

## **1.2**

# **Academic Flexibility**

## **1.2.2**

# **Percentage of Programs in Which CBCS Implemented**

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### 1.2.2 Percentage of programs in which Choice Based Credit System (CBCS)/Elective Course System has been implemented

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 Coordinator

### **List of Programs implemented CBCS**

- 1. BE - Computer Science and Engineering**
- 2. BE - Electronics and Communication Engineering**
- 3. BE - Electrical and Electronics Engineering**
- 4. BE - Mechanical Engineering**

**1.2.2 Percentage of programs in which Choice Based Credit System (CBCS)/Elective Course System has been implemented.**

**Number of Core/Open/Professional Elective Courses**

| Program          | 2018 Scheme |             |              |      |                            |                           |
|------------------|-------------|-------------|--------------|------|----------------------------|---------------------------|
|                  | Semester    | Core Course | Professional | Open | Total Courses per semester | Total Courses per program |
| CSE/ECE/EEE/MECH | I           | 8           | NA           | NA   | 8                          | 63                        |
|                  | II          | 8           | NA           | NA   | 8                          |                           |
|                  | III         | 9           | NA           | NA   | 9                          |                           |
|                  | IV          | 9           | NA           | NA   | 9                          |                           |
|                  | V           | 9           | NA           | NA   | 9                          |                           |
|                  | VI          | 6           | 1            | 1    | 8                          |                           |
|                  | VII         | 4           | 2            | 1    | 7                          |                           |
|                  | VIII        | 4           | 1            | NA   | 5                          |                           |

**1.2.2 Percentage of programs in which Choice Based Credit System (CBCS)/Elective Course System has been implemented.**

**Number of Core/Open/Professional Elective Courses**

| Program              | 2015 Scheme |             |              |      |                            |                           |
|----------------------|-------------|-------------|--------------|------|----------------------------|---------------------------|
|                      | Semester    | Core Course | Professional | Open | Total Courses per semester | Total Courses per program |
| CSE/ECE/EEE/<br>MECH | I           | 8           | NA           | NA   | 8                          | 62                        |
|                      | II          | 8           | NA           | NA   | 8                          |                           |
|                      | III         | 8           | NA           | NA   | 8                          |                           |
|                      | IV          | 8           | NA           | NA   | 8                          |                           |
|                      | V           | 6           | 1            | 1    | 8                          |                           |
|                      | VI          | 6           | 1            | 1    | 8                          |                           |
|                      | VII         | 6           | 2            | NA   | 8                          |                           |
|                      | VIII        | 5           | 1            | NA   | 6                          |                           |
|                      |             |             |              |      |                            |                           |

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI



3rd to 8th Semester BE – Computer Science and Engineering

Scheme of Teaching and Examinations

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

(Effective from the academic year 2018 – 19)

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2018 - 19**  
**Choice Based Credit System (CBCS) AND Outcome Based Education (OBE)**  
**(Effective from the academic year 2018 - 19)**

**III SEMESTER**

| Sl. No | Course and Course Code |         | Course Title                                                | Teaching Department | Teaching Hours/Week                         |          |                    | Examination       |           |           | Credits |             |
|--------|------------------------|---------|-------------------------------------------------------------|---------------------|---------------------------------------------|----------|--------------------|-------------------|-----------|-----------|---------|-------------|
|        |                        |         |                                                             |                     | Theory Lectures                             | Tutorial | Practical/ Drawing | Duration in hours | CIE Marks | SEE Marks |         | Total Marks |
|        |                        |         |                                                             |                     | 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                            | CS/IS               | 3                                           | 2        | --                 | 03                | 40        | 60        | 100     | 4           |
| 3      | PCC                    | 18CS33  | Analog and Digital Electronics                              | CS/IS               | 3                                           | 0        | --                 | 03                | 40        | 60        | 100     | 3           |
| 4      | PCC                    | 18CS34  | Computer Organization                                       | CS/IS               | 3                                           | 0        | --                 | 03                | 40        | 60        | 100     | 3           |
| 5      | PCC                    | 18CS35  | Software Engineering                                        | CS/IS               | 3                                           | 0        | --                 | 03                | 40        | 60        | 100     | 3           |
| 6      | PCC                    | 18CS36  | Discrete Mathematical Structures                            | CS/IS               | 3                                           | 0        | --                 | 03                | 40        | 60        | 100     | 3           |
| 7      | PCC                    | 18CSL37 | Analog and Digital Electronics Laboratory                   | CS/IS               | --                                          | 2        | 2                  | 03                | 40        | 60        | 100     | 2           |
| 8      | PCC                    | 18CSL38 | Data Structures Laboratory                                  | CS/IS               | --                                          | 2        | 2                  | 03                | 40        | 60        | 100     | 2           |
| 9      | HSMC                   | 18KVK39 | Vyavaharika Kannada (Kannada for communication)             | HSMC                | --                                          | 2        | --                 | --                | 100       | --        | 100     | 1           |
|        |                        | 18KAK39 | Aadaliha Kannada (Kannada for Administration)               |                     | --                                          | 2        | --                 | --                | 100       | --        |         |             |
|        |                        | OR      | OR                                                          |                     |                                             |          |                    |                   |           |           |         |             |
|        |                        | 18CPC39 | Constitution of India, Professional Ethics and Cyber Law    |                     | 1                                           | --       | --                 | 02                | 40        | 60        |         |             |
|        |                        |         |                                                             |                     | Examination is by objective type questions. |          |                    |                   |           |           |         |             |
| TOTAL  |                        |         |                                                             |                     | 17                                          | 08       | 04                 | 24                | 420       | 480       | 900     | 24          |
|        |                        |         |                                                             |                     | OR                                          | OR       |                    | OR                | OR        | OR        |         |             |
|        |                        |         |                                                             |                     | 18                                          | 10       |                    |                   | 26        | 360       |         |             |

**Notes:** 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 Aadaliha 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 students have to fulfill the requirements during subsequent semesters 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 in VTU. The Activity Points earned shall be reflected in the student's eighth semester Grade Card. The activities 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.

| SEMESTER |                        |         |                                                          | Teaching Department | Teaching Hours/Week                        |          |                    | Examination       |           |           | Credits |             |
|----------|------------------------|---------|----------------------------------------------------------|---------------------|--------------------------------------------|----------|--------------------|-------------------|-----------|-----------|---------|-------------|
| Sl. No   | Course and Course Code |         | Course Title                                             |                     | Theory Lecture                             | Tutorial | Practical/ Drawing | Duration in hours | CIE Marks | SEE Marks |         | Total Marks |
|          |                        |         |                                                          |                     | 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                        | CS / IS             | 3                                          | 2        | —                  | 03                | 40        | 60        | 100     | 4           |
| 3        | PCC                    | 18CS43  | Operating Systems                                        | CS / IS             | 3                                          | 0        | —                  | 03                | 40        | 60        | 100     | 3           |
| 4        | PCC                    | 18SC44  | Microcontroller and Embedded Systems                     | CS / IS             | 3                                          | 0        | —                  | 03                | 40        | 60        | 100     | 3           |
| 5        | PCC                    | 18CS45  | Object Oriented Concepts                                 | CS / IS             | 3                                          | 0        | —                  | 03                | 40        | 60        | 100     | 3           |
| 6        | PCC                    | 18CS46  | Data Communication                                       | CS / IS             | 3                                          | 0        | —                  | 03                | 40        | 60        | 100     | 3           |
| 7        | PCC                    | 18CSL47 | Design and Analysis of Algorithm Laboratory              | CS / IS             | —                                          | 2        | 2                  | 03                | 40        | 60        | 100     | 2           |
| 8        | PCC                    | 18CSL48 | Microcontroller and Embedded Systems Laboratory          | CS / IS             | —                                          | 2        | 2                  | 03                | 40        | 60        | 100     | 2           |
| 9        | HSMC                   | 18KVK49 | Vyavaharika Kannada (Kannada for communication V)        | HSMC                | —                                          | 2        | —                  | —                 | 100       | —         | 100     | 1           |
|          |                        | 18KAK49 | Adalaha Kannada (Kannada for Administration)             |                     | —                                          | 2        | —                  | —                 | 100       | —         |         |             |
|          |                        | OR      | OR                                                       |                     |                                            |          |                    |                   |           |           |         |             |
|          |                        | 18CPC39 | Constitution of India, Professional Ethics and Cyber Law |                     | 1                                          | —        | —                  | 02                | 40        | 60        |         |             |
|          |                        |         |                                                          |                     | Examination is by objective type questions |          |                    |                   |           |           |         |             |
| TOTAL    |                        |         |                                                          |                     | 17                                         | 08       | 04                 | 24                | 420       | 480       | 900     | 24          |
|          |                        |         |                                                          |                     | OR                                         | OR       |                    | OR                | OR        | OR        |         |             |
|          |                        |         |                                                          |                     | 18                                         | 10       |                    | 26                | 360       | 540       |         |             |

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

(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 students have to fulfill the requirements during subsequent semesters to appear for S-FE.

**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 2018 – 19**  
**Choice Based Credit System (CBCS) AND Outcome Based Education (OBE)**  
**(Effective from the academic year 2018 – 19)**

| 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                    | 18CS61   | System Software and Compilers                  | CS / IS                                                                      | 3                   | 2        | —                  | 03                | 40        | 60        | 100         | 4       |
| 2           | PCC                    | 18CS62   | Computer Graphics and Visualization            | CS / IS                                                                      | 3                   | 2        | —                  | 03                | 40        | 60        | 100         | 4       |
| 3           | PCC                    | 18CS63   | Web Technology and its applications            | CS / IS                                                                      | 3                   | 2        | —                  | 03                | 40        | 60        | 100         | 4       |
| 4           | PEC                    | 18CS64X  | Professional Elective -I                       | CS / IS                                                                      | 3                   | —        | —                  | 03                | 40        | 60        | 100         | 3       |
| 5           | OEC                    | 18CS65X  | Open Elective -A                               | CS / IS                                                                      | 3                   | —        | —                  | 03                | 40        | 60        | 100         | 3       |
| 6           | PCC                    | 18CSL66  | System Software Laboratory                     | CS / IS                                                                      | —                   | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
| 7           | PCC                    | 18CSL67  | Computer Graphics Laboratory with mini project | CS / IS                                                                      | —                   | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
| 8           | MP                     | 18CSMP68 | Mobile Application Development                 | CS / IS                                                                      | —                   | —        | 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       | 06                 | 24                | 320       | 480       | 800         | 24      |

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

**Professional Elective -I**

**Course code under 18XX64X**

| Course code | Course Title                         |
|-------------|--------------------------------------|
| 18CS641     | Data Mining and Data Warehousing     |
| 18CS642     | Object Oriented Modelling and Design |
| 18CS643     | Cloud Computing and its Applications |
| 18CS644     | Advanced JAVA and J2EE               |
| 18CS645     | System Modelling and Simulation      |

**Open Elective -A (Not for CSE / ISE Programs)**

|         |                                                |
|---------|------------------------------------------------|
| 18CS651 | Mobile Application Development                 |
| 18CS652 | Introduction to Data Structures and Algorithms |
| 18CS653 | Programming in JAVA                            |
| 18CS654 | Introduction to Operating System               |

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:**

- 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.
- 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:**

- 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 departments to which the student/s belongs to.

**Internship:** All the students admitted in III year of BE/B Tech shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and in 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 take up/complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements.

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**Scheme of Teaching and Examination 2018 – 19**  
**Outcome Based Education(OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2018 – 19)**

**III 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      | BSC                    | 18MAT31    | Transform Calculus, Fourier Series and Numerical Techniques | Mathematics         | 2                    | 2        | –                  | 03                | 40        | 60        | 100         | 3       |
| 2      | PCC                    | 18EC32     | Network Theory                                              |                     | 3                    | 2        | –                  | 03                | 40        | 60        | 100         | 4       |
| 3      | PCC                    | 18EC33     | Electronic Devices                                          |                     | 3                    | 0        | –                  | 03                | 40        | 60        | 100         | 3       |
| 4      | PCC                    | 18EC34     | Digital System Design                                       |                     | 3                    | 0        | –                  | 03                | 40        | 60        | 100         | 3       |
| 5      | PCC                    | 18EC35     | Computer Organization & Architecture                        |                     | 3                    | 0        | –                  | 03                | 40        | 60        | 100         | 3       |
| 6      | PCC                    | 18EC36     | Power Electronics & Instrumentation                         |                     | 3                    | 0        | –                  | 03                | 40        | 60        | 100         | 3       |
| 7      | PCC                    | 18ECL37    | Electronic Devices & Instrumentation Laboratory             |                     | –                    | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
| 8      | PCC                    | 18ECL38    | Digital System Design Laboratory                            |                     | –                    | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
| 9      | HSMC                   | 18KVK39/49 | Vyavaharika Kannada (Kannada for communication)/            | HSMC                | –                    | 2        | –                  | –                 | 100       | –         | 100         | 1       |
|        |                        | 18KAK39/49 | Adalitha Kannada (Kannada for Administration)               |                     |                      |          |                    |                   |           |           |             |         |
|        |                        | OR         |                                                             |                     |                      |          |                    |                   |           |           |             |         |
|        |                        | 18CPC39/49 | Constitution of India, Professional Ethics and Cyber Law    |                     |                      |          |                    |                   |           |           |             |         |
| TOTAL  |                        |            |                                                             |                     | 17                   | 10       | 04                 | 24                | 420       | 480       | 900         | 24      |
|        |                        |            |                                                             |                     | 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 Adalitha 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 | NC MC | 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 students have to fulfill 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 a 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 in 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 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-credits) 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.

**Program Specific Outcomes (PSOs)**

At the end of the B.E Electronics & Communication Engineering program, students are expected to have developed the following program specific outcomes.

PSO1: Specify, design, build and test analog and digital systems for signal processing including multimedia applications, using suitable components or simulation tools.

PSO2: Understand and architect wired and wireless analog and digital communication systems as per specifications, and determine their performance.

**Note**

1. The Course Outcomes and RBT levels indicated for each course in the syllabus are indicative/suggestive. The faculty can set them appropriately according to their lesson plan.
2. The Question Paper format for the theory courses is as follows:

**Question Paper Pattern for Theory Courses (2018 Scheme):**

- Examination will be conducted for 100 marks with question paper containing 10 full questions, each of 20 marks
- Each full question can have a maximum of 4 sub questions.
- There will be 2 full questions from each module covering all the topics of the module.
- Students will have to answer 5 full questions, selecting one full question from each module.
- The total marks will be proportionally reduced to 60 marks as SEE marks is 60

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2018 - 19**  
**Outcome Based Education(OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2018 - 19)**

**IV SEMESTER**

| 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        | BSC                    | 18MAT41    | Complex Analysis, Probability and Statistical Methods    | Mathematics         | 2                    | 2        | --                 | 03                | 40        | 60        | 100         | 3       |
| 2        | PCC                    | 18EC42     | Analog Circuits                                          |                     | 3                    | 2        | --                 | 03                | 40        | 60        | 100         | 4       |
| 3        | PCC                    | 18EC43     | Control Systems                                          |                     | 3                    | 0        | --                 | 03                | 40        | 60        | 100         | 3       |
| 4        | PCC                    | 18EC44     | Engineering Statistics & Linear Algebra                  |                     | 3                    | 0        | --                 | 03                | 40        | 60        | 100         | 3       |
| 5        | PCC                    | 18EC45     | Signals & Systems                                        |                     | 3                    | 0        | --                 | 03                | 40        | 60        | 100         | 3       |
| 6        | PCC                    | 18EC46     | Microcontroller                                          |                     | 3                    | 0        | --                 | 03                | 40        | 60        | 100         | 3       |
| 7        | PCC                    | 18ECL47    | Microcontroller Laboratory                               |                     | --                   | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
| 8        | PCC                    | 18ECL48    | Analog Circuits Laboratory                               |                     | --                   | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
| 9        | HSMC                   | 18KVK39/49 | Vyavaharika Kannada (Kannada for communication)          | HSMC                | --                   | 2        | --                 | --                | 100       | --        | 100         | 1       |
|          |                        | 18KAK39/49 | Andalitha Kannada (Kannada for Administration)           |                     | --                   | 2        | --                 | --                | 100       | --        |             |         |
|          |                        | OR         |                                                          |                     |                      |          |                    |                   |           |           |             |         |
|          |                        | 18CPC39/49 | Constitution of India, Professional Ethics and Cyber Law |                     | 1                    | --       | --                 | 03                | 40        | 60        |             |         |
| TOTAL    |                        |            |                                                          |                     | 17                   | 10       | 04                 | 24                | 420       | 480       | 900         | 24      |
|          |                        |            |                                                          |                     | 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

18KVK39/49 Vyavaharika Kannada (Kannada for communication) is for non-kannada speaking, reading and writing students and 18KAK39/49 Andalitha 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 fulfill 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 2018 – 19**  
**Outcome Based Education(OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2018 – 19)**

**V SEMESTER**

| 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                   | 18ESS1  | Technological Innovation Management And Entrepreneurship |                                                                  | 3                    | 0        | --                 | 03                | 40        | 60        | 100     | 3           |
| 2          | PCC                    | 18EC52  | Digital Signal Processing                                |                                                                  | 3                    | 2        | --                 | 03                | 40        | 60        | 100     | 4           |
| 3          | PCC                    | 18EC53  | Principles of Communication Systems                      |                                                                  | 3                    | 2        | --                 | 03                | 40        | 60        | 100     | 4           |
| 4          | PCC                    | 18EC54  | Information Theory & Coding                              |                                                                  | 3                    | --       | --                 | 03                | 40        | 60        | 100     | 3           |
| 5          | PCC                    | 18EC55  | Electromagnetic Waves                                    |                                                                  | 3                    | --       | --                 | 03                | 40        | 60        | 100     | 3           |
| 6          | PCC                    | 18EC56  | Verilog HDL                                              |                                                                  | 3                    | --       | --                 | 03                | 40        | 60        | 100     | 3           |
| 7          | PCC                    | 18ECL57 | Digital Signal Processing Laboratory                     |                                                                  | --                   | 2        | 2                  | 03                | 40        | 60        | 100     | 2           |
| 8          | PCC                    | 18ECL58 | HDL Laboratory                                           |                                                                  | --                   | 2        | 2                  | 03                | 40        | 60        | 100     | 2           |
| 9          | HSMC                   | 18CIV59 | Environmental Studies                                    | Civil/ Environmental<br>[Paper setting: Civil Engineering Board] | 1                    | --       | --                 | 02                | 40        | 60        | 100     | 1           |
| TOTAL      |                        |         |                                                          |                                                                  | 19                   | 08       | 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.

**VSVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
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**Outcome Based Education(OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2018 – 19)**

**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                    | 18EC61   | Digital Communication       |                                                                                                | 3                    | 2        | --                 | 03                | 40        | 60        | 100         | 4       |
| 2      | PCC                    | 18EC62   | Embedded Systems            |                                                                                                | 3                    | 2        | --                 | 03                | 40        | 60        | 100         | 4       |
| 3      | PCC                    | 18EC63   | Microwave & Antennas        |                                                                                                | 3                    | 2        | --                 | 03                | 40        | 60        | 100         | 4       |
| 4      | PEC                    | 18XX64X  | Professional Elective -I    |                                                                                                | 3                    | --       | --                 | 03                | 40        | 60        | 100         | 3       |
| 5      | OEC                    | 18XX65X  | Open Elective -A            |                                                                                                | 3                    | --       | --                 | 03                | 40        | 60        | 100         | 3       |
| 6      | PCC                    | 18ECL66  | Embedded Systems Laboratory |                                                                                                | --                   | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
| 7      | PCC                    | 18ECL67  | Communication Laboratory    |                                                                                                | --                   | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
| 8      | MP                     | 18ECMP68 | Mini-project                |                                                                                                | --                   | --       | 2                  | 03                | 40        | 60        | 100         | 2       |
| 9      | Internship             | --       | Internship                  | To be carried out during the vacations of VI and VII semesters and for VII and VIII semesters. |                      |          |                    |                   |           |           |             |         |
| TOTAL  |                        |          |                             |                                                                                                | 15                   | 10       | 6                  | 24                | 320       | 480       | 800         | 24      |

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

**Professional Elective -I**

**Course code under 18XX64X** **Course Title**

|         |                                       |
|---------|---------------------------------------|
| 18EC641 | Operating System                      |
| 18EC642 | Artificial Neural Networks            |
| 18EC643 | Object Oriented Programming using C++ |
| 18EC644 | Digital System Design using Verilog   |
| 18EC645 | Nanoelectronics                       |

**Open Elective -A**

(i) 18EC651 Signal Processing (ii) 18EC652 Sensors & Signal Conditioning

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 under 18XX65X).

