Ref. No.: PU/SoE/CIV/BOS-07/2018-19/MOM-01 Date: 26-05-2018

7TH BOS MINUTES OF MEETING

The 7th meeting of Board of Studies (BoS) for Civil Engineering is held today on 26th May, 2018 in Room No. HG 01 at 10.00 AM in the presence / absence of following members of the committee.

Members Present:

S. No.	Name	Affiliation	Position
1	Mrs. Debalina Banerjee	Assistant Professor and HOD SoE, PU, Bengaluru	Chairman Ex-Officio
2	Dr. Nakul Ramanna	Associate Professor SoE, PU, Bengaluru	Member Secretary (Nominated by VC within the Department)
3	Dr. Amiya Goswami	Adjunct Professor SoE, PU, Bengaluru	Special Invitee
4	Mr. Bhavan Kumar	Assistant Professor SoE, PU, Bengaluru	Internal Member (Nominated by VC within the Department)
5	Mr. Tapas Guha	Assistant Professor SoE, PU, Bengaluru	Internal Member (Nominated by VC within the sister Department)
6	Mr Muralidhara D.M	Assistant Professor SoE, PU, Bengaluru	Internal Member (Nominated by VC within the sister Department)
7	Dr. Srikanth M. Naik	Professor, Civil Engineering MS Ramaiah Institute of Technology, Bengaluru	External Member (Academic)
8	Dr. L. Govindaraju	Associate Professor of Civil Engineering, UVCE, Bengaluru	External Member (Academic)

Members Absent:

S. No.	Name	Affiliation	Position
1	Dr. Sanjiv Aundhe	Director, Citius Project	External Member (Industry)

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PRESIDENCY UNIVERSITY Registrar BANGALORE

Welcome:

Mrs. Debalina Banerjee, Chairman of the Board of Studies (BoS) for Civil Engineering has extended warm welcome to all the members, particularly to the external members and the Special Invitee. Further, she has expressed her pleasure to have youngsters in her team.

Introduction:

At the outset, Mrs. Debalina Banerjee, Chairman of BoS for Civil Engineering, has introduced all the members. Mrs. Debalina has briefed the need for conducting 7th BoS meeting and requested the members to go through the existing Program Regulations and Curriculum of 2017-2021 batch meticulously as it is considered as basic structure for B.Tech. Civil Engineering in Presidency University, Bengaluru.

Mrs. Debalina Banerjee has also requested suggestions from the members of BoS to incorporate essential modifications, if required, in the Program Regulations and Curriculum of 2017-2021. Mrs. Debalina Banerjee has informed that the modifications in the existing Program Regulations and Curriculum of 2016-2020 and 2015-2019 will be incorporated in line with modified Program Regulations and Curriculum of 2017-2021, if applicable. Mrs. Debalina has also informed that the modifications in the proposed Program Regulations and Curriculum of 2018-2022 will be incorporated in line with modified Program Regulations and Curriculum of 2017-2021, if applicable.

Agenda 7.1: Review and approval of the Minutes of 6th BoS meeting

The Minutes of Meeting (MoM) of the previous meeting (i.e., 6th meeting of BoS held on 2nd December, 2017) is unanimously approved by the members.

Agenda 7.2: Approval of the Program Regulations and Curriculum of 2018-2022, 2017-2021, 2016-2020 and 2015-2019

Comment 7.2: The chairman has proposed Program Regulations and Curriculum of 2018-2022 for approval. The draft copy of proposed Program Regulations and Curriculum of 2018-2022 is given in Annexure 7.2.

Resolution 7.2: The members have approved the proposal and suggested to incorporate necessary modifications in the proposed Program Regulations and Curriculum of 2018-2022 in line with modified Program Regulations and Curriculum of 2017-2021, 2016-2020 and 2015-2019, as applicable.

Agenda 7.3: Proposal to add new Discipline Elective Courses

Comment 7.3: Pursuant to feedback received from stakeholders, the chairman has proposed inclusion of new discipline elective course Advanced Surveying. The course description and topics for the proposed course is given in Annexure 7.3.

Resolution 7.3: The members have approved the inclusion of discipline elective course: Advanced Surveying in the programme structure and curriculum of 2018-2022. The members have approved same changes in the existing programme structure and curriculum of 2017-2021, 2016-2020 and 2015-2019, as applicable.

Agenda 7.4: Merge two laboratory courses

Comment 7.4: Pursuant to feedback received from stakeholders, the chairman has proposed to merge Transportation Engineering Lab offered in V semester with Concrete Technology Lab being offered in V

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semester. The new course will be called Concrete and Highway Materials Testing Lab and offered in the same semester. Course description and content has been presented to the committee as given in Annexure 7.4.

Resolution 7.4: The members have approved the proposed change as presented in Annexure 7.4.

Agenda 7.5: Change in credit structure and semester offering for two courses

Comment 7.5: Pursuant to feedback received from stakeholders, the chairman has proposed change in the credit structure and semester offering for following courses.

Course Name	Current Credit Structure	Proposed Structure	Semester Offered
Computer aided building drawing Lab	0-0-4-2	0-0-2-1	V (Previously VI)
Computer aided structural analysis Lab	0-0-4-2	0-0-2-1	VI (Previously VII)

Resolution 7.5: The members have approved the proposed changes for the two courses.

Agenda 7.6: Amendment to the course content of Elements of Civil Engineering and Strength of Materials

Comment 7.6: Pursuant to feedback received from stakeholders, the chairman proposed updated course content for Elements of Civil Engineering and Strength of Materials courses as indicated in Annexure 7.6.

Resolution 7.6: The members have approved the changes in course content of Elements of Civil Engineering and Strength of Materials as shown in Annexure 7.6.

Agenda 7.7: Ratify the changes in the Text Books/ Reference Books for Environmental Geotechnics and Solid Waste Management course

Comment 7.7: The chairman proposed changes in text book / reference books for Environmental Geotechnics and Solid Waste Management course as shown in Annexure 7.7.

Resolution 7.7: The members have approved the changes in text book / reference books as shown in Annexure 7.7.

Agenda 7.8: Any other matter with permission from the Chair

Comment 7.8: The external experts emphasized the importance of access to journals, research databases, and NPTL resource for undergraduate student learning. The committee also recommended networking with Metro for student internship and QC opportunities.

Resolution 7.8: The chairman conveyed that NPTL and similar resources, self-learning topics are currently being utilized as part of continuous assessment of students per our current academic regulations and curriculum. The chairman also assured that best effort will be made to promote industry networking.

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The BoS Committee has authorized Mrs. Debalina Banerjee, the Chairman of BoS for Civil Engineering, to incorporate minor corrections / edits, if required.

Mrs. Debalina Banerjee has conveyed that the decisions taken during the 7th meeting of BoS for Civil Engineering will be implemented for 2018-2022, 2017-2021, 2016-2020 and 2015-2019 as early as possible whereever applicable. She has conveyed thanks to all the members and informed that the date of next BoS meeting will be notified soon.

BoS Committee:

S. No.	Name	Affiliation	Position	Signature with date
1	Mrs. Debalina Banerjee	Assistant Professor & HOD Civil Engineering, SoE, PU	Chairman Ex-Officio	
2	Dr. Nakul Ramanna	Associate Professor, SoE, PU, Bangalore	Member Secretary (Nominated by VC within the Department)	
3	Dr. Amiya Goswami	Adjunct Professor, SoE, PU, Bangalore	Special Invitee	
4	Mr. Bhavan Kumar	Assistant Professor SoE, PU, Bengaluru	Internal Member (Nominated by VC within the Department)	
5	Mr. Tapas Guha	Assistant Professor SoE, PU, Bengaluru	Internal Member (Nominated by VC within the sister Department)	26-5-18
6	Mr Muralidhara D.M	Assistant Professor SoE, PU, Bengaluru	Internal Member (Nominated by VC within the sister Department)	
7	Dr. Srikanth M. Naik	Professor, Civil Engineering MS Ramaiah Institute of Technology, Bengaluru	External Member (Academic)	
8	Dr. L. Govindaraju	Associate Professor of Civil Engineering, UVCE, Bengaluru	External Member (Academic)	
9	Dr. Sanjiv Aundhe	Director, Citius Project	External Member (Industry)	-

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Annexure 7.2

I Sem- PHYSICS CYCLE (Aug-Dec)*							
S. No	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**
			L	**T**	**P**	**CREDITS**	
1	MAT 101	Engineering Mathematics – I	3	1	0	4	4
2	PHY 101	Engineering Physics	4	0	0	4	4
3	EEE 101	Elements of Electrical Engineering	3	0	0	3	3
4	CIV 101	Elements of Civil Engineering	3	0	0	3	3
5	MEC 152	Engineering Graphics	2	0	4	4	6
6	ENG 103	Technical written communication	2	1	0	3	3
7	PHY 151	Engineering Physics Lab	0	0	2	1	2
8	MEC 151	Workshop Practice	0	0	2	1	2
9	PPS 105	Building Self Confidence	0	0	2	1	2
		TOTAL	**17**	**2**	**10**	**24**	**29**

I Sem - CHEMISTRY CYCLE (Aug-Dec)#							
S. No	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**
			L	**T**	**P**	**CREDITS**	
1	MAT 101	Engineering Mathematics – I	3	1	0	4	4
2	CHE 101	Engineering Chemistry	4	0	0	4	4
3	ECE 101	Elements of Electronics Engineering	3	0	0	3	3
4	MEC 101	Elements of Mechanical Engineering	3	0	0	3	3
5	CIV 102	Environmental Science and Disaster Management	3	0	0	3	3
6	ENG 104	Technical spoken communication	1	0	2	2	3
7	CSE 151	Computer Programming	2	0	4	4	6
8	CHE 151	Engineering Chemistry Lab	0	0	2	1	2
9	PPS 105	Building Self Confidence	0	0	2	1	2
		TOTAL	**19**	**1**	**10**	**25**	**30**

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II Sem- CHEMISTRY CYCLE (Jan-May) *							
S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	MAT 102	Engineering Mathematics – II	3	1	0	4	4
2	CHE 101	Engineering Chemistry	4	0	0	4	4
3	ECE 101	Elements of Electronics Engineering	3	0	0	3	3
4	MEC 101	Elements of Mechanical Engineering	3	0	0	3	3
5	CIV 102	Environmental Science and Disaster Management	3	0	0	3	3
6	ENG 104	Technical Spoken Communication	1	0	2	2	3
7	CSE 151	Computer Programming	2	0	4	4	6
8	CHE 151	Engineering Chemistry Lab	0	0	2	1	2
9	PPS 106	Effective Communication	0	0	2	1	2
		TOTAL	**19**	**1**	**10**	**25**	**30**

II Sem -PHYSICS CYCLE (Jan-May) #							
S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	MAT 102	Engineering Mathematics – II	3	1	0	4	4
2	PHY 101	Engineering Physics	4	0	0	4	4
3	EEE 101	Elements of Electrical Engineering	3	0	0	3	3
4	CIV 101	Elements of Civil Engineering	3	0	0	3	3
5	MEC 152	Engineering Graphics	2	0	4	4	6
6	ENG 103	Technical Written Communication	2	1	0	3	3
7	PHY 151	Engineering Physics Lab	0	0	2	1	2
8	MEC 151	Workshop Practice	0	0	2	1	2
9	PPS 106	Effective Communication	0	0	2	1	2
		TOTAL	**17**	**2**	**10**	**24**	**29**

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B.Tech STUDENT FEEDBACK ANALYSIS - (AY 2018-19)

DEPARTMENT OF CIVIL ENGINEERING

Criteria	5 - Excellent (in %)	4 - Very Good (in %)	3 - Good (in %)	2 - Average (in %)	1 - Poor (in %)	Total Respondents
1. How do you rate the syllabus of the courses that you have studied?	21.52	25.95	29.75	21.52	1.27	158
2. Course Applicability /relevance to real life situations (Employability)	25.32	25.32	35.44	13.92	0.00	
3. Learning value in terms of skills, concepts, knowledge and analytical abilities	21.52	33.54	24.05	20.25	0.63	
4. How do you rate the sequence of the Courses that you have studied in the previous semester?	25.32	21.52	37.97	15.19	0.00	
5. How do you rate the sequence of the units in the Course?	21.52	27.22	33.54	17.72	0.00	
6. How do you rate the offering of the electives in terms of their relevance to the specialization streams?	24.05	20.89	41.14	13.92	0.00	
7. How do you rate the relevance of the Text Books and reference books to the Courses?	26.58	24.68	31.01	16.46	1.27	
8. How do you rate the percentage of courses having LAB components?	26.58	23.42	40.51	8.86	0.63	
9. How do you rate the experiments in relation to the real life applications?	25.95	21.52	25.32	25.32	1.90	
10. How do you rate the allocation of the credits to the courses?	29.11	27.22	22.15	21.52	0.00	
Average	**24.75**	**25.13**	**32.09**	**17.47**	**0.57**	

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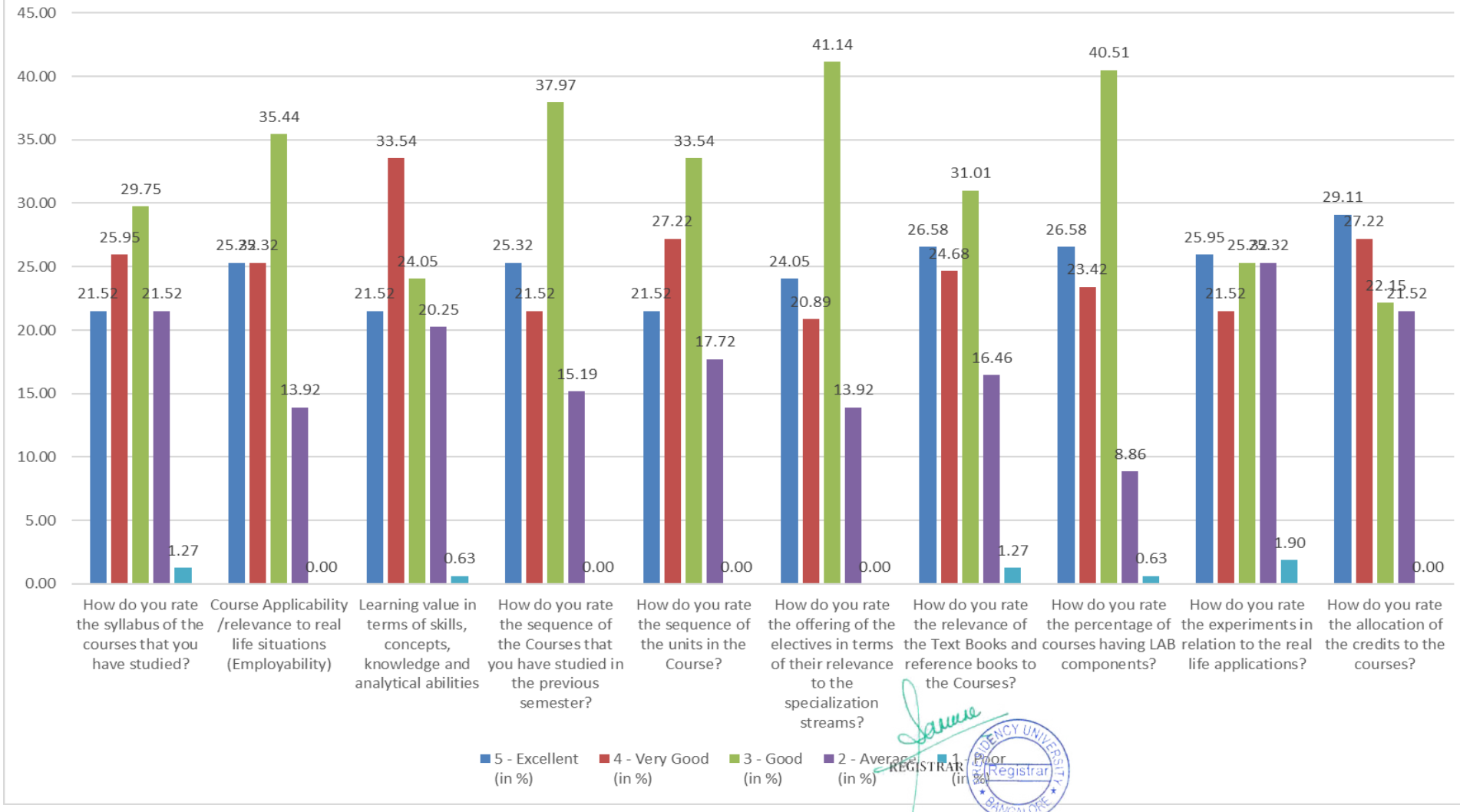
B.Tech STUDENT FEEDBACK ANALYSIS - (AY 2018-19), DEPARTMENT OF CIVIL ENGINEERING



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Feedback from students and action taken report

Sl. No.	Feedback	Action Taken
1	Introduce more field based activities and practical sessions / labs.	Separate slots have been assigned for active learning classes on working Saturdays to accommodate field based activities and practical sessions to link theory with lab. Tests / Experiments in existing lab courses will be reviewed and updated to make it more relevant to respective theory courses.
2	Need to allot more teaching/tutorial hours for design based courses/numerical based courses	The course contents are planned according to the lecture and tutorial hours available. However, there might have been a need felt to engage more tutorial hours only for slow learners. Remedial classes are being arranged for slow learners after regular working hours.

Pursuant to feedback received from stakeholders, new courses are added to curriculum as shown in Annexures CIV 7.3 and 7.4 for B.Tech Civil Engineering. Revised courses are shown in Annexures 7.5 and 7.6.

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PRESIDENCY UNIVERSITY Registrar BANGALORE

FACULTY FEEDBACK ANALYSIS – B.Tech Program (2018-19)

DEPARTMENT OF CIVIL ENGINEERING

Criteria	5 - Excellent (in %)	4 - Very Good (in %)	3 - Good (in %)	2 - Average (in %)	1 - Poor (in %)	Total Respondents
1. Syllabus is suitable to the course	25.26	42.66	19.80	12.29	0.00	12
2. Syllabus is need based	30.72	36.52	21.84	10.92	0.00	
3. Aims and objectives of the syllabi are well defined and clear to teachers and students	32.08	35.49	21.50	10.92	0.00	
4. The courses / syllabus has good balance between theory and application	29.35	32.42	22.18	15.36	0.68	
5. The course / program of studies carries sufficient number of optional papers	27.30	29.01	32.08	11.60	0.00	
6. The books prescribed / listed as reference materials are relevant, updated and appropriate	35.15	31.06	29.69	1.02	3.07	
7. Tests and examinations are conducted well in time with proper coverage of all units in the syllabus	36.18	30.72	27.99	4.10	1.02	
8. I have the freedom to propose, modify, suggest and incorporate new topics in the syllabus	32.76	33.45	22.53	9.90	1.37	
9. I have the freedom to adopt new techniques/strategies of teaching such as seminar presentations, group discussions and learners participations	39.93	30.38	22.53	6.14	1.02	
10. The environment in the department is conducive to teaching and research	31.74	32.76	19.80	14.33	1.37	
Average	**32.05**	**33.45**	**23.99**	**9.66**	**0.85**	

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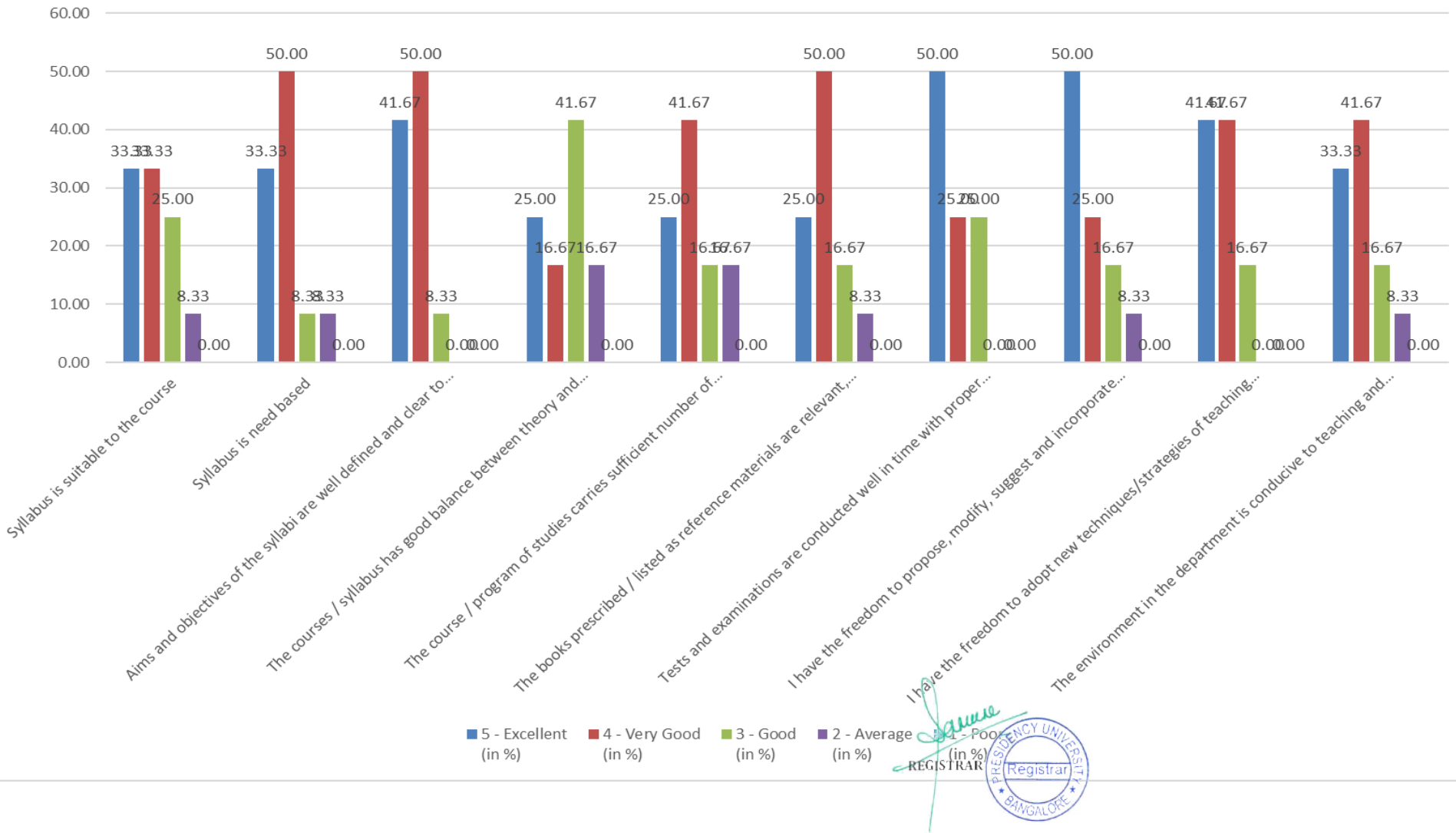
FACULTY FEEDBACK ANALYSIS - B.Tech Program Civil Engineering (2018-19)



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Feedback from faculty and action taken report

Sl. No.	Feedback	Action Taken
1	Need remedial / bridge classes to improve student's fundamental knowledge and performance in assessments.	Remedial classes are permitted to be taken by faculty during working Saturdays and free periods. Faculty to communicate timetable and session plans to the students and encourage them to attend offline classes for the same.
2	Technical and placement training sessions needed to prepare for first placement drive of the department	Aptitude and placement training for the pre-final year students will be given by L&D department, placement department and FACE training institute. In addition department will conduct technical training to make the students more competent.

Pursuant to feedback received from stakeholders, new courses are added to curriculum as shown in Annexures CIV 7.3 and 7.4 for B.Tech Civil Engineering. Revised courses are shown in Annexures 7.5 and 7.6.

Annexure 7.3

Course Name:	Advanced Surveying					
Course Code:	CIV 313	Credit Structure :	L	T	P	C
			3	0	0	3

Course Description: This course will enable students to apply geometric principles to arrive at solutions to surveying problems. Analyze spatial data using appropriate computational and analytical techniques. Use the concepts of advanced data capturing methods necessary for engineering practice.

The course consists of advanced surveying concepts including geodetic surveying, theory of errors, introduction to field astronomy, aerial photogrammetry and modern surveying instruments.

Text Book(s):

1. B.C. Punmia, *"Surveying Vol.2*", Laxmi Publications pvt. Ltd., New Delhi.
2. Chandra .A.M, "*Plane Surveying and Higher Surveying"*, New Age International (P) Limited, Publishers, Chennai.

Reference book(s):

1. James M Anderson and Adward M Mikhail, *Surveying theory and practice*, 7th Edition, Tata McGraw Hill Publication
2. Kanetkar T P and S V Kulkarni, *Surveying and Levelling Part 2*, Pune Vidyarthi Griha Prakashan.
3. K.R. Arora, "*Surveying Vol. III*" Standard Book House, New Delhi.
4. Sateesh Gopi, *Global Positioning System*, Tata McGraw Hill Publishing Co. Ltd. New Delhi.

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Annexure 7.4

Course Name:	Concrete and Highway Materials Testing Lab					
Course Code:	CIV 262	Credit Structure :	L	T	P	C
			0	0	2	1

Course Description: The objective of concrete laboratory is to determine the physical properties of building construction materials like cement, fine and coarse aggregate. The tests include determination of specific gravity, fineness, normal consistency, setting times, workability and soundness of cement, fineness modulus of fine and coarse aggregate, strength of cement mortar, cement concrete. Students can design the mix, make the specimens and test the same for their respective strengths.

The objective of highway materials laboratory is to determine some of the properties of coarse aggregates and bitumen. Experiments include tests for impact, abrasion and crushing strength for coarse aggregates. For bitumen, tests include penetration, ductility, viscosity, softening point and flash and fire point. The students will be able to infer the suitability of these materials for construction of road. This laboratory course will help the students to understand the theoretical concepts learned in the course transportation engineering.

On pursuing this Course, the students would develop first-hand knowledge on the properties and uses of concrete and highway materials.

Course Material: "*Concrete and highway material testing Lab",* Presidency University.

Text Book(s):

1. B.L. Gambhir, *"Concrete Technology", Tata McGraw Hill, New Delhi*
2. S K Khanna, C E G Justo and A Veeraragavan, "*Highway Engineering*", Nem Chand Bros, Roorkee.
3. M.S. Shetty, *"Concrete Technology",* Chand S and Co.

Annexure 7.5

Course Name	Current Credit Structure	Proposed Structure	Semester Offered
Computer aided building drawing Lab	0-0-4-2	0-0-2-1	V (Previously VI)
Computer aided structural analysis Lab	0-0-4-2	0-0-2-1	VI (Previously VII)

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Annexure 7.6

Course Name:	Elements of Civil Engineering					
Course Code:	CIV 101	Credit Structure :	L	T	P	C
			3	0	0	3

Course Description: The objective of this Course is to make students learn the basics of Civil Engineering concepts, role of civil engineers, infrastructure development, sustainability, and solve problems involving forces, loads and moments and know their applications in allied subjects. It is a pre-requisite for several Courses involving Forces and Moments.

The students should have a prior knowledge of basic mathematics to pursue the Course. The Course consists of an introduction of civil engineering through an exposition of its disciplines, types of Infrastructure, different types of construction materials, composition of forces, concepts of resultants and equilibrium of forces.

After successful completion of the Course, the students would acquire knowledge on the basics of Civil Engineering, its scope of study, knowledge about green buildings, roads, airports, bridges and dams. They would be able to comprehend the action of Forces, Moments and other loads on systems of rigid bodies; Compute the reactive forces and the effects that develop as a result of the external loads. The student would be equipped to pursue studies in allied Courses in Mechanics.

Text Book(s):

1. M.N. Shesha Prakash, Ganesh B. Mogaveer, "Elements of Civil Engineering and Engineering Mechanics", PHI Learning.
2. Mimi Das Saikia, Bhargab Mohan Das and Madan Mohan Das, "Elements of Civil Engineering", PHI Learning Pvt Ltd.

Reference Book(s):

1. Shrikrishna A Dhale and Kiran M Tajne, "*Basics of Civil Engineering*", S Chand Publication.
2. SS Bhavikatti, "*Basic Civil Engineering*", New Age International Publication
3. Satheesh Gopi, "*Basic Civil Engineering*", Pearson Publication.

Course Name:	Strength of Materials					
Course Code:	CIV 201	Credit Structure :	L	T	P	C
			3	1	0	4

Course Description: The main objective of the Course is to impart an understanding of the strength of the engineering materials when subjected to compression, bending moment, shear force and torsion. The students having basic knowledge of mechanics can easily understand this Course.

This Course deals with effect of forces on semi rigid bodies. It includes the concepts of Hooke's law, elastic constants, compound stresses, composite bars, thermal stresses, strain energy due to axial force, resilience, stresses due to impact and suddenly applied load, principal stress and principal planes - Mohr's circle, beams and support conditions,

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Columns and struts, types of supports and loads, shear force and bending moment, theory of simple bending and elements of torsion.

This Course helps students to design various engineering materials subject to bending, compression, shear force and torsion and also read allied Courses like structural analysis.

Text Book(s):

1. S. Ramamrutham, R Narayanan, "*Strength of Materials*", Dhanpat Rai Publishing
2. P. Beer, E. R. Johnston (Jr.) and J.T. DeWolf, "*Mechanics of Materials"*, Tata McGraw Hill.

Reference book(s):

1. Egor Popov, "*Mechanics of Materials*", Pearson
2. Timoshenko, S.P. and Gere, "*J.M. Mechanics of Materials"*, Tata McGraw Hill.
3. Kazimi, '*Mechanics of Solids"*, Tata McGraw – Hill.

Annexure 7.7

Course Name:	**Environmental Geotechnics and Solid Waste Management**					
Course Code:	**CIV 311**	**Credit Structure :**	**L**	**T**	**P**	**C**
			3	**0**	**0**	**3**

Text Book(s):

1. Lakshmi Reddi, Hilary I. Inyang, "*Geoenvironmental Engineering: Principles and Applications"*, Marcel Dekkar, New York.

Reference Book(s):

1. George Tchobanoglous and Frank Kreith, "*Handbook of solid waste management*", McGraw-Hill
2. H.D. Sharma and K. Reddy, "*Geoenvironmental Engineering: Site Remediation, Waste Containment, and Emerging Waste Management Technologies"*.
3. R.N.Yong and H.R. Thomas, "*Geoenvironmental Engineering contaminated ground: Fate of pollutants and remediation",* Thomas Telford, London.

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Private University Estd. in Karnataka State by Act No. 41 of 2013

SCHOOL OF ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

Ref. No: PU/SOE/CIV/BOS-09/2018-19/MOM-01 Date: 4th May 2019

Minutes of the 9th Meeting of Board of Studies (Civil Engineering – BOS – CIV)

The 9th meeting of the Board of Studies of the Civil Engineering was held on 4th May, 2019 at 11 am in Room No. MG03, in the presence / absence of following members of the committee.

The following members were present:

Name	Designation	Status
Dr. S.B. Anadinni	Professor and HOD SoE, PU, Bengaluru	Chairperson Ex-Officio
Dr. Sukomal Mandal	Professor SoE, PU, Bengaluru	Internal Member (Nominated by VC within the Department)
Dr. Nakul Ramanna	Associate Professor SoE, PU, Bengaluru	Internal Member (Nominated by VC within the Department)
Dr. Chandankeri Ganapathi Gurlingappa	Associate Professor SoE, PU, Bengaluru	Internal Member (Nominated by VC within the Department)
Dr. K. Venkatesh Raju	Assistant Professor SoE, PU, Bengaluru	Internal Member (Nominated by VC within the Department)
Mr. Bhavan Kumar	Assistant Professor SoE, PU, Bengaluru	Internal Member (Nominated by VC within the Department)
Dr. Devendra Dandotiya	Assistant Professor SoE, PU, Bengaluru	Internal Member (Nominated by VC from the sister Department)
Mr. Bhairab Jyoti Gogoi	Assistant Professor SoE, PU, Bengaluru	Internal Member (Nominated by VC from the sister Department)
Dr. Srikanth M. Naik	Professor, Civil Engineering MS Ramaiah Institute of Technology, Bengaluru	External Member (Academic)
Dr. L. Govindaraju	Professor, Civil Engineering, UVCE, Bengaluru	External Member (Academic)
Dr. Sanjiv Aundhe	Director, Citius Project	External Member (Industry)

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Name	Designation	Status
Dr. Amiya Goswami	Adjunct Professor SoE, PU, Bengaluru	Special Invitee
Dr. Jagdish Godihal	Professor SoE, PU, Bengaluru	Special Invitee
Mr. Aaron Darius Vaz	Assistant Professor SoE, PU, Bengaluru	Special Invitee
Ms. Navaneetha H	Assistant Professor SoE, PU, Bengaluru	Special Invitee
Ms. Shwetha. A	Assistant Professor SoE, PU, Bengaluru	Member Secretary (Nominated by VC within the Department)

The following members were given leave of absence:

Name	Designation	Status
Dr. Devendra Dandotiya	Assistant Professor SoE, PU, Bengaluru	Internal Member (Nominated by VC from the sister Department)
Ms. Navaneetha H	Assistant Professor SoE, PU, Bengaluru	Special Invitee

Welcome:

Dr. S.B. Anadinni, Chairperson of the Board of Studies (BoS) for Civil Engineering has extended warm welcome to all the members, particularly to the external members and the Special Invitees. Further, he has expressed his pleasure to have youngsters in his team.

Introduction:

At the outset, Dr. Anadinni, Chairperson of BoS for Civil Engineering, has introduced all the members. The chairperson has briefed the need for conducting 9th BoS meeting and requested the members to go through the proposed Program Regulations and Curriculum of 2019-2023 batch meticulously as it is considered as the basic structure for B.Tech. Civil Engineering in Presidency University, Bengaluru. The chairperson also requested the committee to review Program Regulations and Curriculum of 2019-2021 batch of M.Tech in Building Construction Technology.

Dr. Anadinni has also requested suggestions from the members of BoS to incorporate essential modifications, if required, in the Program Structure and Curriculum of 2018-2022, 2017-2021 and 2016-2020 batches of B.Tech Civil Engineering, in line with the PRC of 2019-2023 batch.

Agenda CIV 9.1: Approval of the Minutes of 8th Board of Studies meeting.

The minutes of the 8th meeting of the Board of Studies of Civil Engineering held on 12th January, 2019 was placed before the members and the same was confirmed.

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Agenda CIV 9.2: Action Taken Report.

The action taken report on the previous minutes was presented by the Chairperson, and summarized below:

1. Program Regulations and Curriculum of 2018-2022, 2017-2021, 2016-2020 and 2015-2019 batches of B.Tech Civil Engineering was amended per committee's suggestions.
2. New discipline and open electives were added to curriculum, including NPTEL courses.
3. Extensive survey project was moved from 4th to 6th Semester for 2018-2022 batch of B.Tech Civil Engineering.
4. Program structure and curriculum for 2019-2021 batch of M.Tech in Building Construction Technology was approved by BOS committee members.

The above was noted and taken on record.

Agenda CIV 9.3: Approval of B.Tech program regulations and curriculum of 2019-2023, 2018-2022, 2017-2021, and 2016-2020 batches.

Comment: The chairperson proposed Program regulations and Curriculum of 2019-2023, 2018-2022, 2017-2021, and 2016-2020 batches, as given in Annexure CIV 9.3.1

Resolution: The members have approved the proposal and suggested to incorporate necessary modifications in the Program Regulations and Curriculum of 2019-2023. The members have approved same changes in the existing program regulations and curriculum of 2018-2022, 2017-2021, and 2016-2020, as applicable.

Agenda CIV 9.4: Approval of program regulations and curriculum of 2019-2021 batch for M.Tech in Building Construction Technology.

Comment: The chairperson has proposed Program Regulations and Curriculum of 2019-2021 of M.Tech Building Construction Technology for approval, as given in Annexure CIV 9.4.1

Resolution: The members have approved the proposal and suggested to incorporate necessary modifications in the Program Regulations and Curriculum of 2019-2021.

Agenda CIV 9.5: Inclusion to Discipline and Open Elective Courses based on stakeholders' feedback

Comment: The chairperson has proposed the inclusion of new discipline and open elective courses based on feedback from alumni and Industry as shown in Annexure CIV 9.5.1 for B.Tech Civil Engineering and Annexure CIV 9.5.2 for M. Tech. Building Construction Technology.

Resolution: The members have approved the inclusion of new discipline and open elective courses in the programme structure and curriculum of 2019-2023, 2018-2022, 2017-2021, and 2016-2020 of B.Tech Civil Engineering, as applicable. The members have also approved the proposed discipline and open elective courses in the programme structure and curriculum of 2019-2021 batch of M.Tech Building Construction Technology.

Agenda CIV 9.6: Inclusion of NPTEL Courses as Elective Courses

Comment: The chairperson has proposed the inclusion of NPTEL courses (12 weeks duration) as elective courses. The list of courses is given in Annexure CIV 9.6.1 for B.Tech Civil Engineering and Annexure CIV 9.6.2 for M.Tech Building Construction Technology.

Resolution: The members have approved the inclusion of NPTEL courses as presented in Annexure CIV 9.6.1 and 9.6.2.

