Industrial Processes: Material selection, Pollution Prevention, Industrial Ecology, Industrial symbiosis.

Name of Module – Study of Geological Maps & Subsurface Exploration

Module Code – CE0322S4

Module Contents –

Study of geological map to identify the geological nature of the area like fault, fold, dip, strike etc., which are very important in deciding the location of major civil engineering project site like Dams and Bridges etc. Geological maps represent the geological conditions and structure of the area as they appear at the earth surface. A good geological map does not only show which rocks, crops out at the land surface but also enables the stratigraphy and tectonic structure of the area to be visualized.

SEP (Skills Enhancement Program) Modules

Name of Module – Structural Design of Two Storey RC Building

Module Code – CE0620V3

Module Contents –

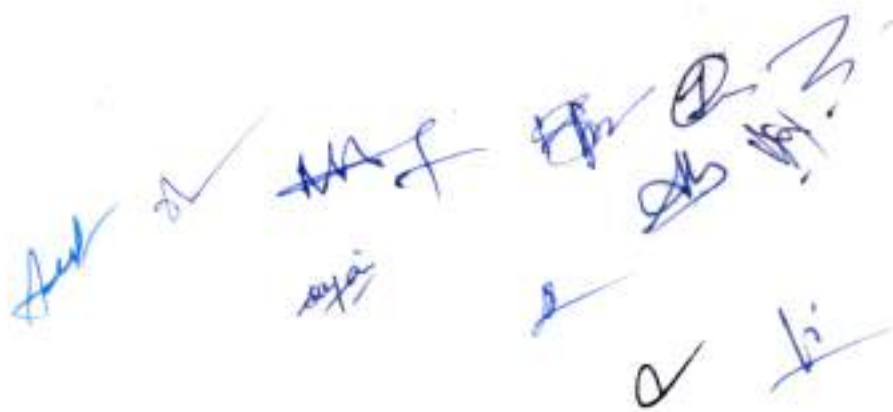
The module consists of concepts and theories involved in understanding the building plan and structural planning; estimation of design loads on different elements; design and analysis of different building elements and preparing design details.

Understanding the building plan & its structural planning, Estimation of Design loads on various elements, Analysis of different elements for estimated design loads, Designing the building elements for design variables, Preparing design details.



ANNEXURE – XVIII

(Tentative List of B.Tech Projects)



ANNEXURE - XVIII

TENTATIVE LIST OF B.TECH PROJECTS

1. Development of concrete using construction waste
2. Investigation of Self compacting concrete properties
3. Investigation of properties of mortar using different construction waste as fine aggregates
4. Development of concrete using fibre.
5. R.C.C. Building design
6. Design of Load bearing buildings
7. Design of RC framed buildings.
8. Design of Self Compacting Concrete
9. Design of concrete using non-conventional aggregates
10. Soil stabilization
11. Performance of Rate Analysis
12. Preparation of Estimate of Construction Projects.
13. Evaluation of Tender's.
14. Study of Contract System in Construction Industry
15. Contractor Selection for infrastructure projects
16. Present maturity level of construction industry in India
17. Industry 4.0 in Civil Engineering
18. Analysis of Rates for different item of building works.
19. Concrete Mix Design
20. Planning of Residential Building
21. Preparation of Topographic map of given area
22. Field Study of running projects
23. Planning of Buildings
24. Use of New & advanced materials
25. Low cost building construction technology.
26. Green / Energy efficient buildings construction for sustainable development
27. New Construction technology

28. Indoor Air Quality Analysis & Monitoring
29. Ambient & Traffic Noise Analysis & monitoring
30. Comparative Analysis of Water Quality
31. E-Waste Management Practices
32. Plastic Waste Management practices
33. Moment Curvature Analysis
34. Measuring Strength of Concrete
35. Analysis of structure subjected to environmental load
36. Analysis of Shear wall Frame Building
37. Groundwater Modelling
38. GIS based modelling
39. Soft computing techniques in Civil Engineering
40. Air Quality Modelling
41. Contamination Remediation Methods
42. Ground Improvement
43. Devise performance based asphalt mix design method
44. Effect of waste rubber on Cantabro loss of concrete
45. Identification of accident black spots and perform road safety audit
46. Determination of PCU in heterogeneous traffic conditions
47. Determination of traffic flow in heterogeneous traffic conditions
48. Effect of shrinkage in construction and demolition waste
49. Durability tests of concrete and mortar
50. Fresh concrete properties
51. Volume based mix design method
52. Transportation Planning of Gwalior City
53. Route Planning of Gwalior city
54. Traffic Management of Gwalior city
55. Study of different intersections rotary and signals of Gwalior city

