VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

**B.E. in Computer Science and Engineering**

**Scheme of Teaching and Examinations 2022**

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

(Effective from the academic year 2023-24)

**III SEMESTER**

| Sl. No | Course | Course Code | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | Teaching Hours /Week | | | | Examination | | | | Credits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Theory Lecture | Tutorial | Practical / Drawing | SDA | Duration in hours | CIE Marks | SEE Marks | Total Marks | |
| | | | | | L | T | P | S | | | | | |
| 1 | PCC/BSC | BCS301 | Mathematics for Computer Science | TD: Maths<br>PSB: Maths/CS | 3 | 2 | 0 | | 03 | 50 | 50 | 100 | 4 |
| 2 | IPCC | BCS302 | Digital Design & Computer Organization | TD: CS<br>PSB : CS | 3 | 0 | 2 | | 03 | 50 | 50 | 100 | 4 |
| 3 | IPCC | BCS303 | Operating Systems | TD: CS<br>PSB : CS | 3 | 0 | 2 | | 03 | 50 | 50 | 100 | 4 |
| 4 | PCC | BCS304 | Data Structures and Applications | TD: CS<br>PSB : CS | 3 | 0 | 0 | | 03 | 50 | 50 | 100 | 3 |
| 5 | PCCL | BCSL305 | Data Structures Lab | TD: CS<br>PSB : CS | 0 | 0 | 2 | | 03 | 50 | 50 | 100 | 1 |
| 6 | ESC | BCS306x | ESC/ETC/PLC | TD: CS<br>PSB : CS | 2 | 0 | 2 | | 03 | 50 | 50 | 100 | 3 |
| 7 | UHV | BSCK307 | **Social Connect and Responsibility** | Any Department | 0 | 0 | 2 | | 01 | 100 | --- | 100 | 1 |
| 8 | AEC/ SEC | BCS358x | Ability Enhancement Course/Skill Enhancement Course - III | TD: Concerned department<br>PSB:CS | If the course is a Theory<br>1 | 0 | 0 | | 01 | 50 | 50 | 100 | 1 |
| | | | | | If a course is a laboratory<br>0 | 0 | 2 | | 02 | | | | |
| 9 | MC | BNSK359 | National Service Scheme (NSS) | NSS coordinator | 0 | 0 | 2 | | | 100 | --- | 100 | 0 |
| | | BPEK359 | Physical Education (PE) (Sports and Athletics) | Physical Education Director | | | | | | | | | |
| | | BYOK359 | Yoga | Yoga Teacher | | | | | | | | | |
| | | | | | | | | | **Total** | **550** | **350** | **900** | **21** |

**PCC**: Professional Core Course, **PCCL**: Professional Core Course laboratory, **UHV**: Universal Human Value Course, **MC**: Mandatory Course (Non-credit), **AEC**: Ability Enhancement Course, **SEC**: Skill Enhancement Course, **L:** Lecture, **T**: Tutorial, **P**: Practical **S= SDA**: Skill Development Activity, **CIE**: Continuous Internal Evaluation, **SEE**: Semester End Evaluation.K :This letter in the course code indicates common to all the stream of engineering. ESC: Engineering Science Course, ETC: Emerging Technology Course, PLC: Programming Language Course

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| **Engineering Science Course (ESC/ETC/PLC) (Note- Student should opt for the course which should not be similar to the course opted in 1st Year)** | | | |
|---|---|---|---|
| BCS306A | Object Oriented Programming with Java | | |
| BCS306B | Object Oriented Programming with C++ | | |
| **Ability Enhancement Course – III** | | | |
| BCSL358A | Data analytics with Excel | BCSL358C | Project Management with Git |
| BCSL358B | R Programming | BCSL358D | Data Visualization with Python |

**Professional Core Course (IPCC):** Refers to Professional Core Course Theory Integrated with practicals of the same course. Credit for IPCC can be 04 and its Teaching–Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (B.E./B.Tech.) 2022-23 may please be refered.

**National Service Scheme /Physical Education/Yoga:** All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first week of III semesters. Activities shall be carried out between III semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the course is mandatory for the award of degree.

VARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

**B.E. in Computer Science and Engineering**

**Scheme of Teaching and Examinations2022**

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

(Effective from the academic year 2023-24)

**IV SEMESTER**

| Sl. No | Course and Course Code | | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | 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/BSC | BCS401 | Analysis & Design of Algorithms | TD: CS<br>PSB : CS | 3 | 0 | 0 | | 03 | 50 | 50 | 100 | 3 |
| 2 | IPCC | BCS402 | Microcontrollers | TD: CS<br>PSB : CS | 3 | 0 | 2 | | 03 | 50 | 50 | 100 | 4 |
| 3 | IPCC | BCS403 | Database Management Systems | TD: CS<br>PSB : CS | 3 | 0 | 2 | | 03 | 50 | 50 | 100 | 4 |
| 4 | PCCL | BCSL404 | Analysis & Design of Algorithms Lab | TD: CS<br>PSB : CS | 0 | 0 | 2 | | 03 | 50 | 50 | 100 | 1 |
| 5 | ESC | BCS405x | ESC/ETC/PLC | TD: CS/Maths<br>PSB : CS/Maths | 2 | 2 | 0 | | 03 | 50 | 50 | 100 | 3 |
| 6 | AEC/ SEC | BCS456x | Ability Enhancement Course/Skill Enhancement Course- IV | TD: Concerned department PSB:CS | If the course is Theory<br>1 | 0 | 0 | | 01 | 50 | 50 | 100 | 1 |
| | | | | | If the course is a lab<br>0 | 0 | 2 | | 02 | | | | |
| 4 | BSC | BBOC407 | Biology for Computer Engineers | TD / PSB: BT, CHE, | 2 | 0 | 0 | | 03 | 50 | 50 | 100 | 2 |
| 7 | UHV | BUHK408 | Universal human values course | Any Department | 1 | 0 | 0 | | 01 | 50 | 50 | 100 | 1 |
| 9 | MC | BNSK459 | National Service Scheme (NSS) | NSS coordinator | 0 | 0 | 2 | | | 100 | --- | 100 | 0 |
| | | BPEK459 | Physical Education (PE) (Sports and Athletics) | Physical Education Director | | | | | | | | | |
| | | BYOK459 | Yoga | Yoga Teacher | | | | | | | | | |
| | | | | | | | | | **Total** | **500** | **400** | **900** | **19** |

**PCC**: Professional Core Course, **PCCL**: Professional Core Course laboratory, **UHV**: Universal Human Value Course, **MC**: Mandatory Course (Non-credit), **AEC**: Ability Enhancement Course, **SEC**: Skill Enhancement Course, **L:** Lecture, **T**: Tutorial, **P**: Practical **S= SDA**: Skill Development Activity, **CIE**: Continuous Internal Evaluation, **SEE**: Semester End Evaluation. K :This letter in the course code indicates common to all the stream of engineering.

**Ability Enhancement Course / Skill Enhancement Course – IV**

| | | | |
|---|---|---|---|
| BCS456A | Green IT and Sustainability | BCS456C | UI/UX |
| BCS456B | Capacity Planning for IT | BCSL456D | Technical writing using LATEX |

**Engineering Science Course (ESC/ETC/PLC)**

| | | | |
|---|---|---|---|
| BCS405A | Discrete Mathematical Structures | BCS405C | Optimization Technique |
| BCS405B | Graph Theory | BCS405D | Linear Algebra |

**Professional Core Course (IPCC):** Refers to Professional Core Course Theory Integrated with practical of the same course. Credit for IPCC can be 04 and its Teaching–Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (B.E./B.Tech.) 2022-23

**National Service Scheme /Physical Education/Yoga:** All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first week of III semesters. Activities shall be carried out between III semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the courses is mandatory for the award of degree.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

**B.E. in Computer Science and Engineering**

**B.E. in the title of the program**

**Scheme of Teaching and Examinations 2022**

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

(Effective from the academic year 2023-24)

