C-20
2020-21

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GOVERNMENT OF KARNATAKA

ಕಾಲೇಜು ಮತ್ತು ತಾಂತ್ರಿಕ ಶಿಕ್ಷಣ ಇಲಾಖೆ

DEPARTMENT OF COLLEGIATE AND TECHNICAL EDUCATION

Diploma in Civil Engineering

With Effect from 2020-21
C-20

Curriculum Development Cell

Department of Collegiate & Technical Education

Vision

[(To be drafted individually at institution level)]

Develop global civil engineering professionals who serve competently, collaboratively, and ethically as master to create a sustainable world and enhance the global quality of life

Mission

(To be drafted individually at institution level)

- *M1:To develop a specialized professional by imparting quality education and practical training in collaboration with industry, through competitive curriculum*
- *M2:To develop professionally skilled and ethical planners, designers, constructors, and operators of society's economic and social engine*
- *M3: To develop leadership skills in discussions and decisions shaping public environmental and infrastructure policy*
- *M4:To nurture innovators and integrators as entrepreneurs of ideas and technology across the public, private, and academic sectors*

Programme Educational Objectives (PEOs)

(To be drafted individually at institution level)
(After 2/3 years of graduation, the students will have the ability to)

Civil Engineering Programme is committed to transform students into competent professionals, responsible citizens. On completing the diploma programme, the students should have acquired the following characteristics.

PEO1	To apply technical knowledge in analyzing problems in the field of Civil Engineering, in the view of ensuring maximization of economic benefits to society and minimization of damage to ecology and environment.
PEO2	To enhance entrepreneurial, communication and other soft skills, which will enable them to work globally as leaders, team members and contribute to nation building for the betterment of the societywithout overexploitation of natural resources.
PEO3	To make them strongly committed to the highest levels of professional ethics and focus on ensuring quality, adherence to public policy and law, safety, reliability and environmental sustainability in all their professional activities.
PEO4	To be life-long learners with spirit of enquiry and zeal to acquire new knowledge and skills so as to remain contemporary and possess required professional skills.

PROGRAM OUTCOMES (POs)

1. **Basic and Discipline specific knowledge:** Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.

2. **Problem analysis: I**dentify and analyze well-defined engineering problems using codified standard methods.

3. **Design/ development of solutions:** Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.
4. **Engineering Tools, Experimentation and Testing:** Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
5. **Engineering practices for society, sustainability and environment:** Apply appropriate technology in context of society, sustainability, environment and ethical practices.
6. **Project Management:** Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.
7. **Life-long learning:** Ability to analyze individual needs and engage in updating in the context of technological changes.

CONSISTENCY MATRIX OF PEO'S WITH MISSION

	PEO statements	Adapt to Industry	Higher Learning	Team Spirit	Self-Learning	Leadership Qualities	Societal Needs	Environmental Concern
1	To apply technical knowledge in analyzing problems in the field of Civil Engineering, in the view of ensuring maximization of economic benefits to society and minimization of damage to ecology and environment.	3	3		3		3	3
2	To enhance entrepreneurial, communication and other soft skills, which will enable them to work globally as leaders, team members and contribute to nation building for the betterment of the society without overexploitation of natural resources.			3	3	3	3	
3	To make them strongly committed to the highest levels of professional ethics and focus on ensuring quality, adherence to public policy and law, safety, reliability and environmental sustainability in all their professional activities.			3	3		3	3
4	To be life-long learners with spirit of enquiry and zeal to acquire new knowledge and skills so as to remain contemporary and possess required professional skills.	3	3		3	3		

PROGRAM SPECIFIC OUTCOMES (PSOs)

Program shall specify 2-4 Program Specific Outcomes
(To be drafted individually at institution level)

PSO1	The graduates will have the ability to plan, analyses, design, execute and maintain cost effective civil engineering structures without overexploitation of natural resources.
PSO2	The graduates of civil engineering program will have the ability to take up employment, entrepreneurship, research and development for sustainable civil society.
PSO3	The graduates will be able to peruse opportunities for personal and professional growth, higher studies, demonstrate leadership skills and engage in lifelong learning by active participation in the civil engineering profession.
PSO4	The graduates will be able to demonstrate professional integrity and an appreciation of ethical, environmental, regulatory and issues related to civil engineering projects.

