



VIGNAN'S
Foundation for Science, Technology & Research
(Deemed to be UNIVERSITY)
Estd. w/a 3 of UGC Act 1986

DEPARTMENT OF CIVIL ENGINEERING

Board of Studies

Date: 18-06-2022.

Department of Civil Engineering has conducted a BoS meeting on 18-06-2022 in AFF-10 Gallery Hall, First Floor, U-Block to discuss and finalize the draft copy of R22 Curriculum for B. Tech Civil Engineering Programme.

S. No	Name of the Member	Designation	Signature
01.	Dr. N. Ruben	Assoc. Prof. & HoD	
02.	Mr. K. Bala Gopi Krishna	Asst. Prof.	
External Experts			
1	Dr. G. Appa Rao, Dept. of Civil Engineering, IIT Madras, Chennai. Email: garao@iitm.ac.in Mobile No: 9444047421	Professor	
2	Er. C. Sankarlingam Projects, L&T Construction, Chennai. Email: c.sankarlingam651955@gmail.com Mobile No: 9789066977	Special Project Head L & T	- Attended Online -
3	Dr. D. Ramaseshu, Department of Civil Engineering, NIT Warangal, Telangana. Email: drseshu@nitw.ac.in	Professor	- Attended Online -
4	Dr. K. Srinivasa Raju, Department of Civil Engineering, BITS, Pilani-Hyderabad. Email: ksraju@hyderabad.bits-pilani.ac.in Mobile No: 9010820742	Professor	- Attended Online -

Internal Experts

1	Dr. V. Purna Chandra Rao	Professor & Senior Scientist	V. Purnachandra Rao
2	Dr. A. Siva Sankar	Professor	A. Siva Sankar
3	Dr. D. Satish Chandra	Associate Professor	Dr. D. Satish Chandra
4	Dr. M. Karthikeyan	Associate Professor	M. Karthikeyan
5	Dr. M. V. Raju	Assistant Professor	M. V. Raju
6	Dr. P. Parthiban	Assistant Professor	P. Parthiban

K. Bala Gopi Krishna
Mr. K. Bala Gopi Krishna

BoS, Secretary

N. Ruben
Dr. N. Ruben

BoS, Chair Person

Head
Department of Civil Engineering
Vignan's University
Vadlamudi, Guntur-522 213

Following points were discussed:

1. Regulation R22.
2. Curriculum structure with credits, credits distribution.
3. Two modules instead of five units.
4. Assessment methods. (Formative and Summative)
5. Grading Schemes.
6. Electives and Streams/Pools.
7. Minor/Honor Courses.

The suggestions given by BoS members are as follows:

1. Dr. G. Apparao

- ✦ Foreign author should include in Strength of Materials course.
- ✦ For Strength of Materials subject, Lab component should be included.
- ✦ Title of the subject should change for "Concrete Technology", it should include the topics of building materials like steel, wood, bricks, etc.,
- ✦ British author text book needs to be included for Concrete Technology subject.
- ✦ Suggested that for surveying one week training course should be conducted for students. To measure entire campus.
- ✦ "Engineering Geology" course should come in II Year of II Semester in place of Department elective – I.
- ✦ For Structural Analysis – I & II courses, "C.S. Reddy" text book of latest edition can be included.
- ✦ List of expected practices should be modified (i.e., Framing and Sentence formation of experiments) for Fluid Mechanics & Hydraulic Machines.
- ✦ Remove "Pandit G. S. & Gupta S. P" text book from References and place it in Text Books for Structural Analysis – II subject.
- ✦ "Veera Raghavan" text book should be included and Remove foreign author text book in Transportation Engineering subject.
- ✦ "Design of Reinforced Concrete Structures", course should come in III Year of I Semester.
- ✦ "Ramamrutham" text books should not be considered for Design of Reinforced Concrete Structures. (Not only for DRCS for all subjects it should be removed)
- ✦ "Design of Steel Structures", course should come in III Year of II Semester.
- ✦ "S. K. Duggal" should be the first author and latest edition should be kept for Design of Steel Structures.
- ✦ "B. N. Dutta" should be the first author and latest edition should be kept for Engineering Economics, Estimation and Costing.