**V SEMESTER**

| Sl. No | Course and Course Code | | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | Teaching Hours /Week | | | | Examination | | | | Credits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Theory Lecture | Tutorial | Practical / Drawing | SDA | Duration in hours | CIE Marks | SEE Marks | Total Marks | |
| | | | | | L | T | P | S | | | | | |
| 1 | PCC | BCS501 | Software Engineering & Project Management | TD: CS PSB : CS | 4 | 0 | 0 | | 03 | 50 | 50 | 100 | 4 |
| 2 | IPCC | BCS502 | Computer Networks | TD: CS PSB : CS | 3 | 0 | 2 | | 03 | 50 | 50 | 100 | 4 |
| 3 | PCC | BCS503 | Theory of Computation | TD: CS PSB : CS | 3 | 2 | 0 | | 03 | 50 | 50 | 100 | 4 |
| 4 | PCCL | BCSL504 | Web Technology Lab | TD: CS PSB : CS | 0 | 0 | 2 | | 03 | 50 | 50 | 100 | 1 |
| 5 | PEC | BCS515x | Professional Elective Course | TD: CS PSB : CS | 3 | 0 | 0 | | 03 | 50 | 50 | 100 | 3 |
| 6 | PROJ | BCS586 | Mini Project | TD: CS PSB : CS | 0 | 0 | 4 | | 03 | 100 | | 100 | 2 |
| 7 | AEC | BRMK557 | Research Methodology and IPR | TD: HSM PSB : HSM | 2 | 2 | 0 | | 02 | 50 | 50 | 100 | 3 |
| 8 | HSMS | BCS508 | Environmental Studies and E-waste Management | TD: HSM PSB : HSM | 1 | 0 | 0 | | 01 | 50 | 50 | 100 | 1 |
| 9 | MC | BNSK559 | National Service Scheme (NSS) | NSS coordinator | 0 | 0 | 2 | | | 100 | | 100 | 0 |
| | | BPEK559 | Physical Education (PE) (Sports and Athletics) | Physical Education Director | | | | | | | | | |
| | | BYOK559 | Yoga | Yoga Teacher | | | | | | | | | |
| | | | | | | | | | **Total** | **500** | **300** | **800** | **22** |

**Professional Elective Course**

| | | | |
|---|---|---|---|
| **BAI515A** | Computer Graphics | BCS515C | Unix System Programming |
| BCS515B | Artificial Intelligence | BCS515D | Distributed Systems |

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**Professional Core Course (IPCC):** Refers to Professional Core Course Theory Integrated with practicals of the same course. Credit for IPCC can be 04 and its Teaching–Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (B.E./B.Tech.) 2022-23

**National Service Scheme /Physical Education/Yoga:** All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first week of III semesters. Activities shall be carried out between III semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the course is mandatory for the award of degree.

**Mini-project work:** Mini Project is a laboratory-oriented/hands on course that will provide a platform to students to enhance their practical knowledge and skills by the development of small systems/applications etc. 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 faculty members of the Department, one of them being the Guide. The CIE marks awarded for the Mini-project work shall be based on the evaluation of the 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 batches mates.

**(ii) Interdisciplinary:** Continuous Internal Evaluation shall be group-wise at the college level with the participation of all the guides of the project.

The CIE marks awarded for the Mini-project, shall be based on the evaluation of the 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.

**No SEE component for Mini-Project.**

**Professional Elective Courses (PEC):** A professional elective (PEC) course is intended to enhance the depth and breadth of educational experience in the Engineering and Technology curriculum. Multidisciplinary courses that are added supplement the latest trend and advanced technology in the selected stream of engineering. Each group will provide an option to select one course. The minimum number of students' strengths for offering a professional elective is 10. However, this conditional shall not be applicable to cases where the admission to the program is less than 10.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

**B.E. in Computer Science and Engineering**

**Scheme of Teaching and Examinations2022**

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

(Effective from the academic year 2023-24)