Selection of an open elective shall not be allowed if,

- 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 the 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/ Advisor/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 for 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 take-up/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**  
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**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                    | 18EC81  | Wireless and Cellular Communication |                                                                                          | 3                    | --       | --                 | 03                | 40        | 60        | 100         | 3       |
| 2      | PEC                    | 18XX82X | Professional Elective - 4           |                                                                                          | 3                    | --       | --                 | 03                | 40        | 60        | 100         | 3       |
| 3      | Project                | 18ECP83 | Project Work Phase - 2              |                                                                                          | --                   | --       | 2                  | 03                | 40        | 60        | 100         | 8       |
| 4      | Seminar                | 18ECS84 | Technical Seminar                   |                                                                                          | --                   | --       | 2                  | 03                | 100       | --        | 100         | 1       |
| 5      | Internship             | 18ECI85 | Internship                          | Completed during the vacation/s of VI and VII semesters and for VII and VIII semesters.) |                      |          |                    | 03                | 40        | 60        | 100         | 3       |
| TOTAL  |                        |         |                                     |                                                                                          | 06                   | --       | 4                  | 15                | 240       | 240       | 500         | 18      |

**Note:** PCC: Professional Core, PEC: Professional Elective.

**Professional Electives - 4**

| Course code under 18XX82X | Course Title                     |
|---------------------------|----------------------------------|
| 18EC821                   | Network Security                 |
| 18EC822                   | Micro Electro Mechanical Systems |
| 18EC823                   | Radar Engineering                |
| 18EC824                   | Optical Communication Networks   |
| 18EC825                   | Biomedical Signal Processing     |

**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).



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**VISVESVARAYA TECHNOLOGICAL UNIVERSITY  
BELAGAVI**

**BE ELECTRICAL AND ELECTRONICS ENGINEERING  
Scheme of Teaching and Examinations  
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)  
(Effective from the academic year 2018 – 19)**

Approved by BOS held on 24/5/2019

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2018 – 19**  
**Outcome Based Education(OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2018 – 19)**

| III 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 |         |
|              |                        |                                            |                                                                                      |                     |                      |          |                    |                   |           |           |             |         |
| 1            | BSC                    | 18MAT31                                    | Transform Calculus, Fourier Series and Numerical Techniques (Common to all Branches) | Mathematics         | 2                    | 2        | --                 | 03                | 40        | 60        | 100         | 3       |
| 2            | PCC                    | 18EE32                                     | Electric Circuit Analysis                                                            | EEE                 | 3                    | 2        | --                 | 03                | 40        | 60        | 100         | 4       |
| 3            | PCC                    | 18EE33                                     | Transformers and Generators                                                          | EEE                 | 3                    | 0        | --                 | 03                | 40        | 60        | 100         | 3       |
| 4            | PCC                    | 18 EE 34                                   | Analog Electronic Circuits                                                           | EEE                 | 2                    | 2        | --                 | 03                | 40        | 60        | 100         | 3       |
| 5            | PCC                    | 18 EE 35                                   | Digital System Design                                                                | EEE                 | 3                    | 0        | --                 | 03                | 40        | 60        | 100         | 3       |
| 6            | PCC                    | 18 EE 36                                   | Electrical and Electronic Measurements                                               | EEE                 | 3                    | 0        | --                 | 03                | 40        | 60        | 100         | 3       |
| 7            | PCC                    | 18 EE L37                                  | Electrical Machines Laboratory -I                                                    | EEE                 | --                   | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
| 8            | PCC                    | 18 EE L38                                  | Electronics Laboratory                                                               | EEE                 | --                   | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
| 9            | HSMC                   | 18KVK39/49                                 | Vyavaharika Kannada (Kannada for communication)                                      | HSMC                | --                   | 2        | --                 | --                | 100       | --        | 100         | 1       |
|              |                        | 18KAK39/49                                 | Aadalitha Kannada (Kannada for Administration)                                       |                     | --                   | --       | --                 | --                | --        |           |             |         |
|              |                        | OR                                         |                                                                                      |                     |                      |          |                    |                   |           |           |             |         |
|              |                        | 18CPC39                                    | Constitution of India, Professional Ethics and Cyber Law                             |                     | 1                    | --       | --                 | 02                | 40        | 60        |             |         |
|              |                        | Examination is by objective type questions |                                                                                      |                     |                      |          |                    |                   |           |           |             |         |
| TOTAL        |                        |                                            |                                                                                      |                     | 16                   | 10       | --                 | 24                | 420       | 480       | 900         | 24      |
|              |                        |                                            |                                                                                      |                     | OR                   | OR       | 04                 | OR                | OR        | OR        |             |         |
|              |                        |                                            |                                                                                      |                     | 17                   | 12       | --                 | 26                | 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 students have to fulfill the requirements during subsequent semesters 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 carried out 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.

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| IV 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           | BSC                    | 18MAT41    | Complex analysis, probability and statistical methods    | Mathematics         | 2                    | 2        | –                  | 03                | 40        | 60        | 100         | 3       |
| 2           | PCC                    | 18 EE42    | Power Generation and Economics                           | EEE                 | 3                    | 0        | –                  | 03                | 40        | 60        | 100         | 3       |
| 3           | PCC                    | 18 EE43    | Transmission and Distribution                            | EEE                 | 3                    | 2        | –                  | 03                | 40        | 60        | 100         | 4       |
| 4           | PCC                    | 18 EE44    | Electric Motors                                          | EEE                 | 3                    | 0        | –                  | 03                | 40        | 60        | 100         | 3       |
| 5           | PCC                    | 18 EE45    | Electromagnetic Field Theory                             | EEE                 | 2                    | 2        | –                  | 03                | 40        | 60        | 100         | 3       |
| 6           | PCC                    | 18 EE46    | Operational Amplifiers and Linear ICs                    | EEE                 | 3                    | 0        | –                  | 03                | 40        | 60        | 100         | 3       |
| 7           | PCC                    | 18 EEL47   | Electrical Machines Laboratory -2                        | EEE                 | –                    | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
| 8           | PCC                    | 18 EEL48   | Op- amp and Linear ICs Laboratory                        | EEE                 | –                    | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
| 9           | HSMC                   | 18KVK39/49 | Vyavaharika Kannada (Kannada for communication)/         | HSMC                | –                    | 2        | –                  | –                 | 100       | –         | 100         | 1       |
|             |                        | 18KAK39/49 | Aadaliṭha Kannada (Kannada for Administration)           |                     |                      |          |                    |                   |           |           |             |         |
|             |                        | OR         |                                                          |                     |                      |          |                    |                   |           |           |             |         |
|             |                        | 18CPC49    | Constitution of India, Professional Ethics and Cyber Law |                     |                      |          |                    |                   |           |           |             |         |
| TOTAL       |                        |            |                                                          |                     | 16                   | 10       | –                  | 24                | 420       | 480       | 900         | 24      |
|             |                        |            |                                                          |                     | OR                   | OR       | 04                 | OR                | OR        | OR        |             |         |
|             |                        |            |                                                          |                     | 17                   | 12       | –                  | 26                | 360       | 540       |             |         |

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

18KVK39/49 Vyavaharika Kannada (Kannada for communication) is for non-Kannada speaking, reading and writing students and 18KAK39/49 Aadaliṭha 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 | 18MAT01P41 | 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 students have to fulfill the requirements during subsequent semesters 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 have to complete all the activities of degree only after the return of the Eighth semester Grade Card.



**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
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**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                    | 18EE81  | Power System Operation and Control | EEE                                                                                      | 3                    | --       | --                 | 03                | 40        | 60        | 100         | 3       |
| 2      | PEC                    | 18EE82X | Professional Elective - 4          | EEE                                                                                      | 3                    | --       | --                 | 03                | 40        | 60        | 100         | 3       |
| 3      | Project                | 18EEP83 | Project Work Phase - 2             |                                                                                          | --                   | --       | 2                  | 03                | 40        | 60        | 100         | 8       |
| 4      | Seminar                | 18EES84 | Technical Seminar                  |                                                                                          | --                   | --       | 2                  | 03                | 100       | --        | 100         | 1       |
| 5      | Internship             | 18EEI85 | Internship                         | Completed during the vacation/s of VI and VII semesters and for VII and VIII semesters.) |                      |          |                    | 03                | 40        | 60        | 100         | 3       |
| TOTAL  |                        |         |                                    |                                                                                          | 06                   | --       | 04                 | 15                | 260       | 240       | 500         | 18      |

Note: PCC: Professional Core, PEC: Professional Elective.

**Professional Electives - 4**

| Course code under 18XX82X | Course Title                      |
|---------------------------|-----------------------------------|
| 18EE821                   | FACTS and HVDC Transmission       |
| 18EE822                   | Electrical Estimation and Costing |
| 18EE823                   | Electric Vehicles Technologies    |
| 18EE824                   | Power System Planning             |
| 18EE825                   | Electrical Power Quality          |

**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).

**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 (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.

**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 for 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 take-up/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**

**BE/B.Tech. Scheme of Teaching and Examinations  
Outcome Based Education (OBE) and Choice Based Credit System  
(CBCS) (Effective from the academic year 2018 – 19)**

**MECHANICAL ENGINEERING**

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2018 – 19**  
**Outcome Based Education(OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2018 – 19)**

**III 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            | BSC                    | 18MAT31                  | Mathematics                                                                                                 | Mathematics         | 2                    | 2        | --                 | 03                | 40        | 60        | 100         | 3       |
| 2            | PCC                    | 18ME32                   | Mechanics of Materials                                                                                      |                     | 3                    | 2        | --                 | 03                | 40        | 60        | 100         | 4       |
| 3            | PCC                    | 18ME33                   | Basic Thermodynamics                                                                                        |                     | 3                    | 0        | --                 | 03                | 40        | 60        | 100         | 3       |
| 4            | PCC                    | 18ME34                   | Material Science                                                                                            |                     | 3                    | 0        | --                 | 03                | 40        | 60        | 100         | 3       |
| 5            | PCC                    | 18ME35A or 18ME35B       | Metal cutting and forming<br>Metal Casting and Welding                                                      |                     | 3                    | 0        | --                 | 03                | 40        | 60        | 100         | 3       |
| 6            | PCC                    | 18ME36A or 18ME36B       | Computer Aided Machine Drawing/<br>Mechanical Measurements and Metrology                                    |                     | 1<br>3               | 4<br>0   | --                 | 03                | 40        | 60        | 100         | 3       |
| 7            | PCC                    | 18MEL37A or 18MEL37B     | Material Testing lab<br>Mechanical Measurements and Metrology lab                                           |                     | --                   | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
| 8            | PCC                    | 18MEL38A or 18MEL38B     | Workshop and Machine Shop Practice (Consists of Fitting, and Machining)<br>Foundry, Forging and Welding lab |                     | --                   | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
| 9            | HSMC                   | 18KVK39/49 or 18KAK39/49 | Vyavaharika Kannada (Kannada for communication)/<br>Aadalitha Kannada (Kannada for Administration)          | HSMC                | --                   | 2        | --                 | --                | 100       | --        | 100         | 1       |
|              |                        | OR                       |                                                                                                             |                     | 1                    | --       | --                 | 02                | 40        | 60        |             |         |
|              |                        | 18CPC39                  | Constitution of India, Professional Ethics and Cyber Law                                                    |                     |                      |          |                    |                   |           |           |             |         |
| <b>TOTAL</b> |                        |                          |                                                                                                             |                     | 17                   | 10       |                    | 24                | 420       | 480       | 900         | 24      |
|              |                        |                          |                                                                                                             |                     | OR                   | OR       | 04                 | OR                | OR        | OR        |             |         |
|              |                        |                          |                                                                                                             |                     | 19                   | 14       |                    | 26                | 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 students have to fulfill 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.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2018 – 19**  
**Outcome Based Education(OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2018 – 19)**

**IV 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 |         |
|       |                        |             |                                                                         |                     |                                            |          |                    |                   |           |           |             |         |
| 1     | BSC                    | 18MAT41     | Mathematics                                                             | Mathematics         | 2                                          | 2        | --                 | 03                | 40        | 60        | 100         | 3       |
| 2     | PCC                    | 18ME42      | Applied Thermodynamics                                                  |                     | 3                                          | 2        | --                 | 03                | 40        | 60        | 100         | 4       |
| 3     | PCC                    | 18ME43      | Fluid Mechanics                                                         |                     | 3                                          | 0        | --                 | 03                | 40        | 60        | 100         | 3       |
| 4     | PCC                    | 18ME44      | Kinematics of Machines                                                  |                     | 3                                          | 0        | --                 | 03                | 40        | 60        | 100         | 3       |
| 5     | PCC                    | 18ME45A     | Metal cutting and forming                                               |                     | 3                                          | 0        | --                 | 03                | 40        | 60        | 100         | 3       |
|       |                        | 18ME45B     | Metal Casting and Welding                                               |                     |                                            |          |                    |                   |           |           |             |         |
| 6     | PCC                    | 18ME46A or  | Computer Aided Machine Drawing/                                         |                     | 1                                          | 4        | --                 | 03                | 40        | 60        | 100         | 3       |
|       |                        | 18ME46B     | Mechanical Measurements and Metrology                                   |                     | 3                                          | 0        |                    |                   |           |           |             |         |
| 7     | PCC                    | 18MEL47A or | Material Testing lab                                                    |                     | --                                         | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
|       |                        | 18MEL47B    | Mechanical Measurements and Metrology lab                               |                     |                                            |          |                    |                   |           |           |             |         |
| 8     | PCC                    | 18MEL48A    | Workshop and Machine Shop Practice (Consists of Fitting, and Machining) |                     | --                                         | 2        | 2                  | 03                | 40        | 60        | 100         | 2       |
|       |                        | 18MEL48B    | Foundry, Forging and Welding lab                                        |                     |                                            |          |                    |                   |           |           |             |         |
| 9     | HSMC                   | 18KVK49/49  | Vyavaharika Kannada (Kannada for communication)/                        | HSMC                | --                                         | 2        | --                 | --                | 100       | --        | 100         | 1       |
|       |                        | 18KAK49/49  | Aadalitha Kannada (Kannada for Administration)                          |                     |                                            |          |                    |                   |           |           |             |         |
|       |                        | OR          |                                                                         |                     |                                            |          |                    |                   |           |           |             |         |
|       |                        | 18CPH49     | Constitution of India, Professional Ethics and Cyber Law                |                     |                                            |          |                    |                   |           |           |             |         |
| TOTAL |                        |             |                                                                         |                     | 17                                         | 10       | 04                 | 24                | 420       | 480       | 900         | 24      |
|       |                        |             |                                                                         |                     | OR                                         | OR       |                    | OR                | OR        | OR        |             |         |
|       |                        |             |                                                                         |                     | 19                                         | 14       |                    | 26                | 360       | 540       |             |         |
|       |                        |             |                                                                         |                     | Examination is by objective type questions |          |                    |                   |           |           |             |         |

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 fulfill 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.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2018 – 19**  
**Outcome Based Education(OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2018 – 19)**

**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                    | 18ME71  | Control Engineering                     |                                                                                                                                        | 3                    | --       | --                 | 03                | 40        | 60        | 100     | 3           |
| 2      | PCC                    | 18ME72  | Computer Aided Design and Manufacturing |                                                                                                                                        | 3                    | --       | --                 | 03                | 40        | 60        | 100     | 3           |
| 3      | PEC                    | 18ME73X | Professional Elective - 2               |                                                                                                                                        | 3                    | --       | --                 | 03                | 40        | 60        | 100     | 3           |
| 4      | PEC                    | 18ME74X | Professional Elective - 3               |                                                                                                                                        | 3                    | --       | --                 | 03                | 40        | 60        | 100     | 3           |
| 5      | OEC                    | 18ME75X | Open Elective -B                        |                                                                                                                                        | 3                    | --       | --                 | 03                | 40        | 60        | 100     | 3           |
| 6      | PCC                    | 18MEL76 | Computer Integrated Manufacturing Lab   |                                                                                                                                        | --                   | 2        | 2                  | 03                | 40        | 60        | 100     | 2           |
|        | PCC                    | 18MEL77 | Design Lab                              |                                                                                                                                        | --                   | 2        | 2                  | 03                | 40        | 60        | 100     | 2           |
| 7      | Project                | 18MEP78 | Project Work Phase - 1                  |                                                                                                                                        | --                   | --       | 2                  | --                | 100       | --        | 100     | 1           |
| 8      | Internship             | --      | Internship                              | (If not completed during the vacation of VI and VII semesters, it shall be carried out during the vacation of VII and VIII semesters ) |                      |          |                    |                   |           |           |         |             |
| TOTAL  |                        |         |                                         |                                                                                                                                        | 15                   | 04       | 06                 | 18                | 340       | 360       | 700     | 20          |

**Professional Elective - 2**

| Course code under 18XX73X | Course Title                 | Course code under 18XX73X | Course Title             |
|---------------------------|------------------------------|---------------------------|--------------------------|
| 18ME731                   | Design for Manufacture       | 18ME734                   | Total Quality Management |
| 18ME732                   | Automation and Robotics      | 18ME735                   | Operations Research      |
| 18ME733                   | Computational Fluid Dynamics |                           |                          |

**Professional Electives - 3**

| Course code under 18XX74X | Course Title                                       | Course code under 18XX74X | Course Title       |
|---------------------------|----------------------------------------------------|---------------------------|--------------------|
| 18ME741                   | Additive Manufacturing                             | 18ME744                   | Mechatronics       |
| 18ME742                   | Emerging Sustainable Building Cooling Technologies | 18ME745                   | Project Management |
| 18ME743                   | Theory of Plasticity                               |                           |                    |

**Open Elective -B**

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 under 18XX75X).

Selection of an open elective shall not be allowed if,

- 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 the 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/ Advisor/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 (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.

**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 take-up/complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2018 – 19**  
**Outcome Based Education(OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2018 – 19)**

| 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                    | 18ME81  | Energy Engineering        |                                                                                          | 3                    | --       | --                 | 03                | 40        | 60        | 100         | 3       |
| 2             | PEC                    | 18ME82X | Professional Elective - 4 |                                                                                          | 3                    | --       | --                 | 03                | 40        | 60        | 100         | 3       |
| 3             | Project                | 18MEP83 | Project Work Phase - 2    |                                                                                          | --                   | --       | 2                  | 03                | 40        | 60        | 100         | 8       |
| 4             | Seminar                | 18MES84 | Technical Seminar         |                                                                                          | --                   | --       | 2                  | 03                | 100       | --        | 100         | 1       |
| 5             | Internship             | 18XXI85 | Internship                | Completed during the vacation/s of VI and VII semesters and /or VII and VIII semesters.) |                      |          |                    | 03                | 40        | 60        | 100         | 3       |
| TOTAL         |                        |         |                           |                                                                                          | 06                   | --       | 04                 | 15                | 260       | 240       | 500         | 18      |

**Note:** PCC: Professional Core, PEC: Professional Elective.

**Professional Electives - 4**

| Course code under 18XX82X | Course Title                           | Course code under 18XX82X | Course Title           |
|---------------------------|----------------------------------------|---------------------------|------------------------|
| 18ME821                   | CNC Machine Tools                      | 18ME824                   | Automobile Engineering |
| 18ME822                   | Tribology                              | 18ME825                   | Tool Design            |
| 18ME823                   | Non-Destructive Testing and Evaluation | 18ME826                   | Fracture Mechanics     |

**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 belongs 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).

| B.E. Mechanical Engineering                                                                                                                                                                                                                                                                                                                                                        |                                                 |                        |            |                    |                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|------------------------|------------|--------------------|---------------------------------|
| Outcome Based Education (OBE) and Choice Based Credit System (CBCS)                                                                                                                                                                                                                                                                                                                |                                                 |                        |            |                    |                                 |
| SEMESTER - VI                                                                                                                                                                                                                                                                                                                                                                      |                                                 |                        |            |                    |                                 |
| OPEN ELECTIVE - A                                                                                                                                                                                                                                                                                                                                                                  |                                                 |                        |            |                    |                                 |
| Course Code                                                                                                                                                                                                                                                                                                                                                                        | 18ME65X                                         |                        | CIE Marks  | 40                 |                                 |
| Teaching Hours/Week (L:T:P)                                                                                                                                                                                                                                                                                                                                                        | 3:0:0                                           |                        | SEE Marks  | 60                 |                                 |
| Credits                                                                                                                                                                                                                                                                                                                                                                            | 03                                              |                        | Exam Hours | 03                 |                                 |
| Students can select any one of the open electives offered by other Departments except those that are offered by the parent Department (For syllabus, please refer to the concerned programme syllabus book or VTU website vtu.ac.in may be visited.).                                                                                                                              |                                                 |                        |            |                    |                                 |
| Selection of an open elective shall not be allowed if,                                                                                                                                                                                                                                                                                                                             |                                                 |                        |            |                    |                                 |
| <ul style="list-style-type: none"><li>• The candidate has studied the same course during the previous semesters of the programme.</li><li>• The syllabus content of open elective is similar to that of the Departmental core courses or professional electives.</li><li>• A similar course, under any category, is prescribed in the higher semesters of the programme.</li></ul> |                                                 |                        |            |                    |                                 |
| Registration to electives shall be documented under the guidance of Programme Coordinator/ Advisor/Mentor.                                                                                                                                                                                                                                                                         |                                                 |                        |            |                    |                                 |
| Sl No.                                                                                                                                                                                                                                                                                                                                                                             | Board and the Department offering the Electives |                        | Course     |                    | Course Title                    |
|                                                                                                                                                                                                                                                                                                                                                                                    |                                                 |                        | Sl No.     | code under 18XX65X |                                 |
| 1                                                                                                                                                                                                                                                                                                                                                                                  | ME                                              | Mechanical Engineering | 1          | 18ME651            | Non-Conventional Energy Sources |
|                                                                                                                                                                                                                                                                                                                                                                                    |                                                 |                        | 2          | 18ME652            | World Class Manufacturing       |
|                                                                                                                                                                                                                                                                                                                                                                                    |                                                 |                        | 3          | 18ME653            | Supply Chain Management         |
|                                                                                                                                                                                                                                                                                                                                                                                    |                                                 |                        | 4          | 18ME654            | Advanced Materials Technology   |

| B.E Mechanical Engineering                                                                                                                                                                                                                                                                                                                                                         |                                                 |                        |            |                    |                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|------------------------|------------|--------------------|-------------------------|
| Outcome Based Education (OBE) and Choice Based Credit System (CBCS)                                                                                                                                                                                                                                                                                                                |                                                 |                        |            |                    |                         |
| SEMESTER - VII                                                                                                                                                                                                                                                                                                                                                                     |                                                 |                        |            |                    |                         |
| OPEN ELECTIVE - B                                                                                                                                                                                                                                                                                                                                                                  |                                                 |                        |            |                    |                         |
| Course Code                                                                                                                                                                                                                                                                                                                                                                        | 18ME75X                                         |                        | CIE Marks  | 40                 |                         |
| Teaching Hours/Week (L:T:P)                                                                                                                                                                                                                                                                                                                                                        | 3:0:0                                           |                        | SEE Marks  | 60                 |                         |
| Credits                                                                                                                                                                                                                                                                                                                                                                            | 03                                              |                        | Exam Hours | 03                 |                         |
| Students can select any one of the open electives offered by other Departments except those that are offered by the parent Department (For syllabus, please refer to the concerned programme syllabus book or VTU website vtu.ac.in may be visited.).                                                                                                                              |                                                 |                        |            |                    |                         |
| Selection of an open elective shall not be allowed if,                                                                                                                                                                                                                                                                                                                             |                                                 |                        |            |                    |                         |
| <ul style="list-style-type: none"><li>• The candidate has studied the same course during the previous semesters of the programme.</li><li>• The syllabus content of open elective is similar to that of the Departmental core courses or professional electives.</li><li>• A similar course, under any category, is prescribed in the higher semesters of the programme.</li></ul> |                                                 |                        |            |                    |                         |
| Registration to electives shall be documented under the guidance of Programme Coordinator/ Advisor/Mentor.                                                                                                                                                                                                                                                                         |                                                 |                        |            |                    |                         |
|                                                                                                                                                                                                                                                                                                                                                                                    |                                                 |                        |            |                    |                         |
| Sl NO                                                                                                                                                                                                                                                                                                                                                                              | Board and the Department offering the Electives |                        | Course     |                    | Course Title            |
|                                                                                                                                                                                                                                                                                                                                                                                    |                                                 |                        | Sl No      | code under 18XX75X |                         |
| 2                                                                                                                                                                                                                                                                                                                                                                                  | ME                                              | Mechanical Engineering | 1          | 18ME751            | Energy and Environment  |
|                                                                                                                                                                                                                                                                                                                                                                                    |                                                 |                        | 2          | 18ME752            | Automotive Engineering  |
|                                                                                                                                                                                                                                                                                                                                                                                    |                                                 |                        | 3          | 18ME753            | Industrial Safety       |
|                                                                                                                                                                                                                                                                                                                                                                                    |                                                 |                        | 4          | 18ME754            | Optimization Techniques |
|                                                                                                                                                                                                                                                                                                                                                                                    |                                                 |                        |            |                    |                         |