- ✚ “Construction & Project Management”, course should be reorganized in the curriculum.
- ✚ All the modern technology subjects are offering in department elective, once check the text books, select the latest edition and for some subjects you can prefer one foreign author also.
- ✚ Remove foreign author for surveying, make sure the textbooks are available to student.
- ✚ Course objectives should be generic and outcomes should be specific

2. Dr. D. Rama Seshu

- ✚ The Cos shall preferably be 4 in number to represent 4 units. Some courses have more Cos.
- ✚ The courses which have practical components apart from theory i.e for Ex. Surveying and Geomatics, Concrete technology etc, is there any weightage in terms of marks to Lab part and Theory part.
- ✚ For Fluid Mechanics & Hydraulic machines course, there is a pre-requisite: Engg Mechanics. Is it necessary that student should clear the Engg Mech course before taking the FM&HM? Similarly, the case with Design of RC Struct, Water Resources Engg.
- ✚ For Design of RC Struct: the drawing is done in AUTOCAD or Hand drawing? Better is AUTOCAD.
- ✚ The text books shall be maximum TWO in number. If the two textbooks do not cover the entire syllabus then the third one may be given. References can be any number.
- ✚ In Engg Geology -the CO numbering is wrong.
- ✚ For Design of Steel Struct course: Two text books are OK i.e Duggal and Bhayikatti. Remaining can be moved to References.

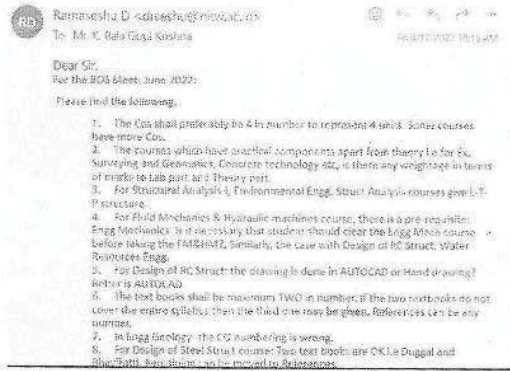
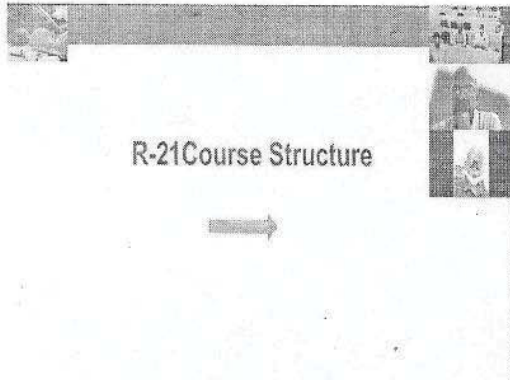
3. C. Sankarlingam

- ✚ Foreign author needs to include in text book for “Surveying & Geomatics”
- ✚ For all the subjects, the text books should follow the below pattern.
- ✚ Author name, Surname, Title, Edition, Year, Publishing name.
- ✚ Teacher should be familiar with the text books given in the course.
- ✚ Consider only two main & important text books for every course.
- ✚ Teacher followed text books should be easily available in library.
- ✚ The course objectives for all courses should be generic & course outcomes should be specific.

4. Dr. K. Srinivasa Raju

- ✚ NPTEL links are to be included in references of every course.
- ✚ L T P Structure for all subjects needs to be Modified.
- ✚ Agreed for merging of Fluid Mechanics & Hydraulic Engineering as a single component.
- ✚ “Construction & Project Management” course should be included as a core course in IV Year of I Semester.
- ✚ In “Railway & Airport Engineering” course “Harbour” topic needs to be included.

- In department elective courses, "Prefabricated Structures, Advanced Construction Materials & Building Services, can be incorporated.
- Comparison between AICTE norms and UGC w.r.t VFSTR needs to be prepared.