1.0 GENERAL PROGRAMME STRUCTURE AND CREDIT DISTRIBUTION

1. **Definition of Credit:** Credit is a kind of weightage given to the contact hours to teach the prescribed syllabus, which is in a modular form. For courses, one credit is allocated to one contact hour for theory / tutorial per week and one credit is allocated to 02 contact hours for practical.

2. **Choice-Based Credit System (CBCS):** CBCS is a flexible system of learning that permit**s** students to learn at their own pace, choose electives from a wide range of elective courses and adopt an inter-disciplinary approach in learning and make best use of the expertise of available faculty.

3. **Range of Credits**

1 Hr. Lecture (L) per week	1 credit
1 Hr. Practical (P) per week	0.5 credit
1 Hr. Tutorial (T) per week	1 credit
4 Hrs. Theory (T) per week	4 credit
3 Hrs. Practical (P) per week [1 Hr. Tutorial +2 Hrs. Practical]	2 credit

4. **Programme**: Programme means Diploma Programme that is Diploma in Civil Engineering, which is of three years duration.

2.0 PROGRAMME STRUCTURE

1. **Course:** A Course is a component (a paper) of a Programme. All the courses need not carry same weightage. The course should define Course objectives. A course may be designed to involve lectures / tutorials / laboratory work / seminar / project work/ Internships / seminar or a combination of these, to meet effectively the teaching and learning needs and the credits may be assigned suitably.

2. **Course Code:** Each course shall have an alphanumeric code, which includes last two digits of year of introduction such as 20 subject code CE (CE for Civil Engineering, CH for Chemical Engineering etc.), then first two digits for example 12 (where 1 represents first semester and 2 represents the course number in incremental order) and the last alphabet represent Theory (T), Practical/Internship/Project (P), Drawing (D), Programme / Open Electives (A, B, C, E, F, G ...).

3. **Programme Courses:** Each Programme will consist of Communication skills and Social Sciences (HS), Engineering Mathematics, Statistics and Analytics (BS), Engineering Sciences (ES), Professional Core (PC), Professional Electives (PE), Open Electives (OE), Employability Enhancement Courses (EEC) and Internships.

1. **Communication Skills and Social Sciences:** Communication Skills and Social Science courses are incorporated in the curriculum to meet the desired needs of communication and life skills amongst students.

2. **Engineering Mathematics, Statistics and Analytics:** Common to all Engineering Programme to develop reasoning and analytical skills amongst students.

3. **Engineering Sciences:** Engineering Science shall create awareness on different specializations of engineering studies. The goal of these courses is to create engineers of tomorrow, who possess the knowledge of all disciplines and can apply their interdisciplinary knowledge in every aspect. It could be any branch of engineering - Civil, Computer Science and Engineering, Electrical, Mechanical, etc.

4. **Professional Core:** Core Courses designed in the programme which are major courses of the discipline, required to attain desired outcomes and to ignite critical thinking skills amongst students.

5. **Professional Elective:** Generally a course can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline or nurtures the candidate's proficiency/skill is called Professional Elective Course.

6. **Open Electives:** An elective course chosen generally from other discipline/ subject, with an intention to seek interdisciplinary exposure is called an open elective. While choosing the electives, students shall ensure that they do not opt for the courses with syllabus contents of which are similar to that of their departmental core/elective courses.

7. **Audit / Non-Core Courses:** An audit / Non-core course is one in which the student attends classes, does the necessary assignments, and takes exams. The Institute encourages students towards extra learning by auditing for additional number of courses. The results of audit courses shall not be considered for prescribed "carry over courses" limit, however students need to pass audit courses for awarding the diploma.

8. **Employability Enhancement Courses**: It contains the following courses:

   a. **Mini Project**: Mini Project is a laboratory oriented course which will provide a platform to students to enhance their practical knowledge and skills by development of small systems/application.

   b. **Seminar:** Seminar should be based on thrust areas in state of art technologies. Students should identify the topic of seminar and finalize in consultation with Guide. Students should understand the topic and compile the report in standard format and present in front of Panel of Examiners respective Programme.

   c. **Major Project:** Every student must do one major project in the Final year of their program. The minimum duration of project is 6 months. Students can do their major project in Industry or R&D Lab or in house or combination of any two.

