

Visvesvaraya Technological University, Belagavi  
**B.E. in Computer Science and Engineering**  
 Scheme of Teaching and Examinations 2021  
 Outcome-Based Education (OBE) and Choice Based Credit System (CBCS)  
 (Effective from the academic year 2021-22)

**III SEMESTER**

Sl. No.	Course and Course Code		Course Title	Teaching Department	Teaching Hours / Week				Examination			Credits		
					Theory Lecture	Tutorial	Practical / Drawing	Self-Study	Duration in Hours	CIE Marks	SEE Marks		Total Marks	
					L	T	P	S						
1	BSC	21MAT31	Transform Calculus, Fourier Series and Numerical Techniques	BSC	3	0	0		3	50	50	100	3	
2	IPCC	21CS32	Data Structures and its Applications	CSEB	3	0	2		3	50	50	100	4	
3	IPCC	21CS33	Analog and Digital Electronics	CSEB	3	0	2		3	50	50	100	4	
4	PCC	21CS34	Computer Organization and Architecture	CSEB	3	0	0		3	50	50	100	3	
5	PCC	21CSL35	Object Oriented Programming with JAVA Laboratory	CSEB	0	0	2		3	50	50	100	1	
6	INT	21INT36	Summer Internship -I	Completed during the vacation of II and III semesters. Lateral entry students have to attend the internship during the vacation of III & IV semester ***					50	50	100	2		
7	HSMC	21KSK37	Samskrutika Kannada	HSMC	1	0	0		1	50	50	100	1	
		21KBK37	Balake Kannada											
		OR												
		21CIP37	Constitution of India and Professional Ethics											
8	AEC	21XX38X	Ability Enhancement Course-III	Any Dept	1	0	0		1	50	50	100	1	
9	UHV	21UHV39	Social Connect and Responsibility	HSMC	1	0	0		1	50	50	100	1	
		<b>Total</b>							18	450	450	900	20	

**Note:** BSC: Basic Science Course, PCC: Professional Core Course, HSMC: Humanity and Social Science & Management Courses, AEC – Ability Enhancement Courses. INT – Internship, UHV- Universal Human Value Courses, IPCC: Integrated Professional Core Course, CSEB – Computer Science and Engg. Board (CS / IS / AI / AD/ IC / CD)

L–Lecture, T–Tutorial, P–Practical/Drawing, S–Self Study Component, CIE: Continuous Internal Evaluation, SEE: Semester End Examination

21KBK37 <b>Balake Kannada</b> is for non-Kannada speaking, reading, and writing students, and 21KSK37 <b>Samskrutika Kannada</b> is for students who speak, read and write Kannada.													
<b>The course prescribed to lateral entry Diploma holders admitted to III semester of Engineering programs</b>													
<b>10</b>	<b>NCMC</b>	<b>21MATDIP31</b>	<b>Additional Mathematics-I</b>	<b>Maths</b>	<b>02</b>	<b>02</b>	<b>--</b>			<b>100</b>	<b>---</b>	<b>100</b>	<b>0</b>
<p>1. The mandatory non – credit courses Additional Mathematics I and II prescribed for III and IV semesters respectively, to the lateral entry Diploma holders admitted to III semester of BE/B.Tech., programs, shall attend the classes during the respective semesters to complete all the formalities of the course and appear for the Continuous Internal Evaluation (CIE). In case, any student fails to register for the said course/fails to secure the minimum 40 % of the prescribed CIE marks, he/she shall be deemed to have secured an F grade. In such a case, the student has to fulfill the requirements during subsequent semester/s to appear for CIE.</p> <p>2. These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree.</p> <p><b>***21INT36: Lateral Entry students:</b> All the students admitted to engineering programs under the lateral entry category shall have to undergo a mandatory <b>21INT36 summer Internship-I of 03 weeks</b> during the intervening vacation of III and IV semesters. Summer Internship shall include Inter / Intra Institutional activities. A University Viva-voce examination shall be conducted during the IV semester examinations and the prescribed credit earned after successful completion of the course 21INT36 shall be included in the III semester grade card. The III semester grade card shall be issued only after completing all the courses of III semester. The internship shall be considered as ahead of passing and shall be considered for vertical progression and for the award of degree. Those, who do not take up / complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements during subsequent semesters. (The faculty coordinator or mentor has to monitor the students' internship progress and interact with guide them for the successful completion of the internship.)</p> <p><b>Integrated Professional Core Course (IPCC):</b> refers to Professional Theory Core Course Integrated with Practical of the same course. Credit for IPCC can be 04 considering L:T:P as 3:0:2 or L:T:P as 2:2:2. The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by CIE only and there shall be no SEE. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (BE/B.Tech.,) 2021-22 may be referred.</p> <p><b>Summer Internship-I: SEE</b> shall be through seminar and viva-voce.</p>													