The following resolutions made after the discussion:

- BoS members approved the revised regulation, curriculum structure, syllabus of B. Tech Civil Engineering programme and it follows based on the NEP 2020. Curriculum structure is provided in Appendix – I.
- Major restructuring has taken place in the curriculum which is oriented towards continuous learning and assessment based on Module structure.
- Major reformation has taken place in the curriculum by offering Honors and Minors degree through additional 20 credit courses.
- The total percentage of syllabus revision for B. Tech, Civil Engineering program is 58%.
- The curriculum is encompassing the courses that enable employability or entrepreneurship or skill development, provided in Appendix – II
- The significant changes are made in the content of all course and hence the courses are considered as new courses provided in Appendix – III.

Based on the suggestions given by the members, the Chairperson of BoS told that, those fruitful suggestions would be incorporated appropriately in the curriculum and syllabus of the regulation R22 and this will be recommended to the Academic council of VFSTR for the approval.

There being no further points for discussion, the Chairperson thanks all the external, internal, invited members and announced that the meeting was adjourned.

BoS, Chair Person

**Head
Department of Civil Engineering
Vignan's University
Vadlamudi, Guntur-522 213**



DEPARTMENT OF CIVIL ENGINEERING

R22 COURSE STRUCTURE

APPENDIX - I

I Year I Semester

Course Code	Course Title	L	T	P	C	Course Category
22MT103	Linear algebra and Ordinary differential equations.	3	2	0	4	Basic Sciences
22PY102	Engineering Physics.	2	0	2	3	Basic Sciences
22ME101	Engineering Graphics.	2	0	2	3	Basic Engineering
22CE101	IT Work Shop & Civil Engineering Products.	1	0	4	3	Basic Engineering
22TP103	Programming in C.	2	0	4	4	Basic Engineering
22EN102	English Proficiency & Communication Skills.	0	0	2	1	Humanities
22TP101	Constitution of India.	0	2	0	1	Binary grade
22SA101	Physical Fitness, Sports & Games – I	0	0	3	1	Binary grade
	Total	10	4	17	20	
			31			

I Year II Semester

Course Code	Course Title	L	T	P	C	Course Category
22MT112	Partial differential equation and Vector calculus.	3	2	0	4	Basic Sciences
22CT103	Engineering Chemistry.	2	0	2	3	Basic science
22EE101	Basic of Electrical & Electronics Engineering.	2	0	2	3	Basic Engineering
22TP104	Basic Coding Competency	0	1	3	2	Basic Engineering
22EN104	Technical English Communication	2	0	2	3	Humanities
22CE102	Strength of Materials	3	2	0	4	Professional core
22SA102	Orientation Session	0	0	6	3	Binary grade
22SA103	Physical Fitness, Sports & Games – II	0	0	3	1	Binary grade
	Total	12	5	18	23	
			35			

II Year I Semester

Course Code	Course Title	L	T	P	C	Course Category
22ST202	Probability & Statistics.	3	2	0	4	Basic Sciences
22TP201	Data Structures.	2	2	2	4	Basic Engineering
22CE201	Fluid Mechanics & Hydraulic Machines.	3	0	2	4	Professional core
22CE202	Building Materials & Concrete Technology.	3	0	2	4	Professional core
22CE203	Surveying and Geomatics.	3	0	2	4	Professional core
22CE204	Structural Analysis.	2	2	0	3	Professional core
22SA201	Life Skills-I	0	0	2	1	Binary grade
	Total	16	6	10	24	
	NCC/ NSS/ SAC/ E-cell/ Student Mentoring/ Social activities/ Publication with good impact factor (Only 2 students can claim 1 paper /patent). These credits maybe earned on or before the end of IV semester.	0	0	0	1	Floating credits Binary grade
	Total	16	6	10	25	
			32			

II Year II Semester

Course Code	Course Title	L	T	P	C	Course Category
22TP203	Advanced Coding Competency	0	0	2	1	Basic Engineering
22TP204	Professional Communication.	0	0	2	1	Humanities
22CT201	Environmental Studies.	1	1	0	1	Basic Sciences
22MS201	Management Science.	2	2	0	3	Humanities
22CE205	Environmental Engineering.	3	0	2	4	Professional core
22CE206	Advance Structural Analysis.	2	2	0	3	Professional core
	Department Elective – I	2	2	0	3	Department Elective
	Open Elective – I	2	2	0	3	Open Elective
22SA202	Life Skills-II	0	0	2	1	Binary grade
	Total	12	9	8	20	
	Minor / Honors – I	3	2	0	4	
	Total	15	11	8	24	
			34			