**Visvesvaraya Technological University, Belagavi**

**REGULATIONS GOVERNING  
THE DEGREE OF BACHELOR OF ENGINEERING/ TECHNOLOGY (B.E/B.Tech)  
UNDER CHOICE BASED CREDIT SYSTEM (CBCS)  
Effective from the academic year 2017 – 18**

**AUGUST 2017**

# Visvesvaraya Technological University, Belagavi

## REGULATIONS GOVERNING THE DEGREE OF BACHELOR OF ENGINEERING/ TECHNOLOGY (B.E/B.Tech) UNDER CHOICE BASED CREDIT SYSTEM (CBCS) Effective from the academic year 2017 – 18

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2017  
SCHEME

# Visvesvaraya Technological University, Belagavi

## REGULATIONS GOVERNING

### THE DEGREE OF BACHELOR OF ENGINEERING/ TECHNOLOGY (B.E/B.Tech) UNDER CHOICE BASED CREDIT SYSTEM (CBCS)

Effective from the academic year 2017 – 18

#### Definitions of Keywords

The following are the definitions/descriptions that have been followed for the different terms used in the Regulations of B.E/B.Tech. Programmes:

- 1) **Programme:** Is an educational programme in a particular stream/ branch of Engineering/branch of specialization leading to award of Degree. It involves events/activities, comprising of lectures/ tutorials/ laboratory work/ field work, outreach activities/ project work/ vocational training/ viva/ seminars/ Internship/ assignments/ presentations/ self-study etc., or a combination of some of these.
- 2) **Branch:** Means Specialization or discipline of B.E/B.Tech. Degree Programme, like Civil Engineering, Mechanical Engineering, Textile Engineering, etc.
- 3) **Semester:** Refers to one of the two sessions of an academic year (vide: serial number 4), each session being of sixteen weeks duration (with working days greater than or equal to ninety). The odd semester may be scheduled from August and even semester from February of the year.
- 4) **Academic Year:** Refers to the sessions of two consecutive semesters (odd followed by an even) including periods of vacation.
- 5) **Course:** Refers to usually referred to as 'papers' and is a component of a programme. All Courses need not carry the same weight. The Courses should define learning objectives and learning outcomes. A Course may be designed to comprise lectures/ tutorials/ laboratory work/ field work/ outreach activities/project work/ vocational training/ viva/ seminars/ term papers/assignments/ presentations/ self-study etc., or a combination of some of these.
- 6) **Credit:** Refers to a unit by which the Course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of lecture or two hours of laboratory/practical Courses/ tutorials/ fieldwork per week etc.
- 7) **Audit Courses:** Means Knowledge/ Skill enhancing Courses without the benefit of a grade or credit for a Course.
- 8) **Choice Based Credit System (CBCS):** Refers to customizing the Course work for a student, through Core, Elective and soft skill Courses.
- 9) **Course Registration:** Refers to formal registration for the Courses of a semester (Credits) by every student under the supervision of a Faculty Advisor (also called Mentor, Counselor etc.,) in each Semester for the Institution to maintain proper record.
- 10) **Course Evaluation:** Means Continuous Internal Evaluation (CIE) and Semester End Examinations (SEE) to constitute the major evaluations prescribed for each Course. CIE and SEE to carry 20% and 80% respectively, to enable each Course to be evaluated for 100 marks, irrespective of its Credits.
- 11) **Continuous Internal Evaluation (CIE):** Refers to evaluation of students' achievement in the learning process. Evaluation process consists of two components namely Continuous Internal Evaluation (CIE) and Semester End Examination. CIE shall be by the Course Instructor and includes tests, problem solving, group discussion, quiz, mini-project and seminar throughout the Semester, with weightage for the different components being fixed at the University level.

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- 12) **Semester end examinations (SEE):** Refers to examination conducted at the University level covering the entire Course Syllabus. For this purpose, Syllabi to be modularized and SEE questions to be set from each module, with a choice confined to the concerned module only. SEE is also termed as university examination.
- 13) **First Attempt:** Refers to a student who has completed all formalities and has become eligible to attend the SEE and has attended at least one head of passing, such attempt shall be considered as first attempt.
- 14) **Credit Based System (CBS):** Refers to quantification of Course work, after a student completes teaching – learning process, followed by passing in both CIE and SEE. Under CBCS, the requirement for awarding degree is prescribed in terms of total number of credits to be earned by the students.
- 15) **Credit Representation:** Refers to Credit Values for different academic activities considered, as per the Table.1. Credits for seminar, project phases, project viva-voce and internship shall be as specified in the Scheme of Teaching and Examination (Annexure -1).

**Table 1: Credit Values**

| Theory/Lectures (L)<br>(hours/week/Semester) | Tutorials (T)<br>(hours/week/Semester) | Laboratory/Practical (P)<br>(hours/week/Semester) | Credits<br>(L: T: P) | Total<br>Credits |
|----------------------------------------------|----------------------------------------|---------------------------------------------------|----------------------|------------------|
| 4                                            | 0                                      | 0                                                 | 4:0:0                | 4                |
| 3                                            | 0                                      | 0                                                 | 3:0:0                | 3                |
| 2                                            | 2                                      | 0                                                 | 2:1:0                | 3                |
| 2                                            | 0                                      | 2                                                 | 2:0:1                | 3                |
| 2                                            | 2                                      | 2                                                 | 2:1:1                | 4                |
| 0                                            | 0                                      | 6                                                 | 0:0:3                | 3                |

NOTE: Activities like, practical training, study tour and participation in Guest lectures not to carry Credits.

- 16) **Letter Grade:** It is an index of the performance of students in a said Course. Grades are denoted by letters S, A, B, C, D, E and F.
- 17) **Grading:** Grade refers to qualitative measure of achievement of a student in each Course, based on the percentage of marks secured in (CIE plus SEE). Grading is done by Absolute Grading [Refer: 17OB6.0]. The rubric attached to letter grades are as follows:  
 S – Outstanding, A – Excellent, B – Very Good, C – Good, D – Above Average, E – Average and F – Fail.
- 18) **Grade Point (GP):** Refers to a numerical weightage allotted to each letter grade on a 10-point scale as under.
- 19) **Passing Standards:** Refers to passing a Course only when getting GP greater than or equal to 04 (as per serial number 18).
- 20) **Credit Point:** Is the product of grade point (GP) and number of credits for a Course i.e.,  
 Credit points (CrP) = GP × Credits for the Course.
- 21) **Semester Grade Point Average (SGPA):** Refers to a measure of academic performance of student/s in a semester. It is the ratio of total credit points secured by a student in various Courses of a semester and the total Course credits taken during that semester. [Refer: 17OB6.0]

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| Letter Grade and corresponding Grade Points on a typical 10 – Point scale |    |    |    |    |    |    |    |
|---------------------------------------------------------------------------|----|----|----|----|----|----|----|
| Letter Grade                                                              | S  | A  | B  | C  | D  | E  | F  |
| Grade Point                                                               | 10 | 09 | 08 | 07 | 06 | 04 | 00 |

- 22) **Cumulative Grade Point Average (CGPA):** Is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points earned by a student in various Courses in all semesters and the sum of the total credits of all Courses in all the semesters. It is expressed up to two decimal places. [Refer: 17OB6.0]
- 23) **Transcript or Grade Card or Certificate:** Refers to a certificate showing the grades earned by a student. A grade certificate shall be issued to all the registered students after every semester. The grade certificate will display the programme details (Course code, title, number of credits, grades secured) along with SGPA of that semester and CGPA earned till that semester.
- 24) **University:** Visvesvaraya Technological University, Belagavi.



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|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>17OB 1.0</b>  | <b>Title, Duration and Credits of the Programme of Study</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>17OB 1.1</b>  | The programme of study shall be called the degree of Bachelor of Engineering (Subject of Specialization) /Bachelor of Technology (Subject of Specialization), abbreviated as B.E. / B.Tech. (Subject of Specialization).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>17 OB1.2</b>  | <p>The program to which students are admitted to I semester of the programme shall be of four academic year duration divided into eight semesters and each semester is of 16 weeks duration.</p> <p>The programme to which students are admitted to III semester of the programme under lateral entry shall be of three academic year duration divided into six semesters and each semester is of 16 weeks duration.</p> <p>The programme (conducted during evening) to which students are admitted to III semester of the programme under lateral entry shall be of three academic year duration divided into six semesters and each semester is of 16 weeks duration. The deficit contact hours of the programme, conducted during evening on all working days, shall be compensated on all Sundays (except on general holidays).</p>                                                                                                                                                                                                                                                                                                                                                   |
| <b>17 OB 1.3</b> | The calendar of events in respect of the program of study shall be notified by the University in advance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>17 OB 1.4</b> | The University examination in all programs of study shall be conducted at the end of each semester for all the eight semesters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>17 OB 1.5</b> | <p><b>Maximum Duration for Programme Completion:</b></p> <p>(a) i. Students admitted to I year B.E/ B.Tech. shall complete the programme within a period of eight academic years from the date of first admission, failing which they have to discontinue the Course.</p> <p>ii. Students admitted II Year B.E./B.Tech. under lateral entry scheme shall complete the Course within a period of six academic years from the date of first admission, failing which he/she has to discontinue the Course.</p> <p>(b)i. A student who has not obtained the eligibility for III semester even after three academic years from the date of admission to I semester shall discontinue the Course or get readmitted to I semester of first year B.E./B.Tech. with a new University Seat Number but retaining the same year of admission.</p> <p>ii. A student (under lateral entry scheme) who has not obtained the eligibility for V semester even after three academic years from the date of admission to III semester shall discontinue the Course or get readmitted to III semester of II year B.E./B.Tech with a new University Seat Number but retaining the same year of admission.</p> |
| <b>17 OB 1.6</b> | <p><b>Prescribed Number of Credits for the Programme:</b></p> <p>(a) The number of credits to be completed by students admitted I semester of B.E./B.Tech programme shall be 200.</p> <p>(b)The number of credits to be completed by students admitted to III semester of B.E./B.Tech programme under lateral entry scheme shall be 152.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

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|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17 OB2.0 | Eligibility for Admission (As per the Government orders issued from time to time)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 17 OB2.1 | <p>Admission to I year/ I semester Bachelor Degree in Engineering/ shall be open to the students who have passed the II PUC/ XII Standard/ Equivalent Examination with English as one of the Languages and obtained a Minimum of 45% of Marks in aggregate in Physics and Mathematics along with Chemistry / Bio-Technology / Biology / Electronics / Computer.</p> <p>In case of SC/ST, Category -I and OBC (2A, 2B, 3A and 3B) category students from Karnataka (Karnataka candidates) the minimum marks for eligibility shall be 40 %.</p> <p>With regard to the qualification earned from foreign countries, Equivalence certificate from the Association of Indian Universities is Mandatory for admission to B.E./B.Tech programme. In case of any dispute about the equivalence in qualification earned from foreign countries, the decision of the Equivalence committee shall be the final in establishing the eligibility of the student.</p> <p>Admission to II year/ III semester Bachelor Degree in Engineering/ Technology (Lateral Entry) shall be open to the Diploma holders and B.Sc. graduates.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 17 OB2.2 | <p><b>(i) Diploma Holders</b></p> <p>(a) Must have passed diploma or equivalent examination as recognized by University and secured not less than forty five percentage (45%) marks in the final year examination (fifth and sixth semesters) in the appropriate branch of engineering. In case of SC/ST and OBC students from Karnataka the minimum marks for eligibility shall be forty percent (40%).</p> <p>(b) Those candidates who have completed Diploma from other than Karnataka state shall provide the Equivalence/ Eligibility Certificate from the Director of Technical Education, Karnataka.</p> <p><b>(ii) B.Sc. Graduates</b></p> <p>(a) Must have passed B.Sc. degree from a recognized University under the UGC or equivalent qualification as recognized by University and secured not less than forty five percentage (45%) marks in aggregate (considering the marks of all six semesters). In case of SC/ST and OBC students from Karnataka (Karnataka candidates) the minimum marks for eligibility shall be forty percent (40%).</p> <p>Candidates must have studied Mathematics as subject of study at XII Standard.</p> <p><b>(iii) Diploma Holders for the programme conducted during evening</b></p> <p>(a) A candidate who has passed diploma examination or equivalent examination and obtained an aggregate minimum of 45 % marks taken together in all the subjects of the final year (fifth and sixth semesters) diploma examination is eligible to B.E Courses, and 40 % of marks in case of SC/ST and backward classes of Karnataka candidates.</p> <p>In addition to this a candidate after passing the diploma, must have minimum of two years full time professional experience as on first September of the year of admission, in a registered firm/company/industry/ educational / Government / Autonomous organizations in the branch of Engineering/ Technology, in which the candidates hold a diploma, and in which admission is sought by him/her.</p> |

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|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>17 OB2.2</b><br><b>(continued)</b> | <p>Further that employment shall be in an establishment situated within the 15 km from the place of the institution to which the candidate is seeking admission. Professional experience refers to the experience earned as an employee on regular basis in</p> <p>(a) Government, Government Undertaking, Public Sector Undertaking, Corporation or</p> <p>(b) In a private company registered under the Directorate of Industries and Commerce or the Directorate of Small Scale Industries or</p> <p>(c) Government, Government recognized Institutions as technical staff.</p> <p>Provided that the period of apprenticeship undergone shall also be treated as professional experience, if sponsored by the Board of Apprenticeship Training, Southern Region, Chennai or by Government, Government undertakings and Public Sector undertakings. Further, those candidates who have completed Diploma from other than Karnataka state shall provide the Equivalence/ Eligibility Certificate from the Director of Technical Education, Karnataka.</p>                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>17 OB2.3</b>                       | <p>Those students, who have passed a qualifying examination other than the PUC II examination of the Pre-University Education Board of Karnataka, have to obtain eligibility certificate for seeking admission to B.E./B.Tech Degree Programme from Visvesvaraya Technological University, Belagavi.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>17 OB3.0</b>                       | <b>Courses</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>17 OB3.1</b>                       | <p>There shall be the following types of Courses:</p> <ol style="list-style-type: none"> <li>Humanities and Social Sciences (HSS) including Management. These are mandatory for all disciplines.</li> <li>Basic Sciences (BS): Physics, Chemistry and Mathematics. These are mandatory for all disciplines.</li> <li>Engineering Sciences (ES): Materials, Workshop, Drawing, and Basics of Electrical/ Electronics/ Instrumentation/ Civil/ Mechanical/ Computer Engineering. These are mandatory for all disciplines.</li> <li>Professional Subjects (PS) - Core: Are the professional Core (PC) Courses, relevant to the chosen specialization/ branch. The core Courses are to be compulsorily studied by a student and are mandatory to complete them to fulfill the requirements of a programme.</li> <li>Professional Subjects (PS) - Elective: Are the professional Electives (PE), relevant to the chosen specialization/ branch and can be chosen from the pool of papers. It shall be supportive to the discipline providing extended scope/enabling an exposure to some other discipline /domain and nurturing student proficiency skills.</li> <li>Open Subjects - Electives (OE): Are from other technical areas and/ or from emerging fields.</li> <li>Mini project and Main Project: Carried out at the Institution or at an Industry.</li> <li>Seminar: Deliverable at the Institution under the supervision of a Faculty.</li> </ol> |

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|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>17 OB3.1</b><br><b>(continued)</b> | <p>i) Internship: Preferably at an industry/R and D organization/IT company/ Government organization of significant repute for a specified period mentioned in Scheme of Teaching and Examination. <b>Period of internship be specified</b></p> <p>j) Mandatory Courses (MC): These Courses are mandatory, without the benefit of a grade or credit, for students admitted to B.E./B.Tech program. A pass in each mandatory Course is required to qualify for Degree award from the University.</p> <p>k) Audit Courses (AC): Knowledge/ skill enhancement Courses without the benefit of a grade or credit for a Course.</p> <p>(i) The Audit Course/s (other than the Course/s considered for completing the prescribed program credits) can be any Course offered by the program to which the student is admitted or other programs offered in the institution, where the student is studying.</p> <p>(ii) The students who are interested in audit Courses can register for one audit Course at a time during III to VIII semesters. Students, who have opted for audit Courses and considered on par with students registered for credit Courses, have to satisfy the attendance and CIE requirements. However, they need not have to appear for SEE.</p> <p>The number of registrations to an audit Course is restricted to 10 % of the AICTE intake.</p> <p>(iii) Registration for any audit Course, in writing, shall be completed at the beginning of semesters. The Institution should intimate the Registrar (Evaluation) about the registration at the beginning of the semester and obtain a formal approval for inclusion of the audit Course/s in the Grade cards/ Transcripts issued to the students.</p> |
| <b>17 OB3.2</b>                       | The minimum number of students registered to any Elective offered by the Departments shall be not less than ten.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>17 OB3.3</b>                       | <p>A student shall exercise his option in respect of Elective Courses and register for the same at the beginning of the concerned semester.</p> <p>The student may be permitted to opt for a change of Elective Course within 15 days from the date of commencement of the semester as per the calendar of the University.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>17 OB3.4</b>                       | <b>Course Registration:</b> Every student shall register for the Courses of a semester (Credits) under the supervision of a Faculty Advisor (also called Mentor, Counselor etc.) in each Semester for the Institution to maintain proper record.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>17OB4.0</b>                        | <b>Internship/Professional Practice</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>17OB4.1</b>                        | <p><b>Internship / Professional Practice:</b></p> <ol style="list-style-type: none"> <li>1) The Internship shall be completed during the period specified in the Scheme of Teaching and Examination.</li> <li>2) The internship can be carried out in any industry/R and D Organization/Research Institute/ Educational institute of repute.</li> <li>3) (a) The Department/college shall nominate staff member/s to facilitate, guide and supervise students under internship.</li> <li>(b) The Internal Guide has to visit place of internship at least once during the student's internship.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>17OB4.1</b><br>(continued) | <p><b>Internship / Professional Practice:</b></p> <ol style="list-style-type: none"> <li>4) The students shall report the progress of the internship to the guide in regular intervals and seek his/her advice.</li> <li>5) After the completion of Internship, students shall submit a report with completion and attendance certificates to the Head of the Department with the approval of both internal and external guides.</li> <li>6) There will be 50 marks for CIE (Seminar: 25, Internship report: 25) and 50 marks for Viva – Voce conducted during SEE.</li> <li>7) The internal guide shall award the marks for seminar and internship report after evaluation. He/she will also be the internal examiner for Viva – Voce conducted during SEE.</li> <li>8) The external guide from the industry has to be an examiner for the viva voce on Internship. Viva-Voce on internship shall be conducted at the college and the date of Viva-Voce shall be fixed in consultation with the external Guide. The Examiners shall jointly award the Viva - Voce marks.</li> <li>9) In case the external Guide expresses his inability to conduct viva voce, the Chief Superintendent of the institution shall appoint a senior faculty of the Department to conduct viva-voce along with the internal guide. The same shall be informed in writing to the concerned Chairperson, Board of Examiners (BOE).</li> <li>10) The students are permitted to carry out the internship anywhere in India or abroad. The University will not provide any kind of financial assistance to any student for carrying out the Internship.</li> </ol> |
| <b>17OB4.2</b>                | <p><b>Failing to undergo Internship:</b> Internship is one of the head of passing. Completion of internship is mandatory. If any student fails to undergo/complete the internship, he/she shall be considered as failed in this Course and shall not be permitted to appear for SEE in this Course. However, student shall reappear for SEE after satisfying the conditions prescribed for Internship. The reappearance shall be considered as an attempt.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>17OB5.0</b>                | <p><b>Seminar and Project</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>17OB5.1</b>                | <p><b>Seminar:</b> Seminar is one of the head of passing.</p> <ol style="list-style-type: none"> <li>i) Each candidate shall deliver seminar as per the Scheme of Teaching and Examination on the topics chosen from the relevant fields for about 30 minutes.</li> <li>ii) The Head of the Department shall make arrangements for conducting seminars through concerned faculty members of the Department. The committee constituted for the purpose by the Head of the Department shall award the CIE marks for the seminar. The committee shall consist of three faculty from the Department and the senior most acting as the Chairman/Chairperson.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>17OB5.2</b>                | <p><b>Project Work:</b> Project is one of the head of passing.</p> <p>Project work shall preferably be batch wise; the strength of each batch shall not exceed a maximum of four students.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>17OB5.3</b>                | <p>Viva-voce examination in project work shall be conducted batch-wise.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