[Handwritten signatures and initials in blue ink]

ANNEXURE – XIX

(Modified Syllabus of M.E. CTM 1st Semester)



ANNEXURE - XIX

MODIFIED SYLLABUS OF M.E. CTM 1st SEMESTER

Course Code: 510121

Course Name: Construction Materials, Machines & Techniques

L	T	P	Credit
3	0	0	3

Course Objectives:

1. To impart knowledge about ingredients of concrete, production of concrete at site and ready mix concrete.
2. To apprise about special concretes for different field requirements.
3. To apprise about various types of equipment's/ machineries used in construction industry.
4. To develop understanding of construction procedure for piles and well foundations.
5. To impart know-how of formwork and scaffolding.
6. To develop technical know-how of shop and insitu construction/fabrication.

Syllabus:

Unit-I

Concrete and its ingredients: Ingredients of concrete including mineral admixtures and chemical admixtures; Proportioning of ingredients; Stages in production of concrete i.e. Batching, Mixing, Transporting, Placing compacting and curing. Design of high strength concrete; Production of Ready mix concrete.

Unit-II

Special Concrete: Polymer concrete, Light weight concrete, Heavy weight concrete, Concrete for radiation shielding, No-Fines concrete, Pervious concrete; Ferro cement; Fiber reinforced concrete, Dry lean concrete and Pavement quality concrete; Self compacting concrete.

Unit-III

Construction Equipments: Characteristics, Operation and selection of different types of construction equipments viz. Power shovels, Drag lines, Scraper, Bulldozer, Tractor, Rippers, Motor graders. Equipments for aggregate processing plant; Ready Mix Concrete Plant; and Hot Mix plant

Unit-IV

Foundations: Construction of piles, Well foundations, Cofferdams and diaphragms; Drilling and blasting, Underpinning, Shoring and shuttering.

Formwork: Different types of formworks, Stationary and slip formwork techniques, Scaffolding

Unit-V

Steel Construction: Shop and insitu construction techniques, Pre-engineered buildings; Erection of steel structures like bridges, and trusses.

Prefabrication: Application of prefabrication in construction, Modular coordination and standardization; equipments for industrial production of prefabricated components.

Prestressing: Prestressing methods; Materials; Loss of prestress; equipments for industrial production of prestressed components; Production of Railway Sleepers, Poles and Tanks.

Course Outcomes:

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

CO 1: Explain the details of various stages in production of normal, high strength & RM concrete.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous Institute affiliated to RGPV, Bhopal)

- CO 2: Design** concrete mix for specific requirements using codal provisions.
CO 3: Determine the suitability of special concretes for specific requirements.
CO 4: Evaluate the suitability of various equipments for a construction site.
CO 5: Explain the details of different type of formwork and foundation construction.
CO 6: Apply shop and insitu methods and the pre-stressing concepts for a construction project

Reference Books:

1. D. G. Gransberg, C. M. Popescu and R. C. Ryan, Construction Equipment Management for Engineers, Estimators, and Owners, Taylor & Francis, New York.
2. R. L. Peurifoy, C. J. Schexnayder, A. Shapira and R. Schmitt, Construction planning, equipment, and methods, 8th ed., McGraw Hill, New York, 2010.
3. A. R. Santha Kumar, Concrete Technology, Oxford University press.
4. A.M. Neville, Properties of concrete. Pearson Publication
5. M.L. Gambhir, Concrete Technology, Tata Mc Graw Hill Pub. Co.
6. Soil Mechanics by Gopal Ranjan, New Age Publishers.
7. Mahesh Verma, Construction Equipment, its planning & Application, Metropolitan Book Co (P) Ltd.
8. Foundation Design Manual by Narayan V. Nayak, Dhanpat Rai Publications
9. Prestressed Concrete by T.Y. Lin and N.H. Burns, Wiley Publishers
10. Highway Engg by Justo and Khanna, Publisher: Nem Chand and Brothers.



