



SRI KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY
An Autonomous Institution, Affiliated to Anna University
Coimbatore - 641 008

DEPARTMENT OF CIVIL ENGINEERING



CURRICULUM AND SYLLABI
BE CIVIL ENGINEERING
REGULATION 2020

SRI KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY

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VISION AND MISSION OF THE DEPARTMENT

Our Vision

To be a center of excellence in Civil Engineering Education through full-fledged learning experience along with research.

Our Mission

To accomplish our vision, we are committed to

- Provide high quality technical education for Undergraduate, Post Graduate and Doctoral Programmes in Civil Engineering.
- Create excellent infrastructural facility and state-of-the-art Laboratories.
- Encourage faculty and students to carry out socially relevant research through collaboration with industry.
- Inculcate ethics and ensure commitment to the society with leadership qualities.

Program Outcomes (POs):-

At the time of their graduation students of Civil Engineering Program should be in possession of the following Program Outcomes

PO 1. **Engineering knowledge:** Apply the knowledge of mathematics, science and engineering fundamentals for the solution of complex Civil Engineering problems.

PO 2. **Problem analysis:** Identify, formulate and analyse complex Civil Engineering problems reaching substantiated conclusions using first principles of mathematics and engineering sciences.

PO 3. **Design/development of solutions:** Design solutions for complex Civil Engineering problems and design system components with appropriate consideration for public health & safety, cultural, societal and environmental considerations.

PO 4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis & interpretation of data and synthesis of the information to provide valid conclusions.

PO 5. **Modern tool usage:** Create, select & apply appropriate techniques, resources,

- modern engineering and IT tools, including prediction and modeling to complex Civil Engineering activities, with an understanding of the limitations.
- PO 6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal & cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO 7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO 8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities as well as norms of the engineering practice.
- PO 9. **Individual and team work:** Function effectively as an individual, a member or leader in diverse teams and in multidisciplinary settings.
- PO 10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO 11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO 12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Educational Objectives (PEOs):-

The following Program Educational Objectives are designed based on the department mission

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|-------|---|--|
| PEO 1 | Employability Skills | Graduates will emerge as competitive professionals in collaboration with renowned builders and set a benchmark in the field of construction. |
| PEO 2 | Technical Competencies | Graduates will adapt to the latest technological development and continue to be a competitive Civil Engineer / Entrepreneur. |
| PEO 3 | Critical Analysis and Design Tools | Graduates will apply logical reasoning and analytical thinking to analyze, interpret, solve multifaceted problems in the field of Civil Engineering and identify advanced tools to satisfy the demands of the society. |

Mapping of POs to PEOs

Program Educational Objectives	Program Outcomes											
	1	2	3	4	5	6	7	8	9	10	11	12
PEO 1	3	2	3	2	2	3	2	2	3	3	3	2
PEO 2	3	3	2	2	3	2	2	2	2	2	2	3
PEO 3	3	3	3	2	3	3	2	2	2	3	2	3

1	Reasonably agreed	2	Moderately agreed	3	Strongly agreed
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Program Specific Outcomes (PSOs):-

At the end of the Program, Graduate shall have

PSO 1	Analytical Knowledge and Practical Skills	The ability to analyse, design and interpret by applying the concepts of mathematics and physical sciences in the core areas of Civil Engineering.
PSO 2	Civil Engineer and Sustainability	The propensity to excel in portfolio of waste management, sanitation, housing and construction management for the sustainable environment.
PSO 3	Environment and Social Commitment	The ability to acquire and update knowledge continuously and offer engineering solutions to meet the environmental and societal needs.