**Visvesvaraya Technological University, Belagavi**  
**Regulations Governing the Degree of Bachelor of Engineering/ Technology (B.E/B.Tech)**  
**Under Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2017 – 18)**

| <b>17OB 6.0</b>                        | <b>Computation of SGPA and CGPA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                  |                                  |                                  |                                  |                                  |                    |         |      |              |   |   |   |   |   |   |   |              |    |   |   |   |   |   |    |                                        |                         |                                  |                                  |                                  |                                  |                                  |                    |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|--------------------|---------|------|--------------|---|---|---|---|---|---|---|--------------|----|---|---|---|---|---|----|----------------------------------------|-------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|--------------------|
| <b>17OB 6.1</b>                        | <p>(i) The University adopts absolute grading system wherein the marks are converted to grades, and every semester results will be declared with semester grade point average (SGPA) and Cumulative Grade Point Average (CGPA). The CGPA will be calculated for every semester, except for the first semester.</p> <p>(ii) The grading system with the letter grades and the assigned range of marks under absolute grading system are as given below:</p> <table border="1"> <tr> <th>Level</th><th>Outstanding</th><th>Excellent</th><th>Very Good</th><th>Good</th><th>Above Average</th><th>Average</th><th>Fail</th></tr> <tr> <td>Letter Grade</td><td>S</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td></tr> <tr> <td>Grade Points</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>4</td><td>00</td></tr> <tr> <td>Percentage of Marks Scored in a Course</td><td> <math>\geq 90</math><br/>(90 - 100) </td><td> <math>&lt; 90</math><br/><math>\geq 80</math><br/>(80 - 89) </td><td> <math>&lt; 80</math><br/><math>\geq 70</math><br/>(70 - 79) </td><td> <math>&lt; 70</math><br/><math>\geq 60</math><br/>(60 - 69) </td><td> <math>&lt; 60</math><br/><math>\geq 45</math><br/>(45 - 59) </td><td> <math>&lt; 45</math><br/><math>\geq 40</math><br/>(40 - 44) </td><td> <math>&lt; 40</math><br/>(0 - 39) </td></tr> </table> <p>(iii) A student obtaining Grade F in a Course shall be considered failed and is required to reappear in subsequent SEE. Whatever the letter grade secured by the student during his /her reappearance shall be retained. However the number of attempts taken to clear a Course shall be indicated in the grade cards/ transcripts.</p> | Level                            | Outstanding                      | Excellent                        | Very Good                        | Good                             | Above Average      | Average | Fail | Letter Grade | S | A | B | C | D | E | F | Grade Points | 10 | 9 | 8 | 7 | 6 | 4 | 00 | Percentage of Marks Scored in a Course | $\geq 90$<br>(90 - 100) | $< 90$<br>$\geq 80$<br>(80 - 89) | $< 80$<br>$\geq 70$<br>(70 - 79) | $< 70$<br>$\geq 60$<br>(60 - 69) | $< 60$<br>$\geq 45$<br>(45 - 59) | $< 45$<br>$\geq 40$<br>(40 - 44) | $< 40$<br>(0 - 39) |
| Level                                  | Outstanding                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Excellent                        | Very Good                        | Good                             | Above Average                    | Average                          | Fail               |         |      |              |   |   |   |   |   |   |   |              |    |   |   |   |   |   |    |                                        |                         |                                  |                                  |                                  |                                  |                                  |                    |
| Letter Grade                           | S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | A                                | B                                | C                                | D                                | E                                | F                  |         |      |              |   |   |   |   |   |   |   |              |    |   |   |   |   |   |    |                                        |                         |                                  |                                  |                                  |                                  |                                  |                    |
| Grade Points                           | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 9                                | 8                                | 7                                | 6                                | 4                                | 00                 |         |      |              |   |   |   |   |   |   |   |              |    |   |   |   |   |   |    |                                        |                         |                                  |                                  |                                  |                                  |                                  |                    |
| Percentage of Marks Scored in a Course | $\geq 90$<br>(90 - 100)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | $< 90$<br>$\geq 80$<br>(80 - 89) | $< 80$<br>$\geq 70$<br>(70 - 79) | $< 70$<br>$\geq 60$<br>(60 - 69) | $< 60$<br>$\geq 45$<br>(45 - 59) | $< 45$<br>$\geq 40$<br>(40 - 44) | $< 40$<br>(0 - 39) |         |      |              |   |   |   |   |   |   |   |              |    |   |   |   |   |   |    |                                        |                         |                                  |                                  |                                  |                                  |                                  |                    |
| <b>17OB 6.2</b>                        | <p><b>Computation of SGPA and CGPA (as per UGC Guidelines)</b></p> <p>The following procedures shall be used to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) respectively:</p> <p>i) The SGPA is the ratio of sum of the product of the number of credits with the grade points secured by a student in all the Courses taken by him/her and the sum of the number of credits of all the Courses undergone by a student, i.e.,</p> $SGPA = \frac{\sum (C_i \times G_i)}{\sum C_i}$ <p>Where <math>C_i</math> is the number of credits of the <math>i^{th}</math> Course and <math>G_i</math> is the grade point scored by the student in the <math>i^{th}</math> Course.</p> <p>ii) The CGPA is also calculated in the same manner taking into account all the Courses undergone by a student over all the semesters of a programme, i.e.,</p> $CGPA = \frac{\sum (C_i \times S_i)}{\sum C_i}$ <p>Where <math>S_i</math> is the SGPA of the <math>i^{th}</math> semester and <math>C_i</math> is the total number of credits in that semester.</p> <p>The SGPA and CGPA shall be rounded off to 2 decimal places and reported in the transcripts.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                  |                                  |                                  |                                  |                                  |                    |         |      |              |   |   |   |   |   |   |   |              |    |   |   |   |   |   |    |                                        |                         |                                  |                                  |                                  |                                  |                                  |                    |

17OB 6.2  
(continued)**Illustration for Computation of SGPA and CGPA**  
**Computation of SGPA****Illustration No.1**

| Course   | Credit | Grade letter | Grade point | Credit Point = (Credit × Grade) |
|----------|--------|--------------|-------------|---------------------------------|
| Course 1 | 4      | B            | 08          | $4 \times 08 = 32$              |
| Course 2 | 4      | D            | 06          | $4 \times 06 = 24$              |
| Course 3 | 4      | C            | 07          | $4 \times 07 = 28$              |
| Course 4 | 3      | S            | 10          | $3 \times 10 = 30$              |
| Course 5 | 3      | E            | 04          | $3 \times 04 = 12$              |
| Course 6 | 3      | D            | 06          | $3 \times 06 = 18$              |
| Course 7 | 2      | A            | 09          | $2 \times 09 = 18$              |
| Course 8 | 2      | D            | 06          | $2 \times 06 = 12$              |
| Total    | 25     | --           | --          | 174                             |

Thus, SGPA =  $174/25 = 6.96$ **Illustration No.2**

| Course   | Credit | Grade letter | Grade point | Credit Point = (Credit × Grade) |
|----------|--------|--------------|-------------|---------------------------------|
| Course 1 | 4      | B            | 08          | $4 \times 08 = 32$              |
| Course 2 | 4      | D            | 06          | $4 \times 06 = 24$              |
| Course 3 | 4      | C            | 07          | $4 \times 07 = 28$              |
| Course 4 | 3      | S            | 10          | $3 \times 10 = 30$              |
| Course 5 | 3      | F            | 00          | $3 \times 00 = 00$              |
| Course 6 | 3      | D            | 06          | $3 \times 06 = 18$              |
| Course 7 | 2      | A            | 09          | $2 \times 09 = 18$              |
| Course 8 | 2      | D            | 06          | $2 \times 06 = 12$              |
| Total    | 25     | --           | --          | 162                             |

Thus, SGPA =  $162/25 = 6.48$ 

If a Student secures letter grade 'C' during reappearance then the SGPA is Calculated as shown below:

**Illustration No. 2(a)**

| Course   | Credit | Grade letter | Grade point | Credit Point = (Credit × Grade) |
|----------|--------|--------------|-------------|---------------------------------|
| Course 5 | 3      | C            | 07          | $7 \times 03 = 21$              |

Total Credit Points = Credit Points of first Attempt) + Credit Points of subsequent attempt  
=  $162 + 21 = 183$ 

Total credits of the semester = 25

Thus, SGPA =  $183/25 = 7.32$ **Illustration No.3**

| Course   | Credit | Grade letter | Grade point | Credit Point = (Credit × Grade) |
|----------|--------|--------------|-------------|---------------------------------|
| Course 1 | 4      | B            | 08          | $4 \times 08 = 32$              |
| Course 2 | 4      | D            | 06          | $4 \times 06 = 24$              |
| Course 3 | 4      | C            | 07          | $4 \times 07 = 28$              |
| Course 4 | 3      | S            | 10          | $3 \times 10 = 30$              |
| Course 5 | 3      | A            | 09          | $3 \times 04 = 18$              |
| Course 6 | 3      | D            | 06          | $3 \times 06 = 18$              |
| Course 7 | 2      | A            | 09          | $2 \times 09 = 18$              |
| Course 8 | 2      | D            | 06          | $2 \times 06 = 12$              |
| Total    | 25     | --           | --          | 189                             |

Thus, SGPA =  $189/25 = 7.56$ CGPA (from illustrations 2 and 3) =  $\frac{25 \times 7.32 + 25 \times 7.56}{50} = 7.44$



**Visvesvaraya Technological University, Belagavi**  
**Regulations Governing the Degree of Bachelor of Engineering/ Technology (B.E/B.Tech)**  
**Under Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2017 – 18)**

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| 17OB8.3  | In the case of a Practical, the CIE marks shall be based on the laboratory journals/ reports and one practical test.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 17OB8.4  | (i) The CIE marks for I year Computer Aided Engineering / Drawing:<br>a) 12 marks for class work (sketching and Computer Aided engineering Drawing).<br>b) 08 marks for test conducted in the same pattern as that of the main examination (The marks secured can be taken as best of the two tests).<br>(ii) The CIE marks for other Drawings/ Design Drawings offered by various branches shall be based on the evaluation of the sheets and one test in the ratio 60:40.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 17OB8.5  | The CIE marks in the case of projects and seminars in the final year shall be based on the evaluation at the end of VIII semester 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 project / seminar guide.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 17OB8.6  | (i) For theory Courses, there shall not be any minimum requirements of CIE marks.<br>(ii) Minimum requirement of CIE marks for Practical/ Internship/Project work shall be 50 % of the maximum marks.<br>(iii) For seminars, the minimum requirement of CIE marks shall be 40% of the maximum marks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 17OB8.7  | (i) Students failing to secure a minimum of 50% of the CIE marks in Practical/ Internship/Project work shall not be eligible for the Practical/ Internship/Project examination conducted by the University and they shall be considered as failed in that/those Course/s. However, they can appear for University examinations conducted in other Courses of the same semester and of other semesters.<br>Students after satisfying the prescribed minimum CIE marks in the Course/s when offered during subsequent semester shall appear for SEE.<br>ii) If any student fails to secure a minimum of 40% of the maximum CIE marks in seminar/deliver the seminar, he/she shall be considered as failed in that Course and shall not be eligible for the award of degree. However, the student shall become eligible for the award of degree after satisfying the requirements prescribed for seminar during the subsequent semester/s.<br>(iii) The Course/s under 17OB8.6 (ii) and (iii), when repeated are considered as attempts. |
| 17OB8.8  | CIE marks of those students, who come under 17OB8.7, shall be sent separately to the Registrar (Evaluation).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 17OB8.9  | If a student remains absent for all the CIE tests conducted, the CIE Marks shall be marked as AB for the Courses against the University Seat Number (USN) of the student in the marks sheet submitted to the University by the Principal of the College.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 17OB8.10 | Improvement of CIE marks shall not be allowed in<br>a. Theory Courses and<br>b. Laboratory/Workshop/Seminar/Internship/Project where the student has already secured the minimum required marks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 17OB8.11 | The final list, incorporating corrections (if any) of CIE marks awarded to the students in the Theory/Practical/Internship/Project work/ Seminar, shall be displayed on the notice board of the college at least seven days before the closure of the semester and a certified copy of the same shall be sent by the Principal to the University Examination Section within the stipulated date. Every page of the CIE marks sheet shall bear the signatures of the concerned Teacher/Teachers, Head of the Department and Principal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

**Visvesvaraya Technological University, Belagavi**  
**Regulations Governing the Degree of Bachelor of Engineering/ Technology (B.E/B.Tech)**  
**Under Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2017 – 18)**

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|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17OB8.12 | Any corrections or overwriting of CIE marks shall bear the signature(s) of concerned Teacher(s) and in such cases the Head of the Department shall indicate the number of corrections on every sheet and attest it with his/her signature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 17OB8.13 | CIE marks shall reach the University before the commencement of examination as per the notification from the office of the Registrar (Evaluation) from time to time. After the submission of CIE marks to the University, any request under any circumstances for change of CIE marks shall not be considered.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 17OB 9.0 | <b>Eligibility for Passing and Award of Degree(To be read along with 17OB4.2, 8.6 and 8.7)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 17OB 9.1 | <p>(a) For a pass in a theory Course/Drawing, the student shall secure minimum of 35% of the maximum marks prescribed in the University examination and in total 40% of the maximum marks (i.e., prescribed for SEE and CIE) including the CIE marks secured by the student.</p> <p>(b) The Minimum Passing letter grade in a Course is E.</p> <p>(c) For a pass in a Practical/Internship/Project/Viva-voce examination, a student shall secure a minimum of 40% of the maximum marks prescribed for the University Examination. The Minimum Passing Grade in a Course is E.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 17OB 9.2 | <p>(1) A student who obtain any grade from S to E shall be considered as passed.</p> <p>(2) If a student secure 'F' grade in any of the head of passing (17 OB 4.2, 17 OB 5.1, 17 OB 5.2 and 17 OB 11.2) he/she has to reappear in that head for the SEE.</p> <p>(3) A student will be declared successful at the end of academic year if he/she has not more than four 'F' grades in the immediate preceding two semesters.</p> <p>(4) A student will be declared successful at the end of program, when he/she has none of the Courses remaining with 'F' grade and shall have CGPA of greater than or equal to 5.00.</p> <p>(5) In case, the CGPA falls below 5.00 at the end of the program, the student shall be permitted to appear again for SEE in full or part of the previous semester Courses by rejecting the performance for required number of Course/s (other than seminar, Project and practical's) and times, subject to the provision of 17OB1.5, to make up CGPA equal to or greater than 5.0. The student should reject the SEE results of the previous attempt and obtain written permission from the Registrar (Evaluation) to reappear in the subsequent SEE.</p> |
| 17OB 9.3 | <p>The students who do not satisfy the provision 17OB9.2 (1) and the students who remain absent for the University examinations shall be deemed to have failed in that Course/s. They have to reappear for the University examination in the subsequent examinations. The CIE marks awarded to the student/s at first attempt in the concerned theory Course/s will be carried forward.</p> <p>Revised CIE marks is considered only in cases under the provisions of 17OB8.7.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 17OB 9.4 | Students who pass a Course of a semester as per 17OB 9.1(3) shall not be allowed to appear for any individual Course again, unless they opt for rejection of results of entire semester.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

# Visvesvaraya Technological University, Belagavi

## REGULATIONS GOVERNING

### THE DEGREE OF BACHELOR OF ENGINEERING/ TECHNOLOGY (B.E./B.Tech)

#### UNDER CHOICE BASED CREDIT SYSTEM (CBCS)

Effective from the academic year 2017-18

#### Annexure -I

| VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI |             |                                             |                                    |                                  |                                          |                    |                   |           |           |             |         |
|-------------------------------------------------|-------------|---------------------------------------------|------------------------------------|----------------------------------|------------------------------------------|--------------------|-------------------|-----------|-----------|-------------|---------|
| Scheme of Teaching and Examination 2017-2018    |             |                                             |                                    |                                  |                                          |                    |                   |           |           |             |         |
| Choice Based Credit System (CBCS)               |             |                                             |                                    |                                  |                                          |                    |                   |           |           |             |         |
| I SEMESTER B.E./B.Tech (CHEMISTRY GROUP)        |             |                                             |                                    |                                  |                                          |                    |                   |           |           |             |         |
| Sl. No                                          | Course Code | Course Title                                | Teaching Department                | Board                            | Teaching Hours/Week                      |                    | Examination       |           |           |             | Credits |
|                                                 |             |                                             |                                    |                                  | Theory                                   | Practical/ Drawing | Duration in hours | SEE Marks | CIE Marks | Total Marks |         |
| 1                                               | 17MAT11     | Engineering Mathematics -I                  | Mathematics                        | Basic Science                    | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 2                                               | 17CHE12     | Engineering Chemistry                       | Chemistry                          | Basic Science                    | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 3                                               | 17PCD13     | Programming in C and Data Structures        | Any Engineering Department         | Computer Science and Engineering | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 4                                               | 17CED14     | Computer Aided Engineering Drawing          | ME, Auto, IP, IEM, Mfg Engineering | Mechanical Engineering           | 02Hour Instruction<br>04Hour Practice    |                    | 03                | 60        | 40        | 100         | 4       |
| 5                                               | 17ELN17     | Basic Electronics                           | ECE/EEE/TC/E and I.                | E and C Engineering              | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 6                                               | 17CPL16     | Computer Programming Laboratory             | Any Engineering Department         | Computer Science and Engineering | 01Hour Tutorial<br>02Hour Practical      |                    | 03                | 60        | 40        | 100         | 2       |
| 7                                               | 17CHE17     | Engineering Chemistry Laboratory            | Chemistry                          | Basic Science                    | 01Hour Tutorial<br>02Hour Practical      |                    | 03                | 60        | 40        | 100         | 2       |
| 8                                               | 17CIV18     | Environmental Studies (Audit Course)        | Civil/ Environmental Engineering   | Civil Engineering                | 01HourTutorial                           |                    | --                | 30        | 20        | 50          | --      |
| TOTAL                                           |             |                                             |                                    |                                  | Theory:21 hours<br>Practical: 08 hours   |                    | 21                | 450       | 300       | 750         | 24      |
| II SEMESTER B.E./B.Tech (PHYSICS GROUP)         |             |                                             |                                    |                                  |                                          |                    |                   |           |           |             |         |
| 1                                               | 17MAT21     | Engineering Mathematics -II                 | Mathematics                        | Basic Science                    | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 2                                               | 17PHY22     | Engineering Physics                         | Physics                            | Basic Science                    | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 3                                               | 17CIV23     | Elements of Civil Engineering and Mechanics | Civil Engineering                  | Civil Engineering                | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 4                                               | 17EME24     | Elements of Mechanical Engineering          | Mechanical Engineering             | Mechanical Engineering           | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 5                                               | 17ELE25     | Basic Electrical Engineering                | E and E Engineering                | E and E Engineering              | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 6                                               | 17WSL26     | Workshop Practice                           | ME, Auto, IP, IEM, Mfg Engineering | Mechanical Engineering           | 01-Hour Instruction<br>02-Hour Practical |                    | 03                | 60        | 40        | 100         | 2       |
| 7                                               | 17PHYL27    | Engineering Physics Laboratory              | Physics                            | Basic Science                    | 01-Hour Instruction<br>02-Hour Practical |                    | 03                | 60        | 40        | 100         | 2       |
| 8                                               | 17ENG28     | Language - English (Audit Course)           | Humanities                         | --                               | 01                                       | --                 | --                | --        | --        | --          | --      |
| TOTAL                                           |             |                                             |                                    |                                  | Theory:21 hours<br>Practical: 06 hours   |                    | 21                | 420       | 280       | 700         | 24      |

# Visvesvaraya Technological University, Belagavi

## REGULATIONS GOVERNING

THE DEGREE OF BACHELOR OF ENGINEERING/ TECHNOLOGY (B.E/B.Tech)

UNDER CHOICE BASED CREDIT SYSTEM (CBCS)

Effective from the academic year 2017-18

### Annexure -1

| VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI |             |                                             |                                    |                                  |                                        |                    |                   |           |           |             |         |
|-------------------------------------------------|-------------|---------------------------------------------|------------------------------------|----------------------------------|----------------------------------------|--------------------|-------------------|-----------|-----------|-------------|---------|
| Scheme of Teaching and Examination 2017-2018    |             |                                             |                                    |                                  |                                        |                    |                   |           |           |             |         |
| Choice Based Credit System (CBCS)               |             |                                             |                                    |                                  |                                        |                    |                   |           |           |             |         |
| I SEMESTER B.E./B.Tech. (PHYSICS GROUP)         |             |                                             |                                    |                                  |                                        |                    |                   |           |           |             |         |
| Sl. No                                          | Course Code | Course Title                                | Teaching Department                | Board                            | Teaching Hours/Week                    |                    | Examination       |           |           |             | Credits |
|                                                 |             |                                             |                                    |                                  | Theory                                 | Practical/ Drawing | Duration in hours | SEE Marks | CIE Marks | Total Marks |         |
| 1                                               | 17MAT11     | Engineering Mathematics -I                  | Mathematics                        | Basic Science                    | 04                                     | --                 | 03                | 60        | 40        | 100         | 4       |
| 2                                               | 17PHY12     | Engineering Physics                         | Physics                            | Basic Science                    | 04                                     | --                 | 03                | 60        | 40        | 100         | 4       |
| 3                                               | 17CIV13     | Elements of Civil Engineering and Mechanics | Civil Engineering                  | Civil Engineering                | 04                                     | --                 | 03                | 60        | 40        | 100         | 4       |
| 4                                               | 17EME14     | Elements of Mechanical Engineering          | Mechanical Engineering             | Mechanical Engineering           | 04                                     | --                 | 03                | 60        | 40        | 100         | 4       |
| 5                                               | 17ELE17     | Basic Electrical Engineering                | E and E Engineering                | E and E Engineering              | 04                                     | --                 | 03                | 60        | 40        | 100         | 4       |
| 6                                               | 17WSL16     | Workshop Practice                           | ME, Auto, IP, IEM, Mfg Engineering | Mechanical Engineering           | 01Hour Instruction<br>02Hour Practical |                    | 03                | 60        | 40        | 100         | 2       |
| 7                                               | 17PHYL17    | Engineering Physics Laboratory              | Physics                            | Basic Science                    | 01Hour Instruction<br>02Hour Practical |                    | 03                | 60        | 40        | 100         | 2       |
| 8                                               | 17ENG18     | Language – English (Audit Course)           | Humanities                         | --                               | 01                                     | --                 | --                | --        | --        | --          | --      |
| TOTAL                                           |             |                                             |                                    |                                  | Theory:21 hours<br>Practical: 06 hours |                    | 21                | 420       | 280       | 700         | 24      |
| II SEMESTER B.E./B.Tech. (CHEMISTRY GROUP)      |             |                                             |                                    |                                  |                                        |                    |                   |           |           |             |         |
| 1                                               | 17MAT21     | Engineering Mathematics -II                 | Mathematics                        | Basic Science                    | 04                                     | --                 | 03                | 60        | 40        | 100         | 4       |
| 2                                               | 17CHE22     | Engineering Chemistry                       | Chemistry                          | Basic Science                    | 04                                     | --                 | 03                | 60        | 40        | 100         | 4       |
| 3                                               | 17PCD23     | Programming in C and Data Structures        | Any Engineering Department         | Computer Science and Engineering | 04                                     | --                 | 03                | 60        | 40        | 100         | 4       |
| 4                                               | 17CED24     | Computer Aided Engineering Drawing          | ME, Auto, IP, IEM, Mfg Engineering | Mechanical Engineering           | 02Hour Instruction<br>04-Hour Practice |                    | 03                | 60        | 40        | 100         | 4       |
| 5                                               | 17ELN25     | Basic Electronics                           | ECE/EEE/TC/E and I                 | E and C Engineering              | 04                                     | --                 | 03                | 60        | 40        | 100         | 4       |
| 6                                               | 17CPL26     | Computer Programming Laboratory             | Any Engineering Department         | Computer Science and Engineering | 01Hour Tutorial<br>02Hour Practical    |                    | 03                | 60        | 40        | 100         | 2       |
| 7                                               | 17CHEL27    | Engineering Chemistry Laboratory            | Chemistry                          | Basic Science                    | 01Hour Tutorial<br>02Hour Practical    |                    | 03                | 60        | 40        | 100         | 2       |
| 8                                               | 17CIV28     | Environmental Studies (Audit Course)        | Civil/ Environmental Engineering   | Civil Engineering                | 01Tutorial                             |                    | --                | 30        | 20        | 50          | --      |
| TOTAL                                           |             |                                             |                                    |                                  | Theory:21 hours<br>Practical: 08 hours |                    | 21                | 450       | 300       | 750         | 24      |

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2017-2018**  
**Choice Based Credit System (CBCS)**

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

**III SEMESTER**

| Sl. No       | Course Code   | Title                                                               | Teaching Department | Teaching Hours /Week                           |                    | Examination       |            |            |             | Credits   |
|--------------|---------------|---------------------------------------------------------------------|---------------------|------------------------------------------------|--------------------|-------------------|------------|------------|-------------|-----------|
|              |               |                                                                     |                     | Theory                                         | Practical/ Drawing | Duration in hours | SEE Marks  | CIE Marks  | Total Marks |           |
| 1            | 17MAT31       | Engineering Mathematics - III                                       | Maths               | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 2            | 17CS32        | Analog and Digital Electronics                                      | CS/IS               | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 3            | 17CS33        | Data Structures and Applications                                    | CS/IS               | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 4            | 17CS34        | Computer Organization                                               | CS/IS               | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 5            | 17CS35        | Unix and Shell Programming                                          | CS/IS               | 03                                             |                    | 03                | 60         | 40         | 100         | 3         |
| 6            | 17CS36        | Discrete Mathematical Structures                                    | CS/IS               | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 7            | 17CSL37       | Analog and Digital Electronics Laboratory                           | CS/IS               | 01-Hour Instruction<br>02-Hour Practical       |                    | 03                | 60         | 40         | 100         | 2         |
| 8            | 17CSL38       | Data Structures Laboratory                                          | CS/IS               | 01-Hour Instruction<br>02-Hour Practical       |                    | 03                | 60         | 40         | 100         | 2         |
| 9            | 17KL/CPH39/49 | Kannada/Constitution of India, Professional Ethics and Human Rights | Humanities          | 01                                             |                    | 01                | 30         | 20         | 50          | 01        |
| <b>TOTAL</b> |               |                                                                     |                     | <b>Theory: 24hours<br/>Practical: 06 hours</b> |                    | <b>25</b>         | <b>510</b> | <b>340</b> | <b>850</b>  | <b>28</b> |

**1.Kannada/Constitution of India, Professional Ethics and Human Rights:** 50 % of the programs of the Institution have to teach Kannada/Constitution of India, Professional Ethics and Human Rights in cycle based concept during III and IV semesters.