<b>Ability Enhancement Course - III</b>	
21XX381	
21XX382	
21XX383	
21CS384	Mastering Office
21CS385	C++ Programming



Visvesvaraya Technological University, Belagavi  
**B.E. in Computer Science and Engineering**  
 Scheme of Teaching and Examinations 2021  
 Outcome-Based Education (OBE) and Choice Based Credit System (CBCS)  
 (Effective from the academic year 2021-22)

**IV SEMESTER**

Sl. No.	Course and Course Code		Course Title	Teaching Department	Teaching Hours / Week				Examination			Credits		
					Theory Lecture	Tutorial	Practical / Drawing	Self-Study	Duration in Hours	CIE Marks	SEE Marks		Total Marks	
					L	T	P	S						
1	BSC	21MAT41	Mathematical Foundations for Computing	BSC	3	0	0		3	50	50	100	3	
2	IPCC	21CS42	Design and Analysis of Algorithms	CSEB	3	0	2		3	50	50	100	4	
3	IPCC	21CS43	Microcontroller and Embedded System	CSEB	3	0	2		3	50	50	100	4	
4	PCC	21CS44	Operating System	CSEB	3	0	0		3	50	50	100	3	
5	AEC	21BE45	Biology For Engineers	BT, CHE, PHY,	2	0	0		2	50	50	100	2	
6	PCC	21CSL46	Python Programming Laboratory	CSEB	0	0	2		3	50	50	100	1	
7	HSMC	21KSK47	Samskrutika Kannada	HSMC	1	0	0		1	50	50	100	1	
		21KBK47	Balake Kannada											
		OR												
		21CIP47	Constitution of India and Professional Ethics											
8	AEC	21XX48X	Ability Enhancement Course-IV	Any Dept	1	0	0		1	50	50	100	1	
9	UHV	21UHV49	Universal Human Values and Professional Ethics	HSMC	1	0	0		1	50	50	100	1	
		<b>Total</b>							20	450	450	900	20	

**Note:** BSC: Basic Science Course, PCC: Professional Core Course, HSMC: Humanity and Social Science & Management Courses, AEC - Ability Enhancement Courses. INT - Internship, UHV - Universal Human Value Courses, IPCC: Integrated Professional Core Course, CSEB - Computer Science and Engg. Board (CS / IS / AI / AD / IC / CD)

L-Lecture, T-Tutorial, P-Practical/Drawing, S-Self Study Component, CIE: Continuous Internal Evaluation, SEE: Semester End Examination

21KBK47 **Balake Kannada** is for non-Kannada speaking, reading, and writing students, and 21KSK47 **Samskrutika Kannada** is for students who speak, read and write Kannada.

**Summer Internship-II (21INT58):** shall be carried out at industrial (State and Central Government /Non-government organizations (NGOs)/Micro, Small and Medium Enterprise (MSME)/Innovation centers/ Incubation centers. The internship can also be Rural internship.All the students admitted shall have to undergo a mandatory internship of 04 weeks during the intervening vacation of IV and V semesters. A University Viva-Voce examination (Presentation followed by Question & Answer session) shall be conducted during Vsemesterandtheprescribedcreditshallbeincludedin the Vsemester.The internshipshallbeconsideredas aheadofpassingandshallbeconsideredforthe award of degree. Those, who do not take up/complete the internship shall be declared fail and shall have to complete during subsequent Universityexaminationafter satisfyingthe internshiprequirements. (The faculty coordinator or mentor has to monitor the students' internship progress and interact to guide them for the successful completion of the internship.)