**B.E. CIVIL ENGINEERING
REGULATION 2020
CHOICE BASED CREDIT SYSTEM
I – VIII SEMESTER CURRICULUM AND SYLLABI**

SEMESTER I							
SL. No.	Course Code	Course	L/T/P	Contact hrs./wk.	C	Ext./Int.	Cat.
THEORY							
1.	20CE101	Introduction to Civil Engineering	3/0/0	3	3	50 /50	ESC
THEORY CUM PRACTICAL							
2.	20MA101	Engineering Mathematics I	2/1/2	5	4	40/60	BSC
3.	20CH101	Engineering Chemistry	3/0/3	6	4.5	40/60	BSC
4.	20CS111	Problem Solving Using C Programming	3/0/2	5	4	40/60	ESC
5	20EN101	Technical Communication Skills	2/0/2	4	3	40/60	HSMC
PRACTICAL							
6	20ME111	Engineering Graphics	1/0/3	4	2.5	40/60	ESC
MANDATORY COURSE							
7.	20MC101	Mandatory Course I	3 WEEKS		0	0/100	MC
Total			14/1/12	27	21	700	

SEMESTER II							
SL. No.	Course Code	Course	L/T/P	Contact hrs./wk.	C	Ext./Int.	Cat.
THEORY CUM PRACTICAL							
1.	20CE201	Architectural Planning and Building Drawing	3/0/2	5	4	40/60	ESC
2.	20MA201	Engineering Mathematics II	2/1/2	5	4	40/60	BSC
3.	20PH201	Applied Physics	3/0/3	6	4.5	40/60	BSC
4.	20EE111	Basics of Electrical and Electronics Engineering	3/0/2	5	4	40/60	ESC
PRACTICAL							
5.	20CS211	Python for Engineers Laboratory	1/0/3	4	2.5	40/60	ESC
6.	20ME103	Engineering Practices Laboratory	0/0/3	3	1.5	40/60	ESC
MANDATORY COURSE							
7.	20MC102	Mandatory Course II	2/0/0	2	0	0/100	MC
Total			14/1/15	30	20.5	700	

SEMESTER III							
SL. No.	Course Code	Course	L/T/P	Contact hrs./wk.	C	Ext./Int.	Cat.
THEORY							
1.	20ME201	Engineering Mechanics	3/1/0	4	4	50 /50	ESC
2.	20GE201	Universal Human Values	3/0/0	3	3	50/50	HSMC
THEORY CUM PRACTICAL							
3.	20MA301	Engineering Mathematics III	2/1/2	5	4	40/60	BSC
4.	20CE301	Construction Materials and Techniques	3/0/2	5	4	40/60	PCC
5.	20CE302	Fluid Mechanics and Hydraulic Machinery	3/0/2	5	4	40/60	PCC
6.	20CE303	Surveying and Geomatics	3/0/2	5	4	40/60	PCC
MANDATORY COURSE							
7.	20MC104	Mandatory Course III	2/0/0	2	0	0/100	MC
Total			19/2/8	29	23	700	

SEMESTER IV							
SL. No.	Course Code	Course	L/T/P	Contact hrs./wk.	C	Ext./Int.	Cat.
THEORY							
1.	20CE401	Mechanics of Solids	3/0/0	3	3	50/50	PCC
THEORY CUM PRACTICAL							
2.	20MA401	Probability and Numerical Methods	2/1/2	5	4	40/60	BSC
3.	20CE402	Engineering Geology and Concrete Technology	3/0/2	5	4	40/60	PCC
4.	20CE403	Environmental Engineering	3/0/2	5	4	40/60	PCC
5.	20CE404	Geotechnical Engineering	3/0/2	5	4	40/60	PCC
6.	20CE405	Transportation Engineering	3/0/2	5	4	40/60	PCC
MANDATORY COURSE							
7.	20MC103	Mandatory Course IV	2/0/0	2	-	0/100	MC
Total			19/1/10	30	23	700	

SEMESTER V							
SL. No.	Course Code	Course	L/T/P	Contact hrs./wk.	C	Ext./Int.	Cat.
THEORY							
1.	20xxxxx	Open Elective I	3/0/0	3	3	50/50	OEC
2.	20CE0xx	Emerging Elective I	3/0/0	3	3	50/50	EEC
3.	20CE9xx	Professional Elective I	3/0/0	3	3	50/50	PEC
THEORY CUM PRACTICAL							
3.	20CE501	Construction Planning and Management	3/0/3	6	4.5	40/60	HSMC
5.	20CE502	Design of Reinforced Concrete Structures	3/0/3	6	4.5	40/60	PCC
6.	20CE503	Mechanics of Materials	3/0/3	6	4.5	40/60	PCC
MANDATORY COURSE							
7.	20MC105	Mandatory Course V	2/0/0	2	-	0/100	MC
Total			20/0/9	29	22.5	700	

