Visvesvaraya Technological University

Department of Computer Science and Engineering

Admission Open for B. Tech 2020

Course Offered
In
COMPUTER SCIENCE AND BUSINESS SYSTEMS

In Collaboration with TCS

The Department of Computer Science and Engineering has been established in the academic year 2002-2003. The department has always attracted the best of engineering aspirants from all over the country and abroad. It is successful in producing skilled and competent Computer Engineers and Entrepreneurs ready to satisfy the needs of the industry and society at large. The department is equipped with adequate infrastructure to support academic, research and extra-curricular activities for all round development.

The department offers Postgraduate and Research Programmes at the headquarters, Belagavi and PG centres at Kalaburagi, Mysuru and Muddenahalli. All the locations have serne enivirons and state of the art infrastructure to facilitate learning and research. The faculty of the department work in all the niche areas of Computer Science contributing to the Knowledge

From this year 2020-21, the Dept of CSE introduced a new engineering course- **B.Tech in Computer Science and Business Systems in collaboration with Tata Consultancy Services(TCS), at VTU Belagavi Campus.** The course will be initiated from this academic year. The course will have subjects on the latest technologies such as big data, design thinking and machine learning. TCS will train faculty members for this course. Students who complete the course successfully will be preferred for recruitment in the Company.

FEATURES

- Experienced & Expert Faculty
- Placement support by TCS & VTU
- Curriculum design by TCS
- Fully Residential Program
- Completely Autonomous
- Intake restricted to 30 and personal care to each student
- Government College fees
- Admission through CET/KEA only
- Department has centre of excellence in Machine Learning for Data Science
- More than 500+ publications in the last 5 Years

For Admission Contact
Phone: 08312498251
 Mobile: 9481981542
Email: chair.cse@vtu.ac.in
Website: https://vtu.ac.in

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

3rd to 8th Semester BE – **Computer Science and Business Systems**

(B.E. in CSBS)

Scheme of Teaching and Examinations

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2019 – 20)

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

Scheme of Teaching and Examination 2019 – 20

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2019 – 20)

III SEMESTER

Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours /Week			Examination				
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
					L	T	P					
1	BSC	18MAT31	Transform Calculus, Fourier Series and Numerical Techniques	Mathematics	2	2	--	03	40	60	100	3
2	PCC	18CS32	Data Structures and Applications	CB/CS / IS	3	2	--	03	40	60	100	4
3	SH	18CB33	Business Communication and Value Science - I + Lab	CB/CS / IS	3	0	--	03	40	60	100	3
4	PCC	18CS34	Computer Organization (incl logic design)	CB/CS / IS	3	0	--	03	40	60	100	3
5	PCC	18CS35	Operating Systems	CB/CS / IS	3	0	--	03	40	60	100	3
6	PCC	18CS36	Discrete Mathematical Structures (incl. FLAT)	CB/CS / IS	3	0	--	03	40	60	100	3
7	SH	18CBL37	Data Structures Laboratory	CB/CS / IS	--	2	2	03	40	60	100	2
8	PCC	18CSL38	Operating Systems Laboratory	CB/CS / IS	--	2	2	03	40	60	100	2
9	HSMC	18KVK39	Vyavaharika Kannada (Kannada for communication)/	HSMC	--	2	--	--	100	--	100	1
		18KAK39	Aadalitha Kannada (Kannada for Administration)									
		OR	OR									
		18CPH39	Constitution of India, Professional Ethics and Cyber Law		1	--	--	02	40	60		
					Examination is by objective type questions							
					17	10	04	24	420	480	900	24

				TOTAL	OR	OR		OR	OR	OR		
					18	08		27	360	540		

Note: BSC: Basic Science, PCC: Professional Core, HSMC: Humanity and Social Science, NCMC: Non-credit mandatory course

18KVK39 Vyavaharika Kannada (Kannada for communication) is for non-Kannada speaking, reading and writing students and **18KAK39** Aadalitha Kannada (Kannada for Administration) is for students who speak, read and write Kannada.