Course Code: 510114

Course Name: Maintenance Management

L	T	P	Credit
3	0	0	3

Course Objectives:

1. To learn about building services required in a building.
2. To learn about fire fighting systems in buildings.
3. To understand planning and maintenance requirements of lifts in high rise buildings.
4. To understand water management and planning system in a building.
5. To learn maintenance of building services and management of related tasks.

Syllabus:

Unit I

Introduction: Introduction to primary services in a building, Applications of computer in service management, Type of services required to keep facility usable, planning of services, Organization structures of services management, Role and administrative functions of supervisors, Acoustics, Acoustic design, Thermal treatment, Water & damp proofing causes & effects, measures to control.

Unit II

Fire Fighting: Standard fire, fire resistance, classification of buildings. Basic requirement of the works for fighting system, various components of the fire fighting system. Maintenance required of the system, fire fighting in high-rise buildings, commercial/industrial complexes. Public buildings, checklist for fire safety. Provision of NBC.

Unit III

Lifts/Elevators, Escalators: Legal formalities for elevators, various types of lifts, working mechanisms of lift and escalators. Indian standard codes for planning & installations of elevator, inspection & maintenance of lifts.

Unit IV

Plumbing Services Water Supply System: Basics of Plumbing systems. Requirement of Plumbing works, Agency, Activity flow chart for plumbing work. Quality checking of materials. Water supply and distribution system in high-rise building & other complexes, pumps and pumping mechanisms. Operation & maintenance of fittings & fixtures of water supply & sanitary. Do's & Don'ts for water pipe networks.

Unit V

Maintenance and management of services: Electrical network & appliances. Basics of single phase & three phase electrification, precautions and safety measures during electrification. Indian standard codes for electrical appliances & wiring operations & maintenance of network & appliances. Wiring & its types, electrical fixtures, earthing, fuses, wiring diagrams. Flowcharts of air conditioning & heating. Centralised systems, monitoring and working of the equipments, Checklist of inspection, Performance testing.

Course Outcome:

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

CO1: Identify various services required in a building.

CO2: Carry out planning of firefighting system for a building.

CO3: Develop a management strategy for maintenance of building services in a building.

CO4: Design a sustainable building services plan for a building.

Reference Books:

1. Building services Design and Management by Jackie Partman, Wiley Blackwell 2014.
2. Building Services Engineering by David V. Chadderton, Routledge 2013.

A collection of approximately 15 handwritten signatures and initials in blue ink, scattered across the page. Some are clearly legible as 'ded', 'AS1', 'AS2', 'AS3', 'AS4', 'AS5', 'AS6', 'AS7', 'AS8', 'AS9', 'AS10', 'AS11', 'AS12', 'AS13', 'AS14', 'AS15', 'AS16', 'AS17', 'AS18', 'AS19', 'AS20', 'AS21', 'AS22', 'AS23', 'AS24', 'AS25', 'AS26', 'AS27', 'AS28', 'AS29', 'AS30', 'AS31', 'AS32', 'AS33', 'AS34', 'AS35', 'AS36', 'AS37', 'AS38', 'AS39', 'AS40', 'AS41', 'AS42', 'AS43', 'AS44', 'AS45', 'AS46', 'AS47', 'AS48', 'AS49', 'AS50', 'AS51', 'AS52', 'AS53', 'AS54', 'AS55', 'AS56', 'AS57', 'AS58', 'AS59', 'AS60', 'AS61', 'AS62', 'AS63', 'AS64', 'AS65', 'AS66', 'AS67', 'AS68', 'AS69', 'AS70', 'AS71', 'AS72', 'AS73', 'AS74', 'AS75', 'AS76', 'AS77', 'AS78', 'AS79', 'AS80', 'AS81', 'AS82', 'AS83', 'AS84', 'AS85', 'AS86', 'AS87', 'AS88', 'AS89', 'AS90', 'AS91', 'AS92', 'AS93', 'AS94', 'AS95', 'AS96', 'AS97', 'AS98', 'AS99', 'AS100'.