SEMESTER VI							
SL. No.	Course Code	Course	L/T/P	Contact hrs./wk.	C	Ext./Int.	Cat.
THEORY							
1.	20xxxxx	Open Elective II	3/0/0	3	3	50/50	OEC
2.	20CE0xx	Emerging Elective II	3/0/0	3	3	50/50	EEC
3.	20CE9xx	Professional Elective II	3/0/0	3	3	50/50	PEC
THEORY CUM PRACTICAL							
4.	20CE601	Construction Cost Estimation and Valuation	3/0/3	6	4.5	40/60	PCC
5.	20CE602	Design of Steel Structures	3/0/3	6	4.5	40/60	PCC
6.	20CE603	Structural Analysis	3/0/2	5	4	40/60	PCC
EMPLOYABILITY ENHANCEMENT SKILLS							
7.	20CEE01	Employability Enhancement Skills (Industry Internship / Training - 4 weeks)			2	40/60	EES
Total			18/0/8	26	24	700	

SEMESTER VII							
SL. No.	Course Code	Course	L/T/P	Contact hrs./wk.	C	Ext./Int.	Cat.
THEORY							
1.	20CE0xx	Emerging Elective III	3/0/0	3	3	50/50	EEC
2.	20CE0xx	Emerging Elective IV	3/0/0	3	3	50/50	EEC
3.	20CE9xx	Professional Elective III	3/0/0	3	3	50/50	PEC
4.	20CE9xx	Professional Elective IV	3/0/0	3	3	50/50	PEC
5.	20CE9xx	Professional Elective V	3/0/0	3	3	50/50	PEC
6.	20CE9xx	Professional Elective VI	3/0/0	3	3	50/50	PEC
PROJECT WORK							
6.	20CE701	Design Comprehensive Project	0/0/2	2	1	40/60	PROJ
Total			18/0/2	20	19	700	

SEMESTER VIII							
SL. No.	Course Code	Course	L/T/P	Contact hrs./wk.	C	Ext./Int.	Cat.
PROJECT WORK							
1.	20CE801	Project Work	0/0/24	24	12	40/60	PROJ
Total			0/0/24	24	12	100	

COURSES DISTRIBUTION - SPECIALIZATION

SL. No.	Stream	Courses								Total
		I	II	III	IV	V	VI	VII	VIII	
1.	Structural Engineering	-	-	-	1	2+2	1+2	0+6	-	4+10
2.	Environmental and Water Resource Engineering	-	-	1	1	0+2	0+2	0+6	-	2+10
3.	Construction Engineering and Management	-	1	1	-	1+2	2+2	0+6	-	5+10
4.	Geotechnical and Transportation Engineering	-	-	1	2	0+2	0+2	0+6	-	3+10
5.	Basic Civil Engineering Courses	2	1	1	1	-	-	-	-	5
6.	Science and Humanities	4	4	2	1	-	-	-	-	11
7.	Open Elective / Mandatory Courses	1	1	1	1	2	1	-	-	7
8.	Project / Internship	-	-	-	-	-	1	1	1	3
Total		7	7	7	7	5+2	5+2	1+6	1	40+10

COURSES DISTRIBUTION - SUMMARY

SL. No.	Stream	Courses/Semester								Total	%
		I	II	III	IV	V	VI	VII	VIII		
1.	Theory	1	-	2	1	3	3	6	-	16	32
2.	Practical	1	2	-	-	-	-	-	-	3	6
3.	Theory cum Practical	4	4	4	5	3	3	-	-	23	46
4.	Project Work / EES	-	-	-	-	-	1	1	1	3	6
5.	Mandatory Course	1	1	1	1	1	-	-	-	5	10
Total		7	7	7	7	7	7	7	1	50	100