Course prescribed to lateral entry Diploma holders admitted to III semester of Engineering programs

10	NCMC	18MATDIP31	Additional Mathematics - I	Mathematics	02	01	--	03	40	60	100	0

(a)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 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 have to fulfil the requirements during subsequent semester/s to appear for SEE.

(b) These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree

Courses prescribed to lateral entry B. Sc degree holders admitted to III semester of Engineering programs

Lateral entrant students from B.Sc. Stream, shall clear the non-credit courses Engineering Graphics and Elements of Civil Engineering and Mechanics of the First Year Engineering Programme. These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree.

AICTE Activity Points to be earned by students admitted to BE/B.Tech/B. Plan day college programme (For more details refer to Chapter 6,AICTE Activity Point Programme, Model Internship Guidelines): Over and above the academic grades, every Day College regular student admitted to the 4 years Degree programme and every student entering 4 years Degree programme through lateral entry, shall earn 100 and 75 Activity Points respectively for the award of degree through AICTE Activity Point Programme. Students transferred from other Universities to fifth semester are required to earn 50 Activity Points from the year of entry to VTU. The Activity Points earned shall be reflected on the student's eighth semester Grade Card. The activities can be can be spread over the years, anytime during the semester weekends and holidays, as per the liking and convenience of the student from the year of entry to the programme. However, minimum hours' requirement should be fulfilled. Activity Points (non-credit) have no effect on SGPA/CGPA and shall not be considered for vertical progression. In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

Scheme of Teaching and Examination 2019 – 20

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2019 – 20)

IV SEMESTER

Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours /Week			Examination				
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
					L	T	P					
1	BSC	18MAT41	Complex Analysis, Probability and Statistical Methods	Mathematics	2	2	--	03	40	60	100	3
2	PCC	18CS42	Design and Analysis of Algorithms	CB/CS / IS	3	2	--	03	40	60	100	4
3	PCC	18CS43	Software Engineering	CB/CS / IS	3	0	--	03	40	60	100	3
4	SH	18CB44	Fundamentals of Economics	CB/CS / IS	3	0	--	03	40	60	100	3
5	PCC	18CS45	Object Oriented Programming Concepts	CB/CS / IS	3	0	--	03	40	60	100	3
6	PCC	18CS46	Data Communication	CB/CS / IS	3	0	--	03	40	60	100	3
7	PCC	18CSL47	Design and Analysis of Algorithm Laboratory	CB/CS / IS	--	2	2	03	40	60	100	2
8	SH	18CBL48	OOPS Laboratory	CB/CS / IS	--	2	2	03	40	60	100	2
9	HSMC	18KVK49	Vyavaharika Kannada (Kannada for communication)/	HSMC	--	2	--	--	100	--	100	1
		18KAK49	Aadalitha Kannada (Kannada for Administration)									
		OR	OR									
		18CPH49	Constitution of India, Professional Ethics and Cyber Law		1	--	--	02	40	60		
					Examination is by objective type questions							
			TOTAL		17 OR 18	10 OR 08	04	24 OR 27	420 OR 360	480 OR 540	900	24

Note: BSC: Basic Science, PCC: Professional Core, HSMC: Humanity and Social Science, NCMC: Non-credit mandatory course

18KVK49 Vyavaharika Kannada (Kannada for communication) is for non-Kannada speaking, reading and writing students and **18KAK49** Aadalitha Kannada (Kannada for Administration) is for students who speak, read and write Kannada.

Course prescribed to lateral entry Diploma holders admitted to III semester of Engineering programs

10	NCMC	18MATDIP41	Additional Mathematics - II	Mathematics	02	01	--	03	40	60	100	0

(a)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 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 have to fulfil the requirements during subsequent semester/s to appear for SEE.

(b) These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree

Courses prescribed to lateral entry B. Sc degree holders admitted to III semester of Engineering programs

Lateral entrant students from B.Sc. Stream, shall clear the non-credit courses Engineering Graphics and Elements of Civil Engineering and Mechanics of the First Year Engineering Programme. These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree.