**Summer Internship-II: SEE** shall be through seminar and viva-voce.

**The course prescribed to lateral entry Diploma holders admitted to II semester of Engineering programs**

<b>10</b>	<b>NCMC</b>	<b>21MATDIP41</b>	<b>Additional Mathematics-II</b>	<b>Maths</b>	<b>02</b>	<b>02</b>	<b>--</b>			<b>100</b>	<b>---</b>	<b>100</b>	<b>0</b>
-----------	-------------	-------------------	----------------------------------	--------------	-----------	-----------	-----------	--	--	------------	------------	------------	----------

1. The mandatory non – credit courses **Additional Mathematics II** prescribed for IV semester, to the lateral entry Diploma holders admitted to III semesters BE/B.Tech., programs, shall attend the classes during the respective semesters to complete all the formalities of the course and appear for the Continuous Internal Evaluation (CIE). In case, any student fails to register for the said course/fails to secure the minimum 40% of the prescribed CIE marks, he/she shall be deemed to have secured an F grade. In such a case, the student has to fulfill the requirements during subsequent semester/s to appear for CIE.
2. These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree

**Integrated Professional Core Course (IPCC):** refers to Professional Theory Core Course Integrated with Practical of the same course. Credit for IPCC can be 04 considering L:T:P as 3:0:2 or L:T:P as 2:2:2. Theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by CIE only and there shall be no SEE. For more details the regulation governing the Degree of Bachelor of Engineering /Technology (BE/B.Tech.,) 2021-22 may be referred

<b>Ability Enhancement Course - III</b>	
21XX481	
21XX482	
21XX483	
21CS484	Unix Shell and PHP Programming
21CS485	R Programming

Visvesvaraya Technological University, Belagavi  
**B.E. in Computer Science and Engineering**  
 Scheme of Teaching and Examinations 2021  
 Outcome-Based Education (OBE) and Choice Based Credit System (CBCS)  
 (Effective from the academic year 2021-22)

**V SEMESTER**

Sl. No.	Course and Course Code		Course Title	Teaching Department	Teaching Hours / Week				Examination				Credits
					Theory Lecture	Tutorial	Practical / Drawing	Self-Study	Duration in Hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	BSC	21CS51	Automata Theory and compiler Design	CSEB	3	0	0		3	50	50	100	3
2	IPCC	21CS52	Computer Network	CSEB	3	0	2		3	50	50	100	4
3	PCC	21CS53	Database Management Systems	CSEB	3	0	0		3	50	50	100	3
4	PCC	21CS54	Artificial Intelligence and Machine Learning	CSEB	3	0	0		3	50	50	100	3
5	PCC	21CSL55	Database Management Systems Lab with Mini Project	CSEB	0	0	2		3	50	50	100	1
6	AEC	21XX56	Research Methodology & Intellectual Property Rights	Any Dept.	2	0	0		2	50	50	100	2
7	INT	21INT57	Summer Internship-II		Completed during the vacation of IV and V semesters				3	50	50	100	3
8	HSMC	21CIV58	Environmental Studies	Civil/Environmental Chemistry/Bio tech [Paper setting: Civil Engineering Board]	1	0	0		1	50	50	100	1
<b>Total</b>									21	400	400	800	20
9	NCMC	21PE59/21Y059/21NS59	Physical Education (Sport & Athletics)/YOGA & NSS	PE/NSS	-	-	2			50	50	100	0

**Note:** BSC: Basic Science Course, PCC: Professional Core Course, HSMC: Humanity and Social Science & Management Courses, AEC – Ability Enhancement Courses. INT – Internship, UHV- Universal Human Value Courses, IPCC: Integrated Professional Core Course, CSEB – Computer Science and Engg. Board (CS / IS / AI / AD/ IC / CD)

**L**-Lecture, **T**-Tutorial, **P**-Practical/Drawing, **S**-Self Study Component, **CIE**: Continuous Internal Evaluation, **SEE**: Semester End Examination