3.0 COURSE CODE AND DEFINITION:

Course code	Definitions	Teaching Dept. Code	Name of the Teaching Department	Teaching Dept. Code	Name of the Teaching Department
L	Lecture	SC	Science	MI	Mechanical Engineering [Instruments]
T	Tutorial	CP	Commercial Practice / English	CR	Ceramic Engineering
P	Practical	ME	Mechanical Engineering	EN	Civil Environmental Engg.
HS	Humanities & Social Sciences Courses	EE	Electrical & Electronics Engg.	AN	Aeronautical Engg.
BS	Basic Science Courses	CE	Civil Engineering	MN	Mining & Mine Surveying
ES	Engineering Science Courses	EC	Electronics &Communications Engg.	MM	Modern Office Management
PC	Program Core Courses	CS	Comp Science &Engg.	LI	Library and Information Science
PE	Program Elective Courses	IS	Info Science &Engg.	FT	Apparel Design and Fabrication Technology
OE	Open Elective Courses	AT	Automobile Engg.	CH	Chemical Engineering
AU	Audit Courses	MC	Mechatronics	PO	Polymer Technology
SI	Summer Internship	MT	Metallurgical Engg.	PT	Printing Technology
PR	Project	HP	Mechanical Engineering [HPT]	TX	Textile Technology
SE	Seminar	WS	Mechanical Engineering [Welding & Sheet Metal]	EI	Electronic Instrumentation & Control Engg.
CIE	Continuous Internal Evaluation	CN	Cinematography	LT	Leather & Fashion Technology
SEE	Semester End Examination	SR	Sound Recording &Engg.	WH	Water Technology & Health Science
		PH	Civil (Public Health & Environment) Engg.	MY	Mechanical Engineering [Machine Tools]
		TD	Tool & Die Making	AR	Architecture
		ID	Interior Decoration	EG	English

4.0 INDUCTION PROGRAMME

The Essence and Details of Induction program can also be understood from the "Detailed Guide on Student Induction program', as available on AICTE Portal, although that is for Diploma students of Engineering & Technology. Suggestive schedule for induction program is given below

(Link:https://www.aicteindia.org/sites/default/files/Detailed%20Guide%20on%20Student%20Induction%20program.pdf)

Induction Program Schedule (Suggestive only)

(Induction program for students to be offered right at the start of the first year)

SL NO	DAY	TIME	ACTIVITY	VENUE
1	1	09.30-12.30	Registration, Formation of Mentor-mentee groups – Introduction of mentors with-in group.	Class rooms of respective programs
		01.30-04.30	Screening of Institute video clips of various functions held and Photos of various events, Institution Excursion	Seminar hall
2	2	09.30-12.30	Prayer- Physical activities such as yoga; Presentation cum Interactive Session with: Important Institution Functionaries like Principal, HoD's etc.	Play ground and seminar hall
		01.30-04.30	Visit to Central facilities such as Reading room,library,Sport center, computer center, hostel, NSS/NCC cell, community development cell functioning in polytechnic	Tour
		01.30-04.30	Lecturer sessions about importance of NSS/NCC/Youth red cross activities and their contribution towards national building and personality and character development	Seminar hall
4	4	09.30-12.30	Personality development talk on Human values	Seminar hall
		01.30-04.30	Interaction with Alumni students of polytechnic of different programs and interaction with few alumina and sharing their experiences	Seminar hall
5	5	09.30-12.30	Introduction to Swatch Bharath Abhiyan-Importance of Abhiyan-Clean drive in around college	Campus
		01.30-04.30	Talent hunt-Music/Antakshri/Instrument play/ Dance/Team Activity	College Auditorium
6	6	09.30-12.30	Talent hunt Activity: Essay/Debate/Best out of Waste/Pick and speak ,other	Seminar hall
		01.30-04.30	Screening of Movie related: personality development, character building, motivational ,Environmental concern, Public health, rural sanitation	College Auditorium
7	7	09.30-12.30	Exchange of views between students and faculty about their Institute/program/carrier opportunities	Seminar hall
		01.30-04.30	Games/Sports Activity	Sports ground
8	8	09.30-12.30	Talk by training and placement cell: Carrier opportunities for diploma students, placement activities in college; placement process	Training and placement cell
		01.30-04.30	Talents hunt Activity: (Street Play/Mime/Acting/Stand Up Comedy /Dance etc.)	Seminar hall
9	9	09.30-12.30	Personality development talks by eminent speakers on - Leadership styles/How to handle failures/stress management	Seminar hall
		01.30-04.30	Importance of student union, student union activities, Student insurance, How to make student insurance by Student welfare officer of college	Seminar hall
10	10	09.30-12.30	Awareness on: Student scholarship- introduction to SSP portal – e-pass portal-Authenticated documents, how to apply in portal: Talk by Taluk/District social welfare officer	Seminar hall