**2. Audit Course:**

(i) \*All lateral entry students (except B.Sc candidates) have to register for Additional Mathematics – I, which is 03 contact hours per week.

|   |            |                           |       |    |  |    |    |    |    |    |
|---|------------|---------------------------|-------|----|--|----|----|----|----|----|
| 1 | 17MATDIP31 | Additional Mathematics –I | Maths | 03 |  | 03 | 60 | -- | 60 | -- |
|---|------------|---------------------------|-------|----|--|----|----|----|----|----|

(ii) Language English (Audit Course) be compulsorily studied by all lateral entry students (except B.Sc candidates)

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2017-2018**  
**Choice Based Credit System (CBCS)**

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

**VI SEMESTER**

| Sl. No       | Course Code | Title                                           | Teaching Department | Teaching Hours /Week                            |                    | Examination       |            |            |             | Credits   |
|--------------|-------------|-------------------------------------------------|---------------------|-------------------------------------------------|--------------------|-------------------|------------|------------|-------------|-----------|
|              |             |                                                 |                     | Theory                                          | Practical/ Drawing | Duration in hours | SEE Marks  | CIE Marks  | Total Marks |           |
| 1            | 17CS61      | Cryptography, Network Security and Cyber Law    | CS/IS               | 04                                              |                    | 03                | 60         | 40         | 100         | 4         |
| 2            | 17CS62      | Computer Graphics and Visualization             | CS/IS               | 04                                              |                    | 03                | 60         | 40         | 100         | 4         |
| 3            | 17CS63      | System Software and Compiler Design             | CS/IS               | 04                                              |                    | 03                | 60         | 40         | 100         | 4         |
| 4            | 17CS64      | Operating Systems                               | CS/IS               | 04                                              |                    | 03                | 60         | 40         | 100         | 4         |
| 5            | 17CS65x     | Professional Elective-2                         | CS/IS               | 03                                              |                    | 03                | 60         | 40         | 100         | 3         |
| 6            | 17CS66x     | Open Elective-2                                 | CS/IS               | 03                                              |                    | 03                | 60         | 40         | 100         | 3         |
| 7            | 17CSL67     | System Software and Operating System Laboratory | CS/IS               | 01-Hour Instruction<br>02-Hour Practical        |                    | 03                | 60         | 40         | 100         | 2         |
| 8            | 17CSL68     | Computer Graphics Laboratory with mini project  | CS/IS               | 01-Hour Instruction<br>02-Hour Practical        |                    | 03                | 60         | 40         | 100         | 2         |
| <b>TOTAL</b> |             |                                                 |                     | <b>Theory: 22 hours<br/>Practical: 06 hours</b> |                    | <b>24</b>         | <b>480</b> | <b>320</b> | <b>800</b>  | <b>26</b> |

| Professional Elective-2 |                                           | Open Elective - 2*** (List offered by CSE Board only) |                                               |
|-------------------------|-------------------------------------------|-------------------------------------------------------|-----------------------------------------------|
| 17CS651                 | Data Mining and Data Warehousing          | 17CS661                                               | Mobile Application Development                |
| 17CS652                 | Software Architecture and Design Patterns | 17CS662                                               | Big Data Analytics (Not for CSE/ISE students) |
| 17CS653                 | Operations research                       | 17CS663                                               | Wireless Networks and Mobile computing        |
| 17CS654                 | Distributed Computing system              | 17CS664                                               | Python Application Programming                |
|                         |                                           | 17CS665                                               | Service Oriented Architecture                 |
|                         |                                           | 17CS666                                               | Multicore Architecture and Programming        |

\*\*\*Students can select any one of the open electives offered by any Department (Please refer to consolidated list of VTU for open electives).  
 Selection of an open elective is not allowed, if:  
 - The candidate has no pre-requisite knowledge.  
 - The candidate has studied similar content course during previous semesters.  
 - The syllabus content of the selected open elective is similar to that of Departmental core course(s) or to be studied Professional elective(s).  
 Registration to open electives shall be documented under the guidance of Programme Coordinator and Adviser.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2017-2018**  
**Choice Based Credit System (CBCS)**

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

**VII SEMESTER**

| Sl. No       | Course Code | Title                                       | Teaching Department | Teaching Hours /Week                                           |                    | Examination       |            |            |             | Credits   |
|--------------|-------------|---------------------------------------------|---------------------|----------------------------------------------------------------|--------------------|-------------------|------------|------------|-------------|-----------|
|              |             |                                             |                     | Theory                                                         | Practical/ Drawing | Duration in hours | SEE Marks  | CIE Marks  | Total Marks |           |
| 1            | 17CS71      | Web Technology and its applications         | CS/IS               | 04                                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 2            | 17CS72      | Advanced Computer Architectures             | CS/IS               | 04                                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 3            | 17CS73      | Machine Learning                            | CS/IS               | 04                                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 4            | 17CS74x     | Professional Elective-3                     | CS/IS               | 03                                                             |                    | 03                | 60         | 40         | 100         | 3         |
| 5            | 17CS75x     | Professional Elective-4                     | CS/IS               | 03                                                             |                    | 03                | 60         | 40         | 100         | 3         |
| 6            | 17CSL76     | Machine Learning Laboratory                 | CS/IS               | 01-Hour Instruction<br>02-Hour Practical                       |                    | 03                | 60         | 40         | 100         | 2         |
| 7            | 17CSL77     | Web Technology Laboratory with mini project | CS/IS               | 01-Hour Instruction<br>02-Hour Practical                       |                    | 03                | 60         | 40         | 100         | 2         |
| 8            | 17CSP78     | Project Work Phase-I + Project work Seminar | CS/IS               |                                                                | 03                 | --                | --         | 100        | 100         | 2         |
| <b>TOTAL</b> |             |                                             |                     | <b>Theory:18 hours<br/>Practical and Project:<br/>09 hours</b> |                    | <b>21</b>         | <b>420</b> | <b>380</b> | <b>800</b>  | <b>24</b> |

| Professional Elective-3 |                                      | Professional Elective-4 |                                 |
|-------------------------|--------------------------------------|-------------------------|---------------------------------|
| 17CS741                 | Natural Language Processing          | 17CS751                 | Soft and Evolutionary Computing |
| 17CS742                 | Cloud Computing and its Applications | 17CS752                 | Computer Vision and Robotics    |
| 17CS743                 | Information and Network Security     | 17CS753                 | Digital Image Processing        |
| 17CS744                 | Unix System Programming              | 17CS754                 | Storage Area Networks           |

**1. Project Phase – I and Project Seminar:** Comprises of Literature Survey, Problem identification, Objectives and Methodology. CIE marks shall be based on the report covering Literature Survey, Problem identification, Objectives and Methodology and Seminar presentation skill.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2017-2018**  
**Choice Based Credit System (CBCS)**

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

**VIII SEMESTER**

| Sl. No       | Course Code | Title                               | Teaching Department | Teaching Hours /Week                                          |                    | Examination       |            |            |             | Credits   |
|--------------|-------------|-------------------------------------|---------------------|---------------------------------------------------------------|--------------------|-------------------|------------|------------|-------------|-----------|
|              |             |                                     |                     | Theory                                                        | Practical/ Drawing | Duration in hours | SEE Marks  | CIE Marks  | Total Marks |           |
| 1            | 17CS81      | Internet of Things and Applications | CS/IS               | 4                                                             | -                  | 3                 | 60         | 40         | 100         | 4         |
| 2            | 17CS82      | Big Data Analytics                  | CS/IS               | 4                                                             | -                  | 3                 | 60         | 40         | 100         | 4         |
| 3            | 17CS83X     | Professional Elective-5             | CS/IS               | 3                                                             | -                  | 3                 | 60         | 40         | 100         | 3         |
| 4            | 17CS84      | Internship/ Professional Practice   | CS/IS               | Industry Oriented                                             |                    | 3                 | 50         | 50         | 100         | 2         |
| 5            | 17CSP85     | Project Work-II                     | CS/IS               | -                                                             | 6                  | 3                 | 100        | 100        | 200         | 6         |
| 6            | 17CSS86     | Seminar                             | CS/IS               | -                                                             | 4                  | -                 | -          | 100        | 100         | 1         |
| <b>TOTAL</b> |             |                                     |                     | <b>Theory: 11 hours<br/>Project and Seminar:<br/>10 hours</b> |                    | <b>15</b>         | <b>330</b> | <b>370</b> | <b>700</b>  | <b>20</b> |

| <b>Professional Elective -5</b> |                                |
|---------------------------------|--------------------------------|
| 17CS831                         | High Performance Computing     |
| 17CS832                         | User Interface Design          |
| 17CS833                         | Network management             |
| 17CS834                         | System Modeling and Simulation |

**1. Internship/ Professional Practice:** 4 Weeks internship to be completed between the (VI and VII semester vacation) and/or (VII and VIII semester vacation) period.

**SCHEME OF TEACHING AND EXAMINATION**  
**B.E Electronics & Communication Engineering / Telecommunication Engineering**  
**(Common to Electronics & Communication and Telecommunication Engineering)**

**III SEMESTER**

| Sl No        | Course Code   | Title                                                               | Teaching Department | Teaching Hours /Week                           |                    | Examination       |            |            |             | Credits   |
|--------------|---------------|---------------------------------------------------------------------|---------------------|------------------------------------------------|--------------------|-------------------|------------|------------|-------------|-----------|
|              |               |                                                                     |                     | Theory                                         | Practical/ Drawing | Duration in hours | SEE Marks  | CIE Marks  | Total Marks |           |
| 1            | 17MAT31       | Engineering Mathematics –III*                                       | Maths               | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 2            | 17EC32        | Electronic Instrumentation                                          | EC                  | 03                                             |                    | 03                | 60         | 40         | 100         | 3         |
| 3            | 17EC33        | Analog Electronics                                                  | EC                  | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 4            | 17EC34        | Digital Electronics                                                 | EC                  | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 5            | 17EC35        | Network Analysis                                                    | EC                  | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 6            | 17EC36        | Engineering Electromagnetics                                        | EC                  | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 7            | 17ECL37       | Analog Electronics Lab                                              | EC                  | 01-Hour Instruction<br>02-Hour Practical       |                    | 03                | 60         | 40         | 100         | 2         |
| 8            | 17ECL38       | Digital Electronics Lab                                             | EC                  | 01-Hour Instruction<br>02-Hour Practical       |                    | 03                | 60         | 40         | 100         | 2         |
| 9            | 17KL/CPH39/49 | Kannada/Constitution of India, Professional Ethics and Human Rights | Humanities          | 01                                             |                    | 01                | 30         | 20         | 50          | 01        |
| <b>TOTAL</b> |               |                                                                     |                     | <b>Theory: 24hours<br/>Practical: 06 hours</b> |                    | <b>25</b>         | <b>510</b> | <b>340</b> | <b>850</b>  | <b>28</b> |

**1.Kannada/Constitution of India, Professional Ethics and Human Rights:** 50 % of the programs of the Institution have to teach Kannada/Constitution of India, Professional Ethics and Human Rights in cycle based concept during III and IV semesters.

**2. Audit Course:**

(i) \*All lateral entry students (except B.Sc candidates) have to register for Additional Mathematics – I, which is 03 contact hours per week.

|   |            |                           |       |    |  |    |    |    |    |    |
|---|------------|---------------------------|-------|----|--|----|----|----|----|----|
| 1 | 17MATDIP31 | Additional Mathematics –I | Maths | 03 |  | 03 | 60 | -- | 60 | -- |
|---|------------|---------------------------|-------|----|--|----|----|----|----|----|

(ii) Language English (Audit Course) be compulsorily studied by all lateral entry students (except B.Sc candidates)

**B.E Electronics & Communication Engineering / Telecommunication Engineering**  
**(Common to Electronics & Communication and Telecommunication Engineering)**

**IV SEMESTER**

| Sl. No       | Course Code   | Title                                                               | Teaching Department | Teaching Hours /Week                           |                    | Examination       |            |            |             | Credits   |
|--------------|---------------|---------------------------------------------------------------------|---------------------|------------------------------------------------|--------------------|-------------------|------------|------------|-------------|-----------|
|              |               |                                                                     |                     | Theory                                         | Practical/ Drawing | Duration in hours | SEE Marks  | CIE Marks  | Total Marks |           |
| 1            | 17MAT41       | Engineering Mathematics –IV*                                        | Maths               | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 2            | 17EC42        | Signals and Systems                                                 | EC                  | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 3            | 17EC43        | Control Systems                                                     | EC                  | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 4            | 17EC44        | Principles of Communication Systems                                 | EC                  | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 5            | 17EC45        | Linear Integrated Circuits                                          | EC                  | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 6            | 17EC46        | Microprocessor                                                      | EC                  | 03                                             |                    | 03                | 60         | 40         | 100         | 3         |
| 7            | 17ECL47       | Microprocessor Lab                                                  | EC                  | 01-Hour Instruction<br>02-Hour Practical       |                    | 03                | 60         | 40         | 100         | 2         |
| 8            | 17ECL48       | Linear ICs and Communication Lab                                    | EC                  | 01-Hour Instruction<br>02-Hour Practical       |                    | 03                | 60         | 40         | 100         | 2         |
| 9            | 17KL/CPH39/49 | Kannada/Constitution of India, Professional Ethics and Human Rights | Humanities          | 01                                             |                    | 01                | 30         | 20         | 50          | 01        |
| <b>TOTAL</b> |               |                                                                     |                     | <b>Theory: 24hours<br/>Practical: 06 hours</b> |                    | <b>25</b>         | <b>510</b> | <b>340</b> | <b>850</b>  | <b>28</b> |

**1. Kannada/Constitution of India, Professional Ethics and Human Rights:** 50 % of the programs of the Institution have to teach Kannada/Constitution of India, Professional Ethics and Human Rights in cycle based concept during III and IV semesters.

**2.Audit Course:**

(i) \*All lateral entry students (except B.Sc candidates) have to register for Additional Mathematics – II, which is 03 contact hours per week.

|   |            |                            |       |    |  |    |    |    |    |    |
|---|------------|----------------------------|-------|----|--|----|----|----|----|----|
| 1 | 17MATDIP41 | Additional Mathematics –II | Maths | 03 |  | 03 | 60 | -- | 60 | -- |
|---|------------|----------------------------|-------|----|--|----|----|----|----|----|

(ii) Language English (Audit Course) be compulsorily studied by all lateral entry students (except B.Sc candidates)

# B.E.: Electronics & Communication Engineering

## V SEMESTER

| SL No        | Course Code | Title                                       | Teaching Department | Teaching Hours /Week                           |                    | Examination       |            |            |             | Credits   |
|--------------|-------------|---------------------------------------------|---------------------|------------------------------------------------|--------------------|-------------------|------------|------------|-------------|-----------|
|              |             |                                             |                     | Theory                                         | Practical/ Drawing | Duration in hours | SEE Marks  | CIE Marks  | Total Marks |           |
| 1            | 17ES51      | Management and Entrepreneurship Development | EC                  | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 2            | 17EC52      | Digital Signal Processing                   | EC                  | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 3            | 17EC53      | Verilog HDL                                 | EC                  | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 4            | 17EC54      | Information Theory & Coding                 | EC                  | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 5            | 17EC55X     | Professional Elective-I                     | EC                  | 03                                             |                    | 03                | 60         | 40         | 100         | 3         |
| 6            | 17EC56X     | Open Elective-I                             | EC                  | 03                                             |                    | 03                | 60         | 40         | 100         | 3         |
| 7            | 17ECL57     | DSP Lab                                     | EC                  | 01-Hour Instruction<br>02-Hour Practical       |                    | 03                | 60         | 40         | 100         | 2         |
| 8            | 17ECL58     | HDL Lab                                     | EC                  | 01-Hour Instruction<br>02-Hour Practical       |                    | 03                | 60         | 40         | 100         | 2         |
| <b>TOTAL</b> |             |                                             |                     | <b>Theory: 22hours<br/>Practical: 06 hours</b> |                    | <b>24</b>         | <b>480</b> | <b>320</b> | <b>800</b>  | <b>26</b> |

| Professional Elective-I |                                    | Open Elective – I*** (List offered by EC/TC Board only) |                                       |
|-------------------------|------------------------------------|---------------------------------------------------------|---------------------------------------|
| 17EC551                 | Nanoelectronics                    | 17EC561                                                 | Automotive Electronics                |
| 17EC552                 | Switching & Finite Automata Theory | 17EC562                                                 | Object Oriented Programming Using C++ |
| 17EC553                 | Operating System                   | 17EC563                                                 | 8051 Microcontroller                  |
| 17EC554                 | Electrical Engineering Materials   |                                                         |                                       |
| 17EC555                 | MSP430 Microcontroller             |                                                         |                                       |

\*\*\*Students can select any one of the open electives offered by any Department (Please refer to consolidated list of VTU for open electives).

Selection of an open elective is not allowed, if:

- The candidate has no pre – requisite knowledge.
- The candidate has studied similar content course during previous semesters.
- The syllabus content of the selected open elective is similar to that of Departmental core course(s) or to be studied Professional elective(s).

Registration to open electives shall be documented under the guidance of Programme Coordinator and Adviser.

## B.E.: Electronics & Communication Engineering

### VIII SEMESTER

| Sl. No       | Course Code | Title                                  | Teaching Department | Teaching Hours /Week                                      |                    | Examination       |            |            |             | Credits   |
|--------------|-------------|----------------------------------------|---------------------|-----------------------------------------------------------|--------------------|-------------------|------------|------------|-------------|-----------|
|              |             |                                        |                     | Theory                                                    | Practical/ Drawing | Duration in hours | SEE Marks  | CIE Marks  | Total Marks |           |
| 1            | 17EC81      | Wireless Cellular and LTE 4G Broadband | EC                  | 4                                                         | -                  | 3                 | 60         | 40         | 100         | 4         |
| 2            | 17EC82      | Fiber Optics & Networks                | EC                  | 4                                                         | -                  | 3                 | 60         | 40         | 100         | 4         |
| 3            | 17EC83X     | Professional Elective-5                | EC                  | 3                                                         | -                  | 3                 | 60         | 40         | 100         | 3         |
| 4            | 17EC84      | Internship/Professional Practice       | EC                  | Industry Oriented                                         |                    | 3                 | 50         | 50         | 100         | 2         |
| 5            | 17ECP85     | Project Work                           | EC                  | -                                                         | 6                  | 3                 | 100        | 100        | 200         | 6         |
| 6            | 17ECS86     | Seminar                                | EC                  | -                                                         | 4                  | -                 | -          | 100        | 100         | 1         |
| <b>TOTAL</b> |             |                                        |                     | <b>Theory: 11 hours<br/>Project and Seminar: 10 hours</b> |                    | <b>15</b>         | <b>330</b> | <b>370</b> | <b>700</b>  | <b>20</b> |

| Professional Elective -5 |                                  |
|--------------------------|----------------------------------|
| 17EC831                  | Micro Electro Mechanical Systems |
| 17EC832                  | Speech Processing                |
| 17EC833                  | Radar Engineering                |
| 17EC834                  | Machine learning                 |
| 17EC835                  | Network and Cyber Security       |

1. **Internship/ Professional Practice:** 4 Weeks internship to be completed between the (VI and VII semester vacation) and/or (VII and VIII semester vacation) period.