1. The mandatory non – credit courses **Physical Education (Sport and Athletics), Yoga and NSS I and II** prescribed for V and VI semesters respectively, to the students admitted to V semester of B.E./B.Tech., programs, shall attend corresponding the classes during the respective semesters to complete all the formalities of the course and appear for the University examination. In case, any student fails to register for the said course/fails to secure the minimum of 40% of the prescribed CIE marks, he/she shall be deemed to have secured F grade. In such a case, the student has to fulfill the requirements during subsequent semester/s to appear for SEE.
2. These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree.
3. The students who take a course on Physical education he/she has to take up the semester-end practical examination prescribed for 100 marks. The students who opt for the NSS course have to submit reports and attend to viva-voce examination. The marks for the report shall be 50 marks and for presentation and viva-voce 50 marks.

**Integrated Professional Core Course (IPCC):** It refers to Professional Theory Core Course Integrated with Practical of the same course. Credit for IPCC can be 04 considering L: T:P as 3:0:2 or L:T:P as 2:2:2. For an IPCC, the theory part shall be evaluated by both CIE and SEE, and the practical part is evaluated by CIE only (there shall be no semester-end examination (SEE) for the practical part). For more details the regulation governing the Degree of Bachelor of Engineering /Technology (BE/B.Tech.) 2021-22 may be referred.

Visvesvaraya Technological University, Belagavi  
**B.E. in Computer Science and Engineering**  
 Scheme of Teaching and Examinations 2021  
 Outcome-Based Education (OBE) and Choice Based Credit System (CBCS)  
 (Effective from the academic year 2021-22)

**VI SEMESTER**

Sl. No.	Course and Course Code		Course Title	Teaching Department	Teaching Hours / Week				Examination			Credits	
					Theory Lecture	Tutorial	Practical / Drawing	Self-Study	Duration in Hours	CIE Marks	SEE Marks		Total Marks
					L	T	P	S					
1	HSMC	21CS61	Software Engineering and Project Management	CSEB	3	0	0	0	3	50	50	100	3
2	IPCC	21CS62	Fullstack Development	CSEB	3	0	2	0	3	50	50	100	4
3	PCC	21CS63	Computer Graphics and Visualization	CSEB	3	0	0	0	3	50	50	100	3
4	PEC	21XX64x	Professional Elective Course-I	CSEB	3	0	0	0	3	50	50	100	3
5	OEC	21XX65x	Open Elective Course-I	CSEB	3	0	0	0	3	50	50	100	3
6	PCC	21CSL66	Computer Graphics and Visualization Lab	CSEB	0	0	2	0	3	50	50	100	1
7	MP	21CSMP67	Mini Project	CSEB					3	100	---	100	2
8	AEC	21CS68X	Ability Enhancement Course-V	CSEB / CONCE RNED DEPT	1	0	0	0	1	50	50	100	1
<b>TOTAL</b>									22	450	350	800	20
9	NCMC	21PE69/21 YO69/ 21NS69	Physical Education (Sport & Athletics)/YOGA & NSS	PE/NS S	-	-	2			50	50	100	0

**Note:** BSC: Basic Science Course, PCC: Professional Core Course, HSMC: Humanity and Social Science & Management Courses, AEC - Ability Enhancement Courses. INT - Internship, UHV- Universal Human Value Courses, IPCC: Integrated Professional Core Course, CSEB - Computer Science and Engg. Board (CS / IS / AI / AD/ IC / CD)

**L**-Lecture, **T**-Tutorial, **P**-Practical/Drawing, **S**-Self Study Component, **CIE**: Continuous Internal Evaluation, **SEE**: Semester End Examination

- The mandatory non - credit courses **Physical Education (Sport and Athletics), Yoga and NSS I and II** prescribed for V and VI Semesters respectively, to the students admitted to V semester of B.E./B.Tech., programs, shall attend the classes during the respective semesters to complete all the formalities



of the course and appear for the University examination. In case, any student fails to register for the said course/fails to secure the minimum 40% of the prescribed CIE marks, he/she shall be deemed to have secured F grade. In such a case, the student has to fulfill the requirements during subsequent semester/s to appear for SEE.