SCHEME OF CREDIT DISTRIBUTION – SUMMARY

SL. No.	Stream	Credits/Semester								C	%
		I	II	III	IV	V	VI	VII	VIII		
1.	Humanities & Social Sciences Including Management (HSMC)	3	-	3	-	4.5		-	-	10.5	6.4
2.	Basic Sciences (BSC)	8.5	8.5	4	4	-	-	-	-	25	15.1
3.	Engg. Sciences (ESC)	9.5	12	4	-	-	-	-	-	25.5	15.5
4.	Professional Core (PCC)	-	-	12	19	9	13	-	-	53	32.1
5.	Professional Electives (PEC)	-	-	-	-	3	3	12	-	18	10.9
6.	Open Electives (OEC) / Emerging Elective Courses (EEC)	-	-	-	-	6	6	6	-	18	10.9
7.	Project Work (PROJ) / (EES)	-	-	-	-	-	2	1	12	15	9.1
8.	Mandatory Course (MC)	Non-credit								0	0
Total		21	20.5	23	23	22.5	24	19	12	165	100

STRUCTURE FOR UNDERGRADUATE ENGINEERING PROGRAMME

SL. No.	Course Work - Subject Area	AICTE Suggested Breakdown of Credits	SKCET Credits
1.	Humanities and Social Sciences including Management courses	12*	10.5
2.	Basic Science courses	25*	25
3.	Engineering Science courses including Workshop, Drawing, Basics of Electrical / Mechanical / Computer etc.	24*	25.5
4.	Professional core courses	48*	53
5.	Professional Electives courses relevant to the chosen specialization / branch	18*	18
6.	Open Subjects - Electives from other technical and / or emerging subjects	18*	18
7.	Project Work, Seminar and / or Internship in Industry or elsewhere.	15*	15
8.	Mandatory Courses	Non-credit	Non-credit
Total		160*	165
<i>*Minor Variations is allowed as per need of the respective disciplines</i>			

HUMANITIES & SOCIAL SCIENCES INCLUDING MANAGEMENT (10.5 Credits)

SL. No.	Course Code	Course Title	L/T/P	Contact hrs./Wk.	C	Cat.
1.	20EN101	Technical Communication skills	2/0/2	4	3	HSMC
2.	20GE201	Universal Human Values	3/0/0	3	3	HSMC
3	20CE501	Construction Planning and Management	3/0/3	6	4.5	HSMC

BASIC SCIENCE COURSES (25 Credits)

SL. No.	Course Code	Course Title	L/T/P	Contact hrs./Wk.	C	Cat.
1.	20MA101	Engineering Mathematics I	2/1/2	5	4	BSC
2.	20CH101	Engineering Chemistry	3/0/3	6	4.5	BSC
3.	20MA201	Engineering Mathematics II	2/1/2	5	4	BSC
4.	20PH201	Applied Physics	3/0/3	6	4.5	BSC
5.	20MA301	Engineering Mathematics III	2/1/2	5	4	BSC
6.	20MA401	Probability and Numerical Methods	2/1/2	5	4	BSC

ENGINEERING SCIENCE COURSES (25.5 Credits)

SL. No.	Course Code	Course Title	L/T/P	Contact hrs./Wk.	C	Cat.
1.	20CE101	Introduction to Civil Engineering	3/0/0	3	3	ESC
2.	20CS111	Problem Solving using C Programming	3/0/2	5	4	ESC
3.	20ME111	Engineering Graphics	1/0/3	4	2.5	ESC
4.	20EE111	Basics of Electrical and Electronics Engineering	3/0/2	5	4	ESC
5.	20CS211	Python for Engineers Laboratory	1/0/3	4	2.5	ESC
6.	20ME103	Engineering Practices Laboratory	0/0/3	3	1.5	ESC
7.	20ME201	Engineering Mechanics	3/1/0	4	4	ESC
8.	20CE201	Architectural Planning and Building Drawing	3/0/2	5	4	ESC

PROFESSIONAL CORE COURSES (53 Credits)