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Agenda CIV 9.7: Amendment to the course content and text books / reference books for Civil Engineering Courses (B.Tech Program)

Comment: The chairperson proposed updated course content and text book / reference books for various B.Tech Civil Engineering courses (Annexure CIV 9.7.1), and M.Tech Building Construction Technology courses (Annexure CIV 9.7.2).

Resolution: The members have approved the proposed changes in course content and text book / reference books as presented in Annexures CIV 9.7.1 and 9.7.2.

Agenda CIV 9.8: Approval of External Examiners

Comment: The chairperson proposed list of external examiners to the committee for approval, as given in Annexure 9.8.1

Resolution: The members have approved the panel of external examiners. The committee also suggested to include more examiners from other autonomous universities such as CMR, Dayanand Sagar. It was further noted that BoS chairperson is authorized to include the examiners on need basis.

Agenda CIV 9.9: Any other matter with permission from the Chair.

Comment 1: The committee suggested to changes the names of following courses to aptly reflect the course content:
CIV 210 – 'Soil Mechanics' to 'Geotechnical Engineering'
CIV 211 – 'Design of RC Elements' to 'Design of RC Structural Elements'
CIV 260 – 'Soil Mechanics Lab' to 'Geotechnical Engineering Lab'
CIV 220 – 'Highway and Pavement Engineering' to 'Highway Engineering'
CIV 305 – 'Geographical Information System' to 'Remote Sensing and Geographical Information System'
CIV 326 – 'Theory of Elasticity and Plasticity' to 'Theory of Elasticity'

Resolution 1: The chairperson has agreed to change the names of the courses, as suggested by committee, in the PRC of 2019-2023, 2018-2022, 2017-2021, and 2016-2020 batches of B.Tech Civil Engineering, as applicable.

Comment 2: The committee deliberated on value added courses to be offered in the department. Training programs on software, Faculty / Student Development Programs, Student competitions and workshops was recommended.
Resolution 2: The chairperson has agreed to implement value added courses in the PRC of 2019-2023, 2018-2022, 2017-2021, and 2016-2020 batches of B.Tech Civil Engineering, and 2019-2021 M.Tech Building Construction Technology, as applicable

Comment 3: The committee suggested to include pre-requisites for all courses, especially Discipline and Open electives. Advising students on choices of Discipline and Open electives was also emphasized. It was also recommended to include latest edition number for Text Books and Reference Books.
Comment 4: Minor edits to M.Tech Courses: CIV 701, CIV 703, CIV 707, CIV 709 – were suggested to avoid overlap on topics and bring clarity. Additions to text books/references were also recommended for courses CIV 220, CIV 225, CIV 255, CIV 320, CIV 321 and CIV 326.

Resolution 3 and 4: The chairperson has agreed to implement the aforementioned suggestions in PRC of 2019-2023, 2018-2022, 2017-2021, and 2016-2020 batches of B.Tech Civil Engineering, and 2019-2021 M.Tech Building Construction Technology, as applicable.

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The meeting ended with Vote of Thanks to the Chair.

The BoS Committee has authorized the Chairperson of the BoS for Civil Engineering to incorporate minor corrections / edits, if required wherever necessary.

Dr. S.B. Anadinni has conveyed that the decisions taken during the 9th meeting of BoS for the Civil Engineering will be implemented in the PRC of 2019-2023, 2018-2022, 2017-2021 and 2016-2020 batches of B.Tech Civil Engineering, and 2019-2021 batch of M.Tech Building Construction Technology, as applicable. He appreciated all the members for their active participation and valuable inputs. The chairperson concluded the session, with a thank you note to all the members.

BoS Committee:

Name	Designation	Signature with date
Dr. S.B. Anadinni	Chairman Ex-Officio	
Dr. Sukomal Mandal	Internal Member (Nominated by VC within the Department)	
Dr. Nakul Ramanna	Internal Member (Nominated by VC within the Department)	
Dr. Chandankeri Ganapathi Gurlingappa	Internal Member (Nominated by VC within the Department)	04/5/19
Dr. K. Venkatesh Raju	Internal Member (Nominated by VC within the Department)	04/05/19
Mr. Bhavan Kumar	Internal Member (Nominated by VC within the Department)	
Dr. Devendra Dandotiya	Internal Member (Nominated by VC from the sister Department)	
Mr. Bhairab Jyoti Gogoi	Internal Member (Nominated by VC from the sister Department)	4/5/19
Dr. Srikanth M. Naik	External Member (Academic)	
Dr. L. Govindaraju	External Member (Academic)	04/05/19
Dr. Sanjiv Aundhe	External Member (Industry)	4/5/19
Dr. Amiya Goswami	Special Invitee	
Dr. Jagdish Godihal	Special Invitee	
Mr. Aaron Darius Vaz	Special Invitee	
Ms. Navaneetha H	Special Invitee	
Ms. Shwetha. A	Member Secretary (Nominated by VC within the Department)	

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Annexure CIV 9.3.1

Program regulations and Curriculum of 2019-2023 and 2018-2022 batches
(Second, Third and Fourth Year)

III SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	MAT 103	Engineering Mathematics – III	3	1	0	4	4		
2	CIV 201	Strength of Materials	3	1	0	4	4	Skill Development	Sustainability
3	CIV 202	Surveying	3	1	0	4	4	Employability	Ethics
4	CIV 203	Engineering Geology	3	0	0	3	3	Employability	Env. & Sustainability
5	CIV 208	Fluid Mechanics	3	1	0	4	4	Skill Development	Sustainability
6	CIV 219	Building Materials and Concrete Technology	3	0	0	3	3	Employability	Env. & Sustainability
7	CIV 263	Basic Materials Testing Lab	0	0	2	1	2	Skill Development	Ethics
8	CIV 252	Surveying Practice	0	0	2	1	2	Skill Development	Env. & Sustainability
9	PPS 107	Design Thinking and Team Building	0	0	2	1	2	Entrepreneurship	Human Val & Ethics
TOTAL			**18**	**4**	**6**	**25**	**28**		

IV SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	MAT 104	Engineering Mathematics – IV	3	1	0	4	4		
2	CIV 205	Structural Analysis-I	3	1	0	4	4	Skill Development	Ethics
3	CIV 210	Geotechnical Engineering	3	1	0	4	4	Employability	Env. & Sustainability
4	CIV 220	Highway Engineering	3	1	0	4	4	Employability	Env. & Sustainability
5	CIV 221	Water Resources Systems	3	0	0	3	3	Employability	Env. & Sustainability
6	CIV 253	Engineering Geology Lab	0	0	2	1	2	Skill Development	Env. & Sustainability
7	CIV 254	Fluid Mechanics Lab	0	0	2	1	2	Skill Development	Env. & Sustainability
8	PPS 108	Being Corporate Ready	0	0	2	1	2	Skill Development	Human Val & Ethics
TOTAL			**15**	**4**	**6**	**22**	**25**		

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V SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	CIV 209	Structural Analysis-II	3	1	0	4	4	Skill Development	Ethics
2	CIV 211	Design of RC Structural Elements	3	1	0	4	4	Employability	Sustainability
3	CIV 214	Foundation Engineering	3	0	0	3	3	Employability	Sustainability
4	MGT 113/ MGT 112	Digital Entrepreneurship / Engineering Economics	3	0	0	3	3	Entrepreneurship / Skill Develop.	Human Val & Ethics
5	CIV 3XX	Discipline Elective I	3	0	0	3	3	Employability	Sustainability
6	CIV 3XX	Discipline Elective II	3	0	0	3	3	Skill Development	Sustainability
7	CIV 258	Computer Aided Building Drawing Lab	0	0	2	1	2	Skill Development	Sustainability
8	CIV 260	Geotechnical Engineering Lab	0	0	2	1	2	Skill Development	Env. & Sustainability
9	ULC 101	University Learning Course^{++}	0	0	0	1	-	Skill Development	Env. & Sustainability
10	PIP 101	Professional Practice –I***				5		Employability	Ethics
TOTAL			18	2	4	27/28	24		

VI SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	CIV 213	Design of Structural Steel Elements	3	1	0	4	4	Employability	Sustainability
2	CIV 222	Water Infrastructure Systems	3	0	0	3	3	Employability	Env. & Sustainability
3	MGT 113/ MGT 112	Digital Entrepreneurship / Engineering Economics	3	0	0	3	3	Entrepreneurship / Skill Develop.	Human Val & Ethics
4	CIV 3XX	Discipline Elective – III	3	0	0	3	3	Employability	Sustainability
5	XXX 4XX	Open Elective I	3	0	0	3	3	Employability	Sustainability
6	CIV 261	Computer Aided Structural Analysis Lab	0	0	2	1	2	Skill Development	Sustainability
7	CIV 262	Concrete and Highway Materials Testing Lab	0	0	2	1	2	Skill Development	Sustainability
8	CIV 255	Extensive Survey Project $^{\#\#}$				3		Skill Development	Env. & Sustainability
9	ULC 101	University Learning Course^{++}				1		Skill Development	Env. & Sustainability
TOTAL			15	1	4	21/22	20		

VII SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	CIV 215	Estimating, Costing and Valuation	3	1	0	4	4	Employability	Ethics
2	CIV 223	Waste Water Treatment and Disposal Systems	3	0	0	3	3	Employability	Env. & Sustainability
3	CIV 224	Design of Irrigation Water Resources Systems	3	0	0	3	3	Employability	Env. & Sustainability
4	CIV 225	Railway, Airport and Harbour Engineering	3	0	0	3	3	Employability	Env. & Sustainability
5	CIV 3XX	Discipline Elective IV	3	0	0	3	3	Skill Development	Sustainability
6	XXX 4XX	Open Elective – II	3	0	0	3	3	Skill Development	Sustainability
7	CIV 259	Environmental Engineering Lab	0	0	2	1	2	Skill Development	Env. & Sustainability
TOTAL			**18**	**1**	**2**	**20**	**21**		

VIII SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	PIP 102	Professional Practice - II				15	6	Employability	Ethics
TOTAL			**0**	**0**	**0**	**15**	**6**		

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Assessment and Evaluation Component for 2019-2023 - B.Tech Civil and 2019-2021 – M.Tech Building Construction Technology

Table 2.12.1 Method of Assessment for Courses with Credit Structure (L –T – 0) or (L – 0 – 0)			
Components of Continuous Assessments		**Weightage (% of Total Marks)**	**Duration of Assessment**
1.	Test 1	15%	1 hour
2.	Test 2	15%	1 hour
3.	This Component of continuous assessment shall consist of at least TWO (02) of the following: (1) Assignment(s) (2) Quiz (3) Technical Seminar / Report (4) Attendance / Class participation (5) Assessment on self-learning topic(s), or (6) Any other type of assessment as prescribed in the concerned Course Handout.	20%	NA
4.	End Term Final Examinations	50%	3 hours
Total		**100%**	
Note: An additional Test 3 may be conducted as an optional test to allow for improvement. If a student opts for Test 3, then the higher marks obtained in any two tests shall be considered for evaluation.			

Table 2.12.2 Method of Assessment for Practical Courses with Credit Structure (0 –0 – P) / (L – 0 – P)			
Components of Continuous Assessments		**Weightage (% of Total Marks)**	**Duration of Assessment**
1.	Laboratory/ Practical Exercise conducted in every Practical Class and Laboratory Records, Practical/ Project Reports as prescribed by the Course Handout.	30%	NA
2.	Practical Test/ Viva/ Quiz/ Assignments as prescribed by the Course Handout	20%	NA
3.	End Term Practical Examinations:	50%	3 hours
Total		**100%**	

V SEMESTER							
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	CIV 209	Structural Analysis-II	3	1	0	4	4
2	CIV 210	Geotechnical Engineering	3	1	0	4	4
3	CIV 211	Design of RC Structural Elements	3	1	0	4	4
4	CIV 3XX	Discipline Elective-I	3	0	0	3	3
5	CIV 3XX	Discipline Elective-II	3	0	0	3	3
6	MGT 112 / MGT 113	Engineering Economics / Digital Entrepreneurship	3	0	0	3	3
7	CIV 262	Concrete and Highway Materials Testing Lab	0	0	2	1	2
8	CIV 258	Computer Aided Building Drawing Lab	0	0	2	1	2
9	ULC 101	University Learning Course*	0	0	0	1	-
10	PIP 101	Professional Practice –I***				5	
TOTAL			**18**	**3**	**4**	**28/29**	**25**

VI SEMESTER							
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	CIV 212	Environmental Engineering	4	0	0	4	4
2	CIV 214	Foundation Engineering	3	1	0	4	4
3	MGT 113 / MGT 112	Digital Entrepreneurship / Engineering Economics	3	0	0	3	3
4	CIV 3XX	Discipline Elective – III	3	0	0	3	3
5	XXX 4XX	Open Elective – I	3	0	0	3	3
6	CIV 260	Geotechnical Engineering Lab	0	0	2	1	2
7	CIV 261	Computer Aided Structural Analysis Lab	0	0	2	1	2
8	ULC 101	University Learning Course*				1	
TOTAL			**16**	**1**	**4**	**19/20**	**21**

VII SEMESTER							
S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	CIV 213	Design of Structural Steel Elements	3	1	0	4	4
2	CIV 215	Estimating, Costing and Valuation	3	1	0	4	4
3	CIV 216	Hydrology and Water Resources Engineering	3	1	0	4	4
4	CIV 3XX	Discipline elective – IV	3	0	0	3	3
5	XXX 4XX	Open Elective – II	3	0	0	3	3
6	CIV 259	Environmental Engineering Lab	0	0	2	1	2
TOTAL			**15**	**3**	**2**	**19**	**20**

VIII SEMESTER							
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	PIP 102	Professional Practice - II				15	6
TOTAL			**0**	**0**	**0**	**15**	**6**

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Program regulations and Curriculum of 2016-2020 batch (Final Year)

VII SEMESTER							
S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	CIV 215	Estimating, Costing and Valuation	3	1	0	4	4
2	CIV 216	Hydrology and Water Resources Engineering	3	1	0	4	4
3	CIV 3XX	Discipline elective – III	3	0	0	3	3
4	CIV 3XX	Discipline Elective – IV	3	0	0	3	3
5	XXX 4XX	Open Elective – I	3	0	0	3	3
6	XXX 4XX	Open Elective – II	3	0	0	3	3
TOTAL			**18**	**2**	**0**	**20**	**20**

VIII SEMESTER							
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	PIP 102	Professional Practice - II				15	6
TOTAL			**0**	**0**	**0**	**15**	**6**

Annexure CIV 9.4.1

Program Regulations and Curriculum of 2019-2021 of M.Tech Building Construction Technology

Sl. No.	Semester	Total Credits
1	I	24
2	II	21
3	III	18
4	IV	15
Total Credits for Completion: 78		

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I SEMESTER									
S. No.	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**	**Type of skill /Focus**	**COURSE INTEGRATES**
			L	**T**	**P**	**CREDITS**			
1	CIV 351	Advanced Construction Materials and Technology	4	0	0	4	4	Employability	Sustainability
2	CIV 352	Quality, Risk and Safety in Construction	4	0	0	4	4	Employment	Human Values and Profess. Ethics
3	CIV 353	Construction Planning, Schedule and Control	4	0	0	4	4	Employability	Ethics
4	RES 301	Research Methodology	3	0	0	3	3	Skill Development	Ethics
5	CIV 354	Mechanization in Construction	3	0	0	3	3	Sustainability	Ethics
6	MAT 301	Advanced Engineering Mathematics	3	1	0	4	4	Skill Development	
7	CIV 511	Material Characterization Lab	0	0	2	1	2	Employability	Ethics
8	CIV 512	Seminar – I	0	0	2	1	2		
TOTAL			**21**	**1**	**04**	**24**	**26**		

II SEMESTER									
S. No.	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**	**Type of skill /Focus**	**COURSE INTEGRATES**
			L	**T**	**P**	**CREDITS**			
1	CIV 355	Construction Economics and Contract Specifications	3	1	0	4	4	Employability	Ethics
2	CIV 356	Building services and Maintenance	4	0	0	4	4	Employability	Sustainability
3	CIV 363	Advanced Design of RC Structures	3	1	0	4	4	Employability	Ethics
4	CIV 3XX	Discipline Elective – 1	3	0	0	3	3		
5	XXX XXX	Open Elective – 1	3	0	0	3	3		
6	CIV 357	Software Application Lab	0	0	4	2	4	Skill Development	Sustainability
7	CIV 513	Seminar - 2	0	0	2	1	2		
TOTAL			**16**	**2**	**6**	**21**	**24**		

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III SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	Type of skill /Focus	COURSE INTEGRATES
			L	T	P	CREDITS			
1	CIV 514	Construction Demolition and Waste Management	4	0	0	4	4	Employability	Sustainability
2	XXX XXX	Open Elective - 2	3	0	0	3	3		
3	CIV 3XX	Discipline Elective – 2	3	0	0	3	3		
4	CIV 3XX	Discipline Elective – 3	3	0	0	3	3		
5	CIV 515	Project phase 1 (Minor Project)	0	0	0	5	0		
TOTAL			**12**	**0**	**0**	**18**	**13**		

IV SEMESTER							
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	CIV 516	Project phase 2 (Major Project)	0	0	0	15	0
TOTAL			**0**	**0**	**0**	**15**	**0**

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GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

(Private University Estd. in Karnataka State by Act No.41 of 2013)

Feedback from B.Tech students and action taken report

Sl. No.	Feedback	Action Taken
1	Introduce more field based activities and practical sessions as part of courses.	Separate slots have been assigned for active learning classes on Saturday to accommodate field based activities and practical sessions to link theory with lab
2	Need to allot more teaching/tutorial hours for design based courses/numerical based courses	The course contents are planned according to the lecture and tutorial hours available. However, there might have been a need felt to engage more tutorial hours only for slow learners. Remedial classes are being arranged for slow learners after regular working hours.

Pursuant to feedback received from stakeholders, new discipline and open elective courses have been added to curriculum as shown in Annexure CIV 9.5.1 for B.Tech Civil Engineering.

Feedback from M.Tech students and action taken report

Sl. No.	Feedback	Action Taken
1	Introduce Industry linked advanced theory and practical sessions by Industrial experts will add the level of exposure to students & faculty.	Every semester Guest lectures, Invited talks and workshops are being organized to expose students and faculty to latest developments in the industry. Students as well as faculty are supported and encouraged to participate in National and International conferences, workshops Industry expos and symposium.

Pursuant to feedback received from stakeholders, new discipline and open elective courses have been added to curriculum as shown in Annexure CIV 9.5.2 for M. Tech. Building Construction Technology.

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PRESIDENCY UNIVERSITY Registrar BANGALORE

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

(Private University Estd. in Karnataka State by Act No.41 of 2013)

Feedback from Alumni and action taken report

Sl. No.	Feedback	Action Taken
1	Add on few courses on software for civil course.	Value added Programs on civil engineering related application software are planned to be organized
2	Need more practical on-site, site experiences	Internships are offered twice during the program to address this. In addition, guest lectures and few Industrial visits are also planned to have better exposure.

Pursuant to feedback received from stakeholders, new discipline and open elective courses have been added to curriculum as shown in Annexure CIV 9.5.1 for B.Tech Civil Engineering and Annexure CIV 9.5.2 for M. Tech. Building Construction Technology.

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PRESIDENCY UNIVERSITY Registrar BANGALORE

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

(Private University Estd. in Karnataka State by Act No.41 of 2013)

Feedback from Faculty members and action taken report

Sl. No.	Feedback	Action Taken
1	Introduce more field based activities and practical sessions as part of courses.	Separate slots have been assigned for active learning classes on Saturday to accommodate field based activities and practical sessions to link theory with lab
2	Introduce Industry linked advanced theory and practical sessions by Industrial experts will add the level of exposure to students & faculty	Every semester Guest lectures, Invited talks and workshops are being organized to expose students and faculty to latest developments in the industry. Students as well as faculty are supported and encouraged to participate in National and International conferences, workshops Industry expos and symposium.
3	Need to allot more teaching/tutorial hours for design based courses/numerical based courses	The course contents are planned according to the lecture and tutorial hours available. However, there might have been a need felt to engage more tutorial hours only for slow learners. Remedial classes are being arranged for slow learners after regular working hours.

Pursuant to feedback received from stakeholders, new discipline and open elective courses have been added to curriculum as shown in Annexure CIV 9.5.1 for B.Tech Civil Engineering and Annexure CIV 9.5.2 for M.Tech. Building Construction Technology.

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Annexure CIV 9.5.1

Program Core Courses (B.Tech Civil Engineering)

1. Building Materials and Concrete Technology (CIV 219)
2. Basic Materials Testing Lab (CIV 263)
3. Highway Engineering (CIV 220)
4. Water Resources Systems (CIV 221)
5. Water Infrastructure Systems (CIV 222)
6. Waste Water Treatment and Disposal Systems (CIV 223)
7. Design of Irrigation Water Resources Systems (CIV 224)
8. Railway, Airport and Harbour Engineering (CIV 225)

Discipline Elective Courses (B.Tech Civil Engineering)

1. Reinforced Earth Structures (CIV 321)
2. Advanced Design of Steel Structures (CIV 322)
3. Design of Retaining Structures (CIV 323)
4. Structural Dynamics (CIV 324)
5. Stability of Structures (CIV 325)
6. Theory of Elasticity (CIV 326)
7. Climate Change and Sustainable Development (CIV 328)
8. Urban flooding: Analysis and Control (CIV 329)
9. Urban air pollution and control (CIV 330)
10. Urban Waste Management (CIV 331)
11. Open channel Flow (CIV 332)

Open Elective Courses (B.Tech Civil Engineering)

1. Systems Design for Environment and Sustainability (CIV 407)
2. Infrastructure Systems for Smart City (CIV 408)

Annexure CIV 9.5.2

Program Core Courses (M.Tech Building Construction Technology)

1. Advanced Construction Materials and Technology (CIV 351)
2. Quality, Risk and Safety in Construction (CIV 352)
3. Construction Planning, Schedule and Control (CIV 353)
4. Mechanization in Construction (CIV 354)
5. Material Characterization Lab (CIV 511)
6. Construction Economics and Contract Specifications (CIV 355)
7. Building services and Maintenance (CIV 356)
8. Advanced Design of RC Structures (CIV 363)
9. Software Application Lab (CIV 357)
10. Construction Demolition and Waste Management (CIV 514)

Discipline Elective Courses (M.Tech Building Construction Technology)

1. Pre – Engineered Construction (CIV 359)
2. Human Resource Management (CIV 360)

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3. Advanced Design of Steel Structures (CIV 322)
4. Design concepts of substructures (CIV 362)

Open Elective Courses (M.Tech Building Construction Technology)

1. Self-Sustainable Buildings (CIV 364)
2. Energy and Buildings (CIV 365)

The syllabus of the new courses as approved by the Board of Studies is included in the relevant PRCs

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Annexure CIV 9.6.1

NPTEL - Discipline Elective Courses (B.Tech Civil Engineering)

1. Maintenance and Repair of Concrete Structures (noc19-ce24)
2. Integrated Waste Management for a Smart City (noc19-ce31)
3. Environmental Geotechnics (noc19-ce37)
4. Glass In Buildings : Design And Applications (noc19-ce42)

NPTEL - Open Elective Courses (B.Tech Civil Engineering)

1. Patent Law For Engineers And Scientists (noc19-hs66)
2. Project management for managers (noc19-mg31)
3. Noise Management and Control (noc19-me72)
4. Introduction to Environmental Engineering and Science - Fundamental and Sustainability Concepts (noc19-ge23)

Annexure CIV 9.6.2

NPTEL - Discipline Elective Courses (M.Tech Building Construction Technology)

1. Design of Masonry Structures (noc19-ce21)
2. Maintenance and Repair of Concrete Structures (noc19-ce24)
3. Integrated Waste Management for a Smart City (noc19-ce31)
4. Glass In Buildings : Design And Applications (noc19-ce42)

NPTEL - Open Elective Courses (M.Tech Building Construction Technology)

1. Patent Law for Engineers and Scientists (noc19-hs66)
2. Project management for managers (noc19-mg31)
3. Financial Derivatives & Risk Management (noc19-mg39)

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Annexure CIV 9.7.1

Updated course content and / or Text books / Reference books (B.Tech Civil Engineering)

Course Name:	Surveying					
Course Code:	CIV 202	Credit Structure :	L	T	P	C
			3	1	0	4

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Describe the knowledge of fundamental principles of Surveying.
(ii) Estimate the Measurement of vertical and horizontal plane, linear and angular dimensions to arrive at solutions to basic surveying problems.
(iii) Apply geodetic data to process and perform analysis for survey problems.
(iv) Analyse the obtained spatial data to compute areas and volume. Represent 3D data on plane figures as contours.

Course Description: This Course deals with the introduction to survey, objectives, plane surveying principles, preparation of map and plan, chain surveying, locating building corners, field book, chain surveying instruments, Compass surveying, Plane table surveying, Levelling and contouring, contour maps, computation of areas and volumes, theodolite surveying, tachometric surveying, trigonometric surveying.

Basic knowledge of mathematics is required for pursuing the Course. The concepts learned from the Course can be adopted in various fields like highway route alignment, setting out of building plan, drawing of site map etc.

Course Name:	Structural Analysis - I					
Course Code:	CIV 205	Credit Structure :	L	T	P	C
			3	1	0	4

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Apply the basic concepts of structural analysis to solve determinate structures.
(ii) Choose the method to analyse a structure which takes only axial loads.
(iii) Demonstrate the working of an arch structure and the forces that are acting upon it.
(iv) Calculate the stress, tension and length of a cable required in a structural system.
(v) Analyse basic indeterminate beams to achieve the forces and moments acting upon the system

Course Description: The Course is designed to calculate the forces acting on different structural elements and to distinguish between determinate and indeterminate structures.

Extending the concept of static equilibrium, deformation relationships and geometric compatibility, this course covers basic methods used to estimate internal forces, reactions and deflections in 2D structures. This course includes analysis of trusses using method of joints and sections. It covers different methods of calculating deflection in cables, arches and beams; also helps in learning various ways in controlling deflection and displacements under various loading conditions. Introduction to indeterminate analysis by consistent deformation method.

The subject helps the student in understanding the forces required for the further design of the structure. The one basic and core concept for any civil engineer is the ability to draw shear force and bending moment.

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diagrams for various beams is a pre-requisite for the student. A basic understanding of elements of civil engineering, strength of materials and mathematics is required to pursue the Course

Course Name:	Fluid Mechanics					
Course Code:	CIV 208	Credit Structure :	L	T	P	C
			3	1	0	4

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Understand the properties of fluid and pressure and their measurement.
(ii) The students would be able to compute forces on immersed plane and curved plates.
(iii) The students would be able to apply continuity equation and energy equation in solving problems on flow through conduits.
(iv) The students would be able to compute the frictional loss in laminar and turbulent flows.

Course Description: The main objective of this course is to understand the properties of fluid at rest and in motion. The students having basic knowledge of mechanics and strength of materials can easily understand this course.

The course is designed to present the fundamental properties of fluids, density, specific weight, specific volume, viscosity, Vapor pressure, cavitation, surface tension, capillary effect, fluid pressure, and its measurements, variation of pressure, Pascal's law, hydrostatic forces on plane surface and curved surface, buoyancy and stability, fluids in rigid - body motion, Lagrangian and Eulerian descriptions, flow patterns and flow visualization, the Reynolds transport theorem, Bernoulli and energy equations, Momentum analysis of flow systems , Newton's laws , forces acting on a control volume, The linear and angular momentum equations, Dimensional analysis and modeling, Types of flows and major and minor losses, Differential analysis of fluid flow, Conservation of Mass – Continuity Equation, Cauchy's equation and Navier –stokes equation.

Course Name:	Extensive Survey Project					
Course Code:	CIV 255	Credit Structure :	L	T	P	C
			0	0	2	1

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Apply basic surveying knowledge and tools efficiently for the project.
(ii) Understand responsibilities, Task focus and technical competence.
(iii) Apply individual effectiveness skills in team and Organizational context.
(iv) Professional etiquettes at work place and in general.

Course Description: This Course gives the complete practical concept of measuring the various dimensions across the field.

This Course initially contains establishing Bench marks for the respective projects. The projects should include New Tank Project, Water Supply and Sanitary Project and Highway Project.

Course Name:	Remote Sensing and Geographical Information System					
Course Code:	CIV 305	Credit Structure:	L	T	P	C
			3	0	0	3

Course Outcomes: On Successful completion of the course, the students shall be able to:

(i) Analyze the principles and components of photogrammetry and remote sensing
(ii) Describe the process of data acquisition of satellite images and their characteristics
(iii) Compute an image visually and digitally with digital image processing techniques
(iv) Explain the concepts and fundamentals of GIS
(v) Apply the knowledge of remote sensing and GIS in different civil engineering applications.

Course Description: This course enables the students to explore the various ways in which remote sensing systems provide geospatial information that is relevant, accurate, timely, accessible and available in an appropriate format. Recent developments in Earth observation such as imaging radar, LIDAR and hyper-spectral sensors are increasing the wealth of information that can be generated from remotely sensed data sources. As a consequence numerous new GIS applications that rely on advanced remotely sensed data sources have emerged at local, regional and global scales. Topics include the use of remote sensing data, platforms and sensors, photogrammetry, image interpretation and processing techniques, fundamentals of GIS and spatial data analysis and applications of remote sensing and GIS in environment and urban applications.

Text Book(s):

1. *"Remote Sensing and Image Interpretation"*, Lillesand, T.M. and Kieffer, R.W., 2003., 5th Edition., Wiley, New York
2. *"Fundamentals of Geographic Information Systems"*, Chakraborty and Sahoo, 2008, , Viva Books Private Limited, India

Reference Book(s):

1. *"Remote Sensing of the Environment"*, John R. Jensen, Prentice Hall, 2000.
2. *"Geographical Information Systems: Principles and Applications"*, Magwire, D. J., Goodchild, M.F. and Rhind, D. M. Ed. 1991, Longman Group, U.K

Course Name:	Building Materials and Concrete Technology					
Course Code:	CIV 219	Credit Structure :	L	T	P	C
			0	0	2	1

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Identify and characterize different building materials.
(ii) Distinguish engineering properties of concrete in fresh and hardened state.
(iii) Design concrete mixes as per IS Code or as per requirements.
(iv) Demonstrate advancements in concreting materials and techniques
(v) Assess material properties, mechanical tests and quality control tests for wood and wood products, masonry, iron and steel, aluminum and aluminum products, paints and protective coatings.

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Course Description: The Course consists of the study of different building materials and their properties which are used in construction of civil engineering projects. The course includes the basic properties of constituents of concrete like cement, aggregates and water. It also includes various assessment tests on quality of ingredients on concrete as per IS codal provisions. The students can develop first-hand knowledge on concrete production process and properties and uses of concrete as a modern material of construction. The courses will enable one to make appropriate decision regarding ingredient selection and use of concrete. Students have the opportunity to experience material capacity and behavior as well as construction methods in the form of demonstrations. Furthermore, material applications and detailing in structural and non-structural building components are explored.

Text Book(s):

1. *"Building Materials"*, S. S. Bhavikatti, Vices publications House private ltd.
2. *"Building Construction"*, S. S. Bhavikatti, Vices publications House private ltd.
3. "*Properties of Concrete"*, Neville, A.M, ELBS Edition, Longman Ltd, London.
4. *"Concrete Technology Theory and Practice"*, M.S Shetty, S.Chand

Reference Book(s):

1. *"Concrete Technology"*, A.R.Santhakumar, Oxford.
2. *"A textbook Building Materials",* P.C Varghese, Prentice-Hall of India Pvt Ltd.
3. *"Engineering Materials"*, Sushil Kumar, Standard Publication and Distributors, New Delhi.

Course Name:	**Highway Engineering**					
Course Code:	**CIV 220**	**Credit Structure :**	**L**	**T**	**P**	**C**
			3	**1**	**0**	**4**

Course outcomes: On successful completion of the course the student shall be able to:

(i) Carry out surveys involved in planning and highway alignment.
(ii) Design cross section elements, sight distance, horizontal and vertical alignment.
(iii) Implement traffic studies, traffic regulations and control, and intersection design.
(iv) Determine the characteristics of pavement materials.
(v) Design flexible and rigid pavements as per IRC.

Course Description. This Course gives an overall exposure to the importance of different modes of transportation and also explains the concepts of planning and design of transport system. The students have a prior basic knowledge of surveying and mathematics for this course.

This Course consist of introduction and importance of transportation, different modes of transportation, highway development and planning, highway alignment, highway surveys, highway geometric design, traffic studies, traffic operations, design of intersections, tests on pavement materials, design of flexible and rigid pavements as per IRC, pavement construction and maintenance.

These concepts can be applied in designing of highway and pavement components.

Textbook(s):

1. *"Highway Engineering"*, Khanna, S.K and Justo, C.E.G., Nem Chand and Bros. Roorkee (U.P), 1998.

Reference book(s):

1. *"Traffic Engineering and Transport Planning"*, Kadiyali, L.R, Khanna Publishers, New Delhi, 2005.

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2. *"Principles and Practice of Highway Engineering"*, Kadiyali, L.R, and Lal, N.B., Khanna Publishers.2005.

Course Name:	Water Resources Systems					
Course Code:	CIV 221	Credit Structure :	L	T	P	C
			3	1	0	4

Course outcomes: On successful completion of the course the student shall be able to:

(i) Define the basic terms involved in Hydrology and Water Resources Engineering.
(ii) Analyze the Precipitation Characteristics at a Location.
(iii) Estimate the Abstractions from Precipitation.
(iv) Estimate the Runoff from a Catchment.
(v) Illustrate the Flood Hydrographs.
(vi) Estimate the risk and reliability of Hydraulic Structures.
(vii) Determine Reservoir Capacity based on the Field Requirements.

Course Description: This course deals with the concepts of hydrologic cycle and the interrelationship of its components such as rainfall, infiltration, evaporation, and runoff. It deals with quantitative methods for analyzing large-scale water resource problems, surface and groundwater addressing both water quantity and quality, human influences on the hydrological system. Topics covered include precipitation and losses from precipitation, hydrographs, estimation of flood and flood routing.

Textbook(s):

1. *"Engineering Hydrology"*, Subrahmanya, K., 2008, Tata Mc Graw Hill Pub. Co., New Delhi.

Reference Book(s):

1. *"Applied Hydrology"*, Chow, V. T., Maidment and Mays, L. A., 2010, Tata Mc Graw Hill Pub. Co., New York.

Course Name:	Water Infrastructure Systems					
Course Code:	CIV 222	Credit Structure :	L	T	P	C
			3	0	0	3

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Identify appropriate water source for adequate water demand
(ii) Analyze basic characteristics of water and its determination.
(iii) Infer appropriate treatment methods and its design.
(iv) Identify feasible components for water supply systems.

Course Description: This course deals with Introduction to Water Infrastructure Systems-Importance and necessity for Planned water supply, Various types of water demand, Per capita demand, variation in demand pattern, Design period and Population forecasting methods. Source of water-Intakes, types of intakes and conduits for transporting water. Water quality and its parameters, BIS and WHO standards. Water treatment processes and treatment units-Screening, Aeration Plain sedimentation, , sedimentation with coagulation, types of coagulants, optimum dose of coagulants, mixing devices, Theory of filtration, types of filters and their comparison, design of slow and rapid sand filter, washing of filter and methods of disinfection. Distribution system.

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Textbook(s):

1. *"Water Supply Engineering"*, S.K. Garg, Khanna Publishers.
2. *"Water Supply Engineering, Vol. 1"*, B.C.Punmia, Ashok Jain & Arun Jain, Laxmi Publications Pvt.Ltd, New Delhi.

Reference Book(s):

1. *"Environmental Engineering"*, Howard S. Peavy, Donald R. Rowe, George T, New York, 2000, Tata McGraw Hill, Indian Edition, 2013
2. "*Water supply and sanitary engineering*", GS Birdie, JS Birdie, Dhanpat Rai Publishing Company (P) Ltd, New Delhi.

Course Name:	**Waste Water Treatment and Disposal Systems**					
Course Code:	**CIV 223**	**Credit Structure :**	**L**	**T**	**P**	**C**
			3	**0**	**0**	**3**

Course outcomes: On successful completion of the course the student shall be able to:

(i) Select the appropriate sewer appurtenances and materials in sewer network.
(ii) Design the sewers network and understand the self-purification process in flowing water.
(iii) Design the various physico - chemical treatment units
(iv) Design the various biological treatment units
(v) Design various AOPs and low cost treatment units.
(vi) Select different types of disposal methods of sewage based on its characteristics

Course Description: This course provides fundamental information on wastewater treatment with a focus on understanding the principles governing design of biological, physical and chemical treatment processes.

The main objective of the Course is to learn the basics of sewage composition and its characteristics and to provide the adequate information on various disposal standards for industrial effluents.

This Course deals with the characteristics and composition of sewage sampling, analysis, population equivalent, drainage in buildings, plumbing systems for drainage, primary treatment, secondary treatment, sludge digestion, tertiary treatment, disposal standards, self-purification of rivers, Streeter Phelps equation, oxygen sag curve etc.

This Course helps students to design various treatments units and to pursue further study on waste water treatment.