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

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

Scheme of Teaching and Examination 2019 – 20

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2019 – 20)

V SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	HSMC	18CS51	Management and Entrepreneurship for IT Industry (including fundamentals of management)	HSMC	2	2	--	03	40	60	100	3
2	PCC	18CB52	Operations Research + Lab	CB	3	2	--	03	40	60	100	4
3	PCC	18CB53	Business Communication and Value Science – II	CB	3	2	--	03	40	60	100	4
4	PCC	18CB54	Embedded Systems and IOT	CB	3	--	--	03	40	60	100	3
5	PCC	18CB55	Database Management Systems	CB	3	--	--	03	40	60	100	3
6	PCC	18CB56	Business strategy	CB	3	--	--	03	40	60	100	3
7	PCC	18CBL57	Electronics and IOT Lab	CB	--	2	2	03	40	60	100	2
8	PCC	18CBL58	Database Laboratory	CB	--	2	2	03	40	60	100	2
9	HSMC	18CIV59	Environmental Studies	Civil/ Environmental [Paper setting: Civil Engineering Board]	1	--	--	02	40	60	100	1
				TOTAL	18	10	4	26	360	540	900	25

Note: PCC: Professional Core, HSMC: Humanity and Social Science.

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

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

Scheme of Teaching and Examination 2019 – 20
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2019 – 20)

VI SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	PCC	18CB61	Computer Networks	CB	3	2	--	03	40	60	100	4
2	PCC	18CB62	AI and Machine Learning with Python	CB	3	2	--	03	40	60	100	4
3	PCC	18CB63	Finance and Cost Accounting	CB	3	2	--	03	40	60	100	4
4	PEC	18CB64X	Professional Elective -1	CB	3	--	--	03	40	60	100	3
5	OEC	18CB65X	Open Elective –A	CB	3	--	--	03	40	60	100	3
6	PCC	18CBL66	Computer Networks Lab	CB	--	2	2	03	40	60	100	2
7	PCC	18CBL67	AI and ML with Python Lab	CB	--	2	2	03	40	60	100	2
8	MP	18CB68	Mini Project	CB	--	--	2	03	40	60	100	2
9	INT	--	Internship	(To be carried out during the intervening vacations of VI and VII semesters)				--	--	--	--	--
				TOTAL	15	10	6	24	320	480	800	24

Note: PCC: Professional core, PEC: Professional Elective, OE: Open Elective, MP: Mini-project, INT: Internship.

Professional Elective -1

Course code under18XX64X	Course Title
18CB641	Human Resource Management
18CB642	Introduction to Innovation IP Management and Entrepreneurship
18CB643	Advanced Java and J2EE + Lab
18CB644	Expert System and Decision support system
18CB645	Soft and Evolutionary Computing
Open Elective –A (18CB65x are not to be opted by CSE / ISE /AIML/CSBS Program)	
18CB651	Introduction to Business Communication and Value Science
18CB652	Introduction to Statistical Software(MATLAB and SPSS)
18CB653	Introduction to Web Technology

Students can select any one of the open electives offered by any Department(Please refer to the list of open electives under 18CS65X).

Selection of an open elective is not allowed provided,

- The candidate has studied the same course during the previous semesters of the programme.
- The syllabus content of open elective is similar to that of Departmental core courses or professional electives.
- A similar course, under any category, is prescribed in the higher semesters of the programme.

Registration to electives shall be documented under the guidance of Programme Coordinator/ Adviser/Mentor.

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.

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 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 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.

(ii) 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 departments to which the student/s belong to.