SL. No.	Course Code	Course Title	L/T/P	Contact hrs./Wk.	C	Cat.
1.	20CE301	Construction Materials and Techniques	3/0/2	5	4	PCC
2.	20CE302	Fluid Mechanics and Hydraulic Machinery	3/0/2	5	4	PCC
3.	20CE303	Surveying and Geomatics	3/0/2	5	4	PCC
4.	20CE401	Mechanics of Solids	2/1/0	3	3	PCC
5.	20CE402	Engineering Geology and Concrete Technology	3/0/2	5	4	PCC
6.	20CE403	Environmental Engineering	3/0/2	5	4	PCC

7.	20CE404	Geotechnical Engineering	3/0/2	5	4	PCC
8.	20CE405	Transportation Engineering	3/0/2	5	4	PCC
9.	20CE502	Design of Reinforced Concrete Structures	3/0/3	6	4.5	PCC
10.	20CE503	Mechanics of Materials	2/1/3	6	4.5	PCC
11.	20CE601	Construction Cost Estimation and Valuation	3/0/3	6	4.5	PCC
12.	20CE602	Design of Steel Structures	3/0/3	6	4.5	PCC
13.	20CE603	Structural Analysis	2/1/2	5	4	PCC

PROFESSIONAL ELECTIVE COURSES (18 Credits)

SL. No.	Course Code	Course Title	L/T/P	Contact hrs./Wk.	C	Cat.
Elective Stream I: Structural and Foundation Engineering						
1.	20CE901	Damage Detection and Rehabilitation of Concrete Structures	3/0/0	3	3	PEC
2.	20CE902	Design of Substructures	3/0/0	3	3	PEC
3.	20CE903	Disaster Resistant Structures	3/0/0	3	3	PEC
4.	20CE904	Green Building Technology	3/0/0	3	3	PEC
5.	20CE905	Ground Improvement and Land Reclamation Methods	3/0/0	3	3	PEC
6.	20CE906	Prefabricated Structures	3/0/0	3	3	PEC
7.	20CE907	Prestressed Concrete Structures	3/0/0	3	3	PEC
8.	20CE908	Tall Structures	3/0/0	3	3	PEC
9.	20CE909	Valuation of Civil Engineering Structures	3/0/0	3	3	PEC
Elective Stream II: Environmental and Water Resource Engineering						
1.	20CE910	Air and Noise Pollution Management	3/0/0	3	3	PEC
2.	20CE911	Ecological Engineering	3/0/0	3	3	PEC
3.	20CE912	Environmental Hazard, Risk Assessment and Management	3/0/0	3	3	PEC
4.	20CE913	GIS for Environmental Engineering	3/0/0	3	3	PEC
5.	20CE914	Industrial Waste Treatment and Disposal	3/0/0	3	3	PEC
6.	20CE915	Irrigation Engineering	3/0/0	3	3	PEC
7.	20CE916	Occupational Hazards and Industrial Safety	3/0/0	3	3	PEC
8.	20CE917	Renewable and Sustainable Energy	3/0/0	3	3	PEC
9.	20CE918	Surface Water Hydrology	3/0/0	3	3	PEC
Elective Stream III: Infrastructural Engineering and Management						
1.	20CE919	Intelligent Transportation Systems	3/0/0	3	3	PEC
2.	20CE920	Construction Methods and Equipment Management	3/0/0	3	3	PEC

3.	20CE921	Disaster Management Planning and Mitigation	3/0/0	3	3	PEC
4.	20CE922	Infrastructure Asset Management and Financing	3/0/0	3	3	PEC
5.	20CE923	Pavement construction and management	3/0/0	3	3	PEC
6.	20CE924	Project Safety Management	3/0/0	3	3	PEC
7.	20CE925	Sustainable Building Materials	3/0/0	3	3	PEC
8.	20CE926	Traffic Engineering and Management	3/0/0	3	3	PEC
9.	20CE927	Transport and Environment	3/0/0	3	3	PEC

EMERGING ELECTIVE COURSES (12 Credits)