**VI SEMESTER**

| Sl. No | Course and Course Code | | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | Teaching Hours /Week | | | | Examination | | | | Credits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Theory Lecture | Tutorial | Practical / Drawing | SDA | Duration in hours | CIE Marks | SEE Marks | Total Marks | |
| | | | | | L | T | P | S | | | | | |
| 1 | IPCC | BCS601 | Cloud Computing (Open Stack /Google) | TD: CS PSB : CS | 3 | 0 | 2 | | 03 | 50 | 50 | 100 | 4 |
| 2 | PCC | BCS602 | Machine Learning | TD: CS PSB : CS | 4 | 0 | 0 | | 03 | 50 | 50 | 100 | 4 |
| 3 | PEC | BXX613x | Professional Elective Course | TD: CS PSB : CS | 3 | 0 | 0 | | 03 | 50 | 50 | 100 | 3 |
| 4 | OEC | BXX654x | Open Elective Course | TD: CS PSB : CS | 3 | 0 | 0 | | 03 | 50 | 50 | 100 | 3 |
| 5 | PROJ | BCS685 | Project Phase I | TD: CS PSB : CS | 0 | 0 | 4 | | 03 | 100 | -- | 100 | 2 |
| 6 | PCCL | BCSL606 | Machine Learning lab | TD: CS PSB : CS | 0 | 0 | 2 | | 03 | 50 | 50 | 100 | 1 |
| 7 | AEC/SDC | BXX657x | Ability Enhancement Course/Skill Development Course V | TD and PSB: Concerned department | If the course is offered as a Theory: 1 | 0 | 0 | | 01 | 50 | 50 | 100 | 1 |
| | | | | | If course is offered as a practical: 0 | 0 | 2 | | | | | | |
| 8 | MC | BNSK658 | National Service Scheme (NSS) | NSS coordinator | 0 | 0 | 2 | | | 100 | --- | 100 | 0 |
| | | BPEK658 | Physical Education (PE) (Sports and Athletics) | Physical Education Director | | | | | | | | | |
| | | BYOK658 | Yoga | Yoga Teacher | | | | | | | | | |
| 9 | MC | BIKS609 | Indian Knowledge System | | 1 | 0 | 0 | | 01 | 100 | --- | 100 | 0 |
| | | | | | | | | | **Total** | **500** | **300** | **800** | **18** |

**Professional Elective Course**

| | | | |
|---|---|---|---|
| BCS613A | Blockchain Technology | BCS613C | Compiler Design |

| | | | |
|---|---|---|---|
| BCS613B | Computer Vision | BCS613D | Advanced Java |
| **Open Elective Course** | | | |
| BCS654A | Introduction to Data Structures | BIS654C | Mobile Application Development |
| BCS654B | Fundamentals of Operating Systems | BAI654D | Introduction to Artificial Intelligence |
| **Ability Enhancement Course / Skill Enhancement Course-V** | | | |
| BISL657A | Tosca – Automated Software testing | BAIL657C | Generative AI |
| BCSL657B | React | BCSL657D | Devops |

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**Professional Core Course (IPCC):** Refers to Professional Core Course Theory Integrated with practicals of the same course. Credit for IPCC can be 04 and its Teaching–Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (B.E./B.Tech.) 2022-23

**National Service Scheme /Physical Education/Yoga:** All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first week of III semesters. Activities shall be carried out between III semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the course is mandatory for the award of degree.

**Professional Elective Courses (PEC):** A professional elective (PEC) course is intended to enhance the depth and breadth of educational experience in the Engineering and Technology curriculum. Multidisciplinary courses that are added supplement the latest trend and advanced technology in the selected stream of engineering. Each group will provide an option to select one course. The minimum number of students' strengths for offering professional electives is 10. However, this conditional shall not be applicable to cases where the admission to the program is less than 10.

**Open Elective Courses:**

Students belonging to a particular stream of Engineering and Technology are not entitled to the open electives offered by their parent Department. However, they can opt for an elective offered by other Departments, provided they satisfy the prerequisite condition if any. Registration to open electives shall be documented under the guidance of the Program Coordinator/ Advisor/Mentor. The minimum numbers of students' strength for offering Open Elective Course is 10. However, this condition shall not be applicable to class where the admission to the program is less than 10.

**Project Phase-I :** Students have to discuss with the mentor /guide and with their helphe/she has to complete the literature survey and prepare the report and finally define the problem statement for the project work.

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**B.E. in Computer Science and Engineering**

**Scheme of Teaching and Examinations2022**

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

(Effective from the academic year 2023-24)