# Visvesvaraya Technological University, Belagavi

## REGULATIONS GOVERNING

### THE DEGREE OF BACHELOR OF ENGINEERING/ TECHNOLOGY (B.E/B.Tech)

#### UNDER CHOICE BASED CREDIT SYSTEM (CBCS)

Effective from the academic year 2017-18

#### Annexure -1

| VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI |             |                                             |                                    |                                  |                                          |                    |                   |           |           |             |         |
|-------------------------------------------------|-------------|---------------------------------------------|------------------------------------|----------------------------------|------------------------------------------|--------------------|-------------------|-----------|-----------|-------------|---------|
| Scheme of Teaching and Examination 2017-2018    |             |                                             |                                    |                                  |                                          |                    |                   |           |           |             |         |
| Choice Based Credit System (CBCS)               |             |                                             |                                    |                                  |                                          |                    |                   |           |           |             |         |
| 1 SEMESTER B.E./B.Tech (CHEMISTRY GROUP)        |             |                                             |                                    |                                  |                                          |                    |                   |           |           |             |         |
| Sl. No                                          | Course Code | Course Title                                | Teaching Department                | Board                            | Teaching Hours /Week                     |                    | Examination       |           |           |             | Credits |
|                                                 |             |                                             |                                    |                                  | Theory                                   | Practical/ Drawing | Duration in hours | SEE Marks | CIE Marks | Total Marks |         |
| 1                                               | 17MAT11     | Engineering Mathematics -I                  | Mathematics                        | Basic Science                    | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 2                                               | 17CHE12     | Engineering Chemistry                       | Chemistry                          | Basic Science                    | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 3                                               | 17PCD13     | Programming in C and Data Structures        | Any Engineering Department         | Computer Science and Engineering | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 4                                               | 17CED14     | Computer Aided Engineering Drawing          | ME, Auto, IP, IEM, Mfg Engineering | Mechanical Engineering           | 02Hour Instruction<br>04Hour Practice    |                    | 03                | 60        | 40        | 100         | 4       |
| 5                                               | 17ELN17     | Basic Electronics                           | ECE/EEE/TCE and I.                 | E and C Engineering              | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 6                                               | 17CPL16     | Computer Programming Laboratory             | Any Engineering Department         | Computer Science and Engineering | 01Hour Tutorial<br>02Hour Practical      |                    | 03                | 60        | 40        | 100         | 2       |
| 7                                               | 17CHE17     | Engineering Chemistry Laboratory            | Chemistry                          | Basic Science                    | 01Hour Tutorial<br>02Hour Practical      |                    | 03                | 60        | 40        | 100         | 2       |
| 8                                               | 17CIV18     | Environmental Studies (Audit Course)        | Civil/ Environmental Engineering   | Civil Engineering                | 01HourTutorial                           |                    | --                | 30        | 20        | 50          | --      |
| TOTAL                                           |             |                                             |                                    |                                  | Theory:21 hours<br>Practical: 08 hours   |                    | 21                | 450       | 300       | 750         | 24      |
| II SEMESTER B.E./B.Tech (PHYSICS GROUP)         |             |                                             |                                    |                                  |                                          |                    |                   |           |           |             |         |
| 1                                               | 17MAT21     | Engineering Mathematics -II                 | Mathematics                        | Basic Science                    | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 2                                               | 17PHY22     | Engineering Physics                         | Physics                            | Basic Science                    | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 3                                               | 17CIV23     | Elements of Civil Engineering and Mechanics | Civil Engineering                  | Civil Engineering                | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 4                                               | 17EME24     | Elements of Mechanical Engineering          | Mechanical Engineering             | Mechanical Engineering           | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 5                                               | 17ELE25     | Basic Electrical Engineering                | E and E Engineering                | E and E Engineering              | 04                                       | --                 | 03                | 60        | 40        | 100         | 4       |
| 6                                               | 17WSL26     | Workshop Practice                           | ME, Auto, IP, IEM, Mfg Engineering | Mechanical Engineering           | 01-Hour Instruction<br>02-Hour Practical |                    | 03                | 60        | 40        | 100         | 2       |
| 7                                               | 17PHYL27    | Engineering Physics Laboratory              | Physics                            | Basic Science                    | 01-Hour Instruction<br>02-Hour Practical |                    | 03                | 60        | 40        | 100         | 2       |
| 8                                               | 17ENG28     | Language – English (Audit Course)           | Humanities                         | --                               | 01                                       | --                 | --                | --        | --        | --          | --      |
| TOTAL                                           |             |                                             |                                    |                                  | Theory:21 hours<br>Practical: 06 hours   |                    | 21                | 420       | 280       | 700         | 24      |

# Visvesvaraya Technological University, Belagavi

## REGULATIONS GOVERNING

### THE DEGREE OF BACHELOR OF ENGINEERING/ TECHNOLOGY (B.E/B.Tech)

#### UNDER CHOICE BASED CREDIT SYSTEM (CBCS)

Effective from the academic year 2017-18

#### Annexure -1

| VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI |             |                                             |                                    |                                  |                                         |                    |                   |           |           |             |         |
|-------------------------------------------------|-------------|---------------------------------------------|------------------------------------|----------------------------------|-----------------------------------------|--------------------|-------------------|-----------|-----------|-------------|---------|
| Scheme of Teaching and Examination 2017-2018    |             |                                             |                                    |                                  |                                         |                    |                   |           |           |             |         |
| Choice Based Credit System (CBCS)               |             |                                             |                                    |                                  |                                         |                    |                   |           |           |             |         |
| I SEMESTER B.E./B.Tech. (PHYSICS GROUP)         |             |                                             |                                    |                                  |                                         |                    |                   |           |           |             |         |
| Sl. No                                          | Course Code | Course Title                                | Teaching Department                | Board                            | Teaching Hours /Week                    |                    | Examination       |           |           |             | Credits |
|                                                 |             |                                             |                                    |                                  | Theory                                  | Practical/ Drawing | Duration in hours | SEE Marks | CIE Marks | Total Marks |         |
| 1                                               | 17MAT11     | Engineering Mathematics -I                  | Mathematics                        | Basic Science                    | 04                                      | --                 | 03                | 60        | 40        | 100         | 4       |
| 2                                               | 17PHY12     | Engineering Physics                         | Physics                            | Basic Science                    | 04                                      | --                 | 03                | 60        | 40        | 100         | 4       |
| 3                                               | 17CIV13     | Elements of Civil Engineering and Mechanics | Civil Engineering                  | Civil Engineering                | 04                                      | --                 | 03                | 60        | 40        | 100         | 4       |
| 4                                               | 17EME14     | Elements of Mechanical Engineering          | Mechanical Engineering             | Mechanical Engineering           | 04                                      | --                 | 03                | 60        | 40        | 100         | 4       |
| 5                                               | 17ELE17     | Basic Electrical Engineering                | E and E Engineering                | E and E Engineering              | 04                                      | --                 | 03                | 60        | 40        | 100         | 4       |
| 6                                               | 17WSL16     | Workshop Practice                           | ME, Auto, IP, IEM, Mfg Engineering | Mechanical Engineering           | 01Hour Instruction<br>02Hour Practical  |                    | 03                | 60        | 40        | 100         | 2       |
| 7                                               | 17PHYL17    | Engineering Physics Laboratory              | Physics                            | Basic Science                    | 01Hour Instruction<br>02Hour Practical  |                    | 03                | 60        | 40        | 100         | 2       |
| 8                                               | 17ENG18     | Language – English (Audit Course)           | Humanities                         | --                               | 01                                      | --                 | --                | --        | --        | --          | --      |
| TOTAL                                           |             |                                             |                                    |                                  | Theory: 21 hours<br>Practical: 06 hours |                    | 21                | 420       | 280       | 700         | 24      |
| II SEMESTER B.E./B.Tech. (CHEMISTRY GROUP)      |             |                                             |                                    |                                  |                                         |                    |                   |           |           |             |         |
| 1                                               | 17MAT21     | Engineering Mathematics -II                 | Mathematics                        | Basic Science                    | 04                                      | --                 | 03                | 60        | 40        | 100         | 4       |
| 2                                               | 17CHE22     | Engineering Chemistry                       | Chemistry                          | Basic Science                    | 04                                      | --                 | 03                | 60        | 40        | 100         | 4       |
| 3                                               | 17PCD23     | Programming in C and Data Structures        | Any Engineering Department         | Computer Science and Engineering | 04                                      | --                 | 03                | 60        | 40        | 100         | 4       |
| 4                                               | 17CED24     | Computer Aided Engineering Drawing          | ME, Auto, IP, IEM, Mfg Engineering | Mechanical Engineering           | 02Hour Instruction<br>04-Hour Practice  |                    | 03                | 60        | 40        | 100         | 4       |
| 5                                               | 17ELN25     | Basic Electronics                           | ECE/EEE/TC/E and I.                | E and C Engineering              | 04                                      | --                 | 03                | 60        | 40        | 100         | 4       |
| 6                                               | 17CPL26     | Computer Programming Laboratory             | Any Engineering Department         | Computer Science and Engineering | 01Hour Tutorial<br>02Hour Practical     |                    | 03                | 60        | 40        | 100         | 2       |
| 7                                               | 17CHEL27    | Engineering Chemistry Laboratory            | Chemistry                          | Basic Science                    | 01Hour Tutorial<br>02Hour Practical     |                    | 03                | 60        | 40        | 100         | 2       |
| 8                                               | 17CIV28     | Environmental Studies (Audit Course)        | Civil/ Environmental Engineering   | Civil Engineering                | 01Tutorial                              |                    | --                | 30        | 20        | 50          | --      |
| TOTAL                                           |             |                                             |                                    |                                  | Theory: 21 hours<br>Practical: 08 hours |                    | 21                | 450       | 300       | 750         | 24      |

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2017-2018**  
**Choice Based Credit System (CBCS)**

**B.E: ELECTRICAL AND ELECTRONICS ENGINEERING**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**

**III SEMESTER**

| Sl. No       | Course Code   | Title                                                               | Teaching Department | Teaching Hours /Week                           |                    | Examination       |            |            |             | Credits   |
|--------------|---------------|---------------------------------------------------------------------|---------------------|------------------------------------------------|--------------------|-------------------|------------|------------|-------------|-----------|
|              |               |                                                                     |                     | Theory                                         | Practical/ Drawing | Duration in hours | SEE Marks  | CIE Marks  | Total Marks |           |
| 1            | 17MAT31       | Engineering Mathematics-III (Core)                                  | Mathematics         | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 2            | 17EE32        | Electric Circuit Analysis (Core)                                    | EEE                 | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 3            | 17EE33        | Transformers and Generators (Core)                                  | EEE                 | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 4            | 17EE34        | Analog Electronic Circuits (Core)                                   | EEE                 | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 5            | 17EE35        | Digital System Design (Core)                                        | EEE                 | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 6            | 17EE36        | Electrical and Electronic Measurements (Foundation course)          | EEE                 | 03                                             |                    | 03                | 60         | 40         | 100         | 3         |
| 7            | 17EEL37       | Electrical Machines Laboratory -I                                   | EEE                 | 01- Hour Instruction<br>02- Hour Practical     |                    | 03                | 60         | 40         | 100         | 2         |
| 8            | 17EEL38       | Electronics Laboratory                                              | EEE                 | 01- Hour Instruction<br>02- Hour Practical     |                    | 03                | 60         | 40         | 100         | 2         |
| 9            | 17KL/CPH39/49 | Kannada/Constitution of India, Professional Ethics and Human Rights | Humanities          | 01                                             |                    | 01                | 30         | 20         | 50          | 01        |
| <b>TOTAL</b> |               |                                                                     |                     | <b>Theory: 24hours<br/>Practical: 06 hours</b> |                    | <b>25</b>         | <b>510</b> | <b>340</b> | <b>850</b>  | <b>28</b> |

1. **Kannada/Constitution of India, Professional Ethics and Human Rights:** 50 % of the programs of the Institution have to teach Kannada/Constitution of India, Professional Ethics and Human Rights in cycle based concept during III and IV semesters.

**2. Audit Course:**

(i) \*All lateral entry students (except B.Sc candidates) have to register for Additional Mathematics – I, which is 03 contact hours per week.

|   |            |                           |       |    |  |    |    |    |    |    |
|---|------------|---------------------------|-------|----|--|----|----|----|----|----|
| 1 | 17MATDIP31 | Additional Mathematics –I | Maths | 03 |  | 03 | 60 | -- | 60 | -- |
|---|------------|---------------------------|-------|----|--|----|----|----|----|----|

(ii) Language English (Audit Course) be compulsorily studied by all lateral entry students (except B.Sc candidates)

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2017-2018**  
**Choice Based Credit System (CBCS)**  
**B.E: ELECTRICAL AND ELECTRONICS ENGINEERING**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**

**V SEMESTER**

| Sl. No       | Course Code | Title                           | Teaching Department | Teaching Hours /Week                           |                    | Examination       |            |            |             | Credits   |
|--------------|-------------|---------------------------------|---------------------|------------------------------------------------|--------------------|-------------------|------------|------------|-------------|-----------|
|              |             |                                 |                     | Theory                                         | Practical/ Drawing | Duration in hours | SEE Marks  | CIE Marks  | Total Marks |           |
| 1            | 17EE51      | Management and Entrepreneurship | EEE                 | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 2            | 17EE52      | Microcontroller(Core)           | EEE                 | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 3            | 17EE53      | Power Electronics(Core)         | EEE                 | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 4            | 17EE54      | Signals and Systems(Core)       | EEE                 | 04                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 5            | 17EE55X     | Professional Elective - I       | EEE                 | 03                                             |                    | 03                | 60         | 40         | 100         | 3         |
| 6            | 17EE56Y     | Open Elective - I               | EEE                 | 03                                             |                    | 03                | 60         | 40         | 100         | 3         |
| 7            | 17EEL57     | Microcontroller Laboratory      | EEE                 | 01-Hour Instruction<br>02-Hour Practical       |                    | 03                | 60         | 40         | 100         | 2         |
| 8            | 17EEL58     | Power Electronics Laboratory    | EEE                 | 01-Hour Instruction<br>02-Hour Practical       |                    | 03                | 60         | 40         | 100         | 2         |
| <b>TOTAL</b> |             |                                 |                     | <b>Theory: 22hours<br/>Practical: 06 hours</b> |                    | <b>24</b>         | <b>480</b> | <b>320</b> | <b>800</b>  | <b>26</b> |

| Professional Elective-I |                                  | Open Elective - I*** (List offered by EEE Board only) |                                  |
|-------------------------|----------------------------------|-------------------------------------------------------|----------------------------------|
| 17EE551                 | Introduction to Nuclear Power    | 17EE561                                               | Electronic Communication systems |
| 17EE552                 | Electrical Engineering Materials | 17EE562                                               | Programmable Logic controllers   |
| 17EE553                 | Estimating and Costing           | 17EE563                                               | Renewable Energy Systems         |
| 17EE554                 | Special Electrical Machines      | 17EE564                                               | Business Communication           |

\*\*\*Students can select any one of the open electives offered by any Department (Please refer to consolidated list of VTU for open electives).

Selection of an open elective is not allowed, if:

- The candidate has no pre-requisite knowledge.
- The candidate has studied similar content course during previous semesters.
- The syllabus content of the selected open elective is similar to that of Departmental core course(s) or to be studied Professional elective(s).

Registration to open electives shall be documented under the guidance of Programme Coordinator and Adviser.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2017-2018**  
**Choice Based Credit System (CBCS)**

**B.E: ELECTRICAL AND ELECTRONICS ENGINEERING**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**

**VII SEMESTER**

| Sl. No       | Course Code | Title                                       | Teaching Department | Teaching Hours /Week                                           |                    | Examination       |            |            |             | Credits   |
|--------------|-------------|---------------------------------------------|---------------------|----------------------------------------------------------------|--------------------|-------------------|------------|------------|-------------|-----------|
|              |             |                                             |                     | Theory                                                         | Practical/ Drawing | Duration in hours | SEE Marks  | CIE Marks  | Total Marks |           |
| 1            | 17EE71      | Power System Analysis – 2(Core)             | EEE                 | 04                                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 2            | 17EE72      | Power System Protection(Core)               | EEE                 | 04                                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 3            | 17EE73      | High Voltage Engineering(Core)              | EEE                 | 04                                                             |                    | 03                | 60         | 40         | 100         | 4         |
| 4            | 17EE74X     | Professional Elective – III                 | EEE                 | 03                                                             |                    | 03                | 60         | 40         | 100         | 3         |
| 5            | 17EE75Y     | Professional Elective – IV                  | EEE                 | 03                                                             |                    | 03                | 60         | 40         | 100         | 3         |
| 6            | 17EEL76     | Power system Simulation Laboratory          | EEE                 | 01-Hour Instruction<br>02-Hour Practical                       |                    | 03                | 60         | 40         | 100         | 2         |
| 7            | 17EEL77     | Relay and High Voltage Laboratory           | EEE                 | 01-Hour Instruction<br>02-Hour Practical                       |                    | 03                | 60         | 40         | 100         | 2         |
| 8            | 17EEP78     | Project Work Phase-I + Project work Seminar | EEE                 |                                                                | 03                 | --                | --         | 100        | 100         | 2         |
| <b>TOTAL</b> |             |                                             |                     | <b>Theory:18 hours<br/>Practical and Project:<br/>09 hours</b> |                    | <b>21</b>         | <b>420</b> | <b>380</b> | <b>800</b>  | <b>24</b> |

| Professional Elective-3 |                                 | Professional Elective-4 |                                                     |
|-------------------------|---------------------------------|-------------------------|-----------------------------------------------------|
| 17EE741                 | Advanced Control Systems        | 17EE751                 | FACTS and HVDC Transmission                         |
| 17EE742                 | Utilization of Electrical Power | 17EE752                 | Testing and Commissioning of Power System Apparatus |
| 17EE743                 | Carbon Capture and Storage      | 17EE753                 | Spacecraft Power Technologies                       |
| 17EE744                 | Power System Planning           | 17EE754                 | Industrial Heating                                  |

1. **Project Phase – I and Project Seminar:** Comprises of Literature Survey, Problem identification, Objectives and Methodology. CIE marks shall be based on the report covering Literature Survey, Problem identification, Objectives and Methodology and Seminar presentation skill.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2017-2018**  
**Choice Based Credit System (CBCS)**

**B.E: ELECTRICAL AND ELECTRONICS ENGINEERING**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**

**VIII SEMESTER**

| Sl. No       | Course Code | Title                                     | Teaching Department | Teaching Hours /Week                              |                    | Examination       |           |           |             | Credits |
|--------------|-------------|-------------------------------------------|---------------------|---------------------------------------------------|--------------------|-------------------|-----------|-----------|-------------|---------|
|              |             |                                           |                     | Theory                                            | Practical/ Drawing | Duration in hours | SEE Marks | CIE Marks | Total Marks |         |
| 1            | 17EE81      | Power System Operation and Control (Core) | EEE                 | 4                                                 | -                  | 3                 | 60        | 40        | 100         | 4       |
| 2            | 17EE82      | Industrial Drives and Applications(Core)  | EEE                 | 4                                                 | -                  | 3                 | 60        | 40        | 100         | 4       |
| 3            | 17EE83X     | Professional Elective-5                   | EEE                 | 3                                                 | -                  | 3                 | 60        | 40        | 100         | 3       |
| 4            | 17EE84      | Internship/ Professional Practice (Core)  | EEE                 | Industry Oriented                                 |                    | 3                 | 50        | 50        | 100         | 2       |
| 5            | 17EEP85     | Project Work-II( Core)                    | EEE                 | -                                                 | 6                  | 3                 | 100       | 100       | 200         | 6       |
| 6            | 17EES86     | Seminar (Core)                            | EEE                 | -                                                 | 4                  | -                 | -         | 100       | 100         | 1       |
| <b>TOTAL</b> |             |                                           |                     | Theory: 11 hours<br>Project and Seminar: 10 hours |                    | 15                | 330       | 370       | 700         | 20      |

| <b>Professional Elective -5</b> |                                                     |
|---------------------------------|-----------------------------------------------------|
| 17EE831                         | Smart Grid                                          |
| 17EE832                         | Operation and Maintenance of Solar Electric Systems |
| 17EE833                         | Integration of Distributed Generation               |
| 17EE834                         | Power System in Emergencies                         |
|                                 |                                                     |

**1. Internship/ Professional Practice:** 4 Weeks internship to be completed between the (VI and VII semester vacation) and/or (VII and VIII semester vacation) period.

### III SEMESTER

MATERIAL SCIENCE

**B.E. Mechanical Engineering**

**IV SEMESTER**

| Sl. No       | Subject Code  | Title                                                               | Teaching Department | Teaching Hours /Week |           |              | Examination      |            |            |             | Credits   |
|--------------|---------------|---------------------------------------------------------------------|---------------------|----------------------|-----------|--------------|------------------|------------|------------|-------------|-----------|
|              |               |                                                                     |                     | Lecture              | Tutorial  | Practical    | Duration (Hours) | SEE Marks  | CIE Marks  | Total Marks |           |
| 1            | 17MAT41       | Engineering Mathematics – III                                       | Maths               | 04                   |           |              | 03               | 60         | 40         | 100         | 04        |
| 2            | 17ME42        | Kinematics of Machinery                                             | ME                  | 03                   | 02        |              | 03               | 60         | 40         | 100         | 04        |
| 3            | 17ME43        | Applied Thermodynamics                                              | ME                  | 03                   | 02        |              | 03               | 60         | 40         | 100         | 04        |
| 4            | 17ME44        | Fluid mechanics                                                     | ME                  | 03                   | 02        |              | 03               | 60         | 40         | 100         | 04        |
| 5            | 17ME45A/      | Metal Casting and Welding                                           | ME                  | 04                   |           |              | 03               | 60         | 40         | 100         | 04        |
|              | 17ME45B       | Machine Tools and Operations                                        | ME                  |                      |           |              |                  |            |            |             |           |
| 6            | 17ME46 A/     | Computer Aided Machine Drawing                                      | ME                  | 01                   |           | 4            | 03               | 60         | 40         | 100         | 03        |
|              | 17ME46B       | Mechanical Measurements and Metrology                               | ME                  | 03                   |           |              |                  |            |            |             |           |
| 7            | 17MEL47A/     | Materials Testing Lab/                                              | ME                  | 1                    |           | 2            | 03               | 60         | 40         | 100         | 02        |
|              | 17MEL47B      | Mechanical Measurements and Metrology Lab                           | ME                  |                      |           |              |                  |            |            |             |           |
| 8            | 17MEL48A/     | Foundry and Forging Lab                                             | ME                  | 1                    |           | 2            | 03               | 60         | 40         | 100         | 02        |
|              | 17MEL48B      | Machine Shop/                                                       | ME                  |                      |           |              |                  |            |            |             |           |
| 9            | 17KL/CPH39/49 | Kannada/Constitution of India, Professional Ethics and Human Rights | Humanities          | 1                    |           |              | 01               | 30         | 20         | 50          | 1         |
| <b>TOTAL</b> |               |                                                                     |                     | <b>21/23</b>         | <b>06</b> | <b>08/04</b> |                  | <b>510</b> | <b>340</b> | <b>850</b>  | <b>28</b> |

# B.E. Mechanical Engineering

## V SEMESTER

| Sl. No       | Subject Code | Title                                | Teaching Hours /Week |           |           | Examination      |            |            |             | Credits   |
|--------------|--------------|--------------------------------------|----------------------|-----------|-----------|------------------|------------|------------|-------------|-----------|
|              |              |                                      | Lecture              | Tutorial  | Practical | Duration (Hours) | SEE Marks  | CIE Marks  | Total Marks |           |
| 1            | 17ME51       | Management and Engineering Economics | 3                    | 2         | 0         | 03               | 60         | 40         | 100         | 4         |
| 2            | 17ME52       | Dynamics of Machinery                | 3                    | 2         | 0         | 03               | 60         | 40         | 100         | 4         |
| 3            | 17ME53       | Turbo Machines                       | 3                    | 2         | 0         | 03               | 60         | 40         | 100         | 4         |
| 4            | 17ME54       | Design of Machine Elements - I       | 3                    | 2         | 0         | 03               | 60         | 40         | 100         | 4         |
| 5            | 17ME55X      | Professional Elective-I              | 3                    | 0         | 0         | 03               | 60         | 40         | 100         | 3         |
| 6            | 17ME56X      | Open Elective-I                      | 3                    | 0         | 0         | 03               | 60         | 40         | 100         | 3         |
| 7            | 17ME157      | Fluid Mechanics & Machinery Lab      | 1                    | 0         | 2         | 03               | 60         | 40         | 100         | 2         |
| 8            | 17ME158      | Energy Lab                           | 1                    | 0         | 2         | 03               | 60         | 40         | 100         | 2         |
| <b>TOTAL</b> |              |                                      | <b>20</b>            | <b>08</b> | <b>04</b> |                  | <b>480</b> | <b>320</b> | <b>60</b>   | <b>40</b> |

| Professional Elective-I |                                    | Open Elective-I |                         |
|-------------------------|------------------------------------|-----------------|-------------------------|
| 17ME551                 | Refrigeration and Air-conditioning | 17ME561         | Optimization Techniques |
| 17ME552                 | Theory of Elasticity               | 17ME562         | Energy and Environment  |
| 17ME553                 | Human Resource Management          | 17ME563         | Automation and Robotics |
| 17ME554                 | Non Traditional Machining          | 17ME564         | Project Management      |

- 1. Core subject:** This is the course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.
- 2. Professional Elective:** Elective relevant to chosen specialization/ branch
- 3. Open Elective:** Electives from other technical and/or emerging subject areas.