2. These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree.
3. The students who take course on Physical education he has to take up practical examination for SEE. The students who take NSS course have to submit report, for SEE has to present (PPT) and answer vivo-voce for marks in the ratio 50:50

**Research/Industry Internship (21INT82)** – At the End of the sixth / Seventh semester (in two cycles to accommodate all the students of the University) Research/Industrial Internship shall be carried out – Based on industrial/Govt./NGO/MSME/Rural Internship/Innovation/Entrepreneurship. All the students admitted shall have to undergo a mandatory internship of **24 weeks** during the vacation of VI/VII semesters. A University Viva-Voce examination shall be conducted during VII/VIII semester and the prescribed credit shall be included in VII/VIII semester. The internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not take up/complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements.

**Research internship** Students have to take up pre-research internships at Centers of Excellence (CoE)/Study Centers established in the same institute and/or out of the institute at reputed research organizations / Institutes. A research internship is intended to give you the flavor of current research going on in a particular topic/s. This helps students get familiarized with the field, the skill needed the effort amount and kind of effort required for carrying out research in that field.

**Industry internships:** Is an extended period of work experience undertaken by students looking to supplement their degree with professional development. The students are allowed to prepare themselves for the workplace and develop practical skills as well as academic ones. It also helps them learn to overcome unexpected obstacles and successfully navigate organizations, perspectives, and cultures. Dealing with contingencies helps students recognize, appreciate, and adapt to organizational realities by tempering knowledge with practical constraints.

The student can take up Interdisciplinary Industry Internship. Students can undergo industry internships in recognized industries from local/within the state/within the country/abroad within the stipulated time as mentioned in the scheme. The faculty coordinator or mentor has to monitor the students' internship progress and interact to guide them for the successful completion of the internship. University shall not bear any expenses incurred in respect of internship.

**Mini-project work:** Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary Mini-project can be assigned to an individual student or to a group having not more than 4 students. (or Mini Project is a laboratory-oriented course which will provide a platform to students to enhance their practical knowledge and skills by the development of small systems/applications)

CIE procedure for Mini-project:

- (i) **Single discipline:** The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide. The CIE marks awarded for the Mini-project work shall be based on the

evaluation of project report, project presentation skill, and question and answer session in the ratio of 50:25:25. **The marks awarded for the project report shall be the same for all the batch mates.**

- (ii) **Interdisciplinary:** Continuous Internal Evaluation shall be group-wise at the college level with the participation of all the guides of the college. The CIE marks awarded for the Mini-project, shall be based on the evaluation of project report, project presentation skill, and question and answer session in the ratio of 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

**SEE for Mini-project:**

- (i) **Single discipline:** Contribution to the Mini-project and the performance of each group member shall be assessed individually in the semester-end examination (SEE) conducted at the department.

**Interdisciplinary:** Contribution to the Mini-project and the performance of each group member shall be assessed individually in semester-end examination (SEE) conducted separately at the department to which the student/s belongs.

**Integrated Professional Core Course (IPCC):** It refers to Professional Theory Core Course Integrated with Practical's of the same course. Credit for IPCC can be 04 considering L:T:P as 3:0:2 or L:T:P as 2:2:2. For an IPCC, theory part shall be evaluated by both CIE and SEE and practical part be evaluated by CIE only (there shall be no semester end examination (SEE) for the practical part). For more details the regulation governing the Degree of Bachelor of Engineering /Technology (BE/B.Tech) 2021-22 may be referred.

**Open Elective Courses:**

All Open Electives are offered to students of all branches in general. However, a student shall choose an open Elective from the list in such a manner that he/she has not studied the same course in any form during the Program. Students can select any one of the open electives offered by other Departments except those that are offered by the parent Department (Please refer to the list of open electives). Selection of an open elective shall not be allowed if,

- The candidate has studied the same course during the previous semesters of the program.
- The syllabus content of open electives is similar to that of the Departmental core courses or professional electives.
- A similar course, under any category, is prescribed in the higher semesters of the program.
- Registration to electives shall be documented under the guidance of the Program Coordinator/Advisor/Mentor.