III Year I Semester

Course Code	Course Title	L	T	P	C	Course Category
22TP301	Soft Skills Laboratory.	0	0	2	1	Humanities
22CE301	Design of Reinforced Concrete Structures.	3	0	2	4	Professional core
22CE302	Geotechnical Engineering..	3	0	2	4	Professional core
22CE303	Transportation Engineering	3	0	2	4	Professional core
	Department Elective – II	2	2	0	3	Department Elective
	Open Elective – II	2	2	0	3	Open Elective
22CE304	Inter-Disciplinary Project – Phase I	0	0	2	0	Project
22CE305	Industry interface course (Modular Course)	1	0	0	1	Binary Grade
	Total	13	4	10	19	
	NCC/ NSS/ SAC/ E-cell/ Student Mentoring/ Social activities/ Publication with good impact factor (Only 2 students can claim 1 paper /patent). These credits maybe earned on or before the end of VI semester.				1	Floating Credits Binary Grade
	Minor / Honors – 2	3	2	0	4	
	Total	17	6	10	25	
			33			

III Year II Semester

Course Code	Course Title	L	T	P	C	Course Category
22TP302	Quantitative aptitude & Logical reasoning.	1	2	0	2	Humanities
22CE306	Design of Steel Structures.	3	2	0	4	Professional core
22CE307	Water Resource Engineering.	2	0	2	3	Professional core
	Department Elective – 3	2	2	0	3	Department Elective
	Department Elective – 4	2	2	0	3	Department Elective
	Open Elective – 3	2	2	0	3	Open Elective
22CE308	Inter-Disciplinary Project – Phase II	0	0	2	2	Project
	Total	12	10	4	20	
	Minor / Honors – 3	3	2	0	4	
	Total	15	12	4	24	
			31			

IV Year I Semester

Course Code	Course Title	L	T	P	C	Course Category
22CE401	Engineering Economics, Estimation and Costing	3	0	2	4	Professional core
22CE402	Engineering Geology	3	0	2	4	Professional core
	Department Elective – 5	2	2	0	3	Department Elective
	Department Elective – 6	2	2	0	3	Department Elective
	Department Elective – 7	2	2	0	3	Department Elective
	Department Elective – 8	2	2	0	3	Department Elective
	Total	14	8	4	20	
	Minor / Honors – 4	3	2	0	4	
	Total	17	10	4	24	
		31				

IV Year II Semester

Course Code	Course Title	L	T	P	C	Course Category
22CE403	Internship / Project Work	0	2	22	12	Project
	Total	0	2	22	12	
	Minor / Honors – 5 (for project)	0	2	6	4	Theory course may be also offered
	Total	0	4	28	16	
		32				

L: Lecture Hours/Week; T: Tutorial Hours/Week;

P: Practical Hours/Week; C: Credits of the Course;

DEPARTMENT ELECTIVES (Odd Semester)

Course Code	Course Title	L	T	P	C
22CE801	Advanced Hydraulics.	2	2	0	3
22CE802	Disaster Management.	2	2	0	3
22CE803	Ground Improvement Techniques.	2	2	0	3
22CE804	Repair & Rehabilitation of Structures.	2	2	0	3
22CE805	Traffic Engineering & Management.	2	2	0	3
22CE806	Bridge Engineering.	2	2	0	3
22CE807	Remote Sensing & Geographical Information System	2	0	2	3
22CE808	Design & Analysis of Algorithms for Civil Engineering.	2	2	0	3
22CE809	Pre-Stressed Concrete.	2	2	0	3
22CE810	Advanced Remote Sensing.	2	0	2	3
22CE811	Finite Element Analysis.	2	0	2	3
22CE812	Advanced Reinforced Concrete Design.	2	0	2	3
22CE813	Construction Planning and Management.	2	2	0	3
22CE814	Earthquake Resistant Design of Structures.	2	2	0	3
22CE815	Seismic Evaluation & Retrofitting of Structures.	2	2	0	3