Course Code: 800109

Course Name: Safety & Quality Management

L	T	P	Credit
3	0	0	3

Course Objectives:

1. To study the basics of quality and safety management.
2. To learn the code of practice in design and construction for quality standards.
3. To understand and evaluate quality and safety management principles and best practices in construction.
4. To understand and evaluate safety management principles in construction.
5. To acquire good basic practices for quality system and progress for quality assurance and quality improvement for construction companies.

Syllabus:

Unit – I

Quality Management: Introduction – Definitions and objectives, Factors influencing construction quality; Responsibilities and authority; Quality plan; Quality Management Guidelines; Quality circles; cost of quality and safety; Quality transition - quality control and inspection; quality assurance; total quality management-principles, tools and techniques; Planning and control of quality during design of structures; Tools and techniques for quality management.

Unit – II

Quality Systems: Introduction - Quality system standard, ISO 9000 family of standards; Requirements-Preparing Quality System Documents; Quality related training; Implementing a Quality system; Third party Certification; Concepts of quality control- Objectives, definitions, and systems.

Unit – III

Quality Planning: Quality Policy, Objectives and methods in Construction industry; Consumers satisfaction, Ergonomics, Time of Completion, Statistical tolerance, Taguchi's concept of quality, Inspection procedures-Processes and products (materials and machinery); Total cost implication.

Quality Assurance and Quality Improvement Techniques:

Evolution of quality assurance, Objectives of quality assurance; Methods, Techniques and needs of quality assurance; Different aspects of quality Appraisals; Quality assurance in construction. Role of quality assurance in TQM process, Quality assurance standards. Developing and implementing quality assurance system, Quality Improvement Tools and Techniques, work study, method study and time study.

Unit – IV

Safety management : Planning for safety provisions, budgeting for safety, safety policy, Safety audit, safety management practices, safety survey, safety inspection, safety sampling, evaluation of performance of supervisors on safety; Construction hazards and safety guidelines; Overall accident investigation process; Risk management; Prevention techniques for construction accidents; Site management with regard to safety recommendations; Training for safety awareness and implementation; Construction safety and health manual.

(Handwritten signatures and initials)

Unit-V

Recent trends and Case studies: Quality and safety issues in steel construction, concrete construction (including pre-cast, and pre-stressed); computer aided hazard analysis.

Course Outcomes:

After this course, students will be able to:

- CO 1: **Explain** the quality management systems and utilize the ISO 9000 family of standards.
- CO 2: **Improve** the quality of the project through tools and techniques.
- CO 3: **Perform** the environmental impact assessment (EIA) for construction projects towards quality.
- CO 4: **Analyse** the quality assurance and quality control, quality improvement tools and techniques.
- CO 5: **Evaluate** the contract and inspection procedures.
- CO 6: **Identify** the safety management practices in construction industry.

Reference Books:

1. B. G. Dale, Managing quality, 4th ed., Blackwell Publishing, Oxford, 2003.
2. D. Reese and J. V. Eidson, Handbook of OSHA construction safety and health, 2nd ed., CRC Press, Bocaaton, 2006.
3. F. Harris, R. McCaffer and F. Edum-Fotwe, Modern construction management, 6th ed., Blackwell Publishing, Oxford, 2006.
4. K. Knutson, C. J. Schexnayder, C. M. Fiori and R. Mayo, Construction management fundamentals, 2nd ed., McGraw Hill, New York, 2008.
5. S. J. Holt, Principles of construction safety, Blackwell Publishing, Oxford, 2008.
6. The Management and Control of Quality: Sixth edition: James R Evans, William M Lindsay.
7. Safety management by John V. Grimaldi Rollin H. Simonds.
8. ISO 9000 family of standards