SL. No.	Course Code	Course Title	L/T/P	Contact hrs./Wk.	C	Cat.
1.	20CE007	Building Services and Management	3/0/0	3	3	EEC
2.	20CE008	Clean Energy Production	3/0/0	3	3	EEC
3.	20CE009	Financing and Costing Management for Civil Engineers	3/0/0	3	3	EEC
4.	20CE010	Instrumentation and Sensor Technologies for Civil Engineering Applications	3/0/0	3	3	EEC
5.	20CE011	Lean startup Management	3/0/0	3	3	EEC
6.	20CE012	Metro Rail Engineering	3/0/0	3	3	EEC
7.	20CE013	Pre-Engineered Industrial Structures	3/0/0	3	3	EEC
8.	20CE014	Risk and Reliability Analysis of Civil Infrastructure Systems	3/0/0	3	3	EEC
9.	20CE015	Rural water supply and Onsite Sanitation Systems	3/0/0	3	3	EEC
10.	20CE016	Contaminated site assessment and Remediation	3/0/0	3	3	EEC
11.	20CE017	Smart City Planning and Development	3/0/0	3	3	EEC
12.	20CE018	Smart Materials and Structures	3/0/0	3	3	EEC

OPEN ELECTIVE COURSES (6 Credits) [Offered to Other Branches]

SL. No.	Course Code	Course Title	L/T/P	Contact hrs./Wk.	C	Cat.
1.	20CE001	Disaster Management	3/0/0	3	3	OEC
2.	20CE002	Engineering Risk and Uncertainty	3/0/0	3	3	OEC
3.	20CE003	Environmental Impact Assessment and Life Cycle Analysis	3/0/0	3	3	OEC
4.	20CE004	Geographical Information System	3/0/0	3	3	OEC
5.	20CE005	Industrial Pollution control and Prevention Techniques	3/0/0	3	3	OEC
6.	20CE006	Sustainability and Infrastructure	3/0/0	3	3	OEC

PROJECT WORK (13 Credits)

SL. No.	Course Code	Course Title	L/T/P	Contact hrs./Wk.	C	Cat.
1.	20CE701	Design Comprehensive Project	0/0/2	2	1	PROJ
2.	20CE801	Project Work	0/0/24	24	12	PROJ

EMPLOYABILITY ENHANCEMENT SKILLS (2 Credits)

SL. No.	Course Code	Course Title	Duration	C	Cat.
1.	20CEE01	Employability Enhancement Skills (Industry Internship / Training)	4 Weeks	2	EES

MANDATORY COURSES (Non-credit)

SL. No.	Course Code	Course Title	L/T/P	Contact hrs./Wk.	C	Cat.
1.	20MC101	Induction Programme	3 WEEKS		0	MC
2.	20MC102	Environmental Sciences	2/0/0	2	0	MC
3.	20MC103	Soft Skills	2/0/0	2	0	MC
4.	20MC104	Management Organizational Behaviour	2/0/0	2	0	MC
5.	20MC105	General Aptitude	2/0/0	2	0	MC

VALUE ADDED COURSES

SL. No.	Course Code	Course Title
1.	20VA101	Arc GIS
2.	20VA102	Auto CAD - 2D for Civil Engineers
3.	20VA103	Construction Planning and Management Using Primavera
4.	20VA104	3D Design and Drafting Using Revit Architecture
5.	20VA105	Structural Analysis and Design Using STAAD.Pro
6.	20VA106	Total Station and GPS Surveying

SEMESTER WISE CREDIT DISTRIBUTION: -

Semester	I	II	III	IV	V	VI	VII	VIII	Total
Credits	21	20.5	23	23	22.5	24	19	12	165

Total Credits: 165

L : Lecture

T : Tutorial

P : Practical

C : Credit

HSMC : Humanities and Social Sciences including Management

Cat. : Category

MC : Mandatory Course

BSC : Basic Science Courses

ESC : Engineering Science Courses

OEC : Open Elective Courses

EEC : Emerging Elective Courses

EES : Employability Enhancement Skills

PROJ : Project Work

PCC : Professional Core Courses

PEC : Professional Elective Courses