DEPARTMENT ELECTIVES (Even Semester)

Course Code	Course Title	L	T	P	C
22CE816	Sustainable Construction Methods.	2	2	0	3
22CE817	Engineering Seismology.	2	2	0	3
22CE818	Environmental Pollution & Control.	2	2	0	3
22CE819	Advanced Concrete Technology.	2	2	0	3
22CE820	Ecological Engineering.	2	2	0	3
22CE821	Structural Dynamics.	2	2	0	3
22CE822	Railway & Airport Engineering.	2	2	0	3
22CE823	EIA for Building Technology	2	2	0	3
22CE824	Soil Dynamics & Machine Foundation.	2	2	0	3

Honours – 1: Structural Engineering

Course Code	Course Title	L	T	P	C
22CE951	Low Cost Materials & Techniques.	3	2	0	4
22CE952	Theory of Plates & Shells.	3	2	0	4
22CE953	Foundation Engineering.	3	2	0	4
22CE954	Design of Underground Water Structures.	3	2	0	4
22CE955	Industrial Structures. / Project Work.	3	2	0	4

Honours – 2: Civil Engineering

Course Code	Course Title	L	T	P	C
22CE956	Green Buildings.	3	2	0	4
22CE957	Solid & Hazardous Waste Management.	3	2	0	4
22CE958	Advanced Soil Mechanics.	3	2	0	4
22CE959	Intelligent transportation system	3	2	0	4
22CE960	Advanced Structural Design. / Project Work.	3	2	0	4

Honours – 3: Construction Technology and Project Management

Course Code	Course Title	L	T	P	C
22CE961	Construction Techniques and Equipments.	3	2	0	4
22CE962	Quality Control and Assurance in Construction.	3	2	0	4
22CE963	Resource Management and Control in Construction.	3	2	0	4
22CE964	Construction & Project Management.	3	2	0	4
22C3965	Lean Construction Management./ Project Work.	3	2	0	4

HONOR STREAM

Basket Name	Structural Engineering	Civil Engineering	Construction Technology & Project Management
Course - I	Low Cost Materials & Techniques.	Green Buildings.	Construction Equipment and Methods.
Course - II	Theory of Plates & Shells.	Solid & Hazardous Waste Management.	Quality Control and Assurance in Construction.
Course - III	Foundation Engineering.	Advanced Soil Mechanics.	Resource Management and Control in Construction.
Course - IV	Design of Underground Water Structures.	Intelligent transportation system.	Construction & Project Management.
Course - V	Industrial Structures. / Project Work.	Advanced Structural Design. / Project Work	Lean Construction Management / Project Work.



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APPENDIX - II

All the Courses in the Curriculum are designed to fall under either of the domains of employability or skill development or Entrepreneurship.

S.No	Course Name	Employability/Skill Development/Entrepreneurship
1	Linear algebra and Ordinary differential equations.	Skill Development
2	Engineering Physics.	Skill Development
3	Engineering Graphics.	Employability
4	IT Work Shop & Civil Engineering Products.	Employability
5	Programming in C.	Employability
6	English Proficiency & Communication Skills.	Skill Development
7	Constitution of India.	Employability
8	Physical Fitness, Sports & Games – I	Skill Development
9	Partial differential equation and Vector calculus.	Skill Development
10	Engineering Chemistry.	Skill Development
11	Basic of Electrical & Electronics Engineering.	Skill Development
12	Basic Coding Competency	Employability
13	Technical English Communication	Skill Development
14	Strength of Materials	Skill Development
15	Orientation Session.	Skill Development
16	Physical Fitness, Sports & Games – II	Skill Development
17	Probability & Statistics.	Skill Development
18	Data Structures.	Employability
19	Fluid Mechanics & Hydraulic Machines.	Skill Development
20	Building Materials & Concrete Technology.	Skill Development
21	Surveying and Geomatics.	Skill Development
22	Structural Analysis.	Skill Development