The students may have studied environmental Engineering-I with basic knowledge on chemistry and physics to pursue the Course

Text Book(s):

1. "*Waste water Engineering, Vol. II*", B.C. Punmia, Ashok Jain & Arun Jain, Laxmi Publications Pvt.Ltd, New Delhi
2. *"Sewage Disposal and Air Pollution",* S.K. Garg, Khanna Publishers, – New Delhi, 28th edition and 2017
3. *"Environmental Engineering"*, Howard S. Peavy, Donald R. Rowe, George T, New York, *2000*, Tata McGraw Hill, Indian Edition, 2013

Reference Book(s):

1. "*Waste Water Engineering*, *Collection, Treatment and Disposal*", Metcalf and Eddy, Tata McGraw Hill,

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Inc., New York.

2. "Water & Waste Water Technology", Mark. J Hammer, John Wiley & Sons Inc., New York, 2008
3. "*Manual of Sewage and Sewage Treatment*", CPHEEO, 1999

Course Name:	**Design of Irrigation Water Resources Systems**					
Course Code:	**CIV 224**	**Credit Structure :**	**L**	**T**	**P**	**C**
			3	**0**	**0**	**3**

Course Outcomes: On successful completion of the course, the student shall be able to

(i) Define the basic terms involved in Hydraulic Structures and Irrigation Engineering.
(ii) Estimate the water requirements of various crops.
(iii) Analyze the Stability of various Hydraulic Structures like Dams, Headworks, Spillways etc.,
(iv) Choose appropriate Irrigation Channel Dimensions.

Course Description: The main theme of this course is to understand the theory and design of irrigation structures. The course covers the major topics such as assessment of water requirements for crops, seepage theories and design of canals, canal headworks, regulation works, and cross-drainage works. Design principles of hydraulic structures like Gravity Dam, Earth Dam, and Spillway are introduced.

Textbook(s):

1. *"Irrigation Water Resources and Water Power Engineering",* Dr. P. N. Modi, Standard Book House.

Reference Book(s):

2. "*Irrigation Engineering and Hydraulic Structures",* Garg S K, Khanna Publications.

Course Name:	**Railway, Airport and Harbour Engineering**					
Course Code:	**CIV 225**	**Credit Structure :**	**L**	**T**	**P**	**C**
			3	**0**	**0**	**3**

Course outcomes: On successful completion of the course the student shall be able to:

(i) Carry out the surveys for railways, airports and harbours.
(ii) Perform geometric design for the three modes.
(iii) Plan the layout of different types of terminals.
(iv) Apply the principles of bus transit, MRTS and LRT.
(v) Demonstrate the fundamentals of Intelligent Transportation Systems.

Course Description: This course deals with the designing of various components of railway, airport, docks and harbour. This course also give the idea of planning the transportation system in modern cities.

This course consist of railway engineering ,location surveys and alignment, permanent way, gauges, geometric design, track Junctions-Points and crossings, railway stations and yards, signaling and interlocking, control systems of train movements, airport engineering, aircraft characteristics, airport obstructions and zoning, runway, taxiways and aprons, terminal area planning and urban transportation systems etc.

These concepts can be applied in designing railway, airport and harbour components.

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Textbook(s):

1. *"Railway Engineering"*, M.M. Agarwal, Prabha & Co. 2007.
2. *"Airport Planning and Design"*, Khanna, S.K. and Arora, M.G., Nemchand and Bros. 1999.
3. *"Elements of Dock and Harbour Engineering"*, Oza and Oza, Charotar Publishing House, 1996.

Course Name:	Basic Materials Testing Lab					
Course Code:	CIV 263	Credit Structure :	L	T	P	C
			0	0	2	1

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Compute the strength of various engineering materials subject to bending, compression, shear force and torsion.

Course Description: The primary objective of the Course is to make the students gain knowledge on mechanical properties of engineering materials.

The students should have studied strength of materials theory Course to pursue the Course. This Course provides an overview of the mechanical properties of structural materials. It is a practical oriented Course dealing with the mechanical properties of materials such as tensile strength, compressive strength, flexural strength, shear strength, torsion, hardness, toughness and tests on fine and coarse aggregates.

This Course helps students to determine the strength of various engineering materials subject to bending, compression, shear force and torsion.

Course Material: "*Basic Materials Testing Lab Manual",* Presidency University

Discipline Elective Courses (B.Tech Civil)

Course Name:	Design of industrial structures					
Course Code:	CIV 314	Credit Structure :	L	T	P	C
			3	0	0	3

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Understand the planning and functional requirements of various industries.
(ii) Get an idea about the materials used and design of industry structural elements.
(iii) Realize the basic concepts and design of power plant structures.
(iv) Design power transmission structures.
(v) Possess the ability to understand the design concepts of chimneys, bunkers and silos

Course Description: This course deals with requirements, planning and design of industrial structures. It covers the different types of industrial structures and planning of Industrial Structures including the requirements regarding Lighting, Ventilation and Fire Safety - Protection against noise and vibration –as per Guidelines of Factories Act. It also include the design of auxiliary structures like Bunkers & Silos, Chimneys and Pipes. The course also focus on large span roof structures and structural aspects of foundation for industrial structures.

Text Book(s):

1. *"Advanced Reinforced Concrete Design"*, By N. Krishna Raju (CBS Publishers & Distributors).

2. *"Design of Steel Structures"*, By Ram Chandra. 3. Design of Steel Structures, By Duggal.
3. *"Tall Chimneys - Design and Construction"*, Manohar S.N, Tata McGraw Hill, 1985
4. *"Planning of Industrial Structures"*, Dunham, C.W., John Wiley and Sons (2001).
5. *"Transmission Line Structures"*, Santhakumar A.R. and Murthy S.S., Tata Mc GrawHill, 1992.

Reference Book(s):

1. *"Handbook of Machine Foundations",* Srinivasulu P and Vaidyanathan.C, Tata McGraw Hill, 1976.
2. *"Industrial Buildings: A Design Manual"*, Jurgen Axel Adam, Katharria Hausmann, Frank Juttner, Klauss Daniel, Birkhauser Publishers, 2004. 5.
3. *"Procs. of Advanced course on Industrial Structures",* Structural Engineering Research Centre, Chennai, 1982.

Course Name:	**Advanced concrete technology**					
Course Code:	**CIV 315**	**Credit Structure :**	**L**	**T**	**P**	**C**
			3	**0**	**0**	**3**

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Execute and test the concrete made with cement, aggregates and admixtures.
(ii) Describe the properties and durability of fresh and hardened concrete
(iii) Execute mix proportioning of concrete and describe how the strength of concrete can be modified by changing the proportions.
(iv) Use suitable concrete for different structures considering the prevailing weathering conditions.
(v) Decide the correct concreting methods in the field depending upon the requirement and site conditions

Course Description: To study the microstructure of concrete, strength and deformation characteristics using advanced techniques. To study concrete mix design, various mineral and chemical admixtures and durability characteristics from the point of advanced concrete technology. To study materials, mix proportioning and application of special concretes namely, HPC, SCC, GPC and HPFRC.

This course enable the students to study the microstructure of concrete, strength and deformation characteristics using advanced techniques. It emphasis on properties of concrete making materials such as cement, aggregates and admixtures including tests to assess the properties of fresh and hardened concrete. The course will focus on concrete mix design, various mineral and chemical admixtures and durability characteristics from the point of advanced concrete technology. It also include the requirements of materials, mix proportioning and application of special concretes namely, HPC, SCC, GPC and HPFRC. It will enable to study the concrete manufacturing processes, concreting methods and different special formworks

Text Book(s):

1. *"Properties of Concrete",* Neville A.M., Prentice Hall, 5th Edition 2012.
2. *"Concrete Technology: Theory and Practice"*, Shetty, M.S., S.Chand and Co. Pvt. Ltd., Delhi, 2005.
3. *"Concrete Technology"*, Santhakumar A.R., Oxford University Press India, 2006.

References Book(s):

1. *"Concrete – Structure, Properties and Materials*", Mehta, P.K. (1983), Prentice Hall, New Jersey, USA.
2. *"High Performance Concrete",* Pierre-Claude Aitcin, Taylor & Francis, 2011.
3. *"Formwork for Concrete",* Mary Krumboltz Hurd, American Concrete Institute, 2005.
4. *"IS: 10262 (2009), Concrete Mix Proportioning – Guideline"*, BIS, New Delhi

Course Name:	Industrial wastewater treatment					
Course Code:	CIV 316	Credit Structure :	L	T	P	C
			3	0	0	3

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Identify environmental standards that apply to both direct and indirect industrial discharges.
(ii) Identify industrial waste stream characteristics from several major industrial categories and why these characteristics are important to the design of unit processes.
(iii) Specify design criteria for physical, chemical, and biological unit operations and processes necessary to treat an industrial wastewater.
(iv) Estimate capital and operating costs for industrial waste treatment systems.
(v) Identify the suitability of the use of treated wastewater for irrigation and to evaluate the optimal method for the management of wastewater.
(vi) Use appropriate modern techniques skills and tools including computer applications, necessary for engineering practice.

Course Description: Understand the industrial process, water utilization and waste water generation. Impart knowledge on selection of treatment methods for industrial wastewater. Acquire the knowledge on operational problems of common effluent treatment plants. Conversant about the polluting potential of major industries in the country and the methods of controlling the same

Reference Book(s):

1. *"Industrial Water Pollution Control"*, Eckenfelder, W.W., McGraw-Hill
2. *"Theories and practices of Industrial Waste Engineering",* N.L. Nemerrow
3. *"Wastewater engineering Treatment disposal reuse",* Metcalf & Eddy, Tata McGraw Hill.
4. *"Industrial Waste Treatment: Contemporary Practice and Vision for the Future",* Nelson Leonard Nemerow, Library of Congress Cataloging-in- Publication data.
5. *"Theories and practices of industrial waste treatment",* Nelson Leonard Nemerow, Library of Congress Cataloging-in- Publication data

Course Name:	Advanced RCC structures					
Course Code:	CIV 317	Credit Structure :	L	T	P	C
			3	0	0	3

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Outline the general behavior and design procedure for building frames
(ii) Illustrate the design of flat slabs
(iii) Illustrate design of shallow foundations from structural considerations
(iv) Summarize the principles of Structural Design and detailing

Course Description: The objective of this course is to make students to learn principles of limit state design of Reinforced Concrete Structures to design structural frames, foundations and to do the reinforcement detailing.

The main objective of this course is to provide civil engineering students with the knowledge of designing complete building frames. This course is a second level course on design of reinforced concrete structures.

The course exposes students to the theory of R.C. design and helps the student to understand the behavior of R.C member under different loading conditions. This course is a second level course on design of reinforced concrete structures. It deals with the load transfer path in frames and design of each structural component post the analysis of the frames. It also deals with the design of flat slabs of large span, yield line approach for design of slabs as well as design of combined foundations and mat foundations. The students having basic knowledge of structural analysis, soil mechanics and design of reinforced concrete structures can easily understand this course. This Course helps students to design framed buildings, flat slabs of large span, combined foundations and mat/raft foundations.

Text Book(s):

1. "*Reinforced concrete Design*", Unnikrishnan Pillai and Devdas Menon., Tata McGraw Hill Publishers Company Ltd., New Delhi, 2006
2. "*Advanced Reinforced Concrete Design",* P. C. Varghese, PHI Learning Private Ltd., New Delhi, 2011
3. "*Design of Reinforced Concrete Foundations",* P. C. Varghese, PHI Learning Private Ltd., New Delhi, 2010
4. "*Advanced Reinforced Concrete Design*", Krishna Raju. N., CBS Publishers & Distributors

Reference book(s):

1. "*Reinforced Concrete Structures"*, Thomas Paulay, R. Park, John Wiley and sons New York.

Course Name:	**Repair and Rehabilitation of Structures**					
Course Code:	**CIV 318**	**Credit Structure :**	**L**	**T**	**P**	**C**
			3	**0**	**0**	**3**

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Estimate the causes for distress and deterioration of structures.
(ii) Understand NDT for condition assessment of structures, identify damages in RC structures.
(iii) Select repair material and retrofitting strategy suitable for distress.
(iv) Formulate guidelines for repair management of deteriorated structures.

Course Description: This course will help students learn how to identify various deterioration mechanisms or damage mechanisms in concrete structures. Use of various non-destructive, partially-destructive tools to assess the condition of the structure will be discussed. Tips on selecting measurable parameters that are useful in deciding the further repair and maintenance practices will be provided. Typical practices for near-surface repair, corrosion protection, structural strengthening, structural stabilization, etc. will be discussed in detail. At the end of the course students will be able to suggest evaluation and repair/retrofitting methods for extending the service life of concrete structures. Importance for preventive maintenance practices (instead of corrective maintenance practices) will be discussed throughout the coursework.

Text Book(s):

1. *"CPWD Handbook on Repair and Rehabilitation of RCC buildings"*, Govt of India Press, New Delhi, 2002.
2. *"Learning from failures - Deficiencies in Design, Construction and Service" Rand Centre (SDCPL),* R.N. Raika, Raikar Bhavan, Bombay, 1987.

References book(s):

1. *"Concrete Technology"*, Santhakumar A.R., Oxford University Press, New Delhi, 2007.
2. J.G. Teng, J.F. Chen, S.T. Smith, L. Lam, "FRP: Strengthened RC Structures", Wiley Publications
3. 440.2R-10/17: "*Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures"*

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Course Name:	Matrix methods of structural analysis					
Course Code:	CIV 319	Credit Structure :	L	T	P	C
			3	0	0	3

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Analyse framed structures using flexibility and stiffness method.
(ii) Analyse Truss and beam matrix methods.
(iii) Ability to analyze determinate and indeterminate plane and space truss / frame system.
(iv) Develop computer programs for analysis of framed structure.
(v) Develop stiffness matrix for prismatic members.
(vi) Understand the use of Finite Element Method.

Course Description: This is a second level course on structural analysis. Herein the concept of matrix method of structural analysis with application in various structural components will be discussed. This course will serve as a bridge between structural analysis 1 (the first course on structural analysis) and more advance topic such as finite element method (FEM).

Text Book(s):

1. *"Matrix Analysis of Structures",* Asslam Kassimali, Brooks/Cole Publishing Co., USA, 1999.

Reference Book(s):

1. *"Advanced Structural Analysis",* Devdas Menon, Narosa Publishing House, 2009.
2. *"Structural Analysis: A Unified Classical and Matrix Approach"*, Amin Ghali, Adam M Neville and Tom G Brown, Sixth Edition, 2007, Chapman & Hall.

Course Name:	Masonry structures					
Course Code:	CIV 320	Credit Structure :	L	T	P	C
			3	0	0	3

Course outcomes: On successful completion of the course the student shall be able to:

(i) Explain engineering properties and uses of masonry units, defects and crack in masonry and its remedial measures.
(ii) Summarize various formulae's for finding compressive strength of masonry units.
(iii) Explain permissible stresses and design criteria as per IS: 1905 and SP-20.
(iv) Design different types of masonry walls for different load considerations.

Course Description: The objective of this course is to understand properties of masonry units, design criteria of various types of wall subjected to different load system and to provide knowledge in analysis and design of masonry elements. This course is a basic course on design of masonry structures. It deals with the properties of masonry units, strength properties, behaviour of masonry walls under different loading conditions. The course also deals with the design of masonry walls subjected to axial, eccentric and transverse load. The students having basic knowledge of structural analysis and strength of materials can easily understand this course. This Course helps students to understand the concept of analysis and design of masonry elements.

Text Book(s):

1. *"Structural Masonry",* Henry, A.W., Macmillan Education Ltd., 1990.

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2. *"Brick and Reinforced Brick Structures",* Dayaratnam P, Oxford & IBH, 1987.

Reference Book(s):

1. IS 1905–1987 *"Code of practice for structural use of un-reinforced masonry"*- (3rd revision) BIS, New Delhi.
2. SP 20 (S&T) – 1991, "Hand book on masonry design and construction (1st revision) BIS, New Delhi.

Course Name:	**Reinforced Earth Structures**					
Course Code:	**CIV 321**	**Credit Structure :**	**L**	**T**	**P**	**C**
			3	**0**	**0**	**3**

Course Outcomes: On successful completion of the course the students shall be able to:

(i) Interpret geosynthetics properties to propose application in different earth structures.
(ii) Understand the application of geosynthetics in foundations and pavements.
(iii) Analyze geosynthetics for drainage and filter function in soils.
(iv) Solve problems involving reinforced retaining walls and soil slopes.

Course Description: This course introduces the students to the different types of geosynthetics, their manufacturing technique, testing methods and their applications in different fields of Civil Engineering projects like retaining walls, slopes, foundations, pavements and drainage. Detailed design techniques and construction methods will be covered in the course.

Text Book(s):

1. *"Designing with Geosynthetics",* Robert M. Koerner, Pearson Prentice Hall, Upper Saddle River, New Jersey, United States, 2005.

Reference book(s):

1. *"Geosynthetics and their applications"*, Sanjay Kumar Shukla, Thomas Telford Publishing, Thomas Telford Ltd, I Heron Quay, London E I4 4JD, 2002.
2. NPTEL material.

Course Name:	**Advanced Design of Steel Structures**					
Course Code:	**CIV 322**	**Credit Structure :**	**L**	**T**	**P**	**C**
			3	**0**	**0**	**3**

Course Outcomes: On successful completion of the course the student shall be able to:
(i) Comprehend plastic behavior of structural steel
(ii) Estimate Plastic Moment capacity of determinate and indeterminate structures
(iii) Illustrate the design of steel trusses and gantry girder as per Indian codal provisions
(iv) Summarize the principles of Steel Design and detailing

Course Description: The objective of this course is to make students to learn understand the plastic behavior of structures and the principles of plastic analysis of Structures as well as to expose students to design of steel trusses and gantry girder.

The main objective of this course is to provide civil engineering students with the knowledge of plastic analysis and behavior as well as design of steel structures. This course is a second level course on steel structures. It deals with the plastic behavior of structures, plastic analysis, and development of plastic hinges.

It also deals with the design of steel trusses and gantry girders as per limit state of design following the Indian codal provisions. The students having basic knowledge of structural analysis and design of steel structures can easily understand this course. This Course helps students to design steel trusses for supporting the roof of industrial structures, railway stations and to design gantry girders used in factories and manufacturing industries to lift and move heavy machinery/equipment.

Text Book(s):

1. *"Limit State Design of Steel Structures"*, Duggal S.K, Tata Mac Graw Hill, New Delhi, 2010.
2. *"Design of Steel Structures"*, N. Subramanian, Oxford, 2008.
3. "*Design of Reinforced Concrete Foundations",* P. C. Varghese, PHI Learning Private Ltd., New Delhi, 2010
4. *"Advanced Reinforced Concrete Design",* Krishna Raju. N., CBS Publishers & Distributors

Reference Book(s):

1. *"Limit State of Design of Steel Structures"*, Ramachandra, Standard Book House - 2012.

Course Name:	**Design of Retaining Structures**					
Course Code:	**CIV 323**	**Credit Structure :**	**L**	**T**	**P**	**C**
			3	**0**	**0**	**3**

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Outline the general behavior and design procedure of retaining walls and water tanks
(ii) Illustrate the design of different types of retaining walls with different backfill conditions
(iii) Illustrate design of water tanks at ground level
(iv) Summarize the principles of Structural Design and detailing of retaining structures

Course Description: The objective of this course is to make students to learn principles of limit state design of retaining walls and water tanks and to do the reinforcement detailing.

The main objective of this course is to provide civil engineering students with the knowledge of designing earth and water retaining structures. This course is an advanced course on design of reinforced concrete structures. It deals with the design of cantilever and counterfort retaining walls with different backfill conditions. It also deals with the design of water tanks at ground level. The students having basic knowledge of structural analysis, soil mechanics and design of reinforced concrete structures can easily understand this course. This Course helps students to design different types of retaining walls of varying heights and backfill condition as well as to design water tanks at ground level.

Text Book(s):

1. *"Reinforced concrete Design"*, Unnikrishnan Pillai and Devdas Menon., Tata McGraw Hill Publishers Company Ltd., New Delhi, 2006
2. "*Advanced Reinforced Concrete Design",* P. C. Varghese, PHI Learning Private Ltd., New Delhi, 2011
3. *"Reinforced Concrete Structures"*, B.C. Punmia, Laxmi Publishing Co.
4. "*Advanced Reinforced Concrete Design*", Krishna Raju. N., CBS Publishers & Distributors

Reference Book(s):

1. "*Reinforced Concrete Structures"*, Thomas Paulay, R. Park, John Wiley and sons New York.

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Course Name:	Structural Dynamics					
Course Code:	CIV 324	Credit Structure :	L	T	P	C
			3	0	0	3

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Understand the principles of Structural Dynamics
(ii) Summarize the Solution techniques for dynamics of single and Multi-degree freedom systems
(iii) Understand the concepts of damping in structures
(iv) Understand behavior of structures under dynamic loading

Course Description: The objective of this course is to make students to learn principles of vibration, structural dynamics and behaviour of structures under different types of dynamic loading.

The main objective of this course is to provide civil engineering students with the knowledge of structural dynamics and principles for analysis of structures under dynamic loading. This course is a basic course on analysis of structures under dynamic loading. It deals with the concept of degree of freedom, modelling of structures as single degree and multi degree of freedom system, free and forced vibration in structures and the concept of damping in structures. It also deals with the analysis of structural systems under various types of dynamic loading and introduces the concept of shear building. The students having basic knowledge of engineering mathematics and structural analysis can easily understand this course. This Course helps students to understand the behavior of structures under dynamic loading which will be useful in the analysis and design of structures subjected to wind and earthquake.

Text Book(s):

1. *"Structural Dynamics",* Mario Paz, CBS publishers.
2. *"Structural Dynamics: Vibrations & Systems"*, M. Mukhopadhaya*,* Anne Books Pvt. Ltd.

Reference Book(s):

1. "*Structural Dynamics"*, Clough & Penzien, Tata Mc Graw Hill.
2. "*Dynamics of Structures – Theory and Application to Earthquake Engineering",* Anil K. Chopra, Pearson Education, 2nd Edition.

Course Name:	Stability of Structures					
Course Code:	CIV 325	Credit Structure :	L	T	P	C
			3	0	0	3

Course outcomes: On successful completion of the course the student shall be able to:

(i) To understand stability of static and dynamic equilibrium.
(ii) To evaluate static stability criteria using stability equations.
(iii) To solve stability problems by energy method and finite difference method.
(iv) To predict critical loads on structures.
(v) To create discrete and continuous models to solve stability problems.

Course Description: This course deals with the buckling behavior of columns, beam column, frames and plates. The student should have prior knowledge of strength of material for this course.

This course consist beam column, Euler's differential equation, elastic buckling of bars and frame, inelastic buckling of bars, lateral buckling of beam, bending of thin plates, buckling of plates and critical load for various boundary conditions.

Text Book(s):

1. *"Theory of Elastic Stability"*, Timoshenko. S. P and Gere. J. M, McGraw Hill Book Company, 1981.

Reference Book(s):

1. "*Principles of Structural Stability Theory*", Alexandar Chajes, Prentice Hall, New Jersey, 1980.
2. *"Structural Stability of Columns and Plates",* Iyenger, N. G. R., Affiliated East West Press Pvt. Ltd., 1990.
3. *"Buckling Strength of Metal Structures"*, Bleich F., McGraw Hill 1991.
4. *"Stability Analysis and Design of Structures"*, Gambhir, Springer, New York, 2004.

Course Name:	**Theory of Elasticity**					
Course Code:	**CIV 326**	**Credit Structure :**	**L**	**T**	**P**	**C**
			3	**0**	**0**	**3**

Course Outcomes: On successful completion of the course the student shall be able to:

(i) To apply elastic analysis to study the fracture mechanics.
(ii) To apply linear elasticity in the design and analysis of structures such as beams, plates, shells and sandwich composites.
(iii) To apply hyper elasticity to determine the response of elastomer-based objects.
(iv) To analyze the structural sections subjected to torsion.
(v) To understand various theories of failure and concept of plasticity.

Course Description: The main objective of the course is give the advance knowledge of mechanics of deformed bodies. This course also deals with polar coordinate system which will help in designing the various component.

The student should have a prior knowledge of basic mathematics, strength of material, solid mechanics.

This course consist basic concept of deformed bodies, equilibrium equation in 2D and 3D Cartesian coordinates, plane stress, plane strain, problems in 2D rectangular coordinate, solution by polynomials, problems in 2D polar coordinate, stress distribution, torsion of non-circular section, stress concentration, application to thin and thick cylinders under internal pressure.

Text Book(s):

1. *"Theory of Elasticity and Plasticity",* Timoshenko and Goodier, McGraw-Hill, 2006.

Reference Book(s):

(i) *"Computation Elasticity"*, Mohammed Amin, Narosa Publications, 2005.
(ii) *"Plasticity for Structural Engineers"*, Chen and Han, Springer Verlag, 1998.
(iii) *"Theory of Isotropic/Orthotropic Elasticity, An Introductory Primer",* K. Baskar, T.K. Varadan, Anne books Pvt. Ltd., 2009.
(iv) *"Theory of Plasticity",* Chakrabarty. J., Elsevier Butterworth-Heinmann-UK, Third Edition, 2006.

Course Name:	**Urban Transportation Planning and traffic engineering**					
Course Code:	**CIV 327**	**Credit Structure :**	**L**	**T**	**P**	**C**
			3	**0**	**0**	**3**

Course Outcome: On successful completion of the course the student shall be able to:

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(i) Design, conduct and administer surveys to provide the data required for transportation planning.
(ii) Supervise the process of data collection about travel behavior and analyze the data for use in transport planning.
(iii) Develop and calibrate modal split, trip generation rates for specific types of land use developments.
(iv) Adopt the steps that are necessary to complete a long-term transportation plan.

Course Description: This Course deals with the planning of transportation system in modern cities.
This course consist urban transport planning, modeling technique in planning, urban mass transportation process, data collection and inventories, trip generation and distribution, traffic assignment, basic elements of transport networks, capacity restraint technique, introduction to land use planning models, sustainable urban transportation, integrated public transport planning.

Text Book(s):

1. *"Traffic Engineering and Transportation Planning",* Kadiyali.L.R., Khanna Publishers, New Delhi.

Reference Book(s):

1. *"Introduction to Urban System Planning",* Hutchinson, B.G, McGraw Hill
2. *"Transportation Engineering – An Introduction",* Khisty C.J., Prentice Hall.
3. *"Fundamentals of Transportation Planning",* Papacostas, Tata McGraw Hill.

Course Name:	**Climate Change and Sustainable Development**					
Course Code:	**CIV 328**	**Credit Structure :**	**L**	**T**	**P**	**C**
			3	**0**	**0**	**3**

Course Outcomes: On successful completion of the course the student shall be able to:
(i) Outline the key concepts on Sustainable development and Climatic change.
(ii) Generalize the climatic mitigations and risk involved in climate change for sustainable development.
(iii) Distinguish the relationship between climate change and sustainable development.
(iv) Identify tools for analysis and Development for Sustainable development.
(v) Infer on Climatic adaptations for attaining risk Resilience

Course Description: This course deals with the introduction to Climatic change and Sustainable development, Life cycle Analysis and overview of key concepts in Climatic change and Sustainable development, Climate risks due to climate change, Climatic mitigations for sustainable development, Nexus of climate change and sustainable development, Tools for analysis and Development for Sustainable development, Climatic adaptations to reduce vulnerability of social and biological systems with concluding remarks. For doing this Course basic knowledge of Environmental Science is required.

Text Book(s):

1. "*Climate Change and Sustainable Development*", R.K. Pachauri, OXFORD University Press.

Reference Book(s):

1. "*Climate Change and Sustainable Development",* Mohan Munasinghe.
2. "*Biodiversity and sustainable Development",* M.L. Narasaiah, Discovery publishing House, New Delhi.

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Course Name:	Urban flooding: Analysis and Control					
Course Code:	CIV 329	Credit Structure :	L	T	P	C
			3	0	0	3

Course Outcomes: On successful completion of the course the student shall be able to:

(i) Understand and explain the governing processes of flood generation and propagation
(ii) Identify the proper modelling methodology for a given problem
(iii) Utilise their hands-on experience in the step-by-step modelling procedure (geometry, bathymetry, boundary conditions, forcing) needed to carry out a practical study with models like., MIKE11, or HEC-RAS package;
(iv) Know how the urban flood model may be used for structural and non-structural measures for flood mitigation.
(v) Understand the Hydro informatics tools available for flood risk management;
(vi) Conceptualize the main principles of Indian flood directive and have knowledge about Indian experience in flood risk management;
(vii) Understand and explain the main principles of flood forecasting and warning and uncertainty issues associated with flood forecasts

Course Description: This course helps the students to learn to identify causes of urban flooding, effective and efficient methodology to combat this anthropogenic phenomenon with technology enabled non-structural measures. Urban flooding models. Basic and practical knowledge of urban flood risk management in India; characteristics of urban flood (including inundation by flooding), countermeasures against urban flood. Case studies of National and International cities with reference to Initiatives, planning, design, execution, monitoring.

Text Book(s):

1. *"Urban Drainage"*, Butler, D. and Davies, J.W., Spon Press, 2nd Edition. 2004.

Reference book(s):

1. *"Urban Hydrology, Hydraulics and Stormwater Quality Engineering Applications and Computer Modeling",* Akan A.O and Hioughtalen R.J., John Wiley & Sons 2003.
2. *"Urban Hydrology",* Hall, M.J. Elsevier, 1984.
3. *"Training Module on Urban Risk Mitigation",* Chandrani Bandyopadhyay, National Institute of Disaster Management, Ministry of Home Affairs, New Delhi, 2014.

Course Name:	Urban air pollution and control					
Course Code:	CIV 330	Credit Structure :	L	T	P	C
			3	0	0	3

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

(i) Identify sampling and analysis techniques for air quality assessment
(ii) Describe the plume behavior for atmospheric stability conditions
(iii) Able to control air pollution by properties various techniques to control.

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Course description: The overall objective of the course is to provide understanding of sources and effects of air pollution, air pollutants and their effects, air pollution episodes, meteorology, plume behavior, windrose diagrams, air pollution control equipment for particulate matter & gaseous pollutants.

This Course helps student to assess impact of air pollution on environment and their control.

The students having good knowledge on air pollution can easily understand this Course.

Text Book(s):

1. "*Air pollution and control"*, M N Rao, McGraw Hill Publication

Reference Book(s):

1. "*Environment pollution and control Engineering"*, C S Rao, New age international publishers.

Course Name:	**Urban Waste Management**					
Course Code:	**CIV 331**	**Credit Structure :**	**L**	**T**	**P**	**C**
			3	**0**	**0**	**3**

Course outcomes: On successful completion of the course the student shall be able to:

(i) Describe about waste characteristics and solid waste management.
(ii) Explain about reuse and recycling potential of solid waste materials.
(iii) Apply knowledge of designing waste disposal site.
(iv) Apply knowledge of reducing environmental implications from landfills.

Course Description: This Course helps student to deal with the identification, characterization and regulatory requirements for disposal of hazardous, non-hazardous and domestic wastes. Previous knowledge of soil mechanics and environmental engineering is helpful in pursuing the Course.

The Course includes causes and effects of subsurface contamination, waste disposal on land; waste management-recycling, composting, incineration and various disposal methods, characteristics of solid wastes; waste containment principles; site selection and geo-environmental investigations, natural attenuation process and mechanism of attenuation, types of landfills; planning of landfills; design of liners and covers for landfills; environmental monitoring around landfills; detection, control and remediation of subsurface contamination; geotechnical re-use of solid waste materials.

It also includes application of geosynthetics in waste disposal design, types of geosynthetics, testing and evaluation; designing with geotextiles, geogrids, geonets and geomembranes, leachate collection and detection system, landfill construction etc.

Course Name:	**Open Channel Flow**					
Course Code:	**CIV 332**	**Credit Structure :**	**L**	**T**	**P**	**C**
			3	**0**	**0**	**3**

Course Outcome: On successful completion of the course the student shall be able to:

(i) The student will be able to design the channel sections and drains,
(ii) The students will be design jumps, and
(iii) The student will be able to design pumps for various hydraulic and hydrologic projects

Course Description: Introduction to kinds of open channel flows and properties like specific energy, force, etc. – Uniform flow – Gradually varied flow – Rapidly varied flow – Hydraulic Jumps – Turbines and Pumps.

To describe the various types of flows in open channels. To describe velocity distribution across and along the channel. To understand hydraulic jumps. To understand the application of turbines and pumps

Textbook(s):

1. *"Hydraulics And Fluid Mechanics Including Hydraulics Machines",* P.N.Modi and S.M.Seth, Standard Book House, 2002

Reference Book(s):

1. *"A Textbook of Fluid Mechanics",* R.K.Bansal, S.Chand
2. *"Flow in open channels",* K. Subramanya, Tata McGraw Hill

Open Elective Courses (B.Tech Civil)

Course Name:	Systems Design for Environment and Sustainability					
Course Code:	CIV 407	Credit Structure :	L	T	P	C
			3	0	0	3

Course Outcome: On successful completion of the course the student shall be able to formulate and use mathematical models to:

(i) Assess human impacts on the environment, Assess the economic value of natural resources.
(ii) Correlate Environment, Energy and Economy beyond academic to real life examples,
(iii) Apply systems thinking to address complex problems emphasizing on pollution control using CDTs
(iv) Conceptualize, formulate, test, and run a simulation model of complex problems using specialist software
(v) Analyse system behaviour using mathematical techniques and software
(vi) Design interventions that improve system behaviour

Course Description: This course provides impetus in enhancing design thinking process among students for widening the boundaries of the objective of design so as to contribute positively to sustainable development. This course will discuss the Design approaches, methods and tools along with case examples with reference to Selection of resources with low environmental impact; Design of products with low environmental impact; and Product-Service System Design for eco-efficiency. This course has been designed to teach about environment, energy and economy through the use of case studies, computer software tools, and seminars from the point of view of sustainable development and changing societal, industrial demands. Case studies provide the basis for group projects as well as individual projects.

Reference Book(s):

1. *"Ecological Water Quality (Water Treatment and Reuse)"*, Kostas Voudouris and Dimitra Voutsa.
2. *"Wastewater Engineering"*, Metcalf and Eddy, McGraw Hill Publication.
3. *"MATLAB for Engineering Application",* Williams J. Palm, Tata McGraw Hill Publication.
4. *"Application of GIS and Remote Sensing in Environmental Management",* S. A. Abbasi, DPH Publications.
5. *"Consider a Cylindrical Cow: More Adventures in Environmental Problem Solving",* Harte, John Mill Valley, CA: University Science Books, 2001.
6. "Energy and the Environment", Fay, James A., and Dan S. Golomb, New York, NY: Oxford University Press, 2002
7. *"Introduction to MATLAB for Engineers and Scientists"*, Etter, Dolores, Upper Saddle River, NJ: Prentice Hall, 1996
8. *"Engineering Problem Solving with MATLAB"*, Etter, Dolores, David Kuncicky, and Holly Moore, Upper Saddle River, NJ: Prentice Hall, 2006.

9. *"Environmental Engineering",* Howard S. Peavy, Donald R. Rowe, George Tchobanoglous, Mcgraw Higher Ed. ISBN: 9789351340263

Course Name:	Infrastructure Systems for Smart City					
Course Code:	CIV 408	Credit Structure :	L	T	P	C
			3	0	0	3

Course Outcome: On successful completion of the course the student shall be able to:

(i) Better understanding of the dynamic behavior of the urban system by going beyond the physical appearance and by focusing on representations, properties and impact factors.
(ii) Exploration of the city as the most complex human-made organism with a metabolism that can be modeled in terms of stocks and flows.
(iii) Knowledge about data-informed approaches for the development of the future city, based on crowd sourcing and sensing.
(iv) Knowledge about the latest research results in for the development and management of future cities.
(v) Understanding how citizens can benefit from data-informed design to develop smart and responsive cities

Course Description: This course helps the students to learn to identify urban problems, effective and feasible ways to coordinate urban technologies, various types of models and methods for effective implementation of smart cities concepts with new technologies for communication and dissemination. New forms of Urban Governance and Organization.

Reference Book(s):

1. *"A city for all: valuing differences and working with diversity"*, Jo Beall (1997), Zed books limited, London (ISBN: 1-85649-477-2).
2. *"Inclusive and sustainable urban planning: a guide for Municipalities"*, UN-Habitat, Volume 3: Urban Development Planning (2007), United Nations Human Settlements Programme (ISBN: 978- 92-1-132024-4).
3. Arup Mitra, *"Insights into inclusive growth, employment and wellbeing in India",* Springer (2013), New Delhi (ISBN: 978-81-322-0655-2).
4. *"Urban Planning and cultural identity",* William J. V. Neill (2004), Routledge, London (ISBN: 0- 415-19747-3).
5. *"Remaking the city: Social science perspective on urban design",* John S. Pipkin, Mark E. La Gory, Judith R. Balu (Editors), State University of New York Press, Albany (ISBN: 0-87395-678-8).
6. *"Smart cities – Ranking of European medium-sized cities",* Giffinger, Rudolf, Christian Fertner, Hans Kramar, Robert Kalasek; Nataša Pichler-Milanovic, Evert Meijers, Vienna: Centre of Regional Science, (2007).
7. *"Draft Concept Note on Smart City Scheme",* Government of India - Ministry of Urban Development (http://indiansmartcities.in/downloads/CONCEPT_NOTE_-.12.2014_REVISED_AND_LATEST_.pdf).