Courses from Law, Business (MBA), Medicine, Arts, Commerce, may be offered as Open Elective Courses (OEC). However, the college has to take approval from the University if such courses are not listed in the group at least one month before the commencement of the semester.

The minimum students' strength for offering professional electives is 05, if the strength is less than the 05 then colleges have to take the permission to offer the course from the University.

**Professional Core Course (Integrated):** Theory Syllabus of Professional Core Courses integrated with Practical Syllabus of the same course. Credit for integrated subject will be  $(L: T: P = 3:0:2)/(L:T:P=2:2:2) = 04$ . In such a course there is no Semester End Examination (SEE) for the practical syllabus of the course, however Continuous Internal Evaluation (CIE) will be conducted for the practical topics.

Professional Elective Courses-I		Open Elective Courses-I	
Subject Code	Title	Subject Code	Title
21CS641	Agile Technology	21CS651	Introduction to Data Structure
21CS642	Advanced JAVA Programming	21CS652	Introduction to Data Base
21CS643	Digital Image Processing	21CS653	Programming in JAVA
21CS644	Advanced Computer Architecture	21CS654	Introduction to Cyber Security
21CS645	Data science and Visualization	21XX655	Course on NCC

Ability Enhancement Courses-V	
21XX681	
21XX682	
21XX683	
21CS684	Angular and React JS
21CS685	C# and Dot Net Framework

Visvesvaraya Technological University, Belagavi  
**B.E. in Computer Science and Engineering**  
 Scheme of Teaching and Examinations 2021  
 Outcome-Based Education (OBE) and Choice Based Credit System (CBCS)  
 (Effective from the academic year 2021-22)

**VII SEMESTER**

Sl. No.	Course and Course Code		Course Title	Teaching Department	Teaching Hours / Week				Examination			Credits	
					Theory Lecture	Tutorial	Practical / Drawing	Self-Study	Duration in Hours	CIE Marks	SEE Marks		Total Marks
					L	T	P	S					
1	PCC	21CS71	Big Data Analytics	CSEB	3	0	0	0	3	50	50	100	3
2	PEC	21XX72X	Professional elective Course-II	CSEB	3	0	0	0	3	50	50	100	3
3	PEC	21XX73X	Professional elective Course-III	CSEB	3	0	0	0	3	50	50	100	3
4	OEC	21XX74X	Open elective Course-II	CSEB	3	0	0	0	3	50	50	100	3
5	Project	21CSP75	Project work	CSEB					3	100	100	200	10
6	AEC	21CS76X	Ability Enhancement Course -VI (Online)	Ant Dept	2	0	0		2	--	--	--	2
<b>TOTAL</b>									17	300	300	600	24

**OR**

**VIII SEMESTER**

Sl. No.	Course and Course Code		Course Title	Teaching Department	Teaching Hours / Week				Examination			Credits	
					Theory Lecture	Tutorial	Practical / Drawing	Self-Study	Duration in Hours	CIE Marks	SEE Marks		Total Marks
					L	T	P	S					
1	Seminar	21CSS81	Technical Seminar							100	--	100	01
2	Internship	21INT82	Research/Industry Internship*							100	100	200	15
3			<b>TOTAL</b>							200	100	300	16

**Note:**

(1) Institutions can swap 7<sup>th</sup> and 8<sup>th</sup> Semester Coursework to accommodate industry/research internship at the end of the sixth semester

(2) Credit earned for the coursework shall be credited to the corresponding semester, i.e., 7<sup>th</sup> or 8<sup>th</sup> whether 7<sup>th</sup> and 8<sup>th</sup> semesters were completed during the first half or second half of the IV year of program

**Research / Industry Internship-(21INT82):** shall be as far as possible be interdisciplinary in nature. If a provision is there all the students of the program can take up an internship in the 8<sup>th</sup> semester, if not 50% of students can take internship-III at the 7<sup>th</sup>-semester level, and the remaining 50% of students can take in 8<sup>th</sup>-semester level.