23	Life Skills-I	Skill Development
24	Advanced Coding Competency	Employability
25	Professional Communication.	Employability
26	Environmental Studies.	Skill Development
27	Management Science.	Entrepreneurship
28	Environmental Engineering.	Skill Development
29	Advance Structural Analysis.	Skill Development
30	Department Elective – I	Skill Development
31	Open Elective – I	Skill Development
32	Life Skills-II	Skill Development
33	Minor/Honors – I	Skill Development
34	Soft Skills Laboratory.	Skill Development
35	Design of Reinforced Concrete Structures.	Skill Development
36	Geotechnical Engineering..	Skill Development
37	Transportation Engineering	Skill Development
38	Department Elective – II	Skill Development
39	Open Elective – II	Skill Development
40	Inter-Disciplinary Project – Phase I	Entrepreneurship
41	Industry interface course (Modular Course)	Entrepreneurship
42	Minor/Honors – II	Skill Development
43	Quantitative aptitude & Logical reasoning.	Skill Development
44	Design of Steel Structures.	Skill Development
45	Water Resource Engineering.	Skill Development
46	Department Elective – 3	Skill Development
47	Department Elective – 4	Skill Development
48	Open Elective – 3	Skill Development
49	Inter-Disciplinary Project – Phase II	Entrepreneurship
50	Minor/Honors – III	Skill Development
51	Engineering Economics, Estimation and Costing	Skill Development
52	Engineering Geology	Skill Development
53	Department Elective – 5	Skill Development
54	Department Elective – 6	Skill Development

55	Department Elective – 7	Skill Development
56	Department Elective – 8	Skill Development
57	Minor/Honors – IV	Skill Development
58	Internship/Project Work	Entrepreneurship
59	Minor/Honors – V	Skill Development/Entrepreneurship
60	Advanced Hydraulics.	Skill Development
61	Disaster Management.	Skill Development
62	Ground Improvement Techniques.	Skill Development
63	Repair & Rehabilitation of Structures.	Skill Development
64	Traffic Engineering & Management.	Skill Development
65	Bridge Engineering.	Skill Development
66	Remote Sensing & Geographical Information System	Skill Development
67	Design & Analysis of Algorithms for Civil Engineering.	Skill Development
68	Pre-Stressed Concrete.	Skill Development
69	Advanced Remote Sensing.	Skill Development
70	Finite Element Analysis.	Skill Development
71	Advanced Reinforced Concrete Design.	Skill Development
72	Construction Planning and Management.	Skill Development
73	Earthquake Resistant Design of Structures.	Skill Development
74	Seismic Evaluation & Retrofitting of Structures.	Skill Development
75	Sustainable Construction Methods.	Skill Development
76	Engineering Seismology.	Skill Development
77	Environmental Pollution & Control.	Skill Development
78	Advanced Concrete Technology.	Skill Development
79	Ecological Engineering.	Skill Development
80	Structural Dynamics.	Skill Development
81	Railway & Airport Engineering.	Skill Development
82	EIA for Building Technology	Skill Development
83	Soil Dynamics & Machine Foundation.	Skill Development
84	Low Cost Materials & Techniques.	Skill Development
85	Theory of Plates & Shells.	Skill Development

86	Foundation Engineering.	Skill Development
87	Design of Underground Water Structures.	Skill Development
88	Industrial Structures. / Project Work.	Skill Development/Entrepreneurship
89	Green Buildings.	Skill Development
90	Solid & Hazardous Waste Management.	Skill Development
91	Advanced Soil Mechanics.	Skill Development
92	Intelligent transportation system	Skill Development
93	Advanced Structural Design. / Project Work.	Skill Development/Entrepreneurship
94	Construction Techniques and Equipments.	Skill Development
95	Quality Control and Assurance in Construction.	Skill Development
96	Resource Management and Control in Construction.	Skill Development
97	Construction & Project Management.	Skill Development
98	Lean Construction Management./ Project Work.	Skill Development/Entrepreneurship
99	Air pollution & Control.	Skill Development
100	Environmental Impact Assessment	Skill Development
101	Principles of Industrial waste Management.	Skill Development
102	Industrial Safety.	Skill Development
103	EIA for Building Technology. / Project Work.	Skill Development/Entrepreneurship
104	Low Cost Materials & Techniques.	Skill Development
105	Smart Materials & Structures.	Skill Development
106	Urban Infrastructure & Development.	Skill Development
107	Infrastructure for Smart Cities.	Skill Development
108	Intelligent transportation systems. / Project Work.	Skill Development/Entrepreneurship
109	Geospatial Data Analysis & Modelling.	Skill Development
110	Geospatial Data Science for Natural Resource Management.	Skill Development
111	Geospatial Data Science for Natural Environment Management.	Skill Development
112	Geospatial Data Science for Water Resource Management.	Skill Development
113	Geospatial Data Science and Applications. / Project Work	Skill Development/Entrepreneurship