Course Name:	Computer Aided Building Drawing Lab					
Course Code:	CIV 258	Credit Structure :	L	T	P	C
			0	0	2	1

Textbook(s):

1. "*Limit State Design of Reinforced Concrete*", P C Varghese, Vol-II-: Prentice Hall of India (P) Ltd".

Reference Book(s):

1. "*Analysis of Structures - Vol-II*", Vazirani V N and M M Ratwani, Khanna Publishers, New Delhi.
2. "*Reinforced Concrete Structures*", B C Punmia, Vol-II-: Laxmi Publications (P) Ltd, New Delhi

Course Name:	Design of Structural Steel Elements					
Course Code:	CIV 213	Credit Structure :	L	T	P	C
			3	1	0	4

Text Book(s):

1. *"Limit state Design of steel Structures",* S.K.Duggal, McGraw Hill Education (India) Pvt. Ltd.
2. "*Design of Steel Structures"*, Subramanian .N, Oxford University Press, New Delhi

Reference Book(s):

1. *"Limit State Design of Steel structures",* Dr.Ramachandra & Virendra Gehlot, Scientific Publishers
2. *"Design of Steel Structures by Limit State Method"*, S.S.Bhavikatti, I.K. International publishing house.
3. IS 800-2007, IS 875-1987 SP- 6 (Part 1) or "Steel Tables", Bureau of Indian Standards.

Course Name:	Urban Transport Planning and Traffic Engineering					
Course Code:	CIV 312	Credit Structure:	L	T	P	C
			3	0	0	3

Text Book(s):

1. "*Traffic Engineering and Transport Planning*", Kadiyali, L R, Khanna Publishers.

2. "*A Course in Traffic Planning and Designing"*, Subash C Saxena, Dhanapat Rai and Sons, Delhi.

Reference Book(s):

1. "*Introduction to Transportation Engineering"*, Jothi Kristey and Lal, PHI, New Delhi.
2. "*Urban and Regional Models in Geography and Planning*", Wilson AG, John Wiley and Sons, London.
3. "*Fundamentals of Transportation Planning*", Papacostas, Tata McGraw Hill.
4. "*Introduction to Urban System Planning*", Hutchinson, B.G, Tata McGraw Hill

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Annexure CIV 9.7.2

Course content and Text books / Reference books (M.Tech Civil Engineering)

Course Name	Advances in Construction Materials and Technology							
Course Code	CIV 351	Credit structure	L	T	P	C	Type of skill /Focus	Course Integrates
			4	0	0	4	Employability	Sustainability

Course Outcomes:

On completion of this course, students will be able to:

(i) Select appropriate material and formulate composition of concrete batch mix to ensure reliability of a structure

(ii) Know the various tests on fresh, hardened concrete, special concrete and the methods of manufacturing of concrete

(iii) Understand the characteristics of hardened concrete and conduct tests to check the quality conformance

(iv) Plan and meet sustainability and affordability objectives

Course Description: This course deals with new and innovative aspects in construction materials.

By participating in this course student gains knowledge regarding, how to select the construction material for structures and execute the same for a given environment. Also, to know the different types of material with characterization and field tests. It includes Concrete making materials-cement, aggregates including recycled, Admixtures (both mineral and chemical), Supplementary cementitious materials (GGBS, Microsilica, Fly ash), Microstructure of concrete, Fresh concrete and its rheology, Mechanical, deformational behaviour of hardened concrete. Creep and Shrinkage of Concrete. Durability of Plain and Reinforced Concrete. Proportioning of Mixes - Normal Concrete, High Strength/Performance Concrete, Light Weight Concrete, High Density Concrete, Fibre Reinforced Concrete, Ferro-cement, Reactive Powder Concrete, Roller Compacted Concrete, Self-Compacting Concrete, Geo-polymer and green cement. Concrete and Decorative Concrete, Types of Reinforcements. Corrosion of Reinforcing Steel- Electro-chemical process, measures of protection. Polymers, fibres, adhesives and sealants- types and their uses. Structural glazing.

By this student can have an in-depth knowledge of construction materials and can select for the suitable application.

Text Book(s):

1. *"Concrete Technology"*, A. R. Shantakumar, Oxford University Press, 2nd Ed.
2. *"Properties of Concrete",* A.M. Neville, 4th Ed., Longman.
3. *"Construction Materials – Their Nature and Behaviour",* P. Domone and J. Illston, 4th Ed., CRC Press.

Reference Book(s):

1. *"Concrete- Microstructure, Properties and Materials",* P.K Mehta and J.M. Paulo Monteiro, Indian Ed., Indian Concrete Institute, McGraw Hill.
2. *"Ferrocement and Laminated Cementitious Composites"*, A. E. Naaman, Techno Press, 2000.
3. *"Lightweight Concrete",* D. P. Jenny, American Concrete Institute.
4. *"Concrete Fracture",* J. G. M. van Mier, CRC Press
5. *"Application of Fracture Mechanics to Reinforced Concrete"*, A. Carpinteri, Taylor and Francis, 2005.
6. *"National Building Code 2016",* Bureau of Indian Standard.

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Course Name	Quality, Risk and Safety in Construction							
Course Code	CIV 352	Credit structure	L	T	P	C	Type of skill	COURSE INTEGRATES
			4	0	0	4	Employment	Human Values and Profess. Ethics

Course Outcomes:

On completion of this course, students will be able to:
(i) To study the elements of quality control and safety of construction projects
(ii) Define and describe construction processes and various engineering roles involved
(iii) To develop organization breakdown structure for a construction project and company
(iv) Identify construction safety hazards and corresponding solutions
(v) To perform risk analysis on construction project

Course Description: This course focusses on management aspects of construction project such as organization, quality management, safety and risk management.

This course will include Introduction to Construction Projects: Concept, Project Categories, Characteristic of projects, project life cycle phase, Project Management- Project Management Function, Role of Project Manager, Organizing for Construction - Principles of organization, type of organization structure. This will also include Project Feasibility Reports, Construction Quality, Inspection and Testing, Quality control, Quality Assurance, Total Quality Management, Critical factors of TQM, TQM in Projects, Benchmarking, concepts of quality policy, standards, manual, Quality philosophy.

This course will also emphasize on Safety in Construction: Causes, classification, cost and measurement of an accident, safety programme for construction, protective equipment, accident report. Types of injuries, Factors affecting safety, Strategic Planning for safety provisions. Personal & Structural safety - Safety consideration during construction, demolition and during use of equipment. Recording injuries and accident indices. Risk and Decision Analysis, Risk mitigation, Decision tree analysis, Monte-carlo simulations etc.

Text Book(s):

1. *"Construction Project Management",* Kumar Neeraj Jha, Pearson. Second Edition

Reference Book(s):

1. *"Safety Management in construction and Industry",* David Gold Smith, Mc Graw Hill
2. *"Construction Safety Management",* K N Vaid, NICMAR, Bombay
3. *"Management for Total Quality",* N. Logothetis, Prentice Hall 2.
4. *"Safety Management in construction and Industry",* David Gold Smith, Mc Graw Hill
5. *"Project Management Body of Knowledge"* (PMBOK® GUIDE, Guide, A.), Project Management Institute, 2001.

Course Name	Construction Planning, Schedule and Control							
Course Code	CIV 353	Credit structure	L	T	P	C	Type of skill /Focus	COURSE INTEGRATES
			4	0	0	4	Employability	Ethics

Course Outcomes:

On successful completion of this course, students will be able to:

(i) To explain fundamentals of project

(ii) To analyze the life-cycle of a construction project
(iii) To assemble and sketch WBS for various construction project
(iv) To assemble and use various construction schedules to manage a construction project.
(v) To prioritize scheduled tasks in order to streamline planning strategies, shorten overall construction schedules, and reduce costs.

Course Description: The course focus on basic project management framework in which the project life-cycle is broken into organizing, planning, monitoring, controlling of construction projects.
It includes Preliminary Planning, estimates , work break down structure (WBS), Project planning Scope: Planning Process, Objectives, Types of Project plans, Resource Planning Process, Time Management and Scheduling -Bar chart/Gantt chart, Network methods -Activity on arrow (AoA) Activity on node (AoN) - Coordination Model- Network diagram, Critical Path Method -network schedule Forward pass -Backward pass, calculation critical path, Floats/slacks -importance -Types of floats / Calculation of floats, PERT - Probability -three time estimates, expected time, standard deviation, variance -critical path, Precedence Network Method, Project monitoring, Line of Balance Scheduling, Time cost Trade off- Crashing, optimum cost, time, Allocation of resources: Histogram, Resource smoothening, Resource leveling. Case studies: residential / commercial / industrial buildings.

Text Book(s):

1. *"Construction Planning and Scheduling",* Jimmie W Hinze, Pearson, Fourth Edition, 2014

Reference Book(s):

1. *"Construction Project Management: Planning, Scheduling and Control"*, Chitkara, K.K., Tata McGraw-Hill Publishing Company, New Delhi, 1998.
2. *"CPM in Construction Management",* Obrien, J. J., Plotnick, F. L., McGraw Hill, 7th. Edition, 2010.
3. *"Modern Construction Management",* Frank Harris and Roland McCaffer, Blackwell Science Ltd, 4th Ed.
4. "*A Guide to the Project Management Body of Knowledge: (PMBOK Guide)*", PMI

Course Name	**Research Methodology**							
Course Code	**RES 5001**	**Credit structure**	**L**	**T**	**P**	**C**	**Type of skill /Focus**	**COURSE INTEGRATES**
			3	0	0	3	Skill Develop	Ethics

Course Outcomes:

(i) Demonstrate knowledge of research processes (reading, evaluating, and developing);
(ii) Perform literature reviews using print and online databases; Employ American Society of Civil Engineering (ASCE) formats for citations of print and electronic materials;
(iii) Describe, compare, and contrast descriptive and inferential statistics, and provide examples of their use in engineering research;
(iv) Describe sampling methods, measurement scales and instruments, and appropriate uses of each;
(v) Identify, explain, compare, and prepare the key elements of a research proposal/report; Explain the rationale for research ethics, plagiarism.
(vi) Understand about IPR, Patent law

Course Description: This course offers "An overview of research methodology including basic concepts employed in quantitative and qualitative research methods. Students for skills needed to undertake a research. Students are expected to begin this course with a draft research question, a hypothesis (for quantitative research designs), a supporting literature review, and ideas about appropriate methods. This course will explore the next steps of the research process, to further develop methods for conducting the

research. This will include refining the research question, what specific methods are appropriate, how to implement the chosen method, how to manage and organize data and how to present the data results.

Reference Book(s):

1. *"Research Methodology: Methods and Techniques",* Kothari, C.R., 1990. New Age International. 418p.
2. *"Law relating to patents, trademarks, copyright designs and geographical indications"*, Wadehra, B.L. Universal Law Publishing, 2000.
3. *"Proposal Writing",* Coley, S.M. and Scheinberg, C. A., Sage Publications, 1990.
4. *"How to Write and Publish a Scientific Paper",* Day, R.A. Cambridge University Press, 1992.

Course Name	Mechanization in Construction							
Course Code	CIV 354	Credit structure	L	T	P	C	Type of skill /Focus	COURSE INTEGRATES
			3	0	0	3	Sustainability	Ethics

Course Outcomes:
On completion of this course the students will be able to:

(i) Understand different construction methods.
(ii) Understand modern techniques used in construction.
(iii) Understand the environmental issues related to construction activities
(iv) Know the methods of drilling and blasting

Course Description: This course deals with different construction methods and process in practice.

This course includes mechanization in aggregate manufacturing, mechanization in concreting, mechanization in rebar fabrication, mechanization through construction technology such as box pushing technology and pile driving techniques, mechanization through construction methods of Drilling, Blasting and Tunneling, . Safety and Environmental issues in mechanization.

Reference Book(s):

1. *"Construction Equipment and its Planning and Applications",* Mahesh Varma, Metropolitan Book Co. (P) Ltd., New Delhi. India.
2. *"Construction Equipment and Management",* Sharma S.C., Khanna Publishers, Delhi, 1988
3. *"Construction Review",* Published by Civil Engineering and Construction Review, New Delhi, 1991.

Course Name	Material Characterization Lab							
Course Code	CIV 511	Credit structure	L	T	P	C	Type of skill /Focus	COURSE INTEGRATES
			0	0	2	1	Employability	Ethics

Course outcomes:

After studying this course, students shall be able to:

(i) Achieve the Knowledge of design and development of experimental skills.
(ii) Understand the properties fresh and hardened concrete
(iii) Understand the behaviour and flow properties of Self Compacting Concrete

(iv) Understanding the mix proportioning of various types of concrete as per national and international codes
(v) Summarize the testing methods and equipment

Course Description: The primary objective of the course is to provide the students with an understanding of behaviour of concrete in fresh and hardened state, effect of materials and their proportioning on the behaviour of concrete. This course consists of study of gradation of aggregate, the effect of water/cement ratio on workability and strength of concrete, effect of aggregate/cement ratio on strength of concrete, Effect of Chemical admixtures on fresh & harden properties of concrete, Effect of mineral admixtures on fresh & harden properties of concrete, Study of Mix design methods as per national and international codes of practice, Mix Design and Flow Tests on Self-compacting Concrete, Correlation between cube strength, cylinder strength, split tensile strength, obtaining the stress-strain behaviour for concrete (Modulus of Elasticity) under compressive loading, Study of Shrinkage of Concrete, Non-Destructive testing of concrete.

Text Book(s):
1. *"Properties of Concrete"*, A.M. Neville, ELBS publications.
2. *"Design of concrete mixes",* Raju N Krishna, CBS Publishers, New Delhi.

Reference Book(s):
1. *"Concrete and Highway Materials Testing Lab Manual",* Presidency University
2. *"Non-destructive testing Handbook",* Maldague Xavier P V, Moore Patrick O, American Society for Non-destructive Testing, USA, 2001.

Course Name	**Construction Economics and Contract Specifications**							
Course Code	**CIV 355**	**Credit structure**	**L**	**T**	**P**	**C**	**Type of skill /Focus**	**COURSE INTEGRATES**
			3	1	0	4	Employability	Ethics

Course Outcomes:

On completion of this course, students will be able to:
(i) Analyze, evaluate and design construction contract documents
(ii) Understand various specifications in a construction project
(iii) Understand various project delivery methods
(iv) Analyze contract disputes and suggest resolution method.
(v) Check for feasibility of a project using cost- benefit ratio
(vi) Estimate book value and depreciating value of construction equipment
(vii) Understand time value of money

Course Description: This course deals with two parts i.e., Construction contracts and specifications and Construction economics

The construction economics includes Basic principles of Engineering economy, Time value of money, Cost benefit ratio, Comparison of alternatives by different methods, Different method of depreciation, Taxes, Inflation, Equipment economics, Equipment costs, Replacement analysis of equipment, Cost estimating.

The field of construction contract management includes Contract Formation and Parties to the Contract, Prime Contract, Forms of Contracts, Bids and Proposals, Breach of the Contract, Contract Changes, Construction Acceleration, Delays, Suspensions, Terminations, Liquidated Damages, Force Majeure, Documentation & Records, Construction Contract Claims, and Dispute Resolution.

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Text Book(s):

1. *"Engineering Contracts",* John G. Betty., McGraw Hill, 2003

Reference Book(s):

1. *"Engineering Economy",* Blank, L. T. and Tarquin, A. J., Fourth Edition, WCB/McGraw-Hill, 1998.
2. *"Modern Construction Management",* Harris, F., McCaffer, R. and Edum-Fotwe, F., Wiley India, New Delhi, 6th ed., 2006.
3. *"Estimating Construction Costs",* Peurifoy, R. L. and Oberlender, G. D., Tata McGraw-Hill, New Delhi, 5th ed., 2004.
4. *"Standard General Conditions for Domestic Contracts",* Published by Ministry of Statistics and Program Implementation, Government of India, 2001 Edition.
5. FIDIC Document (1999).
6. *"Legal Aspects of Building and Engineering Contract"*, Patil, B.S., 1974.
7. *"Principles of Economics",* Mankiw Gregory N. (2002), Thompson Asia 2. V. Mote, S. Paul, G. Gupta (2004)
8. *"Managerial Economics"*, Tata McGraw Hill

Course Name	**Integrated Building Services and Maintenance**							
Course Code	**CIV 356**	**Credit structure**	**L**	**T**	**P**	**C**	**Type of skill /Focus**	**COURSE INTEGRATES**
			4	0	0	4	Employability	Sustainability

Course Outcomes:

On successful completion of the course the student shall be able to:

(i) Identify the arrangement of vertical transportation.

(ii) Describe the basics of HVAC, house plumbing and waste water collection and disposal.

(iii) Discuss the safety and guidelines with respect to fire safety.

(iv) Implement various practices of planned maintenance.

Course Description: The objectives of this course is to expose the students to the concepts functional design of building for thermal aspects and energy efficiency; especially in tropical climates i.e. in Indian context. Further objective is to make the student capable of performing fenestration design for natural ventilation and day lighting & design of space for external and internal noise control. This course includes fire protection and safety measures, vertical transportation (Lifts / Elevators), parking arrangement and intelligent building. The most important component of any building service is the HVAC system, which is covered in-depth with this course. Apart from this, the course also includes plumbing system (water supply system and waste water) needs to egress used water through various fixtures along with maintaining standards. As the building is under service for a long duration of time planned maintenance is an integral part of this course touching upon repair, inspection, etc.

Textbook(s):

1. *"Building Services Design*", T.W.MEVER
2. *"HEATING VENTILATING AND AIR CONDITIONING Analysis and Design",* Faye C. McQuiston and Jerald D. Parker.
3. *"Design of fire resisting structures",* H.L. MALHOTRA.
4. *"An introduction to fire dynamics",* D.DRYSDALE

5. *"Elevator technology",* G.C.BARNEY
6. *"Concrete Structures: Materials, Maintenance And Repair"*, D.CAMPBELL,ALLEN & H.ROPER

Reference Book(s):

1. *"HAND BOOK OF FUNCTIONAL REQUIREMENTS OF BUILDINGS, (SP-41 & SP- 32)",* Bureau of Indian Standards, BIS 1987 and 1989.
2. *"BUILDING CLIMATE AND ENERGY",* Markus, T.A. & Morris, E.N., Pitman publishing limited, 1980.
3. *"AIR CONDITIONING AND VENTILATION OF BUILDINGS VOL-1",* Croome, J.D. Roberts, B.M., Pergamon press.
4. *"Building Engineering & System Design"*, F.S.MERRIT & J. AMBROSE
5. SP-35 (1987): *Handbook of Water supply & drainage*-BIS
6. *N.B.C.,* 2007 BIS
7. *"Concept of building fire safety",* D.EGAN.
8. *"Structural fire protection Edt",* T.T.LIE
9. *"Building Maintenance Management"*, R.LEE
10. *"Developments in Building Maintenance"*, I.EJ. GIBSON

Course Name	**Advanced Design of RC Structures**							
Course Code	**CIV 357**	**Credit structure**	**L**	**T**	**P**	**C**	**Type of skill /Focus**	**COURSE INTEGRATES**
			3	1	0	4	Employability	Ethics

Course Outcomes:

(i) To learn principles of Structural Design
(ii) Understand the principles of designing building frames and to detail the structural components in a frame
(iii) To acquire knowledge on structural design of different types of foundation appropriate to the type of soil.
(iv) To evaluate performance of the structures

Course Description: The objective of this course is to make students to learn principles of limit state design of Reinforced Concrete Structures to design structural frames, foundations and to do the reinforcement detailing.
The main objective of this course is to provide civil engineering students with the knowledge of designing complete building frames. This course is a second level course on design of reinforced concrete structures. The course exposes students to the theory of R.C. design and helps the student to understand the behavior of R.C. member under different loading conditions. It deals with the load transfer path in frames and design of each structural component post the analysis of the frames. It also deals with the design of flat slabs of large span, yield line approach for design of slab as well as design of combined foundations and mat foundations. The students having basic knowledge of structural analysis, soil mechanics and design of reinforced concrete structures can easily understand this course. This Course helps students to design framed buildings, flat slabs of large span, combined foundations and mat/raft foundations.

TextBook(s):

1. "*Reinforced concrete Design*", Unnikrishnan Pillai and Devdas Menon., Tata McGraw Hill Publishers Company Ltd., New Delhi, 2006
2. "*Advanced Reinforced Concrete Design",* P. C. Varghese, PHI Learning Private Ltd., New Delhi, 2011

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3. "*Design of Reinforced Concrete Foundations",* P. C. Varghese, PHI Learning Private Ltd., New Delhi, 2010
4. "*Advanced Reinforced Concrete Design*", Krishna Raju. N., CBS Publishers & Distributors

Reference Book(s):

1. "*Reinforced Concrete Structures",* Thomas Paulay, R. Park, John Wiley and sons New York.

Course Name	**Software Application Lab**							
Course Code	**CIV 357**	**Credit structure**	**L**	**T**	**P**	**C**	**Type of skill /Focus**	**COURSE INTEGRATES**
			0	0	4	2	Skill Develop	Sustainability

Course Outcomes:

On completion of this course, students shall be able to:
(i) Describe workflow in using BIM in the building lifecycle
(ii) Perform model-based cost estimating
(iii) Perform 3D simulations
(iv) Apply BIM to reduce error and change orders in capital projects
(v) Develop WBS for a project
(vi) Provide relationship between activities
(vii) Develop project schedule
(viii) Track the project schedule
(ix) Perform resource levelling

Course Description: In this course two software applications namely REVIT BIM and MSP/Primavera will be taught. This course focuses on the skills and information needed to effectively use an existing Building Information Model (BIM) in plan execution for a building construction project. This is a project-based course where students gain knowledge on the implementation of BIM concepts throughout the lifecycle of a building, from planning and design, to construction and operations. The other part of the course includes Primavera / MSP which provides an in-depth knowledge to the delegates about how to use powerful software programs to manage the whole project lifecycle. With the help of training, the delegates will be able to understand about creating, scheduling and assigning resources as well as executing, controlling and adding activities. The delegates will be able to understand the concepts of planning and scheduling.

It includes Introduction to BIM fundamentals - Modeling Building Elements: modeling exterior and interior walls, creating floors and roofs, Adding doors, windows, footings, columns, and beams, Building Envelope: modeling wall types and design features, working with doors, windows, and wall openings, creating roofs with different shapes and slopes. Curtain Systems: designing curtain grid patterns, adjusting grids and mullions, creating and using curtain panels' types. Interiors and Circulation: creating stairs and ramps, customizing stair shapes, modeling elevators. Sheets and construction documents Families creation Model Sharing: internal and external sharing Site features and analysis Conceptual Massing, Productivity, Interoperability, Visualization and Rendering, Constructability: Project phase and Design Options.

It also includes exploring the Project Environment, Getting Started with Microsoft Project, Modifying and Organizing a Task list, Shaping the schedule, Modifying Task Dependencies, Working with Calendars, Using Project Resources, Entering Project Costs, Task Type Setting, Resolving Resource Over-allocations, Setting Constraints and Deadlines, Tracking Project Progress, Project report

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Reference Book(s):

1. *"BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors"*, Eastman
2. *"Fundamentals of Building Construction",* Allen, Edward, Wiley.
3. Oracle Primavera® P6™ Project Management Reference Manual (version 7.0)
4. MSP 2016 Manual

Course Name	Construction Demolition and Waste Management							
Course Code	CIV 358	Credit structure	L	T	P	C	Type of skill /Focus	COURSE INTEGRATES
			4	0	0	4	Employability	Sustainability

Course Outcomes:

(i) Demonstrate knowledge of key recent research in recycling and reusing concrete and demolition waste to reduce environmental impacts and meet national, regional and global environmental targets
(ii) Describe techniques for managing construction and demolition waste, including waste management plans, ways of estimating levels of waste, the types and optimal location of waste recycling plants
(iii) Reviews key steps in handling construction and demolition waste

Course Description: This course provide insights about the latest technological advancements in construction demolition and subsequent waste management concepts. It deals with issues such as the regulatory framework, government policy, waste management, processing, recovery, and the supply network, recycling opportunities, sustainable ways forward and the economics of sustainability.

Reference Book(s):

1. *"Guidelines on Environmental Management of Construction & Demolition (C & D) Wastes",* CENTRAL POLLUTION CONTROL BOARD (Ministry of Environment, Forests & Climate Change), 2017.

Discipline Elective Courses (M.Tech Building Construction Technology)

Course Name	Pre-Engineered construction							
Course Code	CIV 359	Credit structure	L	T	P	C	Type of skill /Focus	COURSE INTEGRATES
			3	0	0	3	Employability	Sustainability

Course outcomes: On completion of this course, students are able to:

(i) To acquire basics of pre-engineered constructions**.**
(ii) To design the pre-engineered structures and execute the same for a given structure.
(iii) To know the different types of stresses acting on the structures while lifting the prefabricated structures and type of equipment required to support such stresses.
(iv) To analyze which type of Pre-engineered technology is best suited for the respecting field condition

Course Description: This course deals with new and innovative aspects in construction.

By participating in this course student gains knowledge regarding, how to design the pre-engineered structures and execute the same for a given structure. Also, to know the different types of stresses acting on the structures while lifting the prefabricated structures and type of equipment required to support such

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stresses. This course generally deals with General Principles of Prefabrication like comparisons with monolithic constructions, Types of prefabrication, Planning of prefabricated structures, Standardization, Planning and handling of pre-fabricated elements (Rectangular beams and I section etc.,). Knowledge about Prefabricated elements (Roof panels, beams, fastenings, purlins etc.,) is acquired. Along with the concepts of Production and Hoisting Technology such as Choice of production setup, Manufacturing methods, Stationary and mobile production, Planning of production setup, Storage of precast elements, Dimensional tolerances, Acceleration of concrete hardening. Equipment for hoisting and erection, Techniques for erection of different types of members like Beams, Slabs, Wall panels and Columns, Vacuum lifting pads. Precast sandwich Panels, Prestressed concrete solid, Hollow core slab/panels, Prestressed concrete Double "T" Bridge, Precast segmental Box Girders, Specifications and Seismic considerations. By this student can have an ideology of pre-engineered buildings (PEB) and can design for the suitable application.

Text Book(s):

1. L. Mokk, *"Prefabricated Concrete for Industrial and Public Structures",* Publishing House of the Hungarian Academy of Sciences, Budapest, 2007.

Reference Book(s):

1. *"Manual of Precast Concrete Construction",* T. Koncz, Vol. I, II, III & IV, Berlin, 1971.
2. "Building with Large Prefabricates", B. Lewicki, Elsevier Publishing Company, Amsterdam, London, New York, 1998.
3. *"Structural Design Manual, Precast Concrete Connection Details",* Society for the Studies in the use of Precast Concrete, Netherland Betor Verlag, 2009.
4. *"Precast concrete design and Applications"*, Hass, A.M. Applied Science Publishers, 1983.

Course Name	**Repair and Rehabilitation of Structures**							
Course Code	**CIV 318**	**Credit structure**	**L**	**T**	**P**	**C**	**Type of skill /Focus**	**COURSE INTEGRATES**
			3	0	0	3	Employability	Sustainability

Course Outcome: At the end of the course, the student will be able to:

(i) Estimate the causes for distress and deterioration of structures.
(ii) Understand NDT for condition assessment of structures, identify damages in RC structures.
(iii) Select repair material and retrofitting strategy suitable for distress.
(iv) Formulate guidelines for repair management of deteriorated structures.

Course Description: This course will help students learn how to identify various deterioration mechanisms or damage mechanisms in concrete structures. Use of various non-destructive, partially-destructive tools to assess the condition of the structure will be discussed. Tips on selecting measurable parameters that are useful in deciding the further repair and maintenance practices will be provided. Typical practices for near-surface repair, corrosion protection, structural strengthening, structural stabilization, etc. will be discussed in detail. At the end of the course students will be able to suggest evaluation and repair/retrofitting methods for extending the service life of concrete structures. Importance for preventive maintenance practices (instead of corrective maintenance practices) will be discussed throughout the coursework.

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Textbook(s):

1. *"Learning from failures - Deficiencies in Design, Construction and Service",* R.N. Raika, Rand Centre (SDCPL), Raikar Bhavan, Bombay, 1987.
2. *"CPWD Handbook on Repair and Rehabilitation of RCC buildings"*, Govt of India Press, New Delhi, 2002.

Reference Book(s):

1. *"FRP: Strengthened RC Structures",* J.G. Teng, J.F. Chen, S.T. Smith, L. Lam, Wiley Publications
2. 440.2R-10/17: Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures

Course Name	**Earthquake Resistant Design of Structures**							
Course Code	**CIV 360**	**Credit structure**	**L**	**T**	**P**	**C**	**Type of skill /Focus**	**COURSE INTEGRATES**
			3	0	0	3	Employability	Sustainability

Course Outcomes

(i) On successful completion of the course, the student shall be able to:
(ii) Acquire basic knowledge of engineering seismology
(iii) Interpret detrimental effects of structural irregularity on seismic performance of a structure.
(iv) Analyze multi-storeyed structures as shear frames and determine lateral force distribution due to earthquake.
(v) Comprehend ductile design considerations for RC buildings as per IS code.
(vi) Discuss the seismic response of masonry and steel buildings.

Course Description: The objective of this course is to teach the students how to design a structure resistant to the natural force of an earthquake. The course includes basic engineering seismology, conceptual design, linear earthquake analysis and response spectra, load combinations and ductile detailing using Indian standard codes, concepts and types of shear wall and study of the behavior of RC, Masonry and Steel structures. Prior knowledge of Reinforced Concrete design, Steel Structures design, Structural Analysis and Geotechnical Engineering are perquisite for this course. The course finds its application in effective design of Reinforced Concert, Masonry and Steel Structures resistant to natural earthquake forces resulting from tectonic plate movements.

TextBook(s):

1. *"Earthquake Resistant Design of Structures",* Pankaj Agarwal and Manish Shrikande, Prentice Hall of India Private Ltd, New Delhi
2. *"Earthquake Resistant Design of Structures",* Duggal S K, Oxford University Press, New Delhi

Reference Book(s):

1. *"Dynamics of Structures",* Anil K Chopra, Pearson Education, Asia, New Delhi.
2. *"Geotechnical Earthquake Engineering",* Steven L Kramer, Pearson Education, Asia, New Delhi

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Course Name	Human Resource Management							
Course Code	CIV 360	Credit structure	L	T	P	C	Type of skill /Focus	COURSE INTEGRATES
			3	0	0	3	Employability	Human Values and Ethics

Course Outcomes: On completion of this course, students are able to:

(i) To understand human behaviour under varying working conditions.
(ii) To address conflicts among the employees at workplace.
(iii) To apply the studied behaviour pattern to manpower planning in organizational setups.
(iv) To study the means of management of construction personnel and utility of training as a tool for improvement.

Course Description: This course focusses on human behaviour and their impact on construction personnel management and theories of human behavior and how it is influenced by leadership, organization, environment, motivation, and culture.

This course includes HRM Concepts of organizational and individual behavior; Perception and attitudes; Motivation concepts and processes; Group behavior and teams; Communication process and information management; Conflict management; Leadership; Nature of organizations; Organizational development. Human resource policies & practices; Selection, training and assessment; Performance Appraisal; Participative management; HRM trends; Philosophies of values, morals and ethics. Manpower estimation for company and for projects. Methods of recruitment, selection, placement, training, financial compensation discipline, separation etc in employing and retaining engineers, managers, Human resource training, Manpower management.

Text Book(s):

1. *"Human resource development",* Werner, J.M. and DeSimone, R.L., Cengage Learning, 2011.

Reference Book(s):

1. *"Human Resources & Personnel Management",* Werther & Davis, McGraw Hill, 1996
2. *"Manpower planning, John Wiley",* Edwards, John et.al., New York, 1983

Course Name	Design of prestressed Concrete Structures							
Course Code	CIV 307	Credit structure	L	T	P	C	Type of skill /Focus	COURSE INTEGRATES
			3	0	0	3	Employability	Human Values and Ethics

Course Outcomes:

On successful completion of the course the student shall be able to:
(i) Outline the general mechanical behavior of prestressed concrete members
(ii) Analyze transfer and development length as well as prestress losses
(iii) Illustrate design principles of prestressed concrete members for flexure and shear loading conditions

Course Description: The main objective of this course is to provide civil engineering students with the knowledge of pre-stressed concrete structures. This course is an introduction to design of pre-stressed concrete structures. It deals with the characteristics of high strength concrete and steel, basic principles of pre-stressing, pre-tensioning and post-tensioning system, analysis of section for flexure, stresses in concrete due to self-weight, normal force and bending, losses of pre-stress, deflection of pre-stressed structures, losses in pre-tensioning and post-tensioning members, design of pre-stressed concrete structures using limit state of collapse, design of end blocks and beams. The students having basic knowledge of concrete technology and design of reinforced concrete structures can easily understand this course. This Course helps students to design pre and post tensioned concrete structures used for bridges and other important places.

Text Book(s)

1. N.Krishna Raju, "Pre-stressed concrete", Tata McGraw Publishers.

Reference Book(s)

1. T.Y.Lin and Ned H. Burns, "Design of Pre-stressed concrete structures", John Wiley and sons New York.

Course Name	**Advanced Design of Steel Structures**							
Course Code	**CIV 322**	**Credit structure**	**L**	**T**	**P**	**C**	**Type of skill /Focus**	**COURSE INTEGRATES**
			3	0	0	3	Employability	Ethics

Course Outcomes:

On successful completion of the course the student shall be able to:

(i) Comprehend plastic behavior of structural steel
(ii) Estimate Plastic Moment capacity of determinate and indeterminate structures
(iii) Illustrate the design of steel trusses and gantry girder as per Indian codal provisions
(iv) Summarize the principles of Steel Design and detailing

Course Description: The objective of this course is to make students to learn understand the plastic behavior of structures and the principles of plastic analysis of Structures as well as to expose students to design of steel trusses and gantry girder.

The main objective of this course is to provide civil engineering students with the knowledge of plastic analysis and behavior as well as design of steel structures. This course is a second level course on steel structures. It deals with the plastic behavior of structures, plastic analysis, and development of plastic hinges. It also deals with the design of steel trusses and gantry girders as per limit state of design following the Indian codal provisions. The students having basic knowledge of structural analysis and design of steel structures can easily understand this course. This Course helps students to design steel trusses for supporting the roof of industrial structures, railway stations and to design gantry girders used in factories and manufacturing industries to lift and move heavy machinery/equipment.

Text Book(s):

1. *"Limit State Design of Steel Structures",* Duggal S.K, Tata Mac Graw Hill, New Delhi, 2010.
2. *"Design of Steel Structures",* N. Subramanian, Oxford, 2008.
3. "*Design of Reinforced Concrete Foundations",* P. C. Varghese, PHI Learning Private Ltd., New Delhi, 2010
4. "*Advanced Reinforced Concrete Design*", Krishna Raju. N., CBS Publishers & Distributors

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Reference Book(s):

1. *"Limit State of Design of Steel Structures",* Ramachandra, Standard Book House - 2012

Course Name	Design concepts of substructures							
Course Code	CIV 362	Credit structure	L	T	P	C	Type of skill /Focus	COURSE INTEGRATES
			3	0	0	3	Employability	Ethics

Course Outcomes: On successful completion of the course the students shall be able to:

(i) Interpret subsurface information to propose foundation system and bearing capacity of soil.
(ii) Understand the soil structure interaction.
(iii) Analyze shallow and deep foundations.
(iv) Solve problems involving settlement of structures.

Course Description: This Course is intended to cover the in situ sub soil exploration methods of finding soil strength parameters, Selection of foundations, Computations of Loads, Design concepts Concept of soil shear strength parameters. Settlement analysis of various type of Shallow foundations in clay, Shallow foundation in sand & C-Φ soils, Footings on layered soils and sloping ground, soil structure interaction, different methods of modeling the soil. Types of rafts, bearing capacity & settlements of raft foundation, rigid methods, Flexible methods. Deep foundations types, load transfer mechanism and their selection, Bearing capacity & settlement, design of individual pile, group of piles in compression and uplift, lateral, inclined loads, various types of pile load tests, Proportioning and design concepts of piles, stability and design consideration of different types of caissons and drilled piers.

This Course provides students with a working knowledge of the state-of-practice of foundation engineering, covering sub soil explorations, bearing capacity and settlement of shallow and deep foundation

Text Book(s):

1. *"Analysis & Design of Substructures",* Swami Saran, Oxford & IBH Pub. Co. Pvt. Ltd., 1998.

Reference Book(s):

1. *"Design of Foundation Systems",* Nainan P Kurian, Narosa Publishing House, 1992.
2. *"Foundation Analysis and Design",* J.E. Bowles, McGraw-Hill, Fifth Ed., 1996.
3. *"Foundation Design",* W.C. Teng, Prentice Hall of India Pvt. Ltd., 1983.
4. Bureau of Indian Standards: IS-1892, IS-1904, IS-6403, IS-8009, IS-2950, IS-11089, IS - 11233, IS- 2911 and all other relevant codes

Course Name	Applications of Remote Sensing and GIS in Construction							
Course Code	CIV 387	Credit structure	L	T	P	C	Type of skill /Focus	COURSE INTEGRATES
			3	0	0	3	Employability	Sustainability

Course Outcomes:

On Successful completion of the course, the students shall be able to:

(i) Analyze the principles and components of photogrammetry and remote sensing
(ii) Describe the process of data acquisition of satellite images and their characteristics
(iii) Compute an image visually and digitally with digital image processing techniques
(iv) Explain the concepts and fundamentals of GIS

Compute knowledge of remote sensing and GIS in different civil engineering applications.