**VII SEMESTER (Swappable VII and VIII SEMESTER)**

| Sl. No | Course and Course Code | | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | Teaching Hours /Week | | | | Examination | | | | Credits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Theory Lecture | Tutorial | Practical / Drawing | SDA | Duration in hours | CIE Marks | SEE Marks | Total Marks | |
| | | | | | L | T | P | S | | | | | |
| 1 | IPCC | BCS701 | Internet of Things | TD: CS PSB : CS | 3 | 0 | 2 | | 03 | 50 | 50 | 100 | 4 |
| 2 | IPCC | BCS702 | Parallel Computing | TD: CS PSB : CS | 3 | 0 | 2 | | 03 | 50 | 50 | 100 | 4 |
| 3 | PCC | BCS703 | Cryptography & Network Security | TD: CS PSB : CS | 4 | 0 | 0 | | 03 | 50 | 50 | 100 | 4 |
| 4 | PEC | BCS714x | **Professional Elective Course** | TD: CS PSB : CS | 3 | 0 | 0 | | 03 | 50 | 50 | 100 | 3 |
| 5 | OEC | BCS755x | **Open Elective Course** | TD: CS PSB : CS | 3 | 0 | 0 | | 01 | 50 | 50 | 100 | 3 |
| 6 | PROJ | BCS786 | **Major Project Phase-II** | TD: CS PSB : CS | 0 | 0 | 12 | | 03 | 100 | 100 | 200 | 6 |
| | | | | | | | | | | **400** | **300** | **700** | **24** |

**Professional Elective Course**

| | | | |
|---|---|---|---|
| BCS714A | Deep Learning | BAD714D | Social Network Analysis |
| BCS714B | Natural Language Processing | BCS714D | Big Data Analytics |

**Open Elective Course**

| | | | |
|---|---|---|---|
| BCS755A | Introduction to DBMS | BCS755C | Software Engineering |
| BCS755B | Introduction to Algorithms | BCS755D | |

**PCC**: Professional Core Course, **PCCL**: Professional Core Course laboratory, **PEC**: Professional Elective Course, **OEC**: Open Elective Course PR: Project Work, **L:** Lecture, **T**: Tutorial, **P**: Practical **S= SDA**: Skill Development Activity, **CIE**: Continuous Internal Evaluation, **SEE**: Semester End Evaluation. **TD-** Teaching Department, **PSB**: Paper Setting department, **OEC**: Open Elective Course, **PEC**: Professional Elective Course. **PROJ**: Project work

**Note: VII and VIII semesters of IV years of the program**

**(1)** Institutions can swap the VII and VIII Semester Schemes of Teaching and Examinations to accommodate research internships/ industry internships after the VI semester**.**

**(2)** Credits earned for the courses of VII and VIII Semester Scheme of Teaching and Examinations shall be counted against the corresponding semesters whether the VII or VIII semesters is completed during the beginning of the IV year or the later part of IV years of the program.

**Professional Elective Courses (PEC):** A professional elective (PEC) course is intended to enhance the depth and breadth of educational experience in the Engineering and Technology curriculum. Multidisciplinary courses that are added supplement the latest trend and advanced technology in the selected stream of engineering. Each group will provide an option to select one course. The minimum number of students' strengths for offering professional electives is 10. However, this conditional shall not be applicable to cases where the admission to the program is less than 10.

**Open Elective Courses:**

Students belonging to a particular stream of Engineering and Technology are not entitled to the open electives offered by their parent Department. However, they can opt for an elective offered by other Departments, provided they satisfy the prerequisite condition if any. Registration to open electives shall be documented under the guidance of the Program Coordinator/ Advisor/Mentor. The minimum numbers of students' strength for offering Open Elective Course is 10. However, this condition shall not be applicable to class where the admission to the program is less than 10.

**PROJECT WORK (21CSP75):** The objective of the Project work is

**(i)** To encourage independent learning and the innovative attitude of the students.

**(ii)** To develop interactive attitude, communication skills, organization, time management, and presentation skills.

**(iii)** To impart flexibility and adaptability.

**(iv)** To inspire team working.

**(v)** To expand intellectual capacity, credibility, judgment and intuition.

**(vi)** To adhere to punctuality, setting and meeting deadlines.

**(vii)** To install responsibilities to oneself and others.

**(viii)**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.

The CIE marks awarded for the project work, shall be based on the evaluation of the 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.

**(2) 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.

**SEE procedure for Project Work:** SEE for project work will be conducted by the two examiners appointed by the University. The SEE 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.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

**B.E. in Computer Science and Engineering**

**Scheme of Teaching and Examinations2022**

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

(Effective from the academic year 2023-24)