		01.30-04.30	Local visits to surrounding places/Industry	Tour
11	**11**	09.30-12.30	**Talk on** Respective Program scheme of studies and detail of courses, Diploma examination pattern, Passing and eligibility criteria, attendance requirements by respective program coordinator	Department Class rooms
		01.30-04.30	Visit to respective programs lab/work shops of institution	Tour
12	**12**	09.30-12.30	Awareness camp on human health ,Community health, Personal hygiene-By Local Taluk medical officer/Community medical officer	Seminar hall
		01.30-04.30	Collection of student feedback on induction program- Make a report Valedictory of two weeks Induction program by collecting student feed back	Seminar hall

Induction Program (mandatory)	Two- week Duration
Induction program for students to be offered right at the start of the first year.	• Physical activity • Creative arts • Universal human values • Literacy • Proficiency modules • Lectures by Eminent People • Visits to Local Areas • Familiarization to Dept./Branch & Innovations

5.0 MANDATORY VISITS/WORKSHOP/EXPERT LECTURES:

1. It is mandatory to arrange one industrial visit every semester for the students of each branch.

2. It is mandatory to conduct a One-week workshop during the winter break after fifth semester on professional/ industry/ entrepreneurial orientation.

3. It is mandatory to organize at least one expert lecture per semester for each branch by inviting resource persons from domain specific industry.

6.0 EVALUATION SCHEME:

A. For Theory Courses:

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain minimum of 40% marks individually both in CIE and SEE to pass. Theory Semester End Exam (SEE) is conducted for 100 marks (3 Hours duration). Based on this grading will be awarded

B. For Practical Courses:

The weightage of Continuous Internal Evaluation (CIE) is 60% and for Semester End Exam (SEE) is 40%. The student has to obtain minimum of 40% marks individually both CIE and SEE to pass. The practical Semester End Exam (SEE) is conducted for 100 marks (3 Hours duration exams). Based on this grading will be awarded.

C. For Summer Internship / Projects / Seminar etc.

1. Evaluation is based on work done, quality of report, performance in viva-voce, presentation etc.

Note:

A. The Continuous Internal Evaluation (CIE) is based on the student's performance in Internal Assessment tests, student activity, mini project, quizzes, assignments, seminars, viva-voce in practical, lab record etc. as specified in respective course curriculum.

B. **Major Project/Mini Project:** Students can do their major project in Industry or R&D Labor in house. Mini Project is a laboratory oriented course which will provide a platform to students to enhance their practical knowledge and skills by development of small systems/application.

C. **Personality and character development:** It is mandatory for the students from 1ˢ semester to enroll in any one of the personality and character development programmes (NCC/NSS/YRC/Yoga/Technical Club) and undergo training for their Personality and character development.

- National Cadet Corps (NCC).
- National Service Scheme (NSS) will have social service activities in and around the Institution.
- Youth Red Cross (YRC) will have activities in and around the institution.
- Yoga
- Technical Clubs.

D. **Internship:** A minimum of 10 credits (400 Hours) of Internship/ Entrepreneurial activities / Project work/ Seminar and Inter/ Intra Institutional Training may be counted toward three-year diploma programme.