Course Description: This course enables the students to explore the various ways in which remote sensing systems provide geospatial information that is relevant, accurate, timely, accessible and available in an appropriate format. Recent developments in Earth observation such as imaging radar, LIDAR and hyper-spectral sensors are increasing the wealth of information that can be generated from remotely sensed data sources. As a consequence numerous new GIS applications that rely on advanced remotely sensed data sources have emerged at local, regional and global scales. Topics include the introduction to photogrammetry and remote sensing, physics of remote sensing, platforms and sensors of remote sensing systems, image interpretation and processing techniques, principles and techniques of GIS and spatial data analysis and its applications. This course deals with the study of means to get suitable data output and to use the data output for construction management using GIS tools.

Text Book(s):

1. *"Remote Sensing and Image Interpretation"*, Lillesand, T.M. and Kieffer, R.W., Wiley, 5th Edition., New York, 2003.
2. *"Fundamentals of Geographic Information Systems",* Chakraborty and Sahoo, Viva Books Private Limited, India, 2008.

Reference Book(s):

1. *"Remote Sensing of the Environment",* John R. Jensen, Prentice Hall, 2000.
2. *"Geographical Information Systems: Principles and Applications",* Magwire, D. J., Goodchild, M.F. and Rhind, D. M. , Longman Group, U.K. Ed., 1991

Open Elective Courses (M.Tech Building Construction Technology)

Course Name	**Infrastructure Systems for Smart City**							
Course Code	**CIV 408**	**Credit structure**	**L**	**T**	**P**	**C**	**Type of skill /Focus**	**COURSE INTEGRATES**
			3	0	0	3	Employability	Sustainability

Course Outcomes(s): On completion of this course, students will able to:

(i) Better understanding of the dynamic behavior of the urban system by going beyond the physical appearance and by focusing on representations, properties and impact factors.
(ii) Exploration of the city as the most complex human-made organism with a metabolism that can be modeled in terms of stocks and flows.
(iii) Knowledge about data-informed approaches for the development of the future city, based on crowd sourcing and sensing.
(iv) Knowledge about the latest research results in for the development and management of future cities.

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(v) Understanding how citizens can benefit from data-informed design to develop smart and responsive cities

Course Description: This course helps the students to learn to identify urban problems, effective and feasible ways to coordinate urban technologies, various types of models and methods for effective implementation of smart cities concepts with new technologies for communication and dissemination. New forms of Urban Governance and Organization.

Reference Book(s):

1. *"A city for all: valuing differences and working with diversity",* Jo Beall (1997), Zed books limited, London (ISBN: 1-85649-477-2)
2. *"Inclusive and sustainable urban planning: a guide for Municipalities",* UN-Habitat, Volume 3: Urban Development Planning, United Nations Human Settlements Programme (ISBN: 978- 92-1-132024-4), 2007.
3. *"Insights into inclusive growth, employment and wellbeing in India",* Arup Mitra, Springer, New Delhi (ISBN: 978-81-322-0655-2), 2013.
4. *"Urban Planning and cultural identity",* William J. V. Neill (2004), Routledge, London (ISBN: 0- 415-19747-3)
5. *"Remaking the city: Social science perspective on urban design",* John S. Pipkin, Mark E. La Gory, Judith R. Balu (Editors), State University of New York Press, Albany (ISBN: 0-87395-678-8)
6. *"Smart cities – Ranking of European medium-sized cities",* Giffinger, Rudolf, Christian Fertner, Hans Kramar, Robert Kalasek, Nataša Pichler-Milanovic, Evert Meijers, Smart Cities. Vienna: Centre of Regional Science, 2007.
7. *"Draft Concept Note on Smart City Scheme",* Government of India - Ministry of Urban Development (http://indiansmartcities.in/downloads/CONCEPT_NOTE_- .12.2014_REVISED_AND_LATEST_.pdf)

Course Name	**Sustainable Materials and Green Building**							
Course Code	**CIV 281**	**Credit structure**	**L**	**T**	**P**	**C**	**Type of skill /Focus**	**COURSE INTEGRATES**
			3	0	0	3	Skill Develop.	Sustainability

Course Outcomes:

On completion of this course, students will be able to:

(i) Understand the sustainable materials used in construction.
(ii) Understand the amount of energy required for building.
(iii) Select materials to decrease environmental impacts at the local level
(iv) Perform an energy-load analysis of a building

Course Description: This course deals with an interdisciplinary introduction to the principles of design for sustainability, with emphasis on the built environment.

It includes Introduction to Sustainability, Carbon cycle and role of construction material such as concrete and steel, etc. CO_2 contribution from cement and other construction materials, Construction materials and indoor air quality, No/Low cement concrete, Recycled and manufactured aggregate, Role of QC and durability, Life cycle and sustainability, Components of embodied energy, calculation of embodied energy for construction materials, Energy concept and primary energy, Embodied energy via-a-vis operational energy in conditioned building, Life Cycle energy use. It also includes Control of energy use in building, ECBC code, codes in neighboring tropical countries, OTTV concepts and calculations, features of LEED ratings, Role of insulation

and thermal properties of construction materials, influence of moisture content and modeling, Performance ratings of green buildings, Zero energy building.

Text Book(s):

1. *"Sustainable Construction - Green Building Design and Delivery",* Charles J. Kibert, John Wiley & Sons, 2nd edition, 2008

Reference Book(s):

1. *"The Philosophy of Sustainable Design"*, Jason F. McLennan, Ecotone Publishing Co., 2004.
2. *"Green Building Fundamentals",* Mike Montoya, Pearson, 2nd edition, 2010.
3. *"Sustainable Construction: Green Building Design and delivery",* C.J. Kibert (2008), John Wiley, Hoboken, New Jersey, 3rd Ed.

Course Name	**Self-Sustainable Buildings**							
Course Code	**CIV 364**	**Credit structure**	**L**	**T**	**P**	**C**	**Type of skill /Focus**	**COURSE INTEGRATES**
			3	0	0	3	Employability	Sustainability

Course Outcomes: On completion of the course, Students will be able to:

(i) Identify the salient features of self-sustaining dwelling

(ii) List down various options required to make the dwelling self-sustaining through concept map

(iii) Explain the theory behind various provisions such as rain water harvesting, reuse of grey water, use of solar energy and composting

Course Description:

This course provides insight on sustainability concepts in building construction, operation and maintenance phases. The course will also deal with self-sustainable dwelling concept maps, rainwater harvesting, reuse of grey water, composting methods, renewable source utilization and zero energy concepts.

Reference Book(s):

1. *"Guidelines on Environmental Management of Construction & Demolition (C & D) Wastes",* CENTRAL POLLUTION CONTROL BOARD (Ministry of Environment, Forests & Climate Change), 2017.

Course Name	**Energy and Buildings**							
Course Code	**CIV 365**	**Credit structure**	**L**	**T**	**P**	**C**	**Type of skill /Focus**	**COURSE INTEGRATES**
			3	0	0	3	Employability	Sustainability

Course Outcomes: On completion of the course, Students will be able to:

(i) To understand the importance of energy conservation.

(ii) To understand importance of non-renewable resources.

(iii) To design energy efficient buildings.

Course Description:

This course provides a comprehensive exploration of building energy dynamics, renewable system fundamentals, energy economics, passive architecture, energy budgets, site and source energy, policy, codes, financing, and incentive structures. This course also emphasizes on Conservation & energy efficiency.

concepts, Solar energy fundamentals & practices in building design, Sustainable Heating and ventilation design, Design audits & economic optimization. Case studies are used to demonstrate feasibility, key concepts, and lessons learned.

Text Book(s):

1. *"Energy Efficient Buildings in India",* Mili Majumdar, The Energy Research Institute.

Reference Book(s):

1. *"Energy-Efficient Building Systems",* Lal Jayamaha, McGraw Hill Publication.
2. *"Beckman Solar Energy and thermal processes",* J A Duffie & W A, John Wiley.
3. Energy Conservation Building Code, 2007.
4. Handbook of functional requirement of buildings, SP: 41:1987.

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Annexure CIV 9.8.1

List of External Examiners

Sl.No.	Engineering Group	Faculty Name	Name of Institution
1	STRUCTURES	Dr. V. Nagendra	NCET
		Dr. Sunil Kumar Tengli	REVA UNIVERSITY
		Mr. Kiran Umachagi	NMIT
		Mr. Ramesh. S	NCET
		Mr. Sujith. S.K	NCET
		Mr. Agadi Kishan	REVA UNIVERSITY
		Mr. Avinash. S. Deshapande	REVA UNIVERSITY
		Mr. Bhojaraja M	REVA UNIVERSITY
		Mr. Divya Srinath	NCET
		Mr. Nanjunda K.N	REVA UNIVERSITY
		Mr. NareshReddy G.N	REVA UNIVERSITY
		Mr. Prabhakar M	NCET
		Mr. Sachinmohare	REVA UNIVERSITY
		Mr. Sanjay Raj A	REVA UNIVERSITY
		Mr Shashikiran S	NCET
		Mrs Kavitha N	NCET
		Ms. Rekha B	REVA UNIVERSITY
		Ms. Deepika A.N	NCET
2	GEOTECH	Dr. P. Shivananda	REVA UNIVERSITY
		Mr. Jairaj	NMIT
		Mr. Chandra Prakash	REVA UNIVERSITY
		Ms. Vidyashree	NCET
3	HYDROLOGY & IRRIGATION	Dr. Ramesh B.R	NMIT
		Dr. M.A. Nagesh	REVA UNIVERSITY
		Dr. T.M. MohanKumar	REVA UNIVERSITY
		Dr.Y Ramalinga Reddy	REVA UNIVERSITY
		Mr. Nanjundi Prabhu	NMIT
		Mr. Ajaybhaskar Reddy	REVA UNIVERSITY
		Mr. Rajashekhar S.L	REVA UNIVERSITY
		Prof. K. Raghupathi	REVA UNIVERSITY
4	ENVIRONMENT & WATER SUPPLY	Dr. S. Harinath	REVA UNIVERSITY
		Raghunandan Koppad	REVA UNIVERSITY
		Mr. Prashanth N	REVA UNIVERSITY
		Mr. ShivaPrasad H	REVA UNIVERSITY
		Mrs. Rajashree Melannavar	NCET
		Mrs. Pavithra M.P	REVA UNIVERSITY
		Ms. Jeevitha P	REVA UNIVERSITY

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5	TRANSPORTATION	Dr.S. P Mahendra	REVA UNIVERSITY
		Mr. Suresh B	REVA UNIVERSITY
		Mr. Mandeep BV	NCET
		Mr. Muralidhara H	NMIT
		Mr. Chetan Krishna	NCET
		Mr. Pradeep Kumar BK	REVA UNIVERSITY
		Mr. Raveesh J	REVA UNIVERSITY
		Mr. Sreenatha M	REVA UNIVERSITY
		Mrs. Nipa Chanda	REVA UNIVERSITY
		Mrs. Prathima G	NMIT
6	GEOLOGY	Mr.Sunil Kalagudi	BEC
7	CONSTRUCTION TECHNOLOGY	Mr.Vijay K	NCET
		Harshavardhana Raju V	NCET

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SCHOOL OF ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

Ref: PU-SOE-CIVIL/2020-2021/BOS-11/CIR01 Date: 05-09-2020

Minutes of the 11th Meeting of Board of Studies of Civil Engineering

The 11th meeting of the Board of Studies of Department of Civil Engineering, School of Engineering was held virtually on 05th September, 2020 from 10 am.

The following members were present:

Sl. No.	Name	Designation with Affiliation	Position
1.	Dr. S.B Anadinni	Professor & Head, Dept. of Civil Engg., School of Engg., Presidency University	Chairperson
2.	Dr. Jagdish H Godihal	Professor, Dept. of Civil Engg., School of Engg., Presidency University	Member
3.	Dr. Nakul Ramanna	Associate Professor, Dept. of Civil Engg., School of Engg., Presidency University	Member
4.	Dr. Chandanakeri G G	Associate Professor, Dept. of Civil Engg., School of Engg., Presidency University	Member
5.	Dr. Mohammad Shahid G	Assistant Professor, Dept. of Civil Engg., School of Engg., Presidency University	Internal Member (Nominated by VC within the Department)
6.	Mr. Dayalan J	Assistant Professor, Dept. of Civil Engg., School of Engg., Presidency University	Internal Member (Nominated by VC within the Department)
7.	Dr. N Venkatesan	Assistant Professor, Dept. of Mechanical Engg., School of Engg., Presidency University	Internal Member (Nominated by VC within the sister Department)
8.	Mr. Indraneel Agasty	Assistant Professor, Dept. of Petroleum Engg., School of Engg., Presidency University	Internal Member (Nominated by VC within the sister Department)
9.	Dr. K S Nanjunda Rao	Chief Research Scientist, Dept. of Civil Engineering, Indian Institute of Science, Bangalore	External Member (Academic)
10.	Dr. Raghunath S	Professor, Department of Civil Engg., BMS College of Engineering, Bangalore	External Member (Academic)
11.	Mrs. Sangeetha Chachadi	General Manager, Design & Engineering - Structures, Sobha Ltd.	External Member (Industry)
12.	Mr. Gopalakrishnan N	Assistant Professor, Dept. of Civil Engg., SoE, Presidency University	Member Secretary

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Welcome:

The Chairperson of the Board of Studies (BoS) of Civil Engineering has extended warm welcome to the newly formed team of BoS members, particularly to the external members and the nominated members from sister departments. The chairperson also expressed his pleasure on having eminent external members on the board.

Introduction:

At the outset, the Chairperson of the BoS of Civil Engineering, introduced all the members and presented a brief profile of the external members. The chairperson briefed the members on the agenda of the 11th BoS meeting. The chairperson then presented an overview of the academic regulations for the benefit of the new external members. He later presented the proposed Program Regulations and Curriculum of 2020-2024 batch of B. Tech. (Civil Engineering) and 2020-22 batch of M. Tech. (Building Construction Technology). He presented and briefed the members on the Program Structure, the mandatory courses and credits as well as suggested semester wise course grid.

Agenda CIV 11.1: To approve the minutes of 10th Board of Studies Meeting held on 17th January 2020

The minutes and ATR of the 10th meeting of the Board of Studies of Civil Engineering held on 17th Jan, 2020 was placed before the members and the same was ratified.

Agenda CIV 11.2: To consider and approve the Program Regulations and Curriculum for SOE-CIVIL 2020 Batch - 1) B. Tech. (Civil Engineering) and 2) M. Tech. (Building Construction Technology)

Comment: The chairperson presented the Program Regulations and Curriculum for the new batches of 2020-2024 B. Tech. (Civil Engineering) and 2020-22 M. Tech. (Building Construction Technology).

Resolution: The chairperson presented the Program Regulations and Curriculum for the new batches of 2020-2024 B. Tech. (Civil Engineering) and 2020-22 M. Tech. (Building Construction Technology). The program structure, semester wise course grid, course description, list of discipline and open electives along with newly proposed elective courses introduced based on feedback from alumni and Industry representatives were presented. The recommended discipline elective courses for Minor in Infrastructure Development and Smart Cities were also presented.
The members deliberated on the Core Courses offered for B. Tech. (Civil Engineering) in particular. Our External Academic Expert, Dr. K S Nanjunda Rao suggested to shift the elementary level course on Pre-stressed Concrete Structures from Discipline Elective to Core Courses. He highlighted that almost all universities have a course on Pre-stressed Concrete Structures in their curriculum as part of their Core Courses. He stressed that Pre-stressed Concrete is being widely adopted for all constructions and listing the course on Pre-stressed Concrete Structures under Discipline Elective would deprive a few students who do not opt for it of the knowledge of the same.

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The chairperson agreed to relook into the list of core courses to accommodate the course on Pre-stressed Concrete Structures. The core courses were re-organized to include a course on Pre-stressed Concrete Structures under Core Courses at VII Semester.

The updated program regulations and curriculum for 2020-24 batch B. Tech. (Civil Engineering) and 2020-22 batch M. Tech. (Building Construction Technology) incorporating the necessary modifications were duly approved.

The salient parts of the updated program regulations and curriculum 2020-24 batch B. Tech. (Civil Engineering) including the program structure, semester wise course grid, list of discipline and open electives, recommended discipline elective courses for Minor in Infrastructure Development and Smart Cities are arranged in Annexure 1. The Discipline Elective Courses introduced newly based on stakeholders' feedback presented in Annexure 1.4.

The salient parts of the program regulations and curriculum 2020-22 batch M. Tech. (Building Construction Technology including the program structure, semester wise course grid, list of discipline and open electives are arranged in Annexure 2.

Agenda CIV 11.3: To consider and approve the changes to SOE-CIVIL 2019 Batch Program Regulations and Curriculum - 1) B. Tech. (Civil Engineering)

Comment: The chairperson presented the changes to the Program Curriculum of 2019-2023 Batch B. Tech. (Civil Engineering) for review and approval of the members

Resolution: The chairperson mentioned that the change in the curriculum of 2019-2023 Batch B. Tech. (Civil Engineering) was pertaining to the courses offered by the Department of Mathematics in the III and IV semester. He also added that the proposed changes to the mathematics courses offered in the III and IV semester were approved by the Board of Studies of the Department of Mathematics. The members of the Board of Studies duly approved the proposed changes to the 2019-2023 Batch B. Tech. (Civil Engineering) as presented in Annexure 3.

Agenda CIV 11.4.: Approval of the newly added list of MOOC Courses – NPTEL/ SWAYAM that are offered as Discipline and Open Elective Courses across all Programs of the School of Engineering.

Comment: The chairperson has proposed the inclusion of NPTEL courses (12 weeks duration) as elective courses. The list of courses is given in Annexure 4 for B.Tech Civil Engineering and M. Tech. Building Construction Technology.

Resolution: The members have approved the inclusion of NPTEL courses as presented in Annexure 4 after deliberations. The deliberations were initiated by the External Academic Expert Dr. K S Nanjunda Rao, who suggested to keep only those courses for which faculty with expertise is not available in the university. The Chairperson responded to this suggestion by highlighting the fact that NPTEL courses which have been offered as discipline and open elective courses were those that are not part of the regular curriculum. Further, the chairperson also reasoned that NPTEL courses expose students to some of the best faculty in India whose exposure, experience and knowledge

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sharing will be beneficial to the students. Dr. Nanjunda Rao K S agreed to the comments of the Chairperson and the deliberations were closed.

Agenda CIV 11.5.: Approval of updated list of External Examiners for various courses in all the programs of the Department

Comment: The chairperson explained the role of external examiners as lab examiners and paper setters and proposed the updated list of external examiners to the committee for approval, as given in Annexure 5.

Resolution: The members have approved the panel of external examiners. The committee also stated that BoS chairperson is authorized to include these examiners on need basis.

Agenda CIV 11.6.: Approval of Value-Added Courses offered by the department for Odd Semester of Academic Year 2020-21

Comment: The chairperson presented the list of Value-Added Courses offered by the department for Odd Semester of Academic Year 2020-21 for review and approval of the members.

Resolution: The members deliberated on the value added courses proposed. The external members suggested to change a few courses as they were similar to those offered as discipline electives. These courses were removed and new courses were proposed in their place. The updated list of vale added courses as given in Annexure 6 was duly approved by all the members.

Agenda CIV 11.7: Any other matter with the permission of the Chair.

Comment: Our external academic expert member Dr. Raghunath S commented that the scheme proposed is well-rounded and addresses all the constraints appropriately. He also suggested to limit the number of prescribed textbooks for a course, wherever feasible, to a maximum of two and list the remaining books under reference material so as to make it easier for the students to go through the recommended textbooks in detail and take benefit.

The external academic expert members Dr. Nanjunda Rao K S and Dr. Raghunath S requested the chairperson to forward the syllabus/course content of all the courses, as feasible, for progressive review and suggestions.

Resolution: The textbooks prescribed for each course were reviewed again by the subject expert faculty and wherever possible the number of prescribed textbooks were limited to two. The updated PRC incorporating the necessary modifications as suggested by the members with the course descriptions of all the courses was forwarded to the members for further review and comments/suggestions if any.

The meeting ended with the Vote of Thanks proposed by the Member Secretary. The member secretary expressed gratitude to all the members of the board with a special acknowledgement to the external expert members for their valuable insights and suggestions.

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The BoS Committee has authorized the chairperson of the BoS for Civil Engineering to incorporate minor corrections / edits, if required, wherever necessary.

The chairperson has conveyed that the decisions taken during the 11th meeting of BoS for the Civil Engineering will be implemented in the PRC of 2020-2024 and 2019-2023 batches of B. Tech. (Civil Engineering), and 2020-2022 batch of M. Tech. Building Construction Technology, as applicable. He appreciated all the members for their active participation and valuable inputs. The chairperson concluded the session, with a thank you note to all the faculty members of the department for their contribution in building the Program Curriculum and Course description of various courses.

Sl. No.	Name	Position	Signature with Date
1.	Dr. S.B Anadinni	Chairperson	
2.	Dr. Jagdish H Godihal	Member	
3.	Dr. Nakul Ramanna	Member	
4.	Dr. Chandanakeri G G	Member	
5.	Dr. Mohammad Shahid G	Internal Member (Nominated by VC within the Department)	
6.	Mr. Dayalan J	Internal Member (Nominated by VC within the Department)	
7.	Dr. N Venkatesan	Internal Member (Nominated by VC within the sister Department)	
8.	Mr. Indraneel Agasty	Internal Member (Nominated by VC within the sister Department)	
9.	Dr. K S Nanjunda Rao	External Member (Academic)	
10.	Dr. Raghunath S	External Member (Academic)	
11.	Mrs. Sangeetha Chachadi	External Member (Industry)	
12.	Mr. Gopalakrishnan N	Member Secretary	

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Annexure 1

Program regulations and Curriculum of 2020-2024 B. Tech. (Civil Engineering)

1.1 Mandatory Courses and Credits

The B. Tech. (Civil Engineering) Program Structure (2020-2024) consists of a minimum of 63 courses totaling 180 credits.

Table 1 summarizes the type of Courses, number of Courses under each type and the associated credits that are mandatorily required for the completion of the Degree

TABLE 1 B. Tech. (Civil Engineering) 2020-2024: Mandatory Courses and Credits			
S. NO.	**TYPE OF COURSES**	**NO. OF COURSES**	**CREDITS**
1.	Humanities (HS)	3	6
2.	Management Sciences (MS)	Minimum of 2	6
3.	Basic Sciences (BS)	9	29
4.	Engineering Sciences (ES)	7	21
5.	Core (Professional) Course (CC)	28	76
6.	Discipline (Professional) Elective (DE)	Minimum of 5	15
7.	Open Elective (OE)	Minimum of 2	6
8.	Professional Practice (PP)	2	20
9.	Personal and Professional Skills (PPS) (Compulsory to be audited)	4	-
10.	Social Immersion Course (SIC)	1	1
TOTAL		**Minimum of 63**	**180**
The mandatory minimum credits required for the award of the B. Tech. (Civil Engineering) Degree is 180 Credits.			

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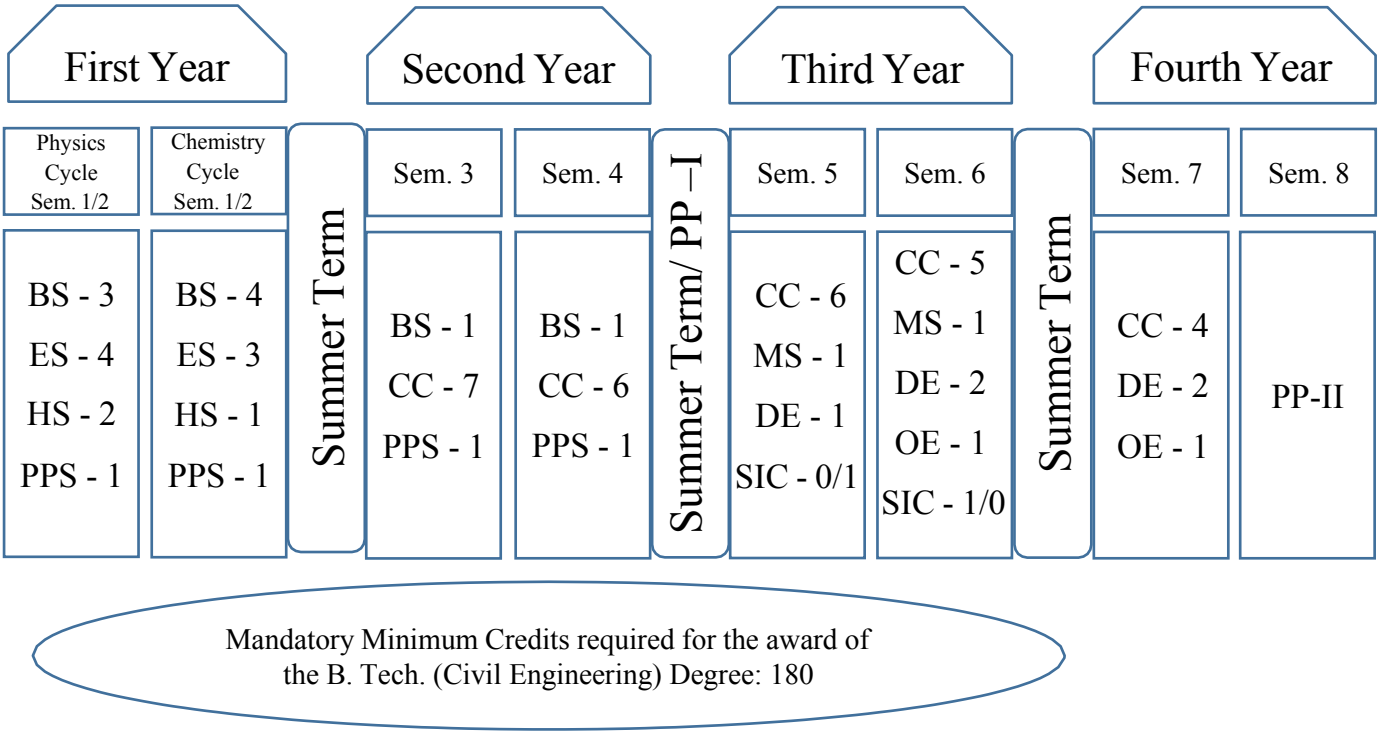
1.2 B. Tech. (Civil Engineering) Program Year Wise Structure



Nomenclature:

BS - Basic Sciences
ES - Engineering Sciences
HS - Humanities
MS - Management Sciences
CC - Core Course
DE - Discipline/Professional Electives
OE - Open Electives
PP-I/PP-II - Professional Practice
PPS - Personal and Professional Skills
SIC - Social Immersion Course

In the entire Program, the practical and skill based Course component contribute to an extent of approximately 30% out of the total credits of 180 for B. Tech. (Civil Engineering) Program of four years duration.

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1.3 B. Tech. (Civil Engineering) Program Structure

I Sem- PHYSICS CYCLE (Aug-Dec)*									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	MAT 105	Calculus and Linear Algebra	3	1	0	4	4	F[1]	-
2	PHY 101	Engineering Physics	4	0	0	4	4	F	-
3	EEE 101	Elements of Electrical Engineering	3	0	0	3	3	P[2]	-
4	CIV 101	Elements of Civil Engineering	3	0	0	3	3	P	Env[4]/S[6]
5	MEC 152	Engineering Graphics	2	0	4	4	6	P	-
6	ENG 103	Technical Written Communication	2	1	0	3	3	F/E[3]	-
7	KAN 101	Kannada Kali	1	0	0	1	1	F	-
8	PHY 151	Engineering Physics Lab	0	0	2	1	2	F	-
9	MEC 151	Workshop Practice	0	0	2	1	2	P	-
10	PPS 105	Building Self Confidence	-	-	-	-	2	E	-
TOTAL			18	2	8	24	30		

[1] Foundation Course
[2] Professional Skills
[3] Employability Skills
[4] Environmental Issues

I Sem - CHEMISTRY CYCLE (Aug-Dec)#									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	MAT 105	Calculus and Linear Algebra	3	1	0	4	4	F	-
2	CHE 101	Engineering Chemistry	4	0	0	4	4	F	-
3	ECE 101	Elements of Electronics Engineering	3	0	0	3	3	P	-
4	MEC 101	Elements of Mechanical Engineering	3	0	0	3	3	P	-
5	CIV 102	Environmental Science and Disaster Management	3	0	0	3	3	F	Env/S
6	ENG 104	Technical Spoken Communication	1	0	2	2	3	E	-
7	CSE 151	Computer Programming	2	0	4	4	6	E	-
8	CHE 151	Engineering Chemistry Lab	0	0	2	1	2	F	-
9	PPS 105	Building Self Confidence	-	-	-	-	2	E	-
TOTAL			19	1	8	24	30		

[5] Professional Ethics
[6] Sustainability Issues

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II Sem - CHEMISTRY CYCLE (Jan-Apr)#									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	MAT 106	Calculus, Differential Equations and Complex Variables	3	1	0	4	4	F	-
2	CHE 101	Engineering Chemistry	4	0	0	4	4	F	-
3	ECE 101	Elements of Electronics Engineering	3	0	0	3	3	P	-
4	MEC 101	Elements of Mechanical Engineering	3	0	0	3	3	P	-
5	CIV 102	Environmental Science and Disaster Management	3	0	0	3	3	F	Env
6	ENG 104	Technical Spoken Communication	1	0	2	2	3	E	-
7	CSE 151	Computer Programming	2	0	4	4	6	E	-
8	CHE 151	Engineering Chemistry Lab	0	0	2	1	2	F	-
9	PPS 106	Effective Communication	-	-	-	-	2	E	PE[5]/S[6]
TOTAL			**19**	**1**	**8**	**24**	**30**		

II Sem- PHYSICS CYCLE (Jan-Apr)*									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	MAT 106	Calculus, Differential Equations and Complex Variables	3	1	0	4	4	F	-
2	PHY 101	Engineering Physics	4	0	0	4	4	F	-
3	EEE 101	Elements of Electrical Engineering	3	0	0	3	3	P[2]	-
4	CIV 101	Elements of Civil Engineering	3	0	0	3	3	P	Env[4]
5	MEC 152	Engineering Graphics	2	0	4	4	6	P	-
6	ENG 103	Technical Written Communication	2	1	0	3	3	F/E[3]	-
7	KAN 101	Kannada Kali	1	0	0	1	1	F	-
8	PHY 151	Engineering Physics Lab	0	0	2	1	2	F	-
9	MEC 151	Workshop Practice	0	0	2	1	2	P	-
10	PPS 106	Effective Communication	-	-	-	-	2	E	PE[5]/S[6]
TOTAL			**18**	**2**	**8**	**24**	**30**		

Note: At the end of the 1st year (Common to all B. Tech. Program) the total credits offered is 48.

The 1st year B.Tech Program structure is executed in two cycles.

* The students undergoing the "Physics" cycle shall take the Courses as indicated.

\# The students undergoing "Chemistry" cycle shall take the Courses as indicated.

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III SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	MAT 107	Transform Techniques, Partial Differential Equations and Probability	3	1	0	4	4	Foundation	-
2	CIV 201	Strength of Materials	3	1	0	4	4	Skill Development	Sustainability
3	CIV 202	Surveying	3	1	0	4	4	Employability	Ethics
4	CIV 203	Engineering Geology	3	0	0	3	3	Employability	Env. & Sustainability
5	CIV 208	Fluid Mechanics	3	1	0	4	4	Skill Development	-
6	CIV 219	Building Materials and Concrete Technology	3	0	0	3	3	Employability	Env. & Sustainability
7	CIV 263	Basic Materials Testing Lab	0	0	2	1	2	Skill Development	Ethics
8	CIV 252	Surveying Practice	0	0	2	1	2	Skill Development	Env. & Sustainability
9	PPS 107	Design Thinking and Team Building	-	-	-	-	2	Entrepreneurs -hip	Human Val. & Ethics
TOTAL			**18**	**4**	**18**	**4**	**4**	**24**	**28**

IV SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	MAT 108	Numerical Methods, Probability and Sampling Distributions	3	1	0	4	4	Foundation	-
2	CIV 205	Structural Analysis-I	3	1	0	4	4	Skill Development	Ethics
3	CIV 210	Geotechnical Engineering	3	1	0	4	4	Employability	Env. &
4	CIV 220	Highway Engineering	3	1	0	4	4	Employability	Env. & Sustainability
5	CIV 221	Water Resources Systems	3	0	0	3	3	Employability	Env. & Sustainability
6	CIV 253	Engineering Geology Lab	0	0	2	1	2	Skill Development	Env. & Sustainability
7	CIV 254	Fluid Mechanics Lab	0	0	2	1	2	Skill Development	Env. & Sustainability
8	PPS 108	Being Corporate Ready	0	0	2	1	2	Employability	Human Val & Ethics
TOTAL			**15**	**4**	**6**	**22**	**25**		

*** Students will undergo Professional Practice – I during the summer break between the fourth and fifth semesters and the credits earned will be accounted for in the fifth semester.

V SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	CIV 209	Structural Analysis-II	3	1	0	4	4	Skill Develop.	Ethics
2	CIV 211	Design of RC Structural Elements	3	1	0	4	4	Employability	Sustainability
3	CIV 214	Geotechnical Engineering-II	3	0	0	3	3	Employability	Sustainability
4	MGT 1XX	Management Sciences I	3	0	0	3	3	Entrepreneurs -hip / Skill	Human Val. & Ethics
5	CIV 3XX	Discipline Elective I	3	0	0	3	3	-	-
6	CIV 223	Waste Water Treatment and Disposal	3	0	0	3	3	Employability	Env. & Sustainability
7	CIV 258	Computer Aided Building Drawing Lab	0	0	2	1	2	Skill Develop.	Sustainability
8	CIV 260	Geotechnical Engineering Lab	0	0	2	1	2	Skill Develop.	Env. & Sustainability
9	SIC 501	Social Immersion Course+	-	-	-	1	-	Skill Develop.	Gender Issues / Env. & Sustain.
10	CIV 501	Professional Practice –I***	-	-	-	5	-	Employability	Ethics
TOTAL			18	2	4	27/ 28	24		

The students have to register for extensive survey project one month before the end of fifth semester & undergo the "Survey Camp" for about 2 weeks during the Winter Break (December/ January) and the credits earned will be accounted for in the sixth semester.
+ Student has to register for Social Immersion Course in any semester out of the fifth or sixth semester to earn the mandatory credits

VI SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	CIV 213	Design of Structural Steel Elements	3	0	0	3	3	Employability	Sustainability
2	CIV 226	Water Resources and Design of Irrigation Systems	3	1	0	4	4	Employability	Env. & Sustainability
3	MGT 1XX	Management Sciences II	3	0	0	3	3	Entrepreneurs -hip / Skill Develop.	Human Val. & Ethics
4	CIV 3XX	Discipline Elective II	3	0	0	3	3	-	-
5	CIV 3XX	Discipline Elective III	3	0	0	3	3	-	-
6	XXX 4XX	Open Elective I	3	0	0	3	3	-	-
7	CIV 259	Environmental Engineering Lab	0	0	2	1	2	Skill Development	Env. & Sustainability
8	CIV 262	Concrete and Highway Materials Testing Lab	0	0	2	1	2	Skill Develop.	Sustainability
9	CIV 255	Extensive Survey Project # #	-	-	-	3	-	Skill Develop.	Env. & Sustainability
10	SIC 501	Social Immersion Course+	-	-	-	1	-	Skill Develop.	Gender Issues / Env. & Sustain.
TOTAL			18	1	4	24/25	23		

VII SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	CIV 215	Estimating, Costing and Valuation	3	1	0	4	4	Employability	Ethics
2	CIV 227	Design of Pre-Stressed Concrete Structures	3	0	0	3	3	Employability	Ethics
3	CIV 225	Railway, Airport and Harbour Engineering	3	0	0	3	3	Employability	Env. & Sustainability
4	CIV 3XX	Discipline Elective IV	3	0	0	3	3	-.	-
5	CIV 3XX	Discipline Elective V	3	0	0	3	3	-	-
6	XXX XXX	Open Elective – II	3	0	0	3	3	-	-
7	CIV 261	Computer Aided Structural Analysis Lab	0	0	2	1	2	Skill Develop.	Sustainability
TOTAL			18	1	2	20	21		

VIII SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	CIV 502	Professional Practice - II	-	-	-	15	-	Employability	Ethics
TOTAL			-	-	-	15	21		

LIST OF MANAGEMENT SCIENCES COURSES									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	MGT 112	Engineering Economics	3	0	0	3	3	Employability	-
2	MGT 113	Digital Entrepreneurship	3	0	0	3	3	Entrepreneurship	-
TOTAL			-	-	-	15	21		

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LIST OF DISCIPLINE ELECTIVES								
S. No.	**COURSE CODE**	**COURSE NAME**	**L**	**T**	**P**	**CREDITS**	**TYPE OF SKILL/ FOCUS**	**COURSE INTEGRATES**
COURSES RELATED TO STRUCTURAL ENGINEERING STREAM								
1	CIV 304	Bridge Design	3	0	0	3	Employability	Ethics
2	CIV 310	Elements of Earthquake Engineering	3	0	0	3	Employability	Ethics/ Env. & Sustainability
3	CIV 314	Design of Industrial Structures	3	0	0	3	Employability/ Skill Development	Ethics/ Env. & Sustainability
4	CIV 315	Advanced Concrete Technology	3	0	0	3	Employability	Env. & Sustainability
5	CIV 317	Advanced RCC structures	3	0	0	3	Employability	Ethics/ Env. & Sustainability
6	CIV 318	Repair and Rehabilitation of Structures	3	0	0	3	Employability	Env. & Sustainability
7	CIV 319	Matrix Methods of Structural Analysis	3	0	0	3	Skill Development	-
8	CIV 320	Masonry Structures	3	0	0	3	Employability	Ethics/ Env. & Sustainability
9	CIV 322	Advanced Design of Steel Structures	3	0	0	3	Skill Development	Env. & Sustainability
10	CIV 323	Design of Retaining Structures	3	0	0	3	Employability	Env. & Sustainability
11	CIV 324	Structural Dynamics	3	0	0	3	Skill Development	-
12	CIV 325	Stability of Structures	3	0	0	3	Skill Development	-
13	CIV 326	Theory of Elasticity	3	0	0	3	Skill Development	-
14	CIV 333	Alternate Building Materials	3	0	0	3	Employability	Env. & Sustainability
15	CIV 334	Finite Element Method	3	0	0	3	Employability	
16	CIV 335	Design Concepts of Building Services	3	0	0	3	Employability	Env. & Sustainability
17	CIV 336	Pre-fabricated Structures	3	0	0	3	Employability	Env. & Sustainability
18	CIV 337	Advanced Prestressed Concrete Design	3	0	0	3	Employability	Env. & Sustainability
19	CIV 360	Earthquake resistant Design of Structures	3	0	0	3	Employability	Ethics/ Env. & Sustainability

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COURSES RELATED TO TRANSPORTATION AND GEOTECHNICAL ENGINEERING								
1	CIV 301	Pavement Design	3	0	0	3	Employability	Env. & Sustainability
2	CIV 302	Ground Improvement Techniques	3	0	0	3	Skill Development	Env. & Sustainability
3	CIV 313	Advanced Surveying	3	0	0	3	Employability	Env. & Sustainability
4	CIV 305	Remote Sensing and Geographical Information System	3	0	0	3	Entrepreneurship/ Skill Develop.	-
5	CIV 311	Environmental Geotechnics and Solid Waste Management	3	0	0	3	Employability	Env. & Sustainability
6	CIV 321	Reinforced Earth Structures	3	0	0	3	Skill Development	Env. & Sustainability
7	CIV 338	Stability of Slopes	3	0	0	3	Skill Development	Ethics
8	CIV 362	Design concepts of Substructures	3	0	0	3	Employability	Ethics
9	CIV 339	Advanced Foundation Design	3	0	0	3	Employability	Ethics
10	CIV 340	Earth and Earth Retaining Structures	3	0	0	3	Employability	Env. & Sustainability
11	CIV 341	Urban Transport Planning	3	0	0	3	Employability	Env. & Sustainability
12	CIV 342	Traffic Engineering	3	0	0	3	Skill Development	Env. & Sustainability
13	CIV 343	Pavement Materials & Construction	3	0	0	3	Skill Development	Env. & Sustainability
14	CIV 344	Highway Geometric Design	3	0	0	3	Skill Development	Env. & Sustainability
15	CIV 345	Highway Construction and Maintenance	3	0	0	3	Employability	Ethics
16	CIV 346	Intelligent Transportation Systems	3	0	0	3	Skill Development	Ethics
17	CIV 347	Advanced Soil Mechanics	3	0	0	3	Skill Development	Ethics
18	CIV 348	Earthquake Resistant Design of Foundations	3	0	0	3	Employability	Ethics

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COURSES RELATED TO WATER RESOURCES AND ENVIRONMENTAL ENGINEERING								
1	CIV 303	Environmental Pollution and Control	3	0	0	3	Skill Development	Env. & Sustainability
2	CIV 305	Remote Sensing and Geographical Information System	3	0	0	3	Entrepreneurship/ Skill Develop.	Ethics
3	CIV 308	Ground Water Hydrology	3	0	0	3	Employability	Env. & Sustainability
4	CIV 311	Environmental Geotechnics and Solid Waste Management	3	0	0	3	Employability	Env. & Sustainability
5	CIV 316	Industrial Wastewater Treatment	3	0	0	3	Employability	Env. & Sustainability
6	CIV 328	Climate Change and Sustainable Development	3	0	0	3	Skill Development	Env. & Sustainability
7	CIV 329	Urban Flooding: Analysis and Control	3	0	0	3	Skill Development	Env. & Sustainability
8	CIV 330	Urban Air Pollution and Control	3	0	0	3	Skill Development	Env. & Sustainability
9	CIV 331	Urban Waste Management	3	0	0	3	Entrepreneurship/ Skill Develop.	Env. & Sustainability
10	CIV 332	Open Channel Flow	3	0	0	3	Skill Development	-
11	CIV 349	Water Resource Management	3	0	0	3	Employability	Env. & Sustainability
12	CIV 366	Advanced Fluid Mechanics	3	0	0	3	Skill Development	-
13	CIV 367	Integrated Watershed Management	3	0	0	3	Employability	Env. & Sustainability
14	CIV 368	Environmental Hydraulics	3	0	0	3	Skill Development	Env. & Sustainability

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DISCIPLINE ELECTIVES FOR THE ADDITIONAL MINOR IN INFRASTRUCTURE DEVELOPMENT								
1	CIV 306	Principles of Construction Management	3	0	0	3	Entrepreneurship/ Skill Develop.	Human Val. & Ethics
2	CIV 369	Introduction to Infrastructure System and Planning	3	0	0	3	Skill Development	Env. & Sustainability
3	CIV 370	Urban Planning and Design	3	0	0	3	Employability	Env. & Sustainability
4	CIV 371	Project Management in Infrastructure Development	3	0	0	3	Employability	Human Val. & Ethics
5	CIV 372	Construction Practices and Challenges in Infrastructure Projects	3	0	0	3	Employability	Human Val. & Ethics
6	CIV 373	Construction Equipment and Machinery	3	0	0	3	Employability	
7	CIV 374	Construction Quality and Safety	3	0	0	3	Employability	Human Val. & Ethics
8	CIV 375	Construction Economics and Finance	3	0	0	3	Employability	Ethics
9	CIV 376	Built Environment Design	3	0	0	3	Skill Development	Env. & Sustainability
10	CIV 304	Bridge Design	3	0	0	3	Employability	Ethics
11	CIV 346	Intelligent Transportation Systems	3	0	0	3	Employability	-
12	CIV 387	Applications of Remote Sensing and GIS in Infrastructure Development	3	0	0	3	Entrepreneurship/ Skill Develop.	-
13	CIV 377	Environmental Impact Assessment for Infrastructure Projects	3	0	0	3	Employability	Env. & Sustainability
14	CIV 328	Climate Change and Sustainable Development	3	0	0	3	Skill Development	Env. & Sustainability
15	CIV 329	Urban Flooding: Analysis and Control	3	0	0	3	Skill Development	Env. & Sustainability
16	CIV 330	Urban Air Pollution and Control	3	0	0	3	Skill Development	Env. & Sustainability
17	CIV 331	Urban Waste Management	3	0	0	3	Entrepreneurship/ Skill Develop.	Env. & Sustainability

DISCIPLINE ELECTIVES FOR THE ADDITIONAL MINOR IN SMART CITIES								
1	CIV 378	Concepts of Smart City	3	0	0	3	Skill Development	-
2	CIV 379	Urban Mobility	3	0	0	3	Skill Development	Env. & Sustainability
3	CIV 369	Introduction to Infrastructure System and Planning	3	0	0	3	Skill Development	Env. & Sustainability
4	CIV 385	Smart city Energy systems and Management	3	0	0	3	Skill Development	Env. & Sustainability
5	CIV 386	Urban sanitation and hygiene	3	0	0	3	Skill Development	Env. & Sustainability
6	CIV 387	Applications of Remote Sensing and GIS in Infrastructure Development	3	0	0	3	Entrepreneurship/ Skill Develop.	-
7	CIV 377	Environmental Impact Assessment for Infrastructure Projects	3	0	0	3	Employability	Env. & Sustainability
8	CIV 346	Intelligent Transportation Systems	3	0	0	3	Employability	-
9	CIV 388	IoT in Construction	3	0	0	3	Skill Development	-
10	CIV 370	Urban Planning and Design	3	0	0	3	Employability	Env. & Sustainability
11	CIV 372	Construction Practices and Challenges in Infrastructure Projects	3	0	0	3	Employability	Human Val. & Ethics
12	CIV 374	Construction Quality and Safety	3	0	0	3	Employability	Human Val. & Ethics
13	CIV 389	Construction Economics and Financing for Smart Cities	3	0	0	3	Employability	Ethics
14	CIV 390	E-Governance	3	0	0	3	Skill Development	Human Val. & Ethics
15	CIV 329	Urban Flooding: Analysis and Control	3	0	0	3	Skill Development	Env. & Sustainability
16	CIV 330	Urban Air Pollution and Control	3	0	0	3	Skill Development	Env. & Sustainability
17	CIV 331	Urban Waste Management	3	0	0	3	Entrepreneurship/ Skill Develop.	Env. & Sustainability
18	CIV 328	Climate Change and Sustainable Development	3	0	0	3	Skill Development	Env. & Sustainability
19	CIV 376	Built Environment Design	3	0	0	3	Skill Development	Env. & Sustainability
20	CIV 391	Smart Materials and Structures	3	0	0	3	Skill Development	

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OPEN ELECTIVES OFFERED BY DEPARTMENT OF CIVIL ENGINEERING								
S. No.	**COURSE CODE**	**COURSE NAME**	**L**	**T**	**P**	**CREDITS**	**TYPE OF SKILL/ FOCUS**	**COURSE INTEGRATES**
1	CIV 380	Geographical Information Systems	3	0	0	3	Employability/ Skill Develop.	Env. & Sustainability
2	CIV 280	Environmental Impact Assessment	3	0	0	3	Skill Development	Env. & Sustainability
3	CIV 281	Sustainable Materials and Green Buildings	3	0	0	3	Skill Development	Env. & Sustainability
4	CIV 381	Construction Project Management	3	0	0	3	Entrepreneurship/ Skill Develop.	Ethics
5	CIV 282	Hazardous Waste Treatment	3	0	0	3	Entrepreneurship/ Skill Develop.	Env. & Sustainability/ Ethics
6	CIV 382	Systems Design for Environment and Sustainability	3	0	0	3	Entrepreneurship/ Skill Develop.	Env. & Sustainability/ Ethics
7	CIV 383	Infrastructure Systems for Smart Cities	3	0	0	3	Entrepreneurship/ Skill Develop.	Env. & Sustainability/ Ethics
8	CIV 384	Occupational Health and Safety	3	0	0	3	Employability/ Skill Develop.	Ethics

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GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

(Private University Estd. in Karnataka State by Act No.41 of 2013)

Feedback from B.Tech students and action taken report

Sl. No.	Feedback	Action Taken
1	Need field trips and industrial visits.	As part of experiential learning faculties are actively encouraged to take students on field trips and industrial visits. Atleast one such visit per section per semester will be undertaken by the department.
2	Need more choices in elective courses	More Discipline and Open elective courses are introduced to offer students more choices.

Pursuant to feedback received from stakeholders, new elective courses have been added to curriculum as shown in Annexure 1.4.

Feedback from M.Tech students and action taken report

Sl. No.	Feedback	Action Taken
1	Industry tie-ups needed to boost placement and collaborative research / projects.	MoU being initiated by the department with industry to boost placement and research work. Every semester Guest lectures, Invited talks and workshops are being organized to expose students and faculty to latest developments in the industry. Students as well as faculty are supported and encouraged to participate in National and International conferences, workshops Industry expos and symposium.

Pursuant to feedback received from stakeholders, new elective courses have been added to curriculum as shown in Annexure 1.4.

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GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

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Feedback from Alumni and action taken report

Sl. No.	Feedback	Action Taken
1	Add few courses on emerging concepts in Civil Engineering.	Discipline Elective courses on Emerging concepts including smart city are introduced
2	Need more practical on-site, site experiences	Internships are offered twice during the program to address this. In addition, guest lectures and few Industrial visits are also planned to have better exposure.

Pursuant to feedback received from stakeholders, new discipline elective courses have been added to curriculum as shown in Annexure 1.4.

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GAIN MORE KNOWLEDGE
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Feedback from Faculty members and action taken report

Sl. No.	Feedback	Action Taken
1	Need to allot more teaching/tutorial hours for design based courses/numerical based courses	The course contents are planned according to the lecture and tutorial hours available. However, there might have been a need felt to engage more tutorial hours only for slow learners. Remedial classes are being arranged for slow learners after regular working hours.
2	Add more domain courses to enrich curriculum	New DE courses introduced across domains such as Structural Engineering, Environmental Engineering, Geotechnical Engineering, Infrastructure and Transportation Engineering, to name a few.

Pursuant to feedback received from stakeholders, new discipline elective courses have been added to curriculum as shown in Annexure 1.4.

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GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

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Feedback from Industry representatives and action taken report

Sl. No.	Feedback	Action Taken
1	Introduce more discipline electives pertaining to Built Environment, Construction Safety, Remote Sensing and GIS, Earthquake Analysis and Design.	New DE courses introduced per recommendations

Pursuant to feedback received from stakeholders, new discipline elective courses have been added to curriculum as shown in Annexure 1.4.

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Annexure 1.4

NEWLY PROPOSED DISCIPLINE ELECTIVE COURSES FOR B.TECH (CIVIL ENGINEERING)								
S. No.	**COURSE CODE**	**COURSE NAME**	**L**	**T**	**P**	**C**	**TYPE OF SKILL/ FOCUS**	**COURSE INTEGRATES**
1.	CIV 333	Alternate Building Materials	3	0	0	3	Employability	Env. & Sustainability
2.	CIV 334	Finite Element Method	3	0	0	3	Employability	-
3.	CIV 335	Design Concepts of Building Services	3	0	0	3	Employability	Ethics
4.	CIV 336	Pre-fabricated Structures	3	0	0	3	Employability	-
5.	CIV 337	Advanced Prestressed Concrete Design	3	0	0	3	Employability	Ethics
6.	CIV 338	Stability of Slopes	3	0	0	3	Employability	-
7.	CIV 339	Advanced Foundation Design	3	0	0	3	Employability	-
8.	CIV 340	Earth and Earth Retaining Structures	3	0	0	3	Employability	-
9.	CIV 341	Urban Transport Planning	3	0	0	3	Employability	-
10.	CIV 342	Traffic Engineering	3	0	0	3	Employability	-
11.	CIV 343	Pavement Materials & Construction	3	0	0	3	Employability	-
12.	CIV 344	Highway Geometric Design	3	0	0	3	Employability	Ethics
13.	CIV 345	Highway Construction and Maintenance	3	0	0	3	Employability	-
14.	CIV 346	Intelligent Transportation Systems	3	0	0	3	Employability	-
15.	CIV 347	Advanced Soil Mechanics	3	0	0	3	Employability	-
16.	CIV 348	Earthquake Resistant Design of Foundations	3	0	0	3	Employability	-
17.	CIV 349	Water Resource Management	3	0	0	3	Employability	Env. & Sustainability

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18.	CIV 360	Earthquake resistant Design of Structures	3	0	0	3	Employability	Ethics
19.	CIV 366	Advanced Fluid Mechanics	3	0	0	3	Employability	-
20.	CIV 367	Integrated Watershed Management	3	0	0	3	Employability	Env. & Sustainability
21.	CIV 368	Environmental Hydraulics	3	0	0	3	Employability	-
22.	CIV 369	Introduction to Infrastructure System and Planning	3	0	0	3	Employability	-
23.	CIV 370	Urban Planning and Design	3	0	0	3	Employability	Env. & Sustainability
24.	CIV 371	Project Management in Infrastructure Development	3	0	0	3	Employability	Ethics
25.	CIV 372	Construction Practices and Challenges in Infrastructure Projects	3	0	0	3	Employability	Ethics
26.	CIV 373	Construction Equipment and Machinery	3	0	0	3	Employability	-
27.	CIV 374	Construction Quality and Safety	3	0	0	3	Employability	-
28.	CIV 375	Construction Economics and Finance	3	0	0	3	Employability	Ethics
29.	CIV 376	Built Environment Design	3	0	0	3	Employability	Env. & Sustainability
30.	CIV 377	Environmental Impact Assessment for Infrastructure Projects	3	0	0	3	Employability	-
31.	CIV 378	Concepts of Smart City	3	0	0	3	Employability	Env. & Sustainability
32.	CIV 379	Urban Mobility	3	0	0	3	Employability	-
33.	CIV 384	Occupational Health and Safety	3	0	0	3	Entrepreneurs hip	-
34.	CIV 385	Smart city Energy systems and Management	3	0	0	3	Employability	Env. & Sustainability
35.	CIV 386	Urban sanitation and hygiene	3	0	0	3	Employability	Env. & Sustainability
36.	CIV 387	Applications of Remote Sensing and GIS in Infrastructure Development	3	0	0	3	Employability	-

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37.	CIV 388	IoT in Construction	3	0	0	3	Employability	-
38.	CIV 389	Construction Economics and Financing for Smart Cities	3	0	0	3	Employability	Ethics
39.	CIV 390	E-Governance	3	0	0	3	Employability	Ethics
40.	CIV 391	Smart Materials and Structures	3	0	0	3	Employability	-

The syllabus of the new courses as approved by the Board of Studies is included in the relevant PRCs

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Annexure 2

M. Tech. (Building Construction Technology) 2020-2022: Mandatory Courses and Credits			
S. No.	**TYPE OF COURSES**	**NO. OF COURSES**	**CREDITS**
1	Foundation Courses (FC)	02	07
2	Core (Professional) Course (CC)	10	34
3	Discipline (Professional) Elective (DE)	03	09
4	Interdisciplinary Elective (IE)	02	06
5	Seminar (SM)	02	02
6	Project Work (PW)	01	05
7	M. Tech. Thesis (MT)	01	15
TOTAL		**21**	**78**
The mandatory minimum credits required for the award of the M. Tech. (Building Construction Technology) Degree is 78 Credits.			

I SEMESTER									
S. No.	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**	**TYPE OF SKILL/ FOCUS**	**COURSE INTEGRATES**
			L	**T**	**P**	**CREDITS**			
1	MAT 301	Advanced Engineering Mathematics	3	1	0	4	4	Skill Development	-
2	CIV 351	Advanced Construction Materials and Technology	4	0	0	4	4	Employability	Sustainability
3	CIV 352	Quality, Risk and Safety in Construction	4	0	0	4	4	Employment	Human Values and Profess. Ethics
4	CIV 353	Construction Planning, Schedule and Control	4	0	0	4	4	Employability	Ethics
5	RES 301	Research Methodology	3	0	0	3	3	Skill Development	Ethics
6	CIV 354	Mechanization in Construction	3	0	0	3	3	Sustainability	Ethics
7	CIV 511	Material Characterization Lab	0	0	2	1	2	Employability	Ethics
8	CIV 512	Seminar – I	0	0	0	1	0	Employability	Ethics
TOTAL			**21**	**1**	**2**	**24**	**24**		

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II SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	CIV 355	Construction Economics and Contract	3	1	0	4	4	Employability	Ethics
2	CIV 356	Building services and Maintenance	4	0	0	4	4	Employability	Sustainability
3	CIV 357	Advanced Design of RC Structures	3	1	0	4	4	Employability	Ethics
4	CIV XXX	Discipline Elective – I	3	0	0	3	3	-	-
5	XXX XXX	Interdisciplinary Elective – I	3	0	0	3	3	-	-
6	CIV 513	Software Application Lab	0	0	4	2	4	Skill Development	Sustainability
7	CIV 514	Seminar - II	0	0	0	1	0	Employability	Ethics
TOTAL			16	2	4	21	22		

III SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	CIV 358	Construction Demolition and Waste Management	4	0	0	4	4	Employability	Sustainability
2	XXX XXX	Interdisciplinary Elective - II	3	0	0	3	3	-	-
3	CIV XXX	Discipline Elective – II	3	0	0	3	3	-	-
4	CIV XXX	Discipline Elective – III	3	0	0	3	3	-	-
5	CIV 515	Project Work (Phase I - Minor Project)	0	0	0	5	0	Employability	Sustainability / Ethics
TOTAL			13	0	0	18	13		

IV SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	CIV 516	M.Tech Dissertation (Phase II - Major Project)	0	0	0	15	0	Skill Development	Sustainability / Ethics
TOTAL			0	0	0	15	0		

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III SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	MAT 107	Transform Techniques, Partial Differential Equations and Probability	3	1	0	4	4	Foundation	-
2	CIV 201	Strength of Materials	3	1	0	4	4	Skill Development	Sustainability
3	CIV 202	Surveying	3	1	0	4	4	Employability	Ethics
4	CIV 203	Engineering Geology	3	0	0	3	3	Employability	Env. & Sustainability
5	CIV 208	Fluid Mechanics	3	1	0	4	4	Skill Development	-
6	CIV 219	Building Materials and Concrete Technology	3	0	0	3	3	Employability	Env. & Sustainability
7	CIV 263	Basic Materials Testing Lab	0	0	2	1	2	Skill Development	Ethics
8	CIV 252	Surveying Practice	0	0	2	1	2	Skill Development	Env. & Sustainability
9	PPS 107	Design Thinking and Team Building	0	0	2	1	2	Entrepreneu-rship	Human Val. & Ethics
TOTAL			**18**	**4**	**6**	**25**	**28**		

IV SEMESTER									
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL/ FOCUS	COURSE INTEGRATES
			L	T	P	CREDITS			
1	MAT 108	Numerical Methods, Probability and Sampling Distributions	3	1	0	4	4	Foundation	-
2	CIV 205	Structural Analysis-I	3	1	0	4	4	Skill Development	Ethics
3	CIV 210	Geotechnical Engineering	3	1	0	4	4	Employability	Env. &
4	CIV 220	Highway Engineering	3	1	0	4	4	Employability	Env. & Sustainability
5	CIV 221	Water Resources Systems	3	0	0	3	3	Employability	Env. & Sustainability
6	CIV 253	Engineering Geology Lab	0	0	2	1	2	Skill Development	Env. & Sustainability
7	CIV 254	Fluid Mechanics Lab	0	0	2	1	2	Skill Development	Env. & Sustainability
8	PPS 108	Being Corporate Ready	0	0	2	1	2	Employability	Human Val & Ethics
TOTAL			**15**	**4**	**6**	**22**	**25**		

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Course Name:	Transform Techniques, Partial Differential Equations and Probability					
Course Code:	MAT 107	Credit Structure :	L	T	P	C
			3	1	0	4

Course Description: This course aims to introduce Fourier transform, z-transform and Laplace transform. The topics include the applications of Laplace transform in LCR circuits and solution of difference equations using z-transform.

This course is commonly designed for all engineering branches and the contents learned in the previous semester are the prerequisite for this course. Solution of second and higher order, linear ordinary differential equations with constant and variable coefficients. Formation of Partial Differential Equations (PDE), solution of homogeneous and non-homogeneous PDEs and the application of PDEs. Laplace transforms of functions and properties; Laplace transform of periodic and unit step functions. Inverse Laplace Transforms, Application of Laplace transforms and solution of differential equations.

The course aims at introducing students to quantitative uncertainty analysis and risk assessment for engineering applications. Probability theory is of great use in understanding and modeling phenomena that exhibit random behavior and the emphasis is on real-world applications to engineering problems. The topics covered include basic concepts of probability and conditional probability, Baye's law and correlation analysis, Linear Regression and method of least square.

Text Book(s):

1. Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Edition, John Wiley& Sons, India, 2014.
2. Grewal B.S., "Higher Engineering Mathematics", 43rd Edition, Khanna Publishers, 2014.

Reference Book(s):

1. Peter V. O'Neil, Advanced Engineering Mathematics, 7th Edition, Cengage Learning, 2012.
2. Ronald E. Walpole, Raymond H. Myers & Sharon L. Myers, "Probability & Statistics for Engineers & Scientists", Ninth Edition

Course Name:	Numerical Methods, Probability and Sampling Distributions					
Course Code:	MAT 108	Credit Structure :	L	T	P	C
			3	1	0	4

Course Description: The objective of Numerical Methods, Probability and Sampling Distributions is to equip the students with adequate knowledge of basic mathematics that will enable them in formulating problems and solving them analytically as well as numerically in their Engineering programme. The course enables students to incorporate the knowledge of complex variables and their significance in engineering, Numerical methods and sampling theory to support their concurrent, subsequent engineering studies to explore complex systems, physicists, engineers and mathematicians require computational methods since mathematical models are rarely solvable analytically. This course provides an introduction to basic numerical methods such as fitting of various curves, interpolation, differentiation, integration. This course also provides an introduction to numerical solution of algebraic and transcendental equations, ordinary differential equations such

as Taylor's series method, modified Euler's method and Runge-Kutta Methods. The course aims at introducing students to quantitative uncertainty analysis and risk assessment for engineering applications. Probability theory is of great use in understanding and modeling phenomena that exhibit random behavior and the emphasis is on real-world applications to engineering problems. The topic covered include discrete and continuous probability distributions covering binomial, Poisson, geometric, exponential, uniform, normal distributions and their applications, functions of random variable, random sampling and its properties, sampling distributions of means and variances, chi-squared, t and F distributions, methods of estimation, estimating means, proportions and variances, maximum likelihood estimation, tests of hypothesis on means, proportions and variances, chi-squared test of goodness of fit.

Text Book(s):

1. Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Edition, John Wiley & Sons (India), 2014.
2. M.K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computations, 6th Edition, New age Publishing House, 2015.
3. Ronald E. Walpole, Raymond. H. Myers, Sharon. L Myers, and Keying E. Ye, "Probability and Statistics for Engineers and Scientists", Pearson Education, Delhi-9th edition, 2012.

Reference Book(s):

1. B.S. Grewal, "*Higher Engineering Mathematics*", 43rd Edition, Khanna Publishers.
2. B.S. Grewal, "*Numerical Methods in Engineering and Science*", 10th Edition, Khanna publishers, 2016.
3. Kishor S Trivedi, "*Probability and Statistics with Reliability, Queuing and Computer Science Applications*", John Wiley & Sons, 2nd Edition, 2008.

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Annexure 4

NPTEL - Discipline Elective Courses for B. Tech. (Civil Engineering)

Sl. No.	Course Id	Course Name
1.	noc20-ar11	Urban Landuse and transportation planning
2.	noc20-ar12	Urban governance and Development Management (UGDM)
3.	noc20-ce42	Theory of Elasticity
4.	noc20-ce43	Integrated Waste Management for a Smart City
5.	noc20-ce47	Glass in buildings : Design and applications
6.	noc20-ce53	Introduction to Multimodal Urban Transportation Systems (MUTS)
7.	noc20-ce61	Introduction to Engineering Seismology
8.	noc20-me54	Advanced Fluid Mechanics

NPTEL - Open Elective Courses for B. Tech. (Civil Engineering)

Sl. No.	Course Id	Course Name
1.	noc20-ag01	Fundamentals of Food Process Engineering
2.	noc20-ag04	Irrigation and Drainage
3.	noc20-ar05	Environmental Soil Chemistry
4.	noc20-cs56	Problem solving through Programming In C
5.	noc20-cs66	Introduction to internet of things
6.	noc20-cs69	Introduction to Industry 4.0 and Industrial Internet of Things
7.	noc20-ee57	Design of photovoltaic systems
8.	noc20-mg43	Industrial Safety Engineering
9.	noc20-mg48	Project management for managers
10.	noc20-ge20	Numerical Methods for Engineers

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NPTEL - Discipline Elective Courses for M. Tech. (Building Construction Technology)

Sl. No.	Course Id	Course Name
1.	noc20-ag04	Managerial Economics
2.	noc20-ar11	Urban Landuse and transportation planning
3.	noc20-ar12	Urban governance and Development Management (UGDM)
4.	noc20-ce43	Integrated Waste Management for a Smart City

NPTEL - Open Elective Courses for M. Tech. (Building Construction Technology)

Sl. No.	Course Id	Course Name
1.	noc20-cs56	Problem solving through Programming In C
2.	noc20-cs66	Introduction to internet of things
3.	noc20-cs69	Introduction to Industry 4.0 and Industrial Internet of Things
4.	noc20-ee57	Design of photovoltaic systems
5.	noc20-mg43	Industrial Safety Engineering
6.	noc20-mg48	Project management for managers
7.	noc20-ge20	Numerical Methods for Engineers
8.	noc20-mg39	Soft Skills For Business Negotiations And Marketing Strategies
9.	noc20-mg59	Decision Support System for Managers
10.	noc20-mg60	Management Information System

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Annexure 5

List of External Examiners

Sl. No.	Engineering Group/ Subject Domain	Faculty Name	Name of Institution
1	STRUCTURES	Dr. Sunil Kumar Tengli	REVA UNIVERSITY
		Mr. Kiran Umachagi	NMIT
		Mr. Ramesh. S	NCET
		Mr. Sujith. S. K	NCET
		Mr. Agadi Kishan	REVA UNIVERSITY
		Mr. Avinash. S. Deshapande	REVA UNIVERSITY
		Mr. Bhojaraja M	REVA UNIVERSITY
		Mr. Nanjunda K. N	REVA UNIVERSITY
		Mr. Naresh Reddy G. N	REVA UNIVERSITY
		Mr. Prabhakar M	NCET
		Mr. Sachin Mohare	REVA UNIVERSITY
		Mr. Sanjay Raj A	REVA UNIVERSITY
		Mr. Shashi kiran S	NCET
		Mrs. Kavitha N	NCET
		Ms. Rekha B	REVA UNIVERSITY
		Ms. Deepika A. N	NCET
2	GEOTECHNICAL	Dr. P. Shivananda	REVA UNIVERSITY
		Mr. Jairaj	NMIT
		Mr. Chandra Prakash	REVA UNIVERSITY
		Ms. Vidya Shree M	NCET
3	HYDROLOGY & IRRIGATION	Dr. Ramesh B. R	NMIT
		Dr. M.A. Nagesh	REVA UNIVERSITY
		Dr. T.M. Mohan Kumar	REVA UNIVERSITY
		Dr. Y Ramalinga Reddy	REVA UNIVERSITY
		Mr. Nanjundi Prabhu	NMIT
		Mr. Ajaybhaskar Reddy	REVA UNIVERSITY
		Mr. Rajashekhar S. L	REVA UNIVERSITY
4	ENVIRONMENT & WATER SUPPLY	Dr. S. Harinath	REVA UNIVERSITY
		Mr. Raghunandan Koppad	REVA UNIVERSITY
		Mr. Prashanth N	REVA UNIVERSITY
		Mr. ShivaPrasad H	REVA UNIVERSITY
		Mrs. Rajashree Melannavar	NCET
		Mrs. Pavithra M. P	REVA UNIVERSITY
		Ms. Jeevitha P	REVA UNIVERSITY

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5	TRANSPORTATION	Dr. S. P Mahendra	REVA UNIVERSITY
		Mr. Suresh B	REVA UNIVERSITY
		Mr. Mandeep B. V	NCET
		Mr. Muralidhara H	NMIT
		Mr. Chetan Krishna	NCET
		Mr. Pradeep Kumar B. K	REVA UNIVERSITY
		Mr. Raveesh J	REVA UNIVERSITY
		Mr. Sreenatha M	REVA UNIVERSITY
		Mrs. Nipa Chanda	REVA UNIVERSITY
		Mrs. Prathima G	NMIT
6	GEOLOGY	Mr. Sunil M Kalagudi	BEC
7	CONSTRUCTION TECHNOLOGY / INFRASTRUCTURE MANAGEMENT	Mr. Sharath Babu Kedagi	NCET
		Mr. Harshavardhana Raju V	NCET

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Annexure 6

List of Value-Added Courses offered by the department for Odd Semester of Academic Year 2020-21

S. No.	COURSE CODE	COURSE NAME
1	CIV V 006	Sustainability - Ideas for a Sustainable Planet
2	CIV V 007	Environmental Auditing
3	CIV V 008	Application of M S Office Tools for Civil Engineering Students
4	CIV V 009	Human Values and Professional Ethics
5	CIV V 002	Building Information Modelling (BIM) with Revit Architecture
6	CIV V 010	Sustainable Engineered Systems
7	CIV V 011	QGIS course for beginners level
8	CIV V 012	Environmental Ethics in Science and Engineering
9	CIV V 013	Recent trends and development in E-Waste management
10	CIV V 014	Preparation of Soil Investigation report
11	CIV V 015	Bridge course for construction practices in civil engineering
12	CIV V 016	Fundamentals of Interior design of a building along with Vaastu components
13	CIV V 017	Modern Irrigation Systems and Field Practices
14	CIV V 018	Cost Analysis of Project Alternatives
15	CIV V 019	Damage Assessment and Strengthening Technique
16	CIV V 020	Forensic Geotechniques
17	CIV V 021	Role of Structural Steel in Indian Scenario
18	CIV V 022	Household water treatment and safe storage
19	CIV V 023	ETABS modelling and design of building structure
20	CIV V 024	Design of Pre Engineered building using STAAD. Pro
21	CIV V 025	Structural Design of Special Concrete Elements
22	CIV V 026	Principles of Transportation Safety
23	CIV V 027	Practical aspects of Design and ductile detailing of Buildings subjected to Seismic Forces
24	CIV V 028	Field Practices in Pavement Construction

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SCHOOL OF ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

Ref: PU-SOE-CIVIL/2021-2022/BOS-12/MOM01 Date: 08-08-2021

Minutes of the 12th Meeting of Board of Studies of Civil Engineering

The 12th meeting of the Board of Studies of Department of Civil Engineering, School of Engineering was held virtually on 07th August, 2021 from 10 am. It was hosted on Microsoft Teams platform by Presidency University, Itgalpur, Rajanukunte, Yelahanka, Bengaluru.

The following members were present:

Sl. No.	Name	Designation with Affiliation	Position
1.	Dr. Abdul Sharief	Dean, School of Engineering, Presidency University	Chairperson
2.	Dr. S. B Anadinni	Professor and Assoc. Dean, Department of Civil Engineering, School of Engineering, Presidency University	Member
3.	Dr. Jagdish H Godihal	Professor, Department of Civil Engineering, School of Engineering, Presidency University	Member
4.	Dr.Vasant Matsagar	Dogra Chair Professor, Department of Civil Engineering, Indian Institute of Technology, Delhi	External Member (Academic)
5.	Dr. G R Dodagoudar	Professor, Department of Civil Engineering, Indian Institute of Technology, Madras	External Member (Academic)
6.	Mrs. Sangeeta Chachadi	General Manager, Design & Engineering - Structures, Sobha Ltd.	External Member (Industry)
7.	Dr. Nakul Ramanna	Associate Professor and Head, Department of Civil Engineering, School of Engineering, Presidency University	Member Secretary

The member secretary / HoD extended a warm welcome to the members, particularly to the external members and introduced all the members in the committee. The chairperson of 12th BoS meeting, Dr Abdul Sharief delivered the opening remarks by requesting BoS members to deliberate on each agenda and to provide constructive suggestions for the effective implementation of the proposed CBCS system.

With the permission of chairperson, the member secretary presented the following agenda points and deliberations were recorded.

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Agenda SOE-CIV 12.1: To approve the minutes of 11th Board of Studies Meeting held on 05th September 2020. Discussion on the Program Regulations & Curriculum [PRC] for the 2020 admitted students

Resolution SOE-CIV 12.1: The Minutes of 11th BoS meeting held on 5th September 2020 and its Action Taken Report (ATR) was discussed and approved by the members.

The proposed changes in Program Regulations & Curriculum [PRC] for the 2020 admitted students was presented as in Annexure 1.1 and Annexure 1.2 by the member secretary and the same had been discussed and approved.

Table 1: Illustrating the proposed changes in PRC for 2020 admitted students

Existing Credit Structure			
S. NO.	**TYPE OF COURSES**	**NO. OF COURSES**	**CREDITS**
1.	Humanities (HS)	3	6
2.	Management Sciences (MS)	Min. of 2	6
3.	Basic Sciences (BS)	9	29
4.	Engineering Sciences (ES)	7	21
5.	Core (Professional) Course (CC)	28	76
6.	Discipline (Professional) Elective (DE)	Min. of 5	15
7.	Open Elective (OE)	Min. of 2	6
8.	Professional Practice (PP)	2	20
9.	Personal and Professional Skills (PPS) *(Compulsory to be audited)*	4	-
10.	Social Immersion Course (SIC)	1	1
TOTAL		**Min. of 63**	**180**
The mandatory minimum credits required for the award of the B. Tech. (Civil Engineering) Degree is 180 Credits.			