Internship: All the students admitted to III year of BE/B.Tech shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not takeup/complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements

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

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

Scheme of Teaching and Examination 2019 – 20

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2019 – 20)

VII SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	PCC	18CB71	Business Intelligence and Data Analytics	CB	4	--	--	03	40	60	100	4
2	PCC	18CB72	Cloud Computing (including micro services and applications)	CB	4	--	--	03	40	60	100	4
3	PEC	18CB73X	Professional Elective – 2	CB	3	--	--	03	40	60	100	3
4	PEC	18CB74X	Professional Elective – 3	CB	3	--	--	03	40	60	100	3
5	OEC	18CB75X	Open Elective –B	CB	3	--	--	03	40	60	100	3
6	PCC	18CBL76	Cloud computing Lab	CB	--	--	2	03	40	60	100	1
7	Project	18CBP77	IT Project Management + Lab	CB	--	--	2	--	100	--	100	2
8	INT	--	Internship	(If not completed during the vacation of VI and VII semesters, it has to be carried out during the intervening vacations of VII and VIII semesters								
				TOTAL	17	--	4	18	340	360	700	20

Note: PCC: Professional core, PEC: Professional Elective, OEC: Open Elective, INT: Internship.

Professional Elective - 2			
Course code under 18CS73X	**Course Title**		
18CB731	Marketing Research and Marketing Management	18CB734	Dot net framework for Application Development
18CB732	Internet of Things + Lab	18CB735	Enterprise systems
18CB733	Web and Mobile Application development + Lab		

Professional Electives – 3			
Course code under 18CS74X	**Course Title**		
18CB741	Usability Design of Software + Lab	18CB744	Behavioral Economics
18CB742	Cryptography and Network Security	18CB745	Web and Cyber Security
18CB743	Data Mining and Data Warehousing		

Open Elective –B (18CB75x are not to be opted by CSE / ISE / AIML/CSBS Programs)	
18CB751	User Interface Design
18CB752	Introduction to Cloud Computing
18CB753	Python Programming

Students can select any one of the open electives offered by any Department(Please refer to the list of open electives under 18CB75X).

Selection of an open elective is not allowed provided,

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

Project work: Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary project can be assigned to an individual student or to a group having not more than 4 students. In extraordinary cases, like the funded projects requiring students from different disciplines, the project student strength can be 5 or 6.

CIE procedure for Project Work Phase - 1:

(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 project work phase -1, shall be based on the evaluation of the project work phase -1 Report (covering Literature Survey, Problem identification, Objectives and Methodology), 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.

(ii) 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 phase -1, shall be based on the evaluation of project work phase -1 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.

Internship: All the students admitted to III year of BE/B.Tech shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not takeup/complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements

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

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

Scheme of Teaching and Examination 2019 – 20

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2019 – 20)

VIII SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	PCC	18CB81	Big data Analytics + Lab	CB	3	--	--	03	40	60	100	3
2	PEC	18CB82X	Professional Elective – 4	CB	3	--	--	03	40	60	100	3
3	Project	18CBP83	Project Work Phase – 2	CB	--	--	2	03	40	60	100	8
4	Seminar	18CBS84	Technical Seminar	CB	--	--	2	03	100	--	100	1
5	INT	18CBI85	Internship	(Completed during the intervening vacations of VI and VII semesters and /or VII and VIII semesters.)				03	40	60	100	3
				TOTAL	06	--	4	15	260	240	500	18

Note: PCC: Professional Core, PEC: Professional Elective, OEC: Open Elective, INT: Internship.

Professional Electives – 4

Course code under 18CS82X	Course Title
18CB821	Financial Management
18CB822	Software Design and Design Thinking + Lab
18CB823	Operations Management
18CB824	Computational Finance Modelling
18CB825	High Performance Computing

Project Work CIE procedure for Project Work Phase - 2:

(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 project work phase -2, shall be based on the evaluation of project work phase -2 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.

(ii) 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 phase -2, shall be based on the evaluation of project work phase -2 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.

SEE for Project Work Phase - 2:

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

(ii) Interdisciplinary: Contribution to the project and the performance of each group member shall be assessed individually in semester end examination (SEE) conducted separately at the departments to which the student/s belong to.

Internship: Those, who have not pursued /completed the internship shall be declared as fail and have to complete during subsequent University examination after satisfying the internship requirements

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of 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 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 eighth semester, the column under activity Points shall be marked NSAP (Not Satisfied Activity Points).