E. **Mapping of Marks to Grades:** Each course (Theory/Practical) is to be assigned 100 marks, irrespective of the number of credits, and the mapping of marks to grades may be done as per the following table:

Range of Marks	Level	Assigned Grade	Grade Point
91-100	Outstanding	A+	10
81-90	Excellent	A	09
71-80	Very Good	B+	08
61-70	Good	B	07
51-60	Above Average	C+	06
45-50	Average	C	05
40-44	Satisfactory	D	04
<40	Fail	F	00
Fail due to shortage of attendance and therefore, to repeat the course/semester.		F*	00
Fail in Continuous internal Evaluation (CIE).		F**	00
Note: Those Candidates who have not obtained requisite minimum pass marks in CIE are not eligible to take up SEE in that course until they get requisite minimum pass marks in the CIE. They may re- register for the CIE in the subsequent regular semesters by paying prescribed examination fee.			

SGPA and CGPA Calculations	
Semester Grade Point Average (SGPA)=	∑[(Course Credits earned)X(Grade Points)] for all the courses in that semester
	∑[Total Course credits applied] for all the courses in that semester
Cumulative Grade Point Average(CGPA)=	∑[(Course Credits earned)X(Grade Points) for all courses, excluding those with F*/F** grades until that semester
	∑[Total Course Credits earned] for all Courses excluding those with F*/F** grades until that semester
Note: The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the semester Diploma marks /grade card.	

A. SGPA and CGPA Calculations: An illustrative example for one academic year

Semester	Course Code	Credits Applied (CA)	Result Grade	Grade Points (GP)	Credits Earned (CE)	Credit points (CP=CE x GP)	SGPA, CGPA
I	Course 1	4	B	7	4	4x7=28	SGPA=CP/CA
I	Course 2	4	F	0	0	0x0=00	
I	Course 3	4	Absent (F)	0	0	0x0=00	=110/22
I	Course 4	4	A	9	4	4x9=36	
I	Course 5	2	A+	10	2	2x10=20	= 5.00
I	Course 6	2	D	4	2	2x4=08	
I	Course 7	2	A	9	2	2x9=18	
	Total	22			14	110	*SGPA = 5.00*

Note: In 1s semester grade/marks card only SGPA is reported. From 2 d semester onwards both SGPA & CGPA will be reported in the grade/marks card.

Semester	Course Code	Credits Applied (CA)	Result Grade	Grade Points (GP)	Credits Earned (CE)	Credit points(CP=CE x GP)	SGPA, CGPA
II	Course 1	4	B	7	4	4x7=28	SGPA=CP/CA
II	Course 2	4	A	9	4	4x9=36	
II	Course 3	3	D	4	3	3x4=12	=100/19
II	Course 4	3	Absent (F)	0	0	0x0=00	
II	Course 5	2	A+	10	2	2x10=20	= 5.26
II	Course 6	1	D	4	1	1x4=04	CGPA
II	Course 7	2	F	0	0	0x0=00	= CP/CE =(110+136)/ (14+22)
		19			14	100	= 246/36
I Semester Back log courses							=6.83
I	Course 2	4	C	5	4	4x5=20	
I	Course 3	4	D	4	4	4x4=16	
	Total	27			22	136	

- Total credits of the semester excluding the credits of the courses under F/F*/F** grade are considered for the calculation of CGPA of the two consecutive semesters under consideration.

B. CGPA Calculation of the entire programme: An Illustrative Example.

Semester	I	II	III	IV	V	VI	Total
Credits of the Semester	22	19	24	24	24	24	137
∑CP	110	136	184	155	191	188	964

$$CGPA = \frac{[110+136+184+155+191+18]}{22+19+22+24+24+24} = \frac{964}{137} = 7.04$$

P=Percentage Conversion= (CGPA-0.75) X 10
Class Declaration:

After the conversion of final CGPA into percentage of marks (P), a graduating student is declared to have passed in:

(i) First Class with Distinction (FCD) if P ≥ 70%

(ii) First Class (FC) if P ≥ 60% but <70% and

(iii) Second Class (SC) if P < 60%.