Existing Credit Structure			
S. NO.	**TYPE OF COURSES**	**NO. OF COURSES**	**CREDITS**
1.	Humanities (HS)	3	6
2.	Management Sciences (MS)	Min. of 2	6
3.	Basic Sciences (BS)	9	27
4.	Engineering Sciences (ES)	7	21
5.	Core (Professional) Course (CC)	17	44
6.	Discipline (Professional) Elective (DE)	Min. of 15	42
7.	Open Elective (OE)	Min. of 5	14
8.	Professional Practice (PP)	2	20
9.	Personal and Professional Skills (PPS) *(Compulsory to be audited)*	4	-
TOTAL		**Min. of 64**	**180**
The mandatory minimum credits required for the award of the B. Tech. (Civil Engineering) Degree is 180 Credits.			

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Agenda SOE-CIV 12.2: Discussion on the Program Regulations & Curriculum [PRC] for the 2019 admitted students

Resolution SOE-CIV 12.2: The member secretary presented the Program Regulations & Curriculum [PRC] for the 2019 admitted students as listed in Annexure 2. (There are no changes except for the points mentioned under Agenda SOE-CIV 12.7.2).

Agenda SOE-CIV 12.3: Discussion on the Program Regulations & Curriculum [PRC] for the 2018 admitted students

Resolution SOE-CIV 12.3: The member secretary presented the Program Regulations & Curriculum [PRC] for the 2018 admitted students as listed in Annexure 3. There are no changes except for additional open electives proposed by other departments as approved in their respective BoS as well as the points mentioned under Agenda SOE-CIV 12.7.1, 12.7.3 and 12.7.4.

Agenda SOE-CIV 12.4: Discussion on the Feedback obtained on curriculum from Industry, students, alumni & faculty members

Resolution SOE-CIV 12.4: The member secretary presented the gist of feedback obtained on existing curriculum from Industry, students, alumni & faculty members as listed in Annexure 4 and highlighted the necessity of revamping the curriculum towards flexible Choice based Credit System (CBCS). All the members have appreciated the efforts.

Agenda SOE-CIV 12.5: Discussion on the Proposed CBCS course grid and the Course catalogues for the 2021 admitted students

Resolution SOE-CIV 12.5: The member secretary presented the salient features of proposed program structure and CBCS Course grid including course catalogues in Annexure 5.1 and Annexure 5.2 which was duly approved after much deliberations with the following discussion points.

1. Dr. Dodagoudar suggested to rename the OE course CIV 1001 - Disaster management and mitigation to 'Disaster mitigation and management'.

Resolution SOE-CIV 12.5.1: Course name changed as suggested by the committee.

2. Dr. Vasant Matsagar and Dr. Dodagoudar suggested that course codes should reflect the level of difficulty accordingly in BTech and MTech Program.

Resolution SOE-CIV 12.5.2: Course codes for BTech and MTech programs were updated per the suggestions of the committee after due approval by Dean Academics and Vice Chancellor.

3. Dr. Vasant Matsagar and Dr. Dodagoudar opined that use of software programs for assignments should be avoided as it will hamper learning.

Resolution SOE-CIV 12.5.3: After deliberations it was agreed that use of structural analysis and design programs will not be permitted for assignments but programming tools such as Matlab and Excel will be used where necessary.

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4. Dr. Vasant Matsagar and Dr. Dodagoudar suggested changing the name of Advanced Engineering Mathematics course, offered in MTech BCT program, to reflect the contents of the course.

Resolution SOE-CIV 12.5.4: The suggestions were brought to the notice of Mathematic department, Dean Academics and Vice Chancellor. The issue will be deliberated in the next BOS meeting of Mathematics department and will be updated to the committee.

5. Dr. Dodagoudar suggested to limit the choice of courses for the the first two years of BTech program as the students many not be capable of making informed decisions, and consequently increase faculty requirement / workload.

Resolution SOE-CIV 12.5.5: The suggestions were brought to the notice of Dean Academics and Vice Chancellor. To address the issue students will be given access to mentors at department level and charted course plan(s) to help them select courses within the confines of CBCS curriculum.

6. Mrs. Sangeeta Chachadi suggested to expose students to current trends in the industry such as Helipad design in tall buildings, Form-work design, Case studies of structural / engineering failures, Structural safety and Building inspection, through site visits and elective courses.

Resolution SOE-CIV 12.5.6: Per the suggestions, new modules will be incorporated in current courses where applicable. The committee was also briefed that students are exposed to current trends and technology in industry through webinars and workshops organized by Force Forum, Department of Civil Engineering, Presidency University. Also, third and final year students are taken on Industrial Visits to broaden their horizon and bridge the gap between industry and academia. Students also have the option of pursuing internship or university project in their third and final year to make the most of learning opportunities available to them.

7. Dr. Vasant Matsagar suggested that topics should not be included in pre-requisites, instead only course names should be listed.

Resolution SOE-CIV 12.5.7: The suggestion was brought to the notice of Dean Academics who discoursed that faculty could test the students on these topics to determine eligibility to take the course, if necessary.

Agenda SOE-CIV 12.6: Discussion on the feedback obtained from Industry, students, faculty members and alumni on the proposed CBCS Course grid

Resolution SOE-CIV 12.6: The feedback questionnaires which were shared to the stake holders, its responses, recommendations and action taken on recommendations was presented by the member secretary as listed in Annexure 6. The committee has appreciated the motive of the exercise. It was suggested to include a text box for the questionnaires in the event the stakeholder wanted to provide additional comments or justification. The committee also opined that the feasible suggestions from stakeholders should be utilized to update the curriculum at the earliest.

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Agenda SOE-CIV 12.7: Any other matter with the permission of the Chair.

1. To ratify the proposal of transfer of credits for Aptitude Training of 3 credits and Coding Training of 2 credits for the 2018 admitted students in lieu of the 5 credits course of Professional Practice 1 (Annexure 7)

Resolution SOE-CIV 12.7.1: The member secretary presented the course handouts of Aptitude Training course of 3 credits and Coding Training course of 2 credits (Annexure 7) for the 2018 admitted students in lieu of PP-1 and the proposal to transfer credits was approved by the committee members.

2. To ratify the proposal of allowing the 2019 admitted students to register for the 'SMART MANAGERS' Certificate program offered by AIU- CII for partial transfer of credit (1 credit) in lieu of the 5 credits course of Professional Practice-I (Annexure 8)

Resolution SOE-CIV 12.7.2: The course handout for the "SMART MANAGERS' Certificate programs offered by AIU- CII for 1 credit, and Soft skill course, Aptitude & Coding training course for 4 credits in lieu of PP-1 for 2019 admitted students was presented by the member secretary and the same was ratified by the committee. This is presented in Annexure 8.

3. To ratify the course contents of 2019-2020 & 2020-2021 academic year courses of various programs and semesters as approved by the BOS chairpersons based on the approval of the respective Departmental Academic Committees [DAC].

Resolution SOE-CIV 12.7.3: The course contents/ course handouts for the Academic Year 2019-2020 & 2020-2021 were approved.

4. To approve EdX courses as a substitute for Open Elective course for 2018 admitted students (Annexure 9)

Resolution SOE-CIV 12.7.4: EdX courses, shown in Annexure 9, was proposed as a substitute for one 3 credit open elective course for 2018 admitted students, which could be availed in the seventh semester of their B.Tech Program. It was approved by the committee as presented.

5. To approve the list of External examiners (Annexure 10)

Resolution SOE-CIV 12.7.5: The list of external examiners of Civil Department was presented to the BOS committee, as shown in Annexure 10. Committee approved the list but opined that criterion has to be set for selection and approval of external examiners. The committee has authorized BoS chairperson to append examiners on need basis.

6. To approve Value Added Courses offered by Civil Department (Annexure 11)

Resolution SOE-CIV 12.7.6: The list of Value-Added Courses offered by the department, including ratification of 5 new courses offered in Summer Term of Academic Year 2020-21, was presented to the committee (Annexure 11). The external experts appreciated the efforts of faculty and university for offering these courses to students and approved it.

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The BoS Committee has authorized the chairperson of the BoS for Civil Engineering to incorporate minor corrections / edits, if required, wherever necessary.

The BOS Chairperson has assured that the decisions taken during the 12th BoS meeting for Civil Engineering will be implemented as early as possible and will be conveyed to all stakeholders. The Chairperson and member secretary expressed special thanks to all the members and requested to extend the same support for future activities.

Sl. No.	Name	Position	Signature
1.	Dr. Abdul Sharief	Chairperson	
2.	Dr. S. B. Anadinni	Member	
3.	Dr. Jagdish H Godihal	Member	
4.	Dr. Vasant Matsagar	External Member (Academic)	
5.	Dr. G R Dodagoudar	External Member (Academic)	
6.	Mrs. Sangeeta Chachadi	External Member (Industry)	
7.	Dr. Nakul Ramanna	Member Secretary	

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Feedback from B.Tech Students and action taken report

Sl. No.	Feedback	Action Taken
1	Should have more outdoor real life activities related to Civil Engineering. More industrial visits be organized.	Separate slots have been assigned for active learning classes on Saturday to accommodate field based activities and practical sessions to link theory with lab. Few Industrial visits are also planned to have better exposure.
2	Introduce more civil engineering related application software in curriculum	Value added Programs on civil engineering related application software are planned to be organized.

Feedback from Faculty Members on B.Tech Program and action taken report

Sl. No.	Feedback	Action Taken
1	More lab based or lab integrated courses can be introduced. This will enable students to get experiential learning and also help them to get trained in different software programs for civil engineering applications.	Lab Integrated Theory courses are being introduced and offered in Building Information Modelling, Construction Projection Management, Remote Sensing and GIS, Computer Aided Analysis and Detailing; Earthquake resistant Design of Structures have been introduced where relevant software is being taught to students.
2	Focus should be on Experiential Learning. Assessment should cover Self learning topics. VAC - Skill based courses / Certification courses / Workshops should be introduced that will prepare students for industry. IELTS and GATE coaching should be introduced to motivate young minds. More industrial visits should be arranged and interaction with industry leaders should be facilitated.	To enable experiential learning and provide more site visits, courses are being designed to incorporate at least one site visit relevant to the course and students are being given an assessment activity based on the site visit as well. Efforts will be made to offer VAC courses in association with Industry partners. VAC course on IELTS is being offered by English department. Fast Learners are being motivated and guided for GATE. Efforts will be made to provide full-fledged GATE coaching classes on weekends.

Feedback from Employer on B.Tech students and action taken report

Sl. No.	Feedback	Action Taken

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1	The curriculum should be made more on the financial aspect of engineering which focuses more on cost management, financial management and project finance appraisal.	A new course on Financing Infrastructure Projects is Introduced. Efforts are being made to emphasize to students the aspect of economy, cost and pricing while teaching courses on Construction materials, design and construction. Students are also being given market survey assignments to understand the cost aspect.
2	Out of 4 years, 2 years course should be in general and next 2 years students should be given training depending on their interest e.g., Design, execution, management.	30 credits worth of Discipline elective electives and 12 credits worth of Open electives are available in the curriculum enabling students to get trained in courses of their interest.

Feedback from Alumni and action taken report

Sl. No.	Feedback	Action Taken
1	General construction related topics could help in field.	Courses on Construction Technology and Process, Construction Equipment and Machinery as well as a Course on Concept of Building services are introduced.
2	Learning about more Industry relevant skills/ Software	Lab Integrated Theory courses are being offered in Building Information Modelling, Construction Projection Management, Remote Sensing and GIS, Computer Aided Analysis and Detailing; Earthquake resistant Design of Structures have been introduced where relevant software is being taught to students.
3	In terms of Survey our curriculum was needs to be updated to include latest methods of surveying.	The syllabus has been updated to include a module on Drone surveying (PPK Based) as well as experiments on Total Station in place of theodolite and tacheometer-based surveying exercise.

Pursuant to feedback received from stakeholders, new courses have been added to curriculum as shown in Annexure 12.6.1 and revised courses are shown in Annexure 12.6.2

Feedback from M.Tech Students and action taken report

Sl. No.	Feedback	Action Taken

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1	Introduce information related to current Industry requirements and practices in classes. Introduce more content related to real life application.	Every semester Guest lectures, Invited talks and workshops are being organized to expose students and faculty to latest developments in the industry. Students as well as faculty are supported and encouraged to participate in National and International conferences, workshops Industry expos and symposium

Feedback from Faculty Members on M.Tech program and action taken report

Sl. No.	Feedback	Action Taken
1	More skill-based courses must be introduced to increase the employability of the students as well as to extract the full potential of faculty. We can focus on the current application in the industry and try to focus on those topics more in class rather than following the traditional approach for example we can use simple tools such R, Microsoft excel, simple programs, analysis software as replacement of manual solving. It might interest the students and help them to get better placement.	Value added courses are being offered to increase the skill of students. Faculty are being encouraged to give assignments based on programming as well as problem solving based on use of other tools like excel and R.

Feedback from Employer on M.Tech students and action taken report

Sl. No.	Feedback	Action Taken
1	Practical sessions to be implemented with theory knowledge	Theory Courses are being revised into lab integrated theory courses to give practical sessions along with theory knowledge
2	Provide more site visits	To enable experiential learning and provide more site visits, courses are being designed to incorporate at least one site visit relevant to the course and students are being given an assessment activity based on the site visit as well.

Feedback from Alumni and action taken report

Sl. No.	Feedback	Action Taken
1	General construction related topics could help in field.	Courses on Construction Technology and Process, Construction Equipment and Machinery as well as a Course on Concept of Building services are introduced.

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2	Learning about more Industry relevant skills/ Software	Lab Integrated Theory courses are being offered in Building Information Modelling, Construction Projection Management, Remote Sensing and GIS, Computer Aided Analysis and Detailing; Earthquake resistant Design of Structures have been introduced where relevant software is being taught to students.
3	In terms of Survey our curriculum was needs to be updated to include latest methods of surveying.	The syllabus has been updated to include a module on Drone surveying (PPK Based) as well as experiments on Total Station in place of theodolite and tacheometer based surveying exercise.

Pursuant to feedback received from stakeholders, new courses have been added to curriculum as shown in Annexure 12.6.1 and revised courses are shown in Annexure 12.6.2

Annexure 12.6.1 – List of New Courses

NEWLY PROPOSED COURSES FOR B.TECH (CIVIL ENGINEERING)					
S. No.	**COURSE CODE**	**COURSE NAME**	**L**	**P**	**C**
1	CIV 2013	Analysis of Determinate Structures	4	0	4
2	CIV 3002	Analysis of Indeterminate Structures	4	0	4
3	CIV 2001	Sustainability Concepts in Engineering	3	0	3
4	CIV 2004	Integrated Project Management	3	0	3
5	CIV 2044	Geospatial Applications for Engineers	2	2	3
6	CIV 3045	Big Data Analytics for Civil Engineers	3	0	3
7	CIV 3032	Design of Hydraulic Structures	3	0	3
8	CIV 2022	Railway Engineering and Tunnelling	3	0	3
9	CIV 2023	Airport Engineering and Harbour	3	0	3
10	CIV 3025	Environmental Geotechnics	3	0	3
11	CIV 3005	Computer Aided Analysis & Detailing Lab	0	2	1
12	CIV 2012	Building Information Modelling	1	4	3
13	CIV 1004	Basic Construction Practice	0	2	1
14	CIV 1003	Elements of Engineering Mechanics	3	0	3
15	CIV 2016	Transportation Engineering	3	0	3
16	CIV 2046	Construction Technology and Processes	3	0	3

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NEWLY PROPOSED COURSES FOR B.TECH (CIVIL ENGINEERING)					
S. No.	**COURSE CODE**	**COURSE NAME**	**L**	**P**	**C**
17	CIV 1007	Building Planning and Drawing	0	2	1
18	CIV 1001	Disaster management and mitigation	3	0	3
19	CIV 2041	Fundamentals of Smart City	3	0	3
20	CIV 3047	Fundamentals of Pre-stressed Concrete Structures	3	0	3
21	CIV 2011	Environmental Engineering	2	2	3
22	CIV 2010	Hydrology and Irrigation Systems	3	0	3

NEW COURSES FOR M.TECH (BUILDING CONSTRUCTION TECHNOLOGY)					
S. No.	**COURSE CODE**	**COURSE NAME**	**L**	**P**	**C**
1	CIV 363	Applications of Remote Sensing and GIS in Construction	3	0	3
2	CIV 307	Elements of Prestressed Concrete Structures	3	0	3
3	CIV 6004	Retrofitting and Repair Techniques	3	0	3
4	CIV 6005	Formwork and Scaffolding Design	3	0	3
5	CIV 5010	Building Automation and 3D Printing	3	0	3
6	CIV 6007	Seismic analysis and Design of Buildings	3	0	3
7	CIV 5001	Sustainable Smart Cities	3	0	3
8	CIV 5002	Systems Design for Sustainability	3	0	3
9	PIP 6001	Dissertation/ Internship - I	-	-	10
10	PIP 6002	Dissertation/ Internship - II	-	-	14
11	CIV 6002	Building Services and Building Information Modelling	2	2	3
12	URE 6001	Research Experience	-	-	3

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12.6.2 - List of Revised Courses

REVISED COURSES FOR B.TECH (CIVIL ENGINEERING)					
S. No.	**COURSE CODE**	**COURSE NAME**	L	P	C
1	CIV 201	Strength of Materials	4	0	4
2	CIV 202	Surveying	4	0	4
3	CIV 203	Engineering Geology	3	0	3
4	CIV 208	Fluid Mechanics	4	0	4
5	CIV 219	Building Materials and Concrete Technology	3	0	3
6	CIV 252	Surveying Practice	0	2	1
7	CIV 210	Geotechnical Engineering	4	0	4
8	CIV 253	Engineering Geology Lab	0	2	1
9	CIV 254	Fluid Mechanics Lab	0	2	1
10	CIV 211	Design of RC Structural Elements	4	0	4
11	CIV 213	Design of Structural Steel Elements	4	0	4
12	CIV 215	Estimating, Costing and Valuation	4	0	4
13	CIV 381	Construction Project Management	3	0	3
14	CIV 384	Occupational Health and Safety	3	0	3

REVISED COURSES FOR M.TECH (BUILDING CONSTRUCTION TECHNOLOGY)					
S. No.		**COURSE NAME**	**L**	**P**	**C**
1	CIV 351	Advanced Construction Materials and Technology	4	0	4
2	CIV 352	Quality, Risk and Safety in Construction	4	0	4
3	CIV 353	Construction Planning, Schedule and Control	4	0	4
4	CIV 354	Mechanization in Construction	3	0	3
5	CIV 511	Material Characterization Lab	0	2	1
6	CIV 355	Construction Economics and Contract Specifications	3	1	4
7	CIV 357	Advanced Design of RC Structures	3	1	4

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8	CIV 358	Construction Demolition and Waste Management	4	0	4
9	CIV363	Applications of Remote Sensing and GIS in Construction	2	2	3

The syllabus of the new courses and revised courses as approved by the Board of Studies is included in the relevant PRCs

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Ref: PU-SOE-CIVIL/2022-2023/BOS-14/CIR01 Date: 27-07-2022

14th BOS MEETING NOTICE

14th Meeting of the Board of Studies of the Department of Civil Engineering, Presidency University - School of Engineering, is convened on Saturday, **30th July, 2022, at 10.00 AM** hosted online from Presidency University Campus, Itgalpur, Rajankunte, Yelahanka, Bengaluru.

Kindly make it convenient to attend the meeting. The meeting link is provided below: https://teams.microsoft.com/l/meetup-join/19%3ameeting_ZWU5MjE3OTMtNDllMy00MTJiLTgwYzUtYjEwYmM0YmMzY2Y5%40thread.v2/0?context=%7b%22Tid%22%3a%22bf93bb5e-ecf0-4e3d-be0e-79b5cc527a48%22%2c%22Oid%22%3a%22177f2350-cb47-4e86-94da-5f92a58f7d88%22%7d

AGENDA

Agenda SOE-CIVIL 14.1	Approval of the MOM and ATR of the 13th Board of Studies meeting held on 30th December 2021
Agenda SOE-CIVIL 14.2	Deliberation and approval of the Program Regulations & Curriculum [PRC] for 2019 admitted students Annexure CIV 14.2
Agenda SOE-CIVIL 14.3	Deliberation and approval of the Program Regulations & Curriculum [PRC] for 2020 admitted students Annexure CIV 14.3
Agenda SOE-CIVIL 14.4	Deliberation and approval of CBCS course grid, Credit Structure and Curriculum for 2021 admitted students Annexure CIV 14.4
Agenda SOE-CIVIL 14.5	Deliberation and approval of CBCS course grid, Credit Structure and Curriculum for 2022 admitted students Annexure CIV 14.5
Agenda SOE-CIVIL 14.6	Discussion on Feedback obtained from Students, Alumni, Faculty Members, and Industry Experts on the Curriculum. Annexure CIV 14.6
Agenda SOE-CIVIL 14.7	Deliberation and approval of new courses Annexure CIV 14.7
Agenda SOE-CIVIL 14.8	Deliberation and approval of syllabus revision in courses affected based on stakeholder feedback Annexure CIV 14.8

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Agenda SOE-CIVIL 14.9	Approval of NPTEL / MOOC course list for DE / OE credit transfer Annexure CIV 14.9
Agenda SOE-CIVIL 14.10	Approval of the list of Examiners Annexure CIV 14.10
Agenda SOE-CIVIL 14.11	Ratify the list of Value Added Courses offered by the Department of Civil Engineering Annexure CIV 14.11
Agenda SOE-CIVIL 14.12	Ratify Course Handouts of the courses offered in the AY 2021-2022 approved by the Department Academic Committee Annexure CIV 14.12
Agenda SOE-CIVIL 14.13	Any other matter with the permission of the Chair

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To,
Members & Invitees

Sl. No.	Name	Designation with Affiliation	Position
1.	Dr. Abdul Sharief	Dean, School of Engineering, Presidency University	Chairperson
2.	Dr. S. B. Anadinni	Professor, Department of Civil Engineering, and Associate Dean (Core Branches), School of Engineering, Presidency University	Member
3.	Dr. Jagdish H Godihal	Professor, Department of Civil Engineering, and Deputy Dean (Academic Research), School of Engineering, Presidency University	Member
4.	Dr.Vasant Matsagar	Dogra Chair Professor, Department of Civil Engineering, Indian Institute of Technology, Delhi	External Member (Academic)
5.	Dr. G. R. Dodagoudar	Professor, Department of Civil Engineering, Indian Institute of Technology, Madras	External Member (Academic)
6.	Mrs. Sangeetha Chachadi	General Manager, Design & Engineering - Structures, Sobha Ltd.	External Member (Industry)
7.	Dr. Nakul Ramanna	Professor and Head, Department of Civil Engineering, School of Engineering, Presidency University	Member Secretary
8.	Dr. Shilpa Mehta	Dean Academics and Associate Dean - Office of Chancellor, Presidency University	Special Invitee
9.	Mr. N. Gopalakrishnan	Assistant Professor, Department of Civil Engineering, and Academic Coordinator, School of Engineering, Presidency University	Special Invitee

Permanent Invitees

Shri. Nissar Ahmed, Hon'ble Chancellor, Presidency University
Shri. Salman Ahmed, Vice President, Presidency University
Dr. D. Subhakar, Vice Chancellor, Presidency University
Dr. Surendra Kumar A M, Pro Vice Chancellor - Academics and Examination, Presidency University
Dr. Nakka Thrivikrama Rao, Pro Vice Chancellor - SOE, Presidency University

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Member Secretary **Chairperson**

SCHOOL OF ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

Ref: PU-SOE-CIVIL/2022-2023/BOS-14/MOM01 Date: 30-07-2022

Minutes of the 14th Meeting of Board of Studies of Civil Engineering

The 14th meeting of the Board of Studies of Department of Civil Engineering, School of Engineering was held virtually on 30th July, 2022 from 10 am. It was hosted on Microsoft Teams platform from Presidency University, Itgalpur, Rajanukunte, Yelahanka, Bengaluru.

The following members were present:

Sl. No.	Name	Designation with Affiliation	Position
1.	Dr. Abdul Sharief	Dean, School of Engineering, Presidency University	Chairperson
2.	Dr. S. B Anadinni	Professor, Department of Civil Engineering, and Associate Dean (Core Branches), School of Engineering, Presidency University	Member
3.	Dr. Jagdish H Godihal	Professor, Department of Civil Engineering, and Deputy Dean (Academic Research), School of Engineering, Presidency University	Member
4.	Dr.Vasant Matsagar	Dogra Chair Professor, Department of Civil Engineering, Indian Institute of Technology, Delhi	External Member (Academic)
5.	Dr. G R Dodagoudar	Professor, Department of Civil Engineering, Indian Institute of Technology, Madras	External Member (Academic)
6.	Mrs. Sangeeta Chachadi	General Manager, Design & Engineering - Structures, Sobha Ltd.	External Member (Industry)
7.	Dr. Nakul Ramanna	Professor and Head, Department of Civil Engineering, School of Engineering, Presidency University	Member Secretary
8.	Dr. Shilpa Mehta	Dean Academics and Associate Dean - Office of Chancellor, Presidency University	Special Invitee
9.	Mr. Gopalakrishnan N	Assistant Professor, Department of Civil Engineering, and Academic Coordinator, School of Engineering, Presidency University	Special Invitee

The member secretary extended a warm welcome to the members and introduced all the members in the committee. The chairperson of 14th BoS meeting, Dr Abdul Sharief delivered the opening remarks by requesting BoS members to deliberate on each agenda and to provide constructive suggestions for the effective implementation of the curriculum.

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With the permission of chairperson, the member secretary presented the following agenda points and deliberations were recorded.

Agenda SOE-CIV 14.1: Approval of the MOM and ATR of the 13th Board of Studies meeting held on 30th December 2021

Resolution SOE-CIV 14.1: The Minutes of 13th BoS meeting held on 30th December 2021 and its Action Taken Report (ATR) was discussed and approved by the members.

Agenda SOE-CIV 14.2: Deliberation and approval of the Program Regulations & Curriculum [PRC] for 2019 admitted students

Resolution SOE-CIV 14.2: The member secretary presented the Program Regulations & Curriculum [PRC] for the 2019 admitted students of B. Tech. (Civil Engineering) [Annexure 14.2]. The member secretary explained that there were no changes proposed in the curriculum. The Program regulations and Curriculum for the 2019 admitted students was duly approved.

Agenda SOE-CIV 14.3: Deliberation and approval of the Program Regulations & Curriculum [PRC] for 2020 admitted students

Resolution SOE-CIV 14.3: The member secretary presented the Program Regulations & Curriculum [PRC] for the 2020 admitted students of B. Tech. (Civil Engineering) [Annexure 14.3]. The changes in the Curriculum were highlighted by the Member secretary and the committee deliberated on the same. The Program regulations and Curriculum for the 2020 admitted students was approved after due deliberations.

Agenda SOE-CIV 14.4: Deliberation and approval of CBCS course grid, Credit Structure and Curriculum for 2021 admitted students

Resolution SOE-CIV 14.4: The member secretary presented the Course grid, Credit Structure and Curriculum for 2021 admitted students of B. Tech. (Civil Engineering) and M. Tech. (Building Construction Technology) [Annexure 14.4.1 and 14.4.2]. The member secretary explained that there were no changes proposed in the curriculum of M. Tech. (Building Construction Technology) and went on to highlight the changes in the grid and Curriculum for B. Tech. (Civil Engineering). The course catalogue of the Program Core course for B. Tech. (Civil Engineering) titled "Construction Technology and Processes" was presented for ratification. The members ratified the course catalogue after reviewing the same. The Member secretary and the committee deliberated on the course grid and Curriculum for the 2021 admitted students of B. Tech. (Civil Engineering) and M. Tech. (Building Construction Technology) and approved the same.

Agenda SOE-CIV 14.5: Deliberation and approval of CBCS course grid, Credit Structure and Curriculum for 2022 admitted students

Resolution SOE-CIV 14.5: The member secretary presented the proposed Course grid, Credit Structure and Curriculum for the 2022 admitted students of B. Tech. (Civil Engineering) and M. Tech. (Building Construction Technology) [Annexure 14.5.1 and 14.5.2]. The member secretary highlighted the variations in the grid and Curriculum structure for 2022 admitted students of B. Tech. (Civil Engineering) as compared to the curriculum structure of 2021 admitted students of B. Tech. (Civil Engineering). The member secretary informed the committee that two new courses titled

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Engineering Graphics and Basic Engineering Sciences were being proposed to be added to the School Core courses which are common to all programs of B. Tech explaining the rationale behind the proposal. The proposal to introduce a course on chemistry titled "Applied Chemistry" to the list of Program Core courses of B. Tech. (Civil Engineering) was also presented. The member secretary also explained that the course grid and curriculum structure of M. Tech. (Building Construction Technology) for 2022 admitted students was the same as that of 2021 admitted students and no changes were being affected. He also added that the stakeholder feedback for M. Tech. did not recommend any major changes/ revisions. The Member secretary and the committee deliberated on the course grid and Curriculum for the 2022 admitted students of B. Tech. (Civil Engineering) and M. Tech. (Building Construction Technology) and approved the same.

Agenda SOE-CIV 14.6: Discussion on Feedback obtained from Students, Alumni, Faculty Members, and Industry Experts on the Curriculum

Resolution SOE-CIV 14.6: The feedback questionnaires shared to the stakeholders along with responses and recommendations received as well as the action taken on specific recommendations were presented by the member secretary as listed in Annexure 14.6. The committee appreciated the motive of the exercise. The committee opined that the feasible suggestions from stakeholders should be utilized to update the curriculum at the earliest.

Agenda SOE-CIV 14.7: Deliberation and approval of new courses

Resolution SOE-CIV 14.7: The member secretary presented the list of newly proposed courses as presented in Annexure 14.7. The member secretary presented the course catalogue of the newly proposed school core course titled "Basic Engineering Sciences" which was being offered as a common core course to all B. Tech. programs of engineering. The member secretary also presented the catalogues of the newly proposed elective courses and stated that new elective courses were being proposed based on feedback from stakeholders. The member secretary further went on to elaborate that the new courses aimed to incorporate recent trends in industry into the curriculum and were intended to enhance the employability of graduates. The committee approved the new courses after reviewing their course catalogues along with a few suggestions. Dr. G R Dodagoudar suggested to change the title of the course "Financing Infrastructure Projects" to "Infrastructure Projects Financing". The suggestion was accepted and the course title has been changed as suggested.

Agenda SOE-CIV 14.8: Deliberation and approval of syllabus revision in courses affected based on stakeholder feedback

Resolution SOE-CIV 14.8: The member secretary presented the list of courses proposed for revision as presented in Annexure 14.8. The member secretary stated that the revisions were being affected based on feedback from stakeholders. The member secretary further went on to elaborate that the revisions aimed to incorporate latest developments in the relevant courses as well as to make the courses more complete. The old and new course catalogues of the revised courses were presented to explain the changes affected. The committee approved the revision in syllabus after reviewing the changes in content.

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Agenda SOE-CIV 14.9: Approval of NPTEL / MOOC course list for DE / OE credit transfer

Resolution SOE-CIV 14.9: The list of NPTEL courses proposed for transfer of Credits for Discipline Elective and Open Elective were presented by the member secretary as listed in Annexure 14.9. The committee suggested the member secretary to educate the students on the list of courses being proposed for transfer of credits. The committee approved the list of NPTEL courses proposed for transfer of credits after due deliberation.

Agenda SOE-CIV 14.10: Approval of the list of Examiners

Resolution SOE-CIV 14.10: The list of Internal and External Examiners were presented by the member secretary as listed in Annexure 14.10. The committee approved the same.

Agenda SOE-CIV 14.11: Ratify the list of Value Added Courses offered by the Department of Civil Engineering

Resolution SOE-CIV 14.11: The list of Value Added Courses being offered currently by the Department of Civil Engineering in the current summer semester was presented by the member secretary as listed in Annexure 14.11 for ratification by the committee. The committee ratified the same.

Agenda SOE-CIV 14.12: Ratify Course Handouts of the courses offered in the AY 2021-2022 approved by the Department Academic Committee

Resolution SOE-CIV 14.12: The Course Handouts of courses offered in Academic Year 2021-22 which were approved by the Departmental Academic Committee were presented for ratification by the member secretary. The committee ratified the same. The list of course handouts ratified are presented in Annexure 14.12.

Agenda SOE-CIV 14.13: Any other matter with the permission of the Chair.

1. Ms. Sangeetha Chachadi, External Member from Industry, opined that mentors from industry should be utilized to train the students on best practices in the industry, environmental approval process and to better prepare them for employment opportunities.

Resolution SOE-CIV 14.13.1: The member secretary explained that during internship efforts are made establish coordination between faculty guide and the industry supervisor to enable comprehensive training. The supervisor is also invited to be part of evaluation to assess student's learning and development. Member secretary also sought Ms. Sangeetha Chachadi's assistance to identify more industry partners and mentors to provide internship opportunities and facilitate training.

2. Ms. Sangeetha Chachadi, External Member from Industry, enquired about the measures being taken to make the course content and virtual classes accessible to all including the differently abled. It was also suggested to enable close captions and live transcript feature in webinars, and guest lectures.

Resolution SOE-CIV 14.13.2: The member secretary explained that close captions and live transcript feature are enabled by default on our Microsoft Teams and Zoom platform for participants benefit. Further, the recorded sessions are also shared through our learning

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management system Edhitch and Teams to enable participants to learn at their own pace. Efforts will also be made to announce the availability of close captions and live transcript feature during the beginning of the session as well.

3. Dr. G R Dodagoudar, External Member from Academia, emphasized that Python programming language should be taught in Numerical Methods for Engineers course as the skill is in much demand in the industry. It was also suggested to include programming based assignments in courses where applicable.

Resolution SOE-CIV 14.13.3: The member secretary assured that students will be exposed to Python in addition to Java, C and Matlab programs through various courses in the school core basket as these are in much demand in the industry. The committee was also informed that there it is a practice in School of Engineering to include programming based assignments in numerical courses, especially for higher semester students.

4. Ms. Sangeetha Chachadi, External Member from Industry, opined that training should be imparted to students on integrating Metaverse, BIM software, Construction sequence visualization using 3DS Max, Maya etc.

Resolution SOE-CIV 14.13.4: The member secretary informed that best efforts are being made to introduce students to current software through Value Added Courses offered by the Department of Civil Engineering including certification from the university upon successful completion of the course. FORCE Forum and Civil Engineering Department also conducts workshops in association with industry partners to give hands on experience in the latest software. Further, opportunities to collaborate with AR/VR lab, Computer Science Department, Presidency University, will be explored to enhance visualizing experience for the students.

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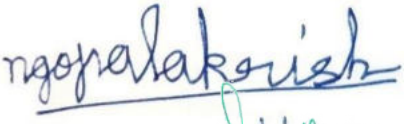
The BoS Committee has authorized the chairperson of the BoS for Civil Engineering to incorporate minor corrections / edits, if required, wherever necessary.

The BOS Chairperson has assured that the decisions taken during the 14th BoS meeting for Civil Engineering will be implemented as early as possible and will be conveyed to all stakeholders. The Chairperson and member secretary expressed special thanks to all the members and requested to extend the same support for future activities.