**VIII SEMESTER (Swappable VII and VIII SEMESTER)**

| Sl. No | Course and Course Code | | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | Teaching Hours /Week | | | | Examination | | | | Credits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Theory Lecture | Tutorial | Practical / Drawing | SDA | Duration in hours | CIE Marks | SEE Marks | Total Marks | |
| | | | | | L | T | P | S | | | | | |
| 1 | PEC | BCS801x | **Professional Elective (Online Courses) Only through NPTEL** | PSB : CS | 3 | 0 | 0 | | 03 | 50 | 50 | 100 | 3 |
| 2 | OEC | BCS802x | **Open Elective (Online Courses) Only through NPTEL** | PSB : CS | 3 | 0 | 0 | | 01 | 50 | 50 | 100 | 3 |
| 3 | INT | BCS803 | **Internship (Industry/Research) (14 - 20 weeks)** | | 0 | 0 | 12 | | 03 | 100 | 100 | 200 | 10 |
| | | | | | | | | | | **200** | **200** | **400** | **16** |

| **Professional Elective Course (Online courses)** | | | |
|---|---|---|---|
| BCS801A | BOS will publish courses based on the availability | BCS801C | |
| BCS801B | | BCS801D | |
| **Open Elective Courses (Online Courses)** | | | |
| BCS802A | BOS will publish courses based on the availability | BCS802C | |
| BCS802B | | BCS802D | |

**L:** Lecture, **T**: Tutorial, **P**: Practical **S= SDA**: Skill Development Activity, **CIE**: Continuous Internal Evaluation, **SEE**: Semester End Evaluation. **TD-** Teaching Department, **PSB**: Paper Setting department, **OEC**: Open Elective Course, **PEC**: Professional Elective Course. **PROJ**: Project work, **INT**: Industry Internship / Research Internship / Rural Internship

**Note: VII and VIII semesters of IV years of the program**
**Swapping Facility**

- Institutions can swap VII and VIII Semester Scheme of Teaching and Examinations to accommodate **research internships/ industry internships/Rural Internship** after the VI semester**.**
- Credits earned for the courses of VII and VIII Semester Scheme of Teaching and Examinations shall be counted against the corresponding semesters whether VII or VIII semester is completed during the beginning of IV year or later part of IV year of the program.
- Note: For BCS801x and BCS802x courses BOS will announce the list of courses in $6^{th}$ , $7^{th}$ & $8^{th}$ Sem . Students can register in any of the semesters to earn the credits in $8^{th}$ Sem.

**Elucidation:**

At the beginning of IV years of the program i.e., after VI semester, VII semester classwork and VIII semester **Research Internship /Industrial Internship / Rural Internship** shall be permitted to be operated simultaneously by the University so that students have ample opportunity for an internship. In other words, a good percentage of the class shall attend VII semester classwork and a similar percentage of others shall attend to Research Internship or Industrial Internship or Rural Internship.

Research/Industrial /Rural Internship shall be carried out at an Industry, NGO, MSME, Innovation center, Incubation center, Start-up, center of Excellence (CoE), Study Centre established in the parent institute and /or at reputed research organizations/institutes.

The mandatory Research internship /Industry internship / Rural Internship is for 14 to 20 weeks. The internship shall be considered as a head of passing and shall be considered for the award of a degree. Those, who do not take up/complete the internship shall be declared to fail and shall have to complete it during the subsequent University examination after satisfying the internship requirements.

**Research internship:** A research internship is intended to offer the flavor of current research going on in the research field. It helps students get familiarized with the field and imparts the skill required for carrying out research.

**Industry internship:** Is an extended period of work experience undertaken by students to supplement their degree for professional development. 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 their knowledge with practical constraints.

**Rural Internship:** Rural development internship is an initiative of Unnat Bharat Abhiyan Cell, RGIT in association with AICTE to involve students of all departments studying in different academic years for exploring various opportunities in techno-social fields, to connect and work with Rural India for their upliftment.

The faculty coordinator or mentor has to monitor the student's internship progress and interact with them to guide for the successful completion of the internship.

The students are permitted to carry out the internship anywhere in India or abroad. University shall not bear any expenses incurred in respect of the internship.

With the consent of the internal guide and Principal of the Institution, students shall be allowed to carry out the internship at their hometown (**within or outside the state or abroad**), provided favorable facilities are available for the internship and the student remains regularly in contact with the internal guide. **University shall not bear any cost involved in carrying out the internship by students.** However, students can receive any financial assistance extended by the organization.

**Professional Elective /Open Elective Course:**These are ONLINE courses suggested by the respective Board of Studies. Details of these courses shall be made available for students on the VTU web portal.

**Please note**: If any clarifications / suggestions please email to **sbhvtuso@yahoo.com**