**Note:** **BSC:** Basic Science Course, **PCC:** Professional Core Course, **HSMC:** Humanity and Social Science & Management Courses, **AEC** – Ability Enhancement Courses. **INT** – Internship, **UHV**- Universal Human Value Courses, **IPCC:** Integrated Professional Core Course, **CSEB** – Computer Science and Engg. Board (CS / IS / AI / AD/ IC / CD)

**L**–Lecture, **T**–Tutorial, **P**-Practical/Drawing, **S**–Self Study Component, **CIE:** Continuous Internal Evaluation, **SEE:** Semester End Examination

**AICTE activity Points:** In case students fail to earn the prescribed activity Points, the Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of the degree only after the release of the Eighth semester Grade Card.

Activity points of the students who have earned the prescribed AICTE activity Points shall be sent to the University along with the CIE marks of 8th semester. In case of students who have not satisfied the AICTE activity Points at the end of the eighth semester, the column under activity Points shall be marked NSAP (Not Satisfied Activity Points).

**TECHNICAL SEMINAR (21XXS81):** The objective of the seminar is to inculcate self-learning, face the audience confidently, enhance communication skill, involve in group discussion, and present and exchange ideas. Each student, under the guidance of a Faculty, shall choose, preferably, a recent topic of his/her interest relevant to the program of Specialization.

- Carry out literature survey, systematically organize the seminar content.
- Prepare the report with own sentences, avoiding a cut and paste act.
- Type the matter to acquaint with the use of Micro-soft equation and drawing tools or any such facilities.
- Present the seminar topic orally and/or through PowerPoint slides.
- Answer the queries and involve in debate/discussion.
- Submit a typed report with a list of references.

The participants shall take part in the discussion to foster a friendly and stimulating environment in which the students are motivated to reach high standards and become self-confident.

**Evaluation Procedure:**

The CIE marks for the seminar shall be awarded (based on the relevance of the topic, presentation skill, participation in the question-and-answer session, and quality of report) by the committee constituted for the purpose by the Head of the Department. The committee shall consist of three teachers from the department with the senior-most acting as the Chairman.

**Marks distribution for CIE of the course:**

Seminar Report:50 marks

Presentation skill:25 marks

Question and Answer:25 marks

**PROJECT WORK (21XXP75):** The objective of the Project work is to encourage independent learning and the innovative attitude of the students. To develop interactive, communication, organization, time management, and presentation skills. To impart flexibility and adaptability. To inspire independence and team working. To expand intellectual capacity, credibility, judgment, intuition. To adhere to punctuality, setting and meeting deadlines. To instill responsibilities to oneself and others. To train students to present the topic of project work in a seminar without any fear, face the audience confidently, enhance communication skills, involve in group discussion to present and exchange ideas.

**CIE procedure for Project Work:**

- (1) **Single discipline:** The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide.
- (2) The CIE marks awarded for the project work, shall be based on the evaluation of project work Report, project presentation skill, and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

**Interdisciplinary:** Continuous Internal Evaluation shall be group-wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable. The CIE marks awarded for the project work, shall be based on the evaluation of project work report, project presentation skill, and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

<b>Professional Elective Courses-II</b>		<b>Professional Elective Courses-III</b>	
<b>SubjectCode</b>	<b>Title</b>	<b>SubjectCode</b>	<b>Title</b>
21CS721	Object oriented Modelling and Design	21CS731	Software Architecture and Design Patterns
21CS722	Cloud Computing	21CS732	Multiagent Systems
21CS723	Cryptography and Network Security	21CS733	Deep Learning
21CS724	Blockchain Technology	21CS734	Robotic Process Automation Design and Development
21CS725	Internet of Things	21CS735	NoSql Data Base

<b>Open Elective Courses-II</b>		<b>Ability Enhancement Courses-VI</b>	
<b>SubjectCode</b>	<b>Title</b>	<b>SubjectCode</b>	<b>Title</b>
21CS741	Programming in Python	21XX761	
21CS742	Introduction to AI and ML	21XX762	
21CS743	Introduction to Big Data	21XX763	
21CS744	Introduction to Data Science	21CS764	Branch Specific Course
21CS745	Course on NCC	21Cs765	Branch Specific Course