Sl. No.	Name	Position	Signature
1.	Dr. Abdul Sharief	Chairperson	
2.	Dr. S. B. Anadinni	Member	
3.	Dr. Jagdish H Godihal	Member	
4.	Dr. Vasant Matsagar	External Member (Academic)	
5.	Dr. G R Dodagoudar	External Member (Academic)	
6.	Mrs. Sangeeta Chachadi	External Member (Industry)	
7.	Dr. Nakul Ramanna	Member Secretary	
8.	Dr. Shilpa Mehta	Special Invitee	
9.	Mr. Gopalakrishnan N	Special Invitee	

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Annexure 14.6

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B.Tech STUDENT FEEDBACK ANALYSIS - (AY 2021-22)
DEPARTMENT OF CIVIL ENGINEERING

Criteria	5 - Excellent	4 - Very Good	3 - Good	2- Average	1- Poor	Total Respondents
1. How do you rate the syllabus of the courses that you have studied?	21.5	35.5	36.5	6	0.5	200
2. Course Applicability /relevance to real life situations (Employability)	21.5	30	38.5	7.5	2.5	
3. Learning value in terms of skills, concepts, knowledge and analytical abilities	21.5	32	37	7.5	2	
4. How do you rate the sequence of the Courses that you have studied in the previous semester?	20.5	29.5	40	9.5	0.5	
5. How do you rate the sequence of the units in the Course?	18.5	32	42.5	5.5	1.5	
6. How do you rate the offering of the electives in terms of their relevance to the specialization streams?	19.5	33.5	34	10	3	
7. How do you rate the relevance of the Text Books and reference books to the Courses?	20	29	36.5	11	3.5	
8. How do you rate the percentage of courses having LAB components?	24.5	31	30	11.5	3	
9. How do you rate the experiments in relation to the real life applications?	17.5	26	41.5	11.5	3.5	
10. How do you rate the allocation of the credits to the courses?	23	30.5	36.5	8	2	
Average	**20.8**	**30.9**	**37.3**	**8.8**	**2.2**	

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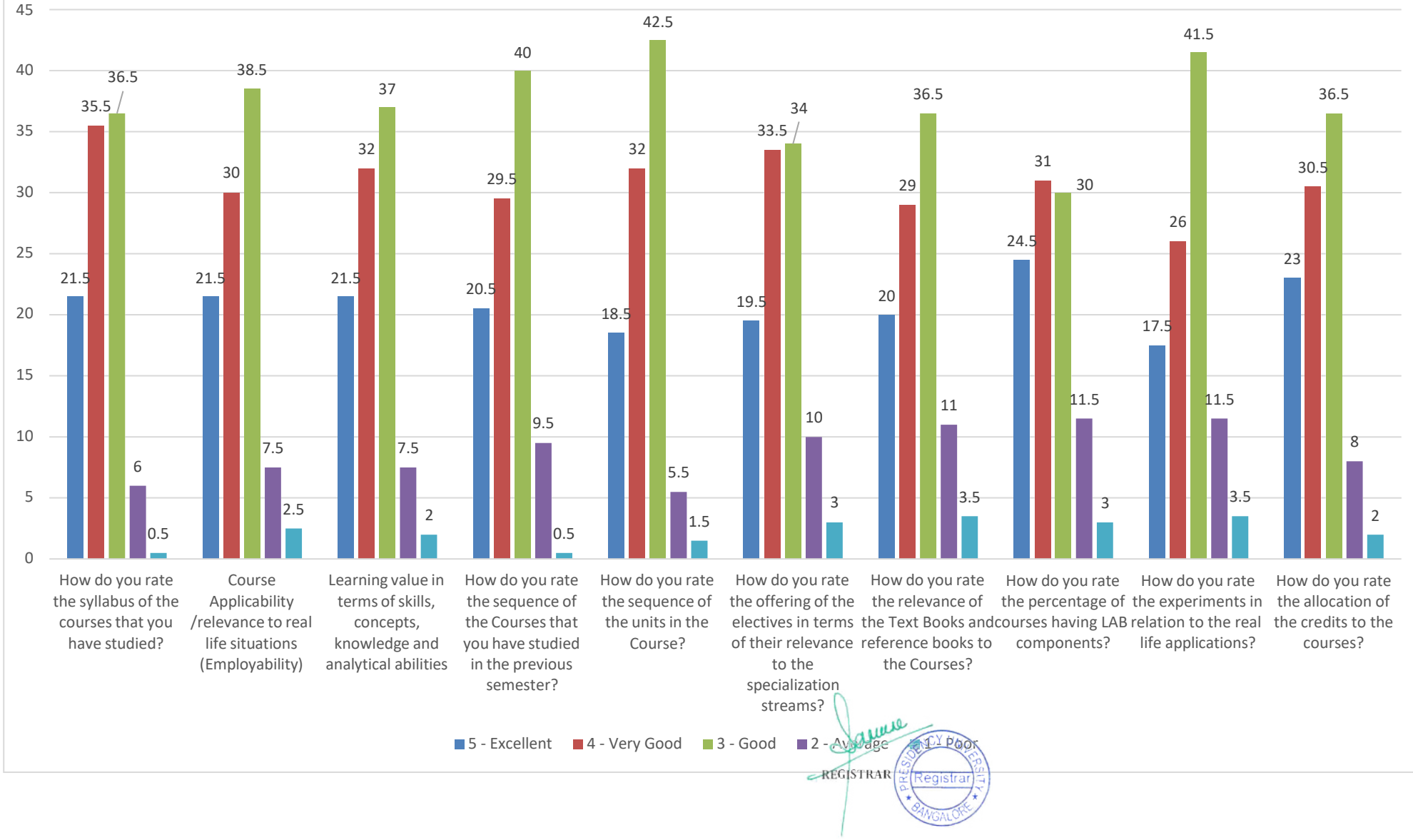
B.Tech STUDENT FEEDBACK ANALYSIS (AY 2021-22)



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M.Tech STUDENT FEEDBACK ANALYSIS - (AY 2021-22)
DEPARTMENT OF CIVIL ENGINEERING

Criteria	5 - Excellent	4 - Very Good	3 - Good	2- Average	1- Poor	Total Respondents
1. How do you rate the syllabus of the courses that you have studied?	30	40	20	10	0	
2. Course Applicability /relevance to real life situations (Employability)	30	40	20	10	0	
3. Learning value in terms of skills, concepts, knowledge and analytical abilities	30	50	0	20	0	
4. How do you rate the sequence of the Courses that you have studied in the previous semester?	30	40	20	10	0	
5. How do you rate the sequence of the units in the Course?	40	40	10	10	0	
6. How do you rate the offering of the electives in terms of their relevance to the specialization streams?	30	40	30	0	0	**10**
7. How do you rate the relevance of the Text Books and reference books to the Courses?	40	30	10	20	0	
8. How do you rate the percentage of courses having LAB components?	50	30	10	10	0	
9. How do you rate the experiments in relation to the real life applications?	30	30	20	20	0	
10. How do you rate the allocation of the credits to the courses?	30	40	30	0	0	
Average	**34**	**38**	**17**	**11**	**0**	

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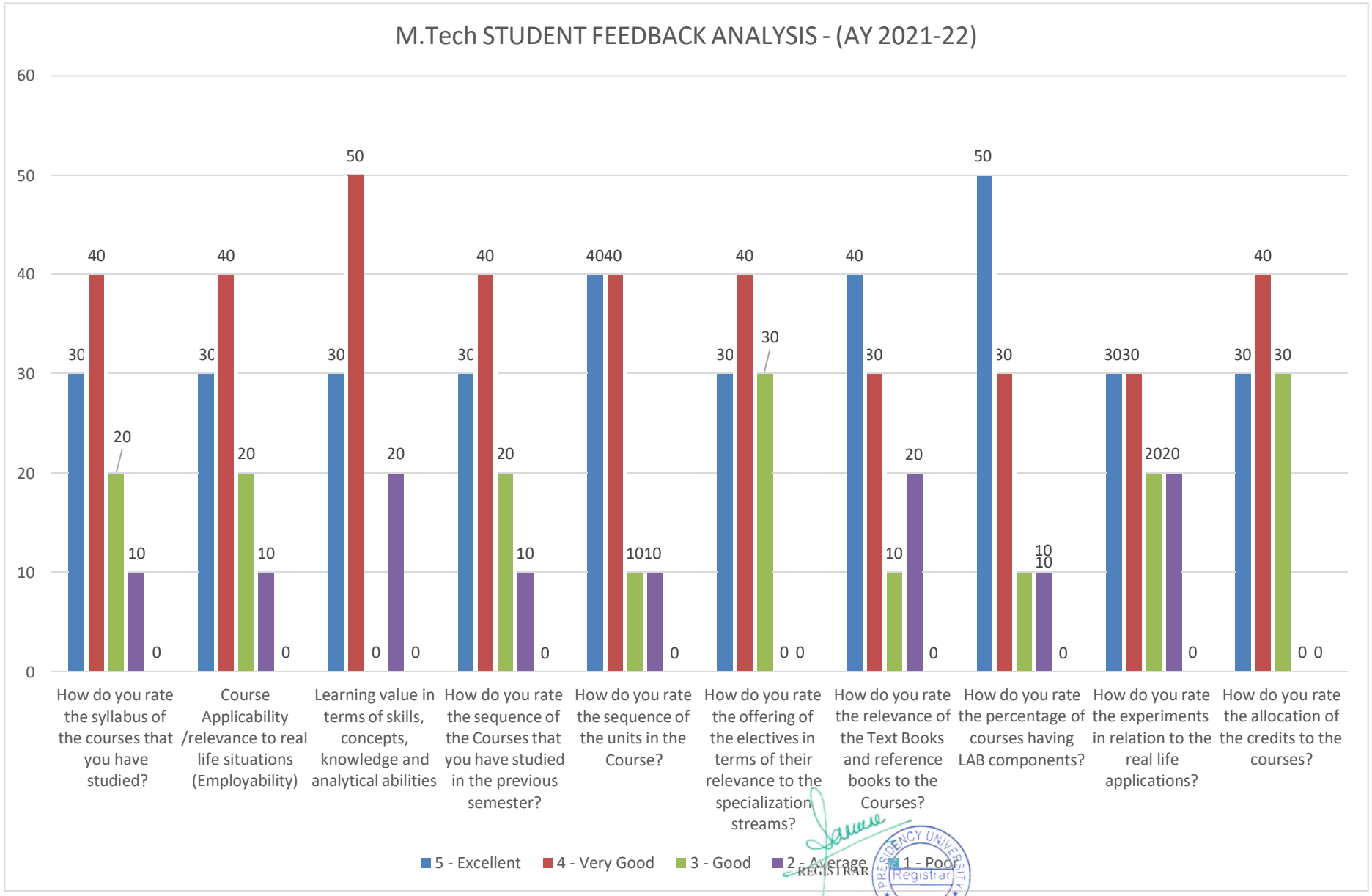

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Feedback from B.Tech Students and action taken report

Sl. No.	Feedback	Action Taken
1	Should have more outdoor real life activities related to Civil Engineering. More industrial visits be organized.	Separate slots have been assigned for active learning classes on Saturday to accommodate field based activities and practical sessions to link theory with lab. Few Industrial visits are also planned to have better exposure.
2	Introduce more civil engineering related application software in curriculum	Value added Programs on civil engineering related application software are planned to be organized.

Pursuant to feedback received from stakeholders, new courses have been added to curriculum as shown in Annexure 14.7 and revised courses are shown in Annexure 14.8.

Feedback from M.Tech Students and action taken report

Sl. No.	Feedback	Action Taken
1	Introduce information related to current Industry requirements and practices in classes. Introduce more content related to real life application.	Every semester Guest lectures, Invited talks and workshops are being organized to expose students and faculty to latest developments in the industry. Students as well as faculty are supported and encouraged to participate in National and International conferences, workshops Industry expos and symposium

Pursuant to feedback received from stakeholders, new courses have been added to curriculum as shown in Annexure 14.7 and revised courses are shown in Annexure 14.8.

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ALUMNI FEEDBACK ANALYSIS – B.Tech (2021-22)
DEPARTMENT OF CIVIL ENGINEERING

Criteria	5 - Excellent	4 - Very Good	3 - Good	2- Average	1- Poor	Total Respondents
1. Was the syllabus relevant to your course	30.0	41.7	16.7	8.3	3.3	
2. Was the syllabus updated enough	36.7	36.7	10.0	8.3	8.3	
3. Was the course content delivery interesting	38.3	41.7	11.7	8.3	0.0	
4. Did the course curriculum intellectually stimulate you	26.7	46.7	20.0	3.3	3.3	
5. Was the course curriculum fulfilling your expectations	28.3	45.0	11.7	10.0	5.0	
6. Have you learnt any skills in the due course of your study	28.3	50.0	13.3	1.7	6.7	
7. Does the syllabus create any interest to pursue post-graduation/research in the particular topic	30.0	38.3	15.0	10.0	6.7	**60**
8. How do you rate the course that you have learnt suiting the requirements of the industry	26.7	36.7	20.0	13.3	3.3	
9. How do you rate the learning experience in terms of their relevance to the real-life applications	21.7	40.0	21.7	11.7	5.0	
10. How do you rate the course that you have learnt in relation to your current job	21.7	30.0	28.3	10.0	10.0	
Average	**28.8**	**40.7**	**16.8**	**8.5**	**5.2**	

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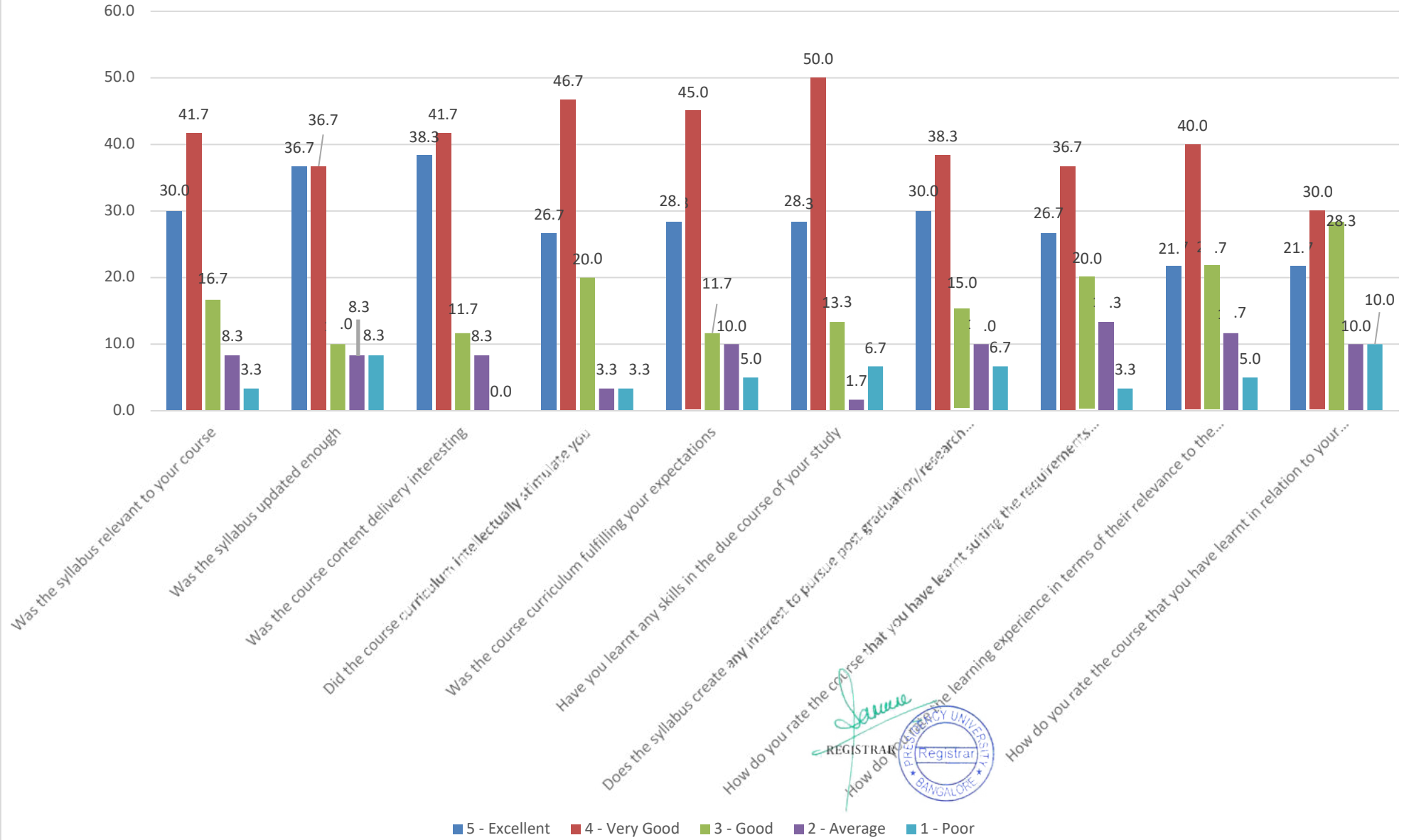
ALUMNI FEEDBACK ANALYSIS - B.Tech (2021-22) - DEPARTMENT OF CIVIL ENGINEERING



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ALUMNI FEEDBACK ANALYSIS – M.Tech (2021-22)
DEPARTMENT OF CIVIL ENGINEERING

Criteria	5 - Excellent	4 - Very Good	3 - Good	2- Average	1- Poor	Total Respondents
1. Was the syllabus relevant to your course	40	40	10	10	0	
2. Was the syllabus updated enough	50	30	10	10	0	
3. Was the course content delivery interesting	30	60	0	10	0	
4. Did the course curriculum intellectually stimulate you	30	50	10	10	0	
5. Was the course curriculum fulfilling your expectations	30	30	30	10	0	
6. Have you learnt any skills in the due course of your study	40	40	10	10	0	
7. Does the syllabus create any interest to pursue post-graduation/research in the particular topic	40	40	10	10	0	**10**
8. How do you rate the course that you have learnt suiting the requirements of the industry	30	40	30	0	0	
9. How do you rate the learning experience in terms of their relevance to the real-life applications	30	30	40	0	0	
10. How do you rate the course that you have learnt in relation to your current job	40	30	10	20	0	
Average	**36**	**39**	**16**	**9**	**0**	

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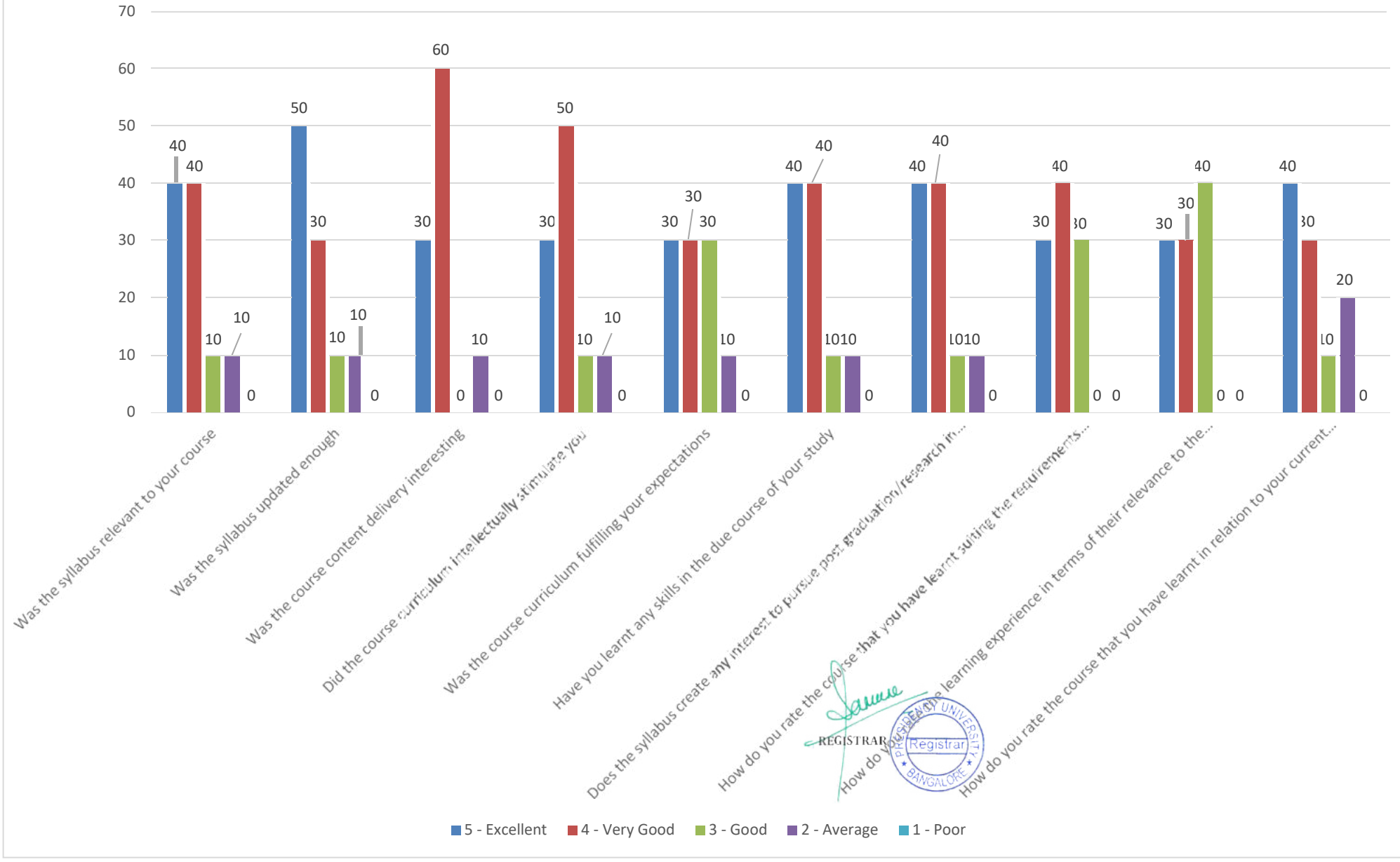
ALUMNI FEEDBACK ANALYSIS - M.Tech (2021-22) - DEPARTMENT OF CIVIL ENGINEERING



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Feedback from Alumni and action taken report

Sl. No.	Feedback	Action Taken
1	General construction related topics could help in field.	Courses on Construction Technology and Process, Construction Equipment and Machinery as well as a Course on Concept of Building services are introduced.
2	Learning about more Industry relevant skills/ Software	Lab Integrated Theory courses are being offered in Building Information Modelling, Construction Projection Management, Remote Sensing and GIS, Computer Aided Analysis and Detailing; Earthquake resistant Design of Structures have been introduced where relevant software is being taught to students.
3	In terms of Survey our curriculum was needs to be updated to include latest methods of surveying.	The syllabus has been updated to include a module on Drone surveying (PPK Based) as well as experiments on Total Station in place of theodolite and tacheometer based surveying exercise.

Pursuant to feedback received from stakeholders, new courses have been added to curriculum as shown in Annexure 14.7 and revised courses are shown in Annexure 14.8.

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EMPLOYERS FEEDBACK ANALYSIS (2021-22)
DEPARTMENT OF CIVIL ENGINEERING

Criteria	5 - Excellent	4 - Very Good	3 - Good	2- Average	1- Poor	Total Respondents
1. Adequacy of the Core Courses	46.2	15.4	38.5	0.0	0.0	
2. Practical Content in the Curriculum	38.5	30.8	7.7	23.1	0.0	
3. Fulfillment of Needs	38.5	30.8	15.4	15.4	0.0	
4. Clear idea about the purpose of the Course	46.2	30.8	7.7	7.7	7.7	
5. Curriculum proved useful at workplace	38.5	30.8	23.1	0.0	7.7	
6. Was the Curriculum followed by the Employee relevant to Employability	30.8	38.5	23.1	7.7	0.0	
7. Was the Curriculum helpful in improving Students performance with respect to general communication skills	46.2	15.4	30.8	7.7	0.0	**13**
8. Was the Curriculum helpful at improving Students performance with respect to their planning and organization skills	30.8	30.8	30.8	7.7	0.0	
9. Was the Curriculum helpful at improving Students performance with respect to developing practical solutions to work place problems	38.5	23.1	23.1	0.0	15.4	
10. Was the Curriculum helpful in building Entrepreneurial motives which helps the Students for starting their ventures	38.5	30.8	7.7	7.7	15.4	
Average	**39.2**	**27.7**	**20.8**	**7.7**	**4.6**	

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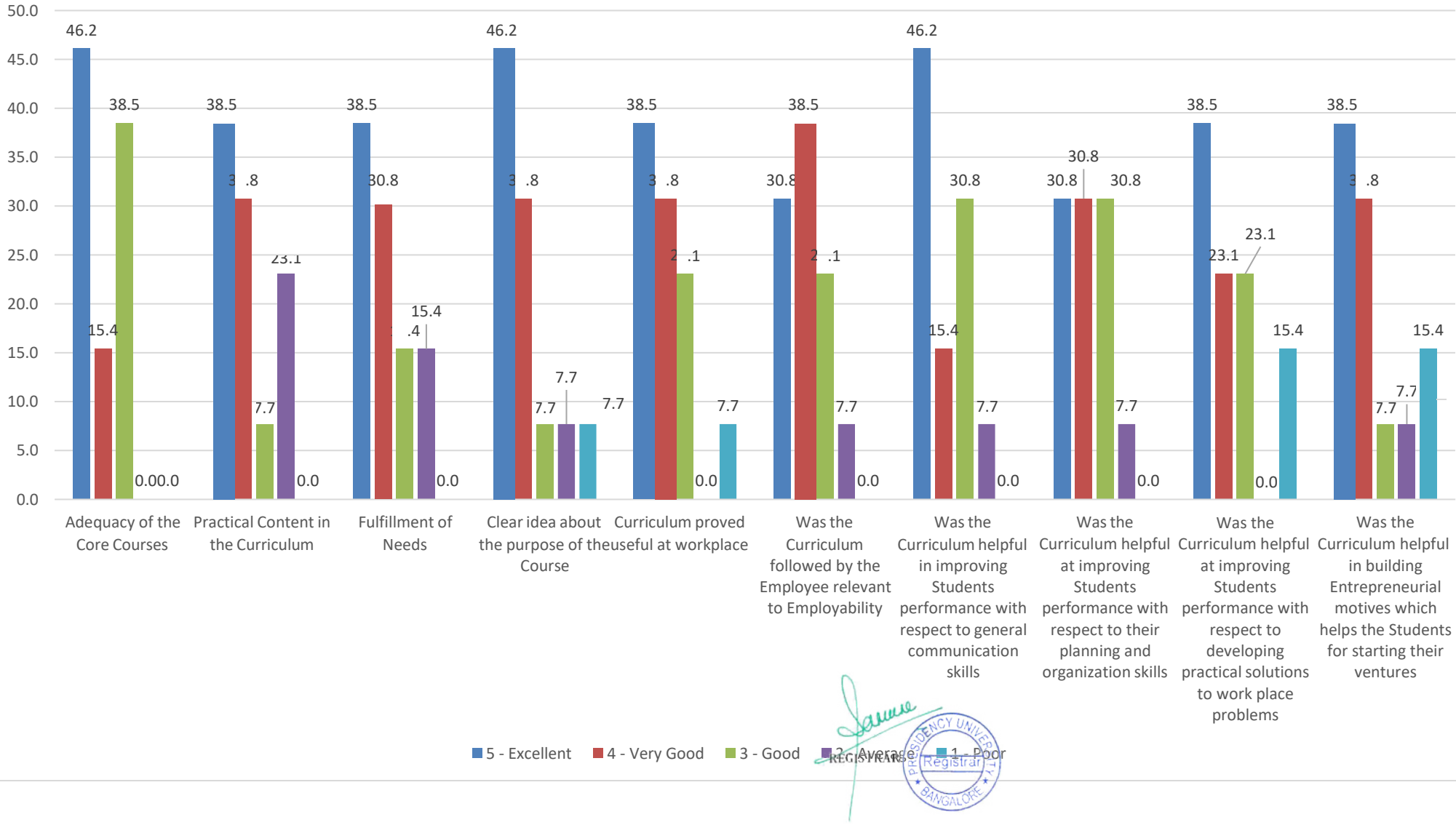
EMPLOYERS FEEDBACK ANALYSIS (2021-22)



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Feedback from Industry representatives and action taken report

Sl. No.	Feedback	Action Taken
1	The curriculum should be made more on the financial aspect of engineering which focuses more on cost management, financial management and project finance appraisal.	A new course on Financing Infrastructure Projects is Introduced. Efforts are being made to emphasize to students the aspect of economy, cost and pricing while teaching courses on Construction materials, design and construction. Students are also being given market survey assignments to understand the cost aspect.
2	Out of 4 years, 2 years course should be in general and next 2 years students should be given training depending on their interest e.g. Design, execution, management.	30 credits worth of Discipline elective electives and 12 credits worth of Open electives are available in the curriculum enabling students to get trained in courses of their interest.
3	Practical sessions to be implemented with theory knowledge	Theory Courses are being revised into lab integrated theory courses to give practical sessions along with theory knowledge
4	Provide more site visits	To enable experiential learning and provide more site visits, courses are being designed to incorporate at least one site visit relevant to the course and students are being given an assessment activity based on the site visit as well.

Pursuant to feedback received from stakeholders, new courses have been added to curriculum as shown in Annexure 14.7 and revised courses are shown in Annexure 14.8.

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FACULTY FEEDBACK ANALYSIS (2021-22)
DEPARTMENT OF CIVIL ENGINEERING

Criteria	5 - Excellent	4 - Very Good	3 - Good	2- Average	1- Poor	Total Respondents
1. Syllabus is suitable to the course	33.3	50.0	16.7	0.0	0.0	18
2. Syllabus is need based	27.8	61.1	11.1	0.0	0.0	
3. Aims and objectives of the syllabi are well defined and clear to teachers and students	44.4	44.4	5.6	5.6	0.0	
4. The courses / syllabus has good balance between theory and application	33.3	44.4	22.2	0.0	0.0	
5. The course / program of studies carries sufficient number of optional papers	50.0	33.3	16.7	0.0	0.0	
6. The books prescribed / listed as reference materials are relevant, updated and appropriate	61.1	33.3	5.6	0.0	0.0	
7. Tests and examinations are conducted well in time with proper coverage of all units in the syllabus	77.8	16.7	5.6	0.0	0.0	
8. I have the freedom to propose, modify, suggest and incorporate new topics in the syllabus	66.7	27.8	5.6	0.0	0.0	
9. I have the freedom to adopt new techniques/strategies of teaching such as seminar presentations, group discussions and learners participations	66.7	22.2	11.1	0.0	0.0	
10. The environment in the department is conducive to teaching and research	44.4	38.9	0.0	11.1	5.6	
Average	**50.6**	**37.2**	**10.0**	**1.7**	**0.6**	

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FACULTY FEEDBACK ANALYSIS (2021-22)
DEPARTMENT OF CIVIL ENGINEERING

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Feedback from Faculty Members and action taken report

Sl. No.	Feedback	Action Taken
1	More lab based or lab integrated courses can be introduced. This will enable students to get experiential learning and also help them to get trained in different software programs for civil engineering applications.	Lab Integrated Theory courses are being introduced and offered in Building Information Modelling, Construction Projection Management, Remote Sensing and GIS, Computer Aided Analysis and Detailing; Earthquake resistant Design of Structures have been introduced where relevant software is being taught to students.
2	More skill-based courses must be introduced to increase the employability of the students as well as to extract the full potential of faculty. We can focus on the current application in the industry and try to focus on those topics more in class rather than following the traditional approach for example we can use simple tools such R, Microsoft excel, simple programs, analysis software as replacement of manual solving. It might interest the students and help them to get better placement.	Value added courses are being offered to increase the skill of students. Faculty are being encouraged to give assignments based on programming as well as problem solving based on use of other tools like excel and R.
3	Focus should be on Experiential Learning. Assessment should cover Self learning topics. VAC - Skill based courses / Certification courses / Workshops should be introduced that will prepare students for industry. IELTS and GATE coaching should be introduced to motivate young minds. More industrial visits should be arranged and interaction with industry leaders should be facilitated.	To enable experiential learning and provide more site visits, courses are being designed to incorporate at least one site visit relevant to the course and students are being given an assessment activity based on the site visit as well. Efforts will be made to offer VAC courses in association with Industry partners. VAC course on IELTS is being offered by English department. Fast Learners are being motivated and guided for GATE. Efforts will be made to provide full fledged GATE coaching classes on weekends.

Pursuant to feedback received from stakeholders, new courses have been added to curriculum as shown in Annexure 14.7 and revised courses are shown in Annexure 14.8.

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Annexure 14.7 – List of New Courses

Based on feedback from stakeholders, the following new courses have been added to the curriculum for the AY 2022-23.

NEWLY PROPOSED COURSES FOR B.TECH (CIVIL ENGINEERING)				
S. No.	**COURSE NAME**	**L**	**P**	**C**
1	Offshore structures	3	0	3
2	Structural Health Monitoring	3	0	3
3	Pavement Management System	3	0	3
4	Soil and water conservation	3	0	3
5	Statistics in Hydrology	3	0	3
6	Integration of SDGs in Civil Engineering	3	0	3
7	Glass in Buildings: Design and Applications	3	0	3
8	Design of Pile Foundations	3	0	3
9	Pavement Materials	3	0	3
10	Optimization methods for Civil Engineering	3	0	3
11	Environmental management Systems and Audits	3	0	3
12	Design of Tall Buildings	3	0	3
13	Infrastructure Projects Financing	3	0	3
14	Geospatial Analysis in Urban Planning	3	0	3
15	Development and Applications of Special Concretes	3	0	3
16	Designing of soil structures with Geosynthetics	3	0	3
17	Theory of Plates and Shells	3	0	3
18	Road Safety and Traffic Management	3	0	3
19	Unsaturated Soil Mechanics	3	0	3
20	Design of Steel Concrete Composite Structures	3	0	3
21	Safety in Construction	3	0	3
22	Basic Engineering Sciences	3	0	3

The syllabus of the new courses as approved by the Board of Studies is included in the relevant PRCs

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Annexure 14.8 – List of Revised Courses

Based on feedback from stakeholders, the following courses have been revised.

REVISED COURSES FOR B.TECH (CIVIL ENGINEERING)				
S. No.	**COURSE NAME**	**L**	**P**	**C**
1	Elements of Engineering Mechanics	3	0	3
2	Analysis of Determinate Structures	3	0	3
3	Analysis of Indeterminate Structures	3	0	3
4	Basic Materials Testing Lab	0	2	1
5	Foundation Engineering	3	0	3
6	Water Infrastructure Systems	3	0	3
7	Concrete and Highway Materials Testing Lab	0	2	1
8	Waste Water Treatment and Disposal Systems	3	0	3
9	Design of Irrigation Water Resources Systems	3	0	3
10	Environmental Engineering Lab	0	2	1
11	Geotechnical Engineering Lab	0	2	1
12	Pavement Design	3	0	3
13	Transportation Engineering	3	0	3
14	Environmental Pollution and Control	3	0	3
15	Bridge Design	3	0	3
16	Building Planning and Drawing	0	2	1
17	Remote Sensing and Geographical Information System	3	0	3
18	Ground Water Hydrology	3	0	3
19	Elements of Earthquake Engineering	3	0	3
20	Environmental Geotechnics and Solid Waste Management	3	0	3
21	Advanced RCC structures	3	0	3
22	Theory of Elasticity	3	0	3
23	Open Channel Flow	3	0	3
24	Masonry Structures	3	0	3
25	Advanced Design of Steel Structures	3	0	3
26	Climate Change and Sustainable Development	3	0	3
27	Urban Air Pollution and Control	3	0	3
28	Urban Waste Management	3	0	3

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REVISED COURSES FOR B.TECH (CIVIL ENGINEERING)				
S. No.	**COURSE NAME**	**L**	**P**	**C**
29	Geographical Information Systems	3	0	3
30	Environmental Impact Assessment	3	0	3
31	Systems Design for Environment and Sustainability	3	0	3
32	Finite Element Method	3	0	3
33	Design Concepts of Building Services	3	0	3
34	Pre-fabricated Structures	3	0	3
35	Advanced Prestressed Concrete Design	3	0	3
36	Stability of Slopes	3	0	3
37	Advanced Foundation Design	3	0	3
38	Earth and Earth Retaining Structures	3	0	3
39	Urban Transport Planning	3	0	3
40	Traffic Engineering	3	0	3
41	Pavement Materials & Construction	3	0	3
42	Highway Geometric Design	3	0	3
43	Advanced Soil Mechanics	3	0	3
44	Earthquake Resistant Design of Foundations	3	0	3
45	Water Resource Management	3	0	3
46	Earthquake resistant Design of Structures	3	0	3
47	Integrated Watershed Management	3	0	3
48	Introduction to Infrastructure System and Planning	3	0	3
49	Urban Planning and Design	3	0	3
50	Project Management in Infrastructure Development	3	0	3
51	Construction Practices and Challenges in Infrastructure Projects	3	0	3
52	Construction Equipment and Machinery	3	0	3
53	Construction Quality and Safety	3	0	3
54	Construction Economics and Finance	3	0	3
55	Built Environment Design	3	0	3
56	Environmental Impact Assessment for Infrastructure Projects	3	0	3
57	Urban Mobility	3	0	3
58	Smart city Energy systems and Management	3	0	3
59	Urban sanitation and hygiene	3	0	3
60	Applications of Remote Sensing and GIS in Infrastructure Development	3	0	3
61	IoT in Construction	3	0	3
62	Construction Economics and Financing for Smart Cities	3	0	3

REVISED COURSES FOR B.TECH (CIVIL ENGINEERING)				
S. No.	**COURSE NAME**	**L**	**P**	**C**
63	E-Governance	3	0	3
64	Smart Materials and Structures	3	0	3
65	Sustainability Concepts in Engineering	3	0	3
66	Advanced Surveying	3	0	3
67	Geospatial Applications for Engineers	2	2	3
68	Environmental Hydraulics	3	0	3
69	Design of Hydraulic Structures	3	0	3
70	Advanced Fluid Mechanics	3	0	3
71	Disaster Management and Mitigation	3	0	3
72	Industrial Water Treatment	3	0	3
73	Highway Construction and Maintenance	3	0	3
74	Intelligent Transportation Systems	3	0	3
75	Environmental Geotechnics	3	0	3
76	Railway Engineering and Tunneling	3	0	3
77	Ground Improvement Techniques	3	0	3
78	Computer Aided Analysis & Detailing Lab	0	2	1
79	Building Information Modelling	3	2	1
80	Basic Construction Practice	0	2	1
81	Alternate Building Materials	3	0	3
82	Construction Technology and Processes	3	0	3

REVISED COURSES FOR M.TECH (BUILDING CONSTRUCTION TECHNOLOGY)				
S. No.	**COURSE NAME**	**L**	**P**	**C**
1	Advanced Design of Steel Structures	3	0	3
2	Human Resource Management	3	0	3
3	Pre – Engineered Construction	3	0	3
4	Self-Sustainable Buildings	3	0	3
5	Energy and Buildings	3	0	3
6	Retrofitting and Repair Techniques	3	0	3
7	Formwork and Scaffolding Design	3	0	3
8	Building Automation and 3D Printing	3	0	3
9	Systems Design for Sustainability	3	0	3
10	Building Services and Building Information Modelling	2	2	3

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

The syllabus of the new courses as approved by the Board of Studies is included in the relevant PRCs