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LIST OF NEW COURSES IN R22

APPENDIX – III

S. No	Name of the Subject
1	Linear algebra and Ordinary differential equations.
2	Engineering Physics.
3	Engineering Graphics.
4	IT Work Shop & Civil Engineering Products.
5	Programming in C.
6	English Proficiency & Communication Skills.
7	Constitution of India.
8	Partial differential equation and Vector calculus.
9	Engineering Chemistry.
10	Basic of Electrical & Electronics Engineering.
11	Basic Coding Competency
12	Technical English Communication
13	Strength of Materials
14	Orientation Session
15	Probability & Statistics.
16	Data Structures.
17	Fluid Mechanics & Hydraulic Machines.
18	Building Materials & Concrete Technology.
19	Surveying and Geomatics.
20	Structural Analysis.
21	Advanced Coding Competency
22	Professional Communication.
23	Environmental Studies.
24	Management Science.
25	Environmental Engineering.
26	Advance Structural Analysis.
27	Soft Skills Laboratory.
28	Design of Reinforced Concrete Structures.
29	Geotechnical Engineering..
30	Transportation Engineering
31	Quantitative aptitude & Logical reasoning.
32	Design of Steel Structures.
33	Water Resource Engineering.

34	Inter-Disciplinary Project – Phase II
35	Engineering Economics, Estimation and Costing
36	Engineering Geology
37	Advanced Hydraulics.
38	Disaster Management.
39	Ground Improvement Techniques.
40	Repair & Rehabilitation of Structures.
41	Traffic Engineering & Management.
42	Bridge Engineering.
43	Remote Sensing & Geographical Information System
44	Design & Analysis of Algorithms for Civil Engineering.
45	Pre-Stressed Concrete.
46	Advanced Remote Sensing.
47	Finite Element Analysis.
48	Advanced Reinforced Concrete Design.
49	Construction Planning and Management.
50	Earthquake Resistant Design of Structures.
51	Seismic Evaluation & Retrofitting of Structures.
52	Sustainable Construction Methods.
53	Engineering Seismology.
54	Environmental Pollution & Control.
55	Advanced Concrete Technology.
56	Ecological Engineering.
57	Structural Dynamics.
58	Railway & Airport Engineering.
59	EIA for Building Technology
60	Soil Dynamics & Machine Foundation.
61	Low Cost Materials & Techniques.
62	Theory of Plates & Shells.
63	Foundation Engineering.
64	Design of Underground Water Structures.
65	Industrial Structures. / Project Work.
66	Green Buildings.
67	Solid & Hazardous Waste Management.
68	Advanced Soil Mechanics.
69	Intelligent transportation system
70	Advanced Structural Design. / Project Work.
71	Construction Techniques and Equipments.
72	Quality Control and Assurance in Construction.
73	Resource Management and Control in Construction.
74	Construction & Project Management.
75	Lean Construction Management./ Project Work.

76	Air pollution & Control.
77	Environmental Impact Assessment
78	Principles of Industrial waste Management.
79	Industrial Safety.
80	EIA for Building Technology. / Project Work.
81	Low Cost Materials & Techniques.
82	Smart Materials & Structures.
83	Urban Infrastructure & Development.
84	Infrastructure for Smart Cities.
85	Intelligent transportation systems. / Project Work.
86	Geospatial Data Analysis & Modelling.
87	Geospatial Data Science for Natural Resource Management.
88	Geospatial Data Science for Natural Environment Management.
89	Geospatial Data Science for Water Resource Management.
90	Geospatial Data Science and Applications. / Project Work



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