# B.E. Mechanical Engineering

## VI SEMESTER

| Sl. No | Subject Code | Title                             | Teaching Hours /Week |          |           | Examination      |           |           |             | Credits |
|--------|--------------|-----------------------------------|----------------------|----------|-----------|------------------|-----------|-----------|-------------|---------|
|        |              |                                   | Lecture              | Tutorial | Practical | Duration (Hours) | SEE Marks | CIE Marks | Total Marks |         |
| 1      | 17ME61       | Finite Element Analysis           | 3                    | 2        | 0         | 03               | 60        | 40        | 100         | 4       |
| 2      | 17ME62       | Computer integrated Manufacturing | 4                    | 0        | 0         | 03               | 60        | 40        | 100         | 4       |
| 3      | 17ME63       | Heat Transfer                     | 3                    | 2        | 0         | 03               | 60        | 40        | 100         | 4       |
| 4      | 17ME64       | Design of Machine Elements -II    | 3                    | 2        | 0         | 03               | 60        | 40        | 100         | 4       |
| 5      | 17ME65X      | Professional Elective-II          | 3                    | 0        | 0         | 03               | 60        | 40        | 100         | 3       |
| 6      | 17ME66X      | Open Elective-II                  | 3                    | 0        | 0         | 03               | 60        | 40        | 100         | 3       |
| 7      | 17MEL67      | Heat Transfer Lab                 | 1                    | 0        | 2         | 03               | 60        | 40        | 100         | 2       |
| 8      | 17MEL68      | Modeling and Analysis Lab (FEA)   | 1                    | 0        | 2         | 03               | 60        | 40        | 100         | 2       |
| TOTAL  |              |                                   | 21                   | 6        | 04        |                  | 480       | 320       | 60          | 40      |

| Professional Elective-II |                                  | Open Elective-II |                          |
|--------------------------|----------------------------------|------------------|--------------------------|
| 17ME651                  | Computational Fluid Dynamics     | 17ME661          | Energy Auditing          |
| 17ME652                  | Mechanics of Composite Materials | 17ME662          | Industrial Safety        |
| 17ME653                  | Metal Forming                    | 17ME663          | Maintenance Engineering  |
| 17ME654                  | Tool Design                      | 17ME664          | Total Quality Management |
| 17ME655                  | Automobile Engineering           |                  |                          |

- 1. Core subject:** This is the course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.
- 2. Professional Elective:** Elective relevant to chosen specialization/ branch
- 3. Open Elective:** Electives from other technical and/or emerging subject areas.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**  
**SCHEME OF TEACHING AND EXAMINATION 2015-2016**

B.E. Mechanical Engineering

**VII SEMESTER**

| Sl. No | Subject Code | Title                       | Teaching Hours /Week |          |           | Examination      |           |           |             | Credits |
|--------|--------------|-----------------------------|----------------------|----------|-----------|------------------|-----------|-----------|-------------|---------|
|        |              |                             | Lecture              | Tutorial | Practical | Duration (Hours) | SEE Marks | CIE Marks | Total Marks |         |
| 1      | 17ME71       | Energy Engineering          | 3                    | 2        | 0         | 03               | 60        | 40        | 100         | 4       |
| 2      | 17ME72       | Fluid Power Systems         | 4                    | 0        | 0         | 03               | 60        | 40        | 100         | 4       |
| 3      | 17ME73       | Control Engineering         | 3                    | 2        | 0         | 03               | 60        | 40        | 100         | 4       |
| 4      | 17ME74X      | Professional Elective - III | 3                    | 0        | 0         | 03               | 60        | 40        | 100         | 3       |
| 5      | 17ME75X      | Professional Elective-IV    | 3                    | 0        | 0         | 03               | 60        | 40        | 100         | 3       |
| 6      | 17MEL76      | Design Lab                  | 1                    | 0        | 2         | 03               | 60        | 40        | 100         | 2       |
| 7      | 17MEL77      | CIM Lab                     | 1                    | 0        | 2         | 03               | 60        | 40        | 100         | 2       |
| 8      | 17MEP78      | Project Phase – I           | -                    | -        | -         | -                | 60        | 40        | 100         | 2       |
| TOTAL  |              |                             | 18                   | 4        | 04        |                  | 480       | 320       | 60          | 24      |

| Professional Elective-III |                               | Professional Elective-IV |                           |
|---------------------------|-------------------------------|--------------------------|---------------------------|
| 17ME741                   | Design of Thermal Equipment's | 17ME751                  | Automotive Electronics    |
| 17ME742                   | Tribology                     | 17ME752                  | Fracture Mechanics        |
| 17ME743                   | Financial Management          | 17ME753                  | Human Resource Management |
| 17ME744                   | Design for Manufacturing      | 17ME754                  | Mechatronics              |
| 17ME745                   | Smart Materials & MEMS        | 17ME755                  | Advanced Vibrations       |

- Core subject:** This is the course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.
- Professional Elective:** Elective relevant to chosen specialization/ branch

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**  
**SCHEME OF TEACHING AND EXAMINATION 2015-2016**

**B.E. Mechanical Engineering**

**VIII SEMESTER**

| Sl. No       | Subject Code | Title                              | Teaching Hours /Week |           |           | Examination      |            |            |             | Credits   |
|--------------|--------------|------------------------------------|----------------------|-----------|-----------|------------------|------------|------------|-------------|-----------|
|              |              |                                    | Lecture              | Tutorial  | Practical | Duration (Hours) | SEE Marks  | CIE Marks  | Total Marks |           |
| 1            | 17ME81       | Operations Research                | 3                    | 2         | 0         | 03               | 60         | 40         | 100         | 4         |
| 2            | 17ME82       | Additive Manufacturing             | 4                    | 0         | 0         | 03               | 60         | 40         | 100         | 4         |
| 3            | 17ME83X      | Professional Elective - V          | 3                    | 0         | 0         | 03               | 60         | 40         | 100         | 3         |
| 4            | 17ME84       | Internship / Professional Practice | Industry Oriented    |           |           | 03               | 60         | 40         | 60          | 40        |
| 5            | 17ME85       | Project Phase – II                 | -                    | 6         | -         | 03               | 60         | 40         | 200         | 6         |
| 6            | 17ME86       | Seminar                            | -                    | 4         | -         | -                | 60         | 40         | 100         | 1         |
| <b>TOTAL</b> |              |                                    | <b>10</b>            | <b>12</b> | <b>-</b>  |                  | <b>480</b> | <b>320</b> | <b>700</b>  | <b>20</b> |

| Professional Elective-V |                               |
|-------------------------|-------------------------------|
| 15ME831                 | Cryogenics                    |
| 15ME832                 | Experimental Stress Analysis  |
| 15ME833                 | Theory of Plasticity          |
| 15ME834                 | Green Manufacturing           |
| 15ME835                 | Product life cycle management |

- 1. Core subject:** This is the course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.
- 2. Professional Elective:** Elective relevant to chosen specialization/ branch
- 3. Internship / Professional Practice:** To be carried out between 6<sup>th</sup> & 7<sup>th</sup> semester vacation or 7<sup>th</sup> & 8<sup>th</sup> semester vacation.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**  
**SCHEME OF TEACHING AND EXAMINATION 2015-2016**

**II SEMESTER B.E./B.TECH.**

| Sl. No. | Subject Code | Subject                                                     |                    | Teaching Department              | Board       | Theory /Lab/ Drawing (Hrs/ Week) | PHYSICS GROUP<br>Examination Marks |      |       | Credits |
|---------|--------------|-------------------------------------------------------------|--------------------|----------------------------------|-------------|----------------------------------|------------------------------------|------|-------|---------|
|         |              |                                                             |                    |                                  |             |                                  | Th./Pr.                            | I.A. | Total |         |
|         |              |                                                             |                    |                                  |             |                                  |                                    |      |       |         |
| 1       | 15MAT21      | Engineering Maths-II                                        | BS                 | Maths                            | Basic Sc.   | 4 (T)                            | 80                                 | 20   | 100   | 4       |
| 2       | 15PHY22      | Engineering Physics                                         | BS                 | Physics                          | Basic Sc.   | 4 (T)                            | 80                                 | 20   | 100   | 4       |
| 3       | 15CIV23      | Elements of Civil Engg. & Mechanics                         | ES                 | Civil Engg.                      | Civil Engg. | 4 (T)                            | 80                                 | 20   | 100   | 4       |
| 4       | 15EME24      | Elements of Mechanical Engg.                                | ES                 | Mech. Engg.                      | Mech. Engg. | 4 (T)                            | 80                                 | 20   | 100   | 4       |
| 5       | 15ELE25      | Basic Electrical Engg.                                      | ES                 | E & E                            | E & E       | 4 (T)                            | 80                                 | 20   | 100   | 4       |
| 6       | 15WSL26      | Workshop Practice                                           | ES                 | Mech., Auto, IP, IEM, Mfg. Engg. | Mech. Engg. | 3(2 hrs lab+ 1 hr instruction)   | 80                                 | 20   | 100   | 2       |
| 7       | 15PHYL27     | Engg. Physics Lab                                           | BS                 | Physics                          | Basic Sc.   | 3(2 hrs lab+ 1 hr instruction)   | 80                                 | 20   | 100   | 2       |
| 8       | 15CPH28      | Constitution of India, Professional Ethics and Human Rights | MNC                | Humanities                       |             | 2 (Tutorial)                     | 40                                 | 10   | 50    | --      |
| 9       |              | Language (Kan.)                                             | Mandatory Learning | Humanities                       |             | 1 (T)                            | -                                  | -    | -     | --      |
|         |              |                                                             |                    |                                  |             | 29                               | 600                                | 150  | 750   | 24      |

Note: The Subjects Kannada and English are Audit Courses

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**  
**SCHEME OF TEACHING AND EXAMINATION 2015-2016**

**I SEMESTER**

**PHYSICS GROUP**

| Sl. No. | Subject                                                           | Teaching Department | Board                            | Theory /Lab/ Drawing (Hrs/ Week) | Examination Marks               |      |       | Credits |    |
|---------|-------------------------------------------------------------------|---------------------|----------------------------------|----------------------------------|---------------------------------|------|-------|---------|----|
|         |                                                                   |                     |                                  |                                  | Th./Pr.                         | I.A. | Total |         |    |
| 1       | Engineering Maths-I                                               | BS                  | Maths                            | Basic Sc.                        | 4 (T)                           | 80   | 20    | 100     | 4  |
| 2       | Engineering Physics                                               | BS                  | Physics                          | Basic Sc.                        | 4 (T)                           | 80   | 20    | 100     | 4  |
| 3       | Elements of Civil Engg. & Mechanics                               | ES                  | Civil Engg.                      | Civil Engg.                      | 4 (T)                           | 80   | 20    | 100     | 4  |
| 4       | Elements of Mechanical Engg.                                      | ES                  | Mech. Engg.                      | Mech. Engg.                      | 4 (T)                           | 80   | 20    | 100     | 4  |
| 5       | Basic Electrical Engg.                                            | ES                  | E & E                            | E & E                            | 4 (T)                           | 80   | 20    | 100     | 4  |
| 6       | Workshop Practice                                                 | ES                  | Mech., Auto, IP, IEM, Mfg. Engg. | Mech. Engg.                      | 3(2 hrs lab+ 1 hr instruction ) | 80   | 20    | 100     | 2  |
| 7       | Engg. Physics Lab                                                 | BS                  | Physics                          | Basic Sc.                        | 3(2 hrs lab+ 1 hr instruction)  | 80   | 20    | 100     | 2  |
| 8       | Constitution of India, Professional Ethics and Human Rights (CPH) | MNC                 | Humanities                       |                                  | 2 (Tutorial)                    | 40   | 10    | 50      | -- |
| 9       | Language (Kan.)                                                   | Mandatory Learning  | Humanities                       |                                  | 1 (T)                           | -    | -     | -       | -- |
|         |                                                                   |                     |                                  |                                  | 29                              | 600  | 150   | 750     | 24 |

Note: The Subjects Kannada and English are Audit Courses

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**  
**SCHEME OF TEACHING AND EXAMINATION 2015-2016**

**I SEMESTER B.E./B.TECH.**

**CHEMISTRY GROUP**

| SL No. | Subject Code | Subject                            |                    | Teaching Department           | Board       | Theory /Lab/ Drawing (Hrs/ Week) | Examination Marks |      |       | Credits |
|--------|--------------|------------------------------------|--------------------|-------------------------------|-------------|----------------------------------|-------------------|------|-------|---------|
|        |              |                                    |                    |                               |             |                                  | Th./Pr.           | L.A. | Total |         |
| 1      | 15MAT11      | Engineering Maths-I                | BS                 | Maths                         | Basic Sc.   | 4 (T)                            | 80                | 20   | 100   | 4       |
| 2      | 15CHE12      | Engineering Chemistry              | BS                 | Chemistry                     | Basic Sc.   | 4 (T)                            | 80                | 20   | 100   | 4       |
| 3      | 15PCD13      | Programming in C & Data Structures | ES                 | Any Engineering Department    | CSE         | 4 (T)                            | 80                | 20   | 100   | 4       |
| 4      | 15CED14      | Computer Aided Engineering Drawing | ES                 | Mech./IP/Auto/ Mfg.Engg./ IEM | Mech. Engg. | 6 (2I+ 4P)                       | 80                | 20   | 100   | 4       |
| 5      | 15ELN15      | Basic Electronics                  | ES                 | E & C / E & E / TC / IT       | E & C       | 4 (T)                            | 80                | 20   | 100   | 4       |
| 6      | 15CPL16      | Computer Programming Lab           | ES                 | Any Engineering Department    | CSE         | 3(2 hrs lab+ 1 hr Tutorial )     | 80                | 20   | 100   | 2       |
| 7      | 15CHE17      | Engg. Chemistry Lab                | BS                 | Chemistry                     | Basic Sci.  | 3(2 hrs lab+ 1 hr Tutorial )     | 80                | 20   | 100   | 2       |
| 8      | 15CIV18      | Environmental Studies              | MNC                | Civil / Environmental         | Civil       | 2 (Tutorial)                     | 40                | 10   | 50    | --      |
| 9      |              | Language (Eng.)                    | Mandatory Learning | Humanities                    |             | 1 (T)                            | -                 | -    | -     | --      |
| Total  |              |                                    |                    |                               |             | 31                               | 600               | 150  | 750   | 24      |

Note: The Subjects Kannada and English are Audit Courses

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**  
**SCHEME OF TEACHING AND EXAMINATION 2015-2016**

B.E. Computer Science & Engineering  
 VIII SEMESTER

| Sl. No | Subject Code | Title                               | Teaching Hours /Week |                    | Examination |            |                         |             | Credits |
|--------|--------------|-------------------------------------|----------------------|--------------------|-------------|------------|-------------------------|-------------|---------|
|        |              |                                     | Theory               | Practical/ Drawing | Duration    | I.A. Marks | Theory/ Practical Marks | Total Marks |         |
| 1      | 15CS81       | Internet of Things and Applications | 4                    | --                 | 3           | 20         | 80                      | 100         | 4       |
| 2      | 15CS82       | Big Data Analytics                  | 4                    | --                 | 3           | 20         | 80                      | 100         | 4       |
| 3      | 15CS83x      | Professional Elective 5             | 3                    | --                 | 3           | 20         | 80                      | 100         | 3       |
| 4      | 15CS84       | Internship / Professional Practice  | Industry Oriented    |                    | 3           | 50         | 50                      | 100         | 2       |
| 5      | 15CSP85      | Project work phase II               | --                   | 6                  | 3           | 100        | 100                     | 200         | 5       |
| 6      | 15CSS86      | Seminar                             | --                   | 4                  | --          | 100        | --                      | 100         | 2       |
| TOTAL  |              |                                     | 11                   | 10                 | 15          | 310        | 390                     | 700         | 20      |

|                         |                                |
|-------------------------|--------------------------------|
| Professional Elective 5 |                                |
| 15CS831                 | High Performance Computing     |
| 15CS832                 | User Interface Design          |
| 15CS833                 | Network management             |
| 15CS834                 | System Modeling and Simulation |

1. Professional Elective: Electives relevant to chosen specialization / branch
2. Internship / Professional Practice: To be carried out between 6<sup>th</sup> and 7<sup>th</sup> semester vacation or 7<sup>th</sup> and 8<sup>th</sup> semester vacation period

**SCHEME OF TEACHING AND EXAMINATION**  
**B.E Electronics & Communication Engineering / Telecommunication Engineering**  
**(Common to Electronics & Communication and Telecommunication Engineering)**

**III SEMESTER**

| Sl. No       | Subject Code | Title                         | Teaching Hours /Week |                    | Duration  | Examination             |            |             | Credits   |
|--------------|--------------|-------------------------------|----------------------|--------------------|-----------|-------------------------|------------|-------------|-----------|
|              |              |                               | Theory               | Practical/ Drawing |           | Theory/ Practical Marks | I.A. Marks | Total Marks |           |
| 1            | 15MAT31      | Engineering Mathematics -III* | 04                   |                    | 03        | 80                      | 20         | 100         | 4         |
| 2            | 15EC32       | Analog Electronics            | 04                   |                    | 03        | 80                      | 20         | 100         | 4         |
| 3            | 15EC33       | Digital Electronics           | 04                   |                    | 03        | 80                      | 20         | 100         | 4         |
| 4            | 15EC34       | Network Analysis              | 04                   |                    | 03        | 80                      | 20         | 100         | 4         |
| 5            | 15EC35       | Electronic Instrumentation    | 04                   |                    | 03        | 80                      | 20         | 100         | 4         |
| 6            | 15EC36       | Engineering Electromagnetics  | 04                   |                    | 03        | 80                      | 20         | 100         | 4         |
| 7            | 15ECL37      | Analog Electronics Lab        |                      | 11+2P              | 03        | 80                      | 20         | 100         | 2         |
| 8            | 15ECL38      | Digital Electronics Lab       |                      | 11+2P              | 03        | 80                      | 20         | 100         | 2         |
| <b>TOTAL</b> |              |                               | <b>24</b>            | <b>6</b>           | <b>24</b> | <b>640</b>              | <b>160</b> | <b>800</b>  | <b>28</b> |

\*Additional course for Lateral entry students only:

|   |            |                            |    |  |    |    |    |    |    |
|---|------------|----------------------------|----|--|----|----|----|----|----|
| 1 | 15MATDIP31 | Additional Mathematics - I | 03 |  | 03 | 80 | -- | 80 | -- |
|---|------------|----------------------------|----|--|----|----|----|----|----|

**SCHEME OF TEACHING AND EXAMINATION**  
**B.E.: Electronics & Communication Engineering**

**VIII SEMESTER**

| Sl. No       | Subject Code | Title                                  | Teaching Hours / Week |                     | Examination |            |                          |             | Credits   |
|--------------|--------------|----------------------------------------|-----------------------|---------------------|-------------|------------|--------------------------|-------------|-----------|
|              |              |                                        | Theory                | Practical / Drawing | Duration    | I.A. Marks | Theory / Practical Marks | Total Marks |           |
| 1            | 15EC81       | Wireless Cellular and LTE 4G Broadband | 4                     | -                   | 3           | 20         | 80                       | 100         | 4         |
| 2            | 15EC82       | Fiber Optics & Networks                | 4                     | -                   | 3           | 20         | 80                       | 100         | 4         |
| 3            | 15EC83X      | Professional Elective-5                | 3                     | -                   | 3           | 20         | 80                       | 100         | 3         |
| 4            | 15EC84       | Internship / Professional Practice     | Industry Oriented     |                     | 3           | 50         | 50                       | 100         | 2         |
| 5            | 15ECP85      | Project Work                           | -                     | 6                   | 3           | 100        | 100                      | 200         | 6         |
| 6            | 15ECS86      | Seminar                                | -                     | 4                   | -           | 100        | -                        | 100         | 1         |
| <b>TOTAL</b> |              |                                        | <b>11</b>             | <b>10</b>           | <b>15</b>   | <b>310</b> | <b>390</b>               | <b>700</b>  | <b>20</b> |

| Professional Elective -5 |                                  |
|--------------------------|----------------------------------|
| 15EC831                  | Micro Electro Mechanical Systems |
| 15EC832                  | Speech Processing                |
| 15EC833                  | Radar Engineering                |
| 15EC834                  | Machine learning                 |
| 15EC835                  | Network and Cyber Security       |

- 1. Internship / Professional Practice:** To be carried between the (6<sup>th</sup> and 7<sup>th</sup> Semester) or (7<sup>th</sup> and 8<sup>th</sup>) Semester Vacation period.

# VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

## SCHEME OF TEACHING AND EXAMINATION - 2015-16 B.E. ELECTRICAL AND ELECTRONICS ENGINEERING CHOICE BASED CREDIT SYSTEM (CBCS)

### III SEMESTER

| Sl. No       | Subject Code | Subject (Course)  | Title                                  | Teaching Dept. | Teaching Hours /Week                            |                    | Examination       |            |                         |             | Credits   |
|--------------|--------------|-------------------|----------------------------------------|----------------|-------------------------------------------------|--------------------|-------------------|------------|-------------------------|-------------|-----------|
|              |              |                   |                                        |                | Theory                                          | Practical/ Drawing | Duration in hours | L.A. Marks | Theory/ Practical Marks | Total Marks |           |
| 1            | 15MAT31      | Core Subject      | Engineering Mathematics-III            | Mathematics    | 04                                              | --                 | 03                | 20         | 80                      | 100         | 4         |
| 2            | 15EE32       | Core Subject      | Electric Circuit Analysis              | EEE            | 04                                              | --                 | 03                | 20         | 80                      | 100         | 4         |
| 3            | 15EE33       | Core Subject      | Transformers and Generators            | EEE            | 04                                              | --                 | 03                | 20         | 80                      | 100         | 4         |
| 4            | 15EE34       | Core Subject      | Analog Electronic Circuits             | EEE            | 04                                              | --                 | 03                | 20         | 80                      | 100         | 4         |
| 5            | 15EE35       | Core Subject      | Digital System Design                  | EEE            | 04                                              | --                 | 03                | 20         | 80                      | 100         | 4         |
| 6            | 15EE36       | Foundation Course | Electrical and Electronic Measurements | EEE            | 04                                              | --                 | 03                | 20         | 80                      | 100         | 4         |
| 7            | 15EEL37      | Laboratory        | Electrical Machines Laboratory -I      | EEE            | 01-Hour Instruction<br>02-Hour Practical        |                    | 03                | 20         | 80                      | 100         | 2         |
| 8            | 15EEL38      | Laboratory        | Electronics Laboratory                 | EEE            | 01-Hour Instruction<br>02-Hour Practical        |                    | 03                | 20         | 80                      | 100         | 2         |
| <b>TOTAL</b> |              |                   |                                        |                | <b>Theory: 24 hours<br/>Practical: 06 hours</b> |                    | <b>24</b>         | <b>160</b> | <b>640</b>              | <b>800</b>  | <b>28</b> |

1. **Core subject:** This is the course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.

2. **Foundation Course:** The courses based upon the content that leads to Knowledge enhancement.

# VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

SCHEME OF TEACHING AND EXAMINATION - 2015-16  
B.E. ELECTRICAL AND ELECTRONICS ENGINEERING  
CHOICE BASED CREDIT SYSTEM (CBCS)

## IV SEMESTER

| Sl. No       | Subject Code | Subject (Course)  | Title                                 | Teaching Dept. | Teaching Hours /Week                            |                    | Examination       |            |                         |             | Credits   |
|--------------|--------------|-------------------|---------------------------------------|----------------|-------------------------------------------------|--------------------|-------------------|------------|-------------------------|-------------|-----------|
|              |              |                   |                                       |                | Theory                                          | Practical/ Drawing | Duration in hours | L.A. Marks | Theory/ Practical Marks | Total Marks |           |
| 1            | 15MAT41      | Core Subject      | Engineering Mathematics-IV            | Maths          | 04                                              | --                 | 03                | 20         | 80                      | 100         | 4         |
| 2            | 15EE42       | Core Subject      | Power Generation and Economics        | EEE            | 04                                              | --                 | 03                | 20         | 80                      | 100         | 4         |
| 3            | 15EE43       | Core Subject      | Transmission and Distribution         | EEE            | 04                                              | --                 | 03                | 20         | 80                      | 100         | 4         |
| 4            | 15EE44       | Core Subject      | Electric Motors                       | EEE            | 04                                              | --                 | 03                | 20         | 80                      | 100         | 4         |
| 5            | 15EE45       | Core Subject      | Electromagnetic Field Theory          | EEE            | 04                                              | --                 | 03                | 20         | 80                      | 100         | 4         |
| 6            | 15EE46       | Foundation Course | Operational Amplifiers and Linear ICs | EEE            | 04                                              | --                 | 03                | 20         | 80                      | 100         | 4         |
| 7            | 15EEL47      | Laboratory        | Electrical Machines Laboratory -2     | EEE            | 01-Hour Instruction<br>02-Hour Practical        |                    | 03                | 20         | 80                      | 100         | 2         |
| 8            | 15EEL48      | Laboratory        | Op- amp and Linear ICs Laboratory     | EEE            | 01-Hour Instruction<br>02-Hour Practical        |                    | 03                | 20         | 80                      | 100         | 2         |
| <b>TOTAL</b> |              |                   |                                       |                | <b>Theory: 24 hours<br/>Practical: 06 hours</b> |                    | <b>24</b>         | <b>160</b> | <b>640</b>              | <b>800</b>  | <b>28</b> |

1. **Core subject:** This is the course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.

2. **Foundation Course:** The courses based upon the content that leads to Knowledge enhancement.

# VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

## SCHEME OF TEACHING AND EXAMINATION - 2015-16 B.E. ELECTRICAL AND ELECTRONICS ENGINEERING CHOICE BASED CREDIT SYSTEM (CBCS)

### V SEMESTER

| Sl. No | Subject Code | Subject (Course)      | Title                           | Teaching Department | Teaching Hours /Week                     |                    | Examination       |                         |            |             | Credits |
|--------|--------------|-----------------------|---------------------------------|---------------------|------------------------------------------|--------------------|-------------------|-------------------------|------------|-------------|---------|
|        |              |                       |                                 |                     | Theory                                   | Practical/ Drawing | Duration in hours | Theory/ Practical Marks | L.A. Marks | Total Marks |         |
| 1      | 15EE51       | Core Subject          | Management and Entrepreneurship | EEE                 | 04                                       | -                  | 03                | 80                      | 20         | 100         | 4       |
| 2      | 15EE52       | Core Subject          | Microcontroller                 | EEE                 | 04                                       | -                  | 03                | 80                      | 20         | 100         | 4       |
| 3      | 15EE53       | Core Subject          | Power Electronics               | EEE                 | 04                                       | -                  | 03                | 80                      | 20         | 100         | 4       |
| 4      | 15EE54       | Core Subject          | Signals and Systems             | EEE                 | 04                                       | -                  | 03                | 80                      | 20         | 100         | 4       |
| 5      | 15EE55X      | Professional Elective | Professional Elective - I       | EEE                 | 03                                       | -                  | 03                | 80                      | 20         | 100         | 3       |
| 6      | 15EE56Y      | Open Elective         | Open Elective - I               | EEE                 | 03                                       | -                  | 03                | 80                      | 20         | 100         | 3       |
| 7      | 15EEL57      | Laboratory            | Microcontroller Laboratory      | EEE                 | 01-Hour Instruction<br>02-Hour Practical |                    | 03                | 80                      | 20         | 100         | 2       |
| 8      | 15EEL58      | Laboratory            | Power Electronics Laboratory    | EEE                 | 01-Hour Instruction<br>02-Hour Practical |                    | 03                | 80                      | 20         | 100         | 2       |
| TOTAL  |              |                       |                                 |                     | Theory: 22 hours<br>Practical: 06 hours  |                    | 24                | 160                     | 640        | 800         | 26      |

### Elective

#### Professional Elective

#### Open Elective

Offered by the Department of Electrical and Electronics Engineering

| Courses under Code 15EE55X | Title                            | Courses under Code 15EE55X | Title                            |
|----------------------------|----------------------------------|----------------------------|----------------------------------|
| 15EE551                    | Introduction to Nuclear Power    | 15EE561                    | Electronic Communication systems |
| 15EE552                    | Electrical Engineering Materials | 15EE562                    | Programmable Logic controllers   |
| 15EE553                    | Estimating and Costing           | 15EE563                    | Renewable Energy Systems         |
| 15EE554                    | Special Electrical Machines      | 15EE564                    | Business Communication           |

Students can select any one of the open electives offered by any Department (Please refer to consolidated list of VTU for open electives). Selection of an open elective is not allowed provided;

- The candidate has pre-requisite knowledge.
- The candidate has not studied during I and II year 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.

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

1. **Core subject:** This is the course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.

2. **Professional Elective:** Electives relevant to chosen specialization/ branch.

3. **Open Elective:** Electives from other technical and/ or emerging subject areas.

# VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

## SCHEME OF TEACHING AND EXAMINATION - 2015-16 B.E. ELECTRICAL AND ELECTRONICS ENGINEERING CHOICE BASED CREDIT SYSTEM (CBCS)

### VI SEMESTER

| Sl. No       | Subject Code | Subject (Course)      | Title                                | Teaching Department | Teaching Hours /Week                            |                    | Examination       |                         |            |             | Credits   |
|--------------|--------------|-----------------------|--------------------------------------|---------------------|-------------------------------------------------|--------------------|-------------------|-------------------------|------------|-------------|-----------|
|              |              |                       |                                      |                     | Theory                                          | Practical/ Drawing | Duration in hours | Theory/ Practical Marks | L.A. Marks | Total Marks |           |
| 1            | 15EE61       | Core Subject          | Control Systems                      | EEE                 | 04                                              | --                 | 03                | 80                      | 20         | 100         | 4         |
| 2            | 15EE62       | Core Subject          | Power System Analysis - I            | EEE                 | 04                                              | --                 | 03                | 80                      | 20         | 100         | 4         |
| 3            | 15EE63       | Core Subject          | Digital Signal Processing            | EEE                 | 04                                              | --                 | 03                | 80                      | 20         | 100         | 4         |
| 4            | 15EE64       | Core Subject          | Electrical Machine Design            | EEE                 | 04                                              | --                 | 03                | 80                      | 20         | 100         | 4         |
| 5            | 15EE65X      | Professional Elective | Professional Elective - II           | EEE                 | 03                                              | --                 | 03                | 80                      | 20         | 100         | 3         |
| 6            | 15EE66Y      | Open Elective         | Open Elective - II                   | EEE                 | 03                                              | --                 | 03                | 80                      | 20         | 100         | 3         |
| 7            | 15EEL67      | Laboratory            | Control System Laboratory            | EEE                 | 01-Hour Instruction<br>02-Hour Practical        |                    | 03                | 80                      | 20         | 100         | 2         |
| 8            | 15EEL68      | Laboratory            | Digital Signal Processing Laboratory | EEE                 | 01-Hour Instruction<br>02-Hour Practical        |                    | 03                | 80                      | 20         | 100         | 2         |
| <b>TOTAL</b> |              |                       |                                      |                     | <b>Theory: 22 hours<br/>Practical: 06 hours</b> |                    | <b>24</b>         | <b>160</b>              | <b>640</b> | <b>800</b>  | <b>26</b> |

### Elective

| Professional Elective      |                                         | Open Elective <sup>***</sup>                                        |                                                                          |
|----------------------------|-----------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------------|
|                            |                                         | Offered by the Department of Electrical and Electronics Engineering |                                                                          |
| Courses under Code 15EE65X | Title                                   | Courses under Code 15EE66Y                                          | Title                                                                    |
| 15EE651                    | Computer Aided Electrical Drawing       | 15EE661                                                             | Artificial Neural Networks and Fuzzy logic                               |
| 15EE652                    | Advanced Power Electronics              | 15EE662                                                             | Sensors and Transducers                                                  |
| 15EE653                    | Energy Audit and Demand side Management | 15EE663                                                             | Batteries and Fuel Cells for Commercial, Military and Space Applications |
| 15EE654                    | Solar and Wind Energy                   | 15EE664                                                             | Industrial Servo Control Systems                                         |

<sup>\*\*\*</sup> Students can select any one of the open electives offered by any Department (Please refer to consolidated list of VTU for open electives). Selection of an open elective is not allowed provided;

- The candidate has pre-requisite knowledge.
- The candidate has not studied during I and II year 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.

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

**1. Core subject:** This is the course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.

**2. Professional Elective:** Electives relevant to chosen specialization/ branch.

**3. Open Elective:** Electives from other technical and/ or emerging subject areas.

# VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

## SCHEME OF TEACHING AND EXAMINATION - 2015-16 B.E. ELECTRICAL AND ELECTRONICS ENGINEERING CHOICE BASED CREDIT SYSTEM (CBCS)

### VII SEMESTER

| SL No | Course Code | Subject (Course)            | Title                              | Teaching Department | Teaching Hours/Week                      |                       | Examination       |            |                            |             | Credits |
|-------|-------------|-----------------------------|------------------------------------|---------------------|------------------------------------------|-----------------------|-------------------|------------|----------------------------|-------------|---------|
|       |             |                             |                                    |                     | Theory                                   | Practical/<br>Drawing | Duration in hours | L.A. Marks | Theory/<br>Practical Marks | Total Marks |         |
| 1     | 15EE71      | Core Subject                | Power System Analysis - 2          | EEE                 | 04                                       | --                    | 03                | 20         | 80                         | 100         | 4       |
| 2     | 15EE72      | Core Subject                | Power System Protection            | EEE                 | 04                                       | --                    | 03                | 20         | 80                         | 100         | 4       |
| 3     | 15EE73      | Core Subject                | High Voltage Engineering           | EEE                 | 04                                       | --                    | 03                | 20         | 80                         | 100         | 4       |
| 4     | 15EE74X     | Professional Elective       | Professional Elective – III        | EEE                 | 04                                       | --                    | 03                | 20         | 80                         | 100         | 3       |
| 5     | 15EE75Y     | Professional Elective       | Professional Elective – IV         | EEE                 | 04                                       | --                    | 03                | 20         | 80                         | 100         | 3       |
| 6     | 15EEL76     | Laboratory                  | Power system Simulation Laboratory | EEE                 | 01-Hour Instruction<br>02-Hour Practical |                       | 03                | 20         | 80                         | 100         | 2       |
| 7     | 15EEL77     | Laboratory                  | Rely and High Voltage Laboratory   | EEE                 | 01-Hour Instruction<br>02-Hour Practical |                       | 03                | 20         | 80                         | 100         | 2       |
| 8     | 15EEP78     | Project Phase – I + Seminar |                                    |                     | EEE                                      | --                    | --                | 100        | --                         | 100         | 2       |
| TOTAL |             |                             |                                    |                     | Theory:24 hours<br>Practical: 06 hours   |                       | 21                | 240        | 560                        | 800         | 24      |

### Elective

| Professional Elective - III |                                 | Professional Elective - IV |                                                     |
|-----------------------------|---------------------------------|----------------------------|-----------------------------------------------------|
| Courses under Code 15EE74X  | Title                           | Courses under Code 15EE75Y | Title                                               |
| 15EE741                     | Advanced Control Systems        | 15EE751                    | FACTS and HVDC Transmission                         |
| 15EE742                     | Utilization of Electrical Power | 15EE752                    | Testing and Commissioning of Power System Apparatus |
| 15EE743                     | Carbon Capture and Storage      | 15EE753                    | Spacecraft Power Technologies                       |
| 15EE744                     | Power System Planning           | 15EE754                    | Industrial Heating                                  |

**1. Core subject:** This is the course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.

**2. Professional Elective:** Elective relevant to chosen specialization/ branch.

**3. Project Phase -I + Seminar:** Literature Survey, Problem Identification, objectives and Methodology, Submission of synopsis and seminar.

**4. Internship / Professional Practice:** To be carried between the VI and VII semester vacation or VII and VIII semester vacation period.



**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**  
**SCHEME OF TEACHING AND EXAMINATION 2015-2016**

**I SEMESTER B.E./B.TECH.**

**PHYSICS GROUP**

| Sl. No. | Subject Code | Subject                                                           |                    | Teaching Department              | Board       | Theory /Lab/ Drawing (Hrs/ Week) | Examination Marks |      |       | Credits |
|---------|--------------|-------------------------------------------------------------------|--------------------|----------------------------------|-------------|----------------------------------|-------------------|------|-------|---------|
|         |              |                                                                   |                    |                                  |             |                                  | Th./Pr.           | L.A. | Total |         |
| 1       | 15MAT11      | Engineering Maths-I                                               | BS                 | Maths                            | Basic Sc.   | 4 (T)                            | 80                | 20   | 100   | 4       |
| 2       | 15PHY12      | Engineering Physics                                               | BS                 | Physics                          | Basic Sc.   | 4 (T)                            | 80                | 20   | 100   | 4       |
| 3       | 15CIV13      | Elements of Civil Engg. & Mechanics                               | ES                 | Civil Engg.                      | Civil Engg. | 4 (T)                            | 80                | 20   | 100   | 4       |
| 4       | 15EME14      | Elements of Mechanical Engg.                                      | ES                 | Mech. Engg.                      | Mech. Engg. | 4 (T)                            | 80                | 20   | 100   | 4       |
| 5       | 15ELE15      | Basic Electrical Engg.                                            | ES                 | E & E                            | E & E       | 4 (T)                            | 80                | 20   | 100   | 4       |
| 6       | 15WSL16      | Workshop Practice                                                 | ES                 | Mech., Auto, IP, IEM, Mfg. Engg. | Mech. Engg. | 3(2 hrs lab+ 1 hr instruction)   | 80                | 20   | 100   | 2       |
| 7       | 15PHYL17     | Engg. Physics Lab                                                 | BS                 | Physics                          | Basic Sc.   | 3(2 hrs lab+ 1 hr instruction)   | 80                | 20   | 100   | 2       |
| 8       | 15CPH18      | Constitution of India, Professional Ethics and Human Rights (CPH) | MNC                | Humanities                       |             | 2 (Tutorial)                     | 40                | 10   | 50    | --      |
| 9       |              | Language (Kan.)                                                   | Mandatory Learning | Humanities                       |             | 1 (T)                            | -                 | -    | -     | --      |
|         |              |                                                                   |                    |                                  |             | 20                               | 600               | 150  | 750   | 24      |

Note: The Subjects Kannada and English are Audit Courses

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**  
**SCHEME OF TEACHING AND EXAMINATION 2015-2016**

**II SEMESTER B.E./B.TECH.**

| SL No. | Subject Code | Subject                                                     |                    | Teaching Department              | Board       | Theory /Lab/ Drawing (Hrs/ Week) | PHYSICS GROUP<br>Examination Marks |      |       | Credits |
|--------|--------------|-------------------------------------------------------------|--------------------|----------------------------------|-------------|----------------------------------|------------------------------------|------|-------|---------|
|        |              |                                                             |                    |                                  |             |                                  | Th./Pr.                            | L.A. | Total |         |
| 1      | 15MAT21      | Engineering Maths-II                                        | BS                 | Maths                            | Basic Sc.   | 4 (T)                            | 80                                 | 20   | 100   | 4       |
| 2      | 15PHY22      | Engineering Physics                                         | BS                 | Physics                          | Basic Sc.   | 4 (T)                            | 80                                 | 20   | 100   | 4       |
| 3      | 15CIV23      | Elements of Civil Engg. & Mechanics                         | ES                 | Civil Engg.                      | Civil Engg. | 4 (T)                            | 80                                 | 20   | 100   | 4       |
| 4      | 15EME24      | Elements of Mechanical Engg.                                | ES                 | Mech. Engg.                      | Mech. Engg. | 4 (T)                            | 80                                 | 20   | 100   | 4       |
| 5      | 15ELE25      | Basic Electrical Engg.                                      | ES                 | E & E                            | E & E       | 4 (T)                            | 80                                 | 20   | 100   | 4       |
| 6      | 15WSL26      | Workshop Practice                                           | ES                 | Mech., Auto, IP, IEM, Mfg. Engg. | Mech. Engg. | 3(2 hrs lab+ 1 hr instruction)   | 80                                 | 20   | 100   | 2       |
| 7      | 15PHY1.27    | Engg. Physics Lab                                           | BS                 | Physics                          | Basic Sc.   | 3(2 hrs lab+ 1 hr instruction)   | 80                                 | 20   | 100   | 2       |
| 8      | 15CPH28      | Constitution of India, Professional Ethics and Human Rights | MNC                | Humanities                       |             | 2 (Tutorial)                     | 40                                 | 10   | 50    | --      |
| 9      |              | Language (Kan.)                                             | Mandatory Learning | Humanities                       |             | 1 (T)                            | -                                  | -    | -     | --      |
|        |              |                                                             |                    |                                  |             | 29                               | 600                                | 150  | 750   | 24      |

Note: The Subjects Kannada and English are Audit Courses

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**  
**SCHEME OF TEACHING AND EXAMINATION 2015-2016**

**I SEMESTER B.E./B.TECH.**

**CHEMISTRY GROUP**

| Sl. No. | Subject Code | Subject                            |                    | Teaching Department           | Board       | Theory /Lab/ Drawing (Hrs/ Week) | Examination Marks |     |       | Credits |
|---------|--------------|------------------------------------|--------------------|-------------------------------|-------------|----------------------------------|-------------------|-----|-------|---------|
|         |              |                                    |                    |                               |             |                                  | Th./Pr.           | LA. | Total |         |
| 1       | 15MAT11      | Engineering Maths-I                | BS                 | Maths                         | Basic Sc.   | 4 (T)                            | 80                | 20  | 100   | 4       |
| 2       | 15CHE12      | Engineering Chemistry              | BS                 | Chemistry                     | Basic Sc.   | 4 (T)                            | 80                | 20  | 100   | 4       |
| 3       | 15PCD13      | Programming in C & Data Structures | ES                 | Any Engineering Department    | CSE         | 4 (T)                            | 80                | 20  | 100   | 4       |
| 4       | 15CED14      | Computer Aided Engineering Drawing | ES                 | Mech./IP/Auto/ Mfg.Engg./ IEM | Mech. Engg. | 6 (21+ 40)                       | 80                | 20  | 100   | 4       |
| 5       | 15ELN15      | Basic Electronics                  | ES                 | E & C / E & E / TC / IT       | E & C       | 4 (T)                            | 80                | 20  | 100   | 4       |
| 6       | 15CPL16      | Computer Programming Lab           | ES                 | Any Engineering Department    | CSE         | 3(2 hrs lab+ 1 hr Tutorial )     | 80                | 20  | 100   | 2       |
| 7       | 15CHEL17     | Engg. Chemistry Lab                | BS                 | Chemistry                     | Basic Sci.  | 3(2 hrs lab+ 1 hr Tutorial )     | 80                | 20  | 100   | 2       |
| 8       | 15CIV18      | Environmental Studies              | MNC                | Civil / Environmental         | Civil       | 2 (Tutorial)                     | 40                | 10  | 50    | --      |
| 9       |              | Language (Eng.)                    | Mandatory Learning | Humanities                    |             | 1 (T)                            | -                 | -   | -     | --      |
| Total   |              |                                    |                    |                               |             | 31                               | 600               | 150 | 750   | 24      |

Note: The Subjects Kannada and English are Audit Courses

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**  
**SCHEME OF TEACHING AND EXAMINATION 2015-2016**

**II SEMESTER B.E./B.TECH.**

**CHEMISTRY GROUP**

| SL No. | Subject Code | Subject                            |                    | Teaching Department           | Board       | Theory /Lab/ Drawing (Hrs/ Week) | Examination Marks |      |       | Credits |
|--------|--------------|------------------------------------|--------------------|-------------------------------|-------------|----------------------------------|-------------------|------|-------|---------|
|        |              |                                    |                    |                               |             |                                  | Th./Pr.           | I.A. | Total |         |
| 1      | 15MAT21      | Engineering Maths-II               | BS                 | Maths                         | Basic Sc.   | 4 (T)                            | 80                | 20   | 100   | 4       |
| 2      | 15CHE22      | Engineering Chemistry              | BS                 | Chemistry                     | Basic Sc.   | 4 (T)                            | 80                | 20   | 100   | 4       |
| 3      | 15PCD23      | Programming in C & Data Structures | ES                 | Any Engineering Department    | CSE         | 4 (T)                            | 80                | 20   | 100   | 4       |
| 4      | 15CED24      | Computer Aided Engineering Drawing | ES                 | Mech./IP/Auto/ Mfg.Engg./ IEM | Mech. Engg. | 6 (21+ 4P)                       | 80                | 20   | 100   | 4       |
| 5      | 15ELN25      | Basic Electronics                  | ES                 | E & C / E & E / TC / IT       | E & C       | 4 (T)                            | 80                | 20   | 100   | 4       |
| 6      | 15CPL26      | Computer Programming Lab           | ES                 | Any Engineering Department    | CSE         | 3(2 hrs lab+ 1 hr Tutorial )     | 80                | 20   | 100   | 2       |
| 7      | 15CHEL27     | Engg. Chemistry Lab                | BS                 | Chemistry                     | Basic Sc.   | 3(2 hrs lab+ 1 hr Tutorial )     | 80                | 20   | 100   | 2       |
| 8      | 15CIV28      | Environmental Studies              | MNC                | Civil / Environmental         | Civil       | 2 (Tutorial)                     | 40                | 10   | 50    | --      |
| 9      |              | Language (Eng.)                    | Mandatory Learning | Humanities                    |             | 1 (T)                            | -                 | -    | -     | --      |
| Total  |              |                                    |                    |                               |             | 31                               | 600               | 150  | 750   | 24      |

Note: The Subjects Kannada and English are Audit Courses

**B.E. Mechanical Engineering**

**III SEMESTER**

| Sl. No       | Subject Code | Title                                     | Teaching Hours /Week |           |              | Examination      |                         |            |             | Credits   |
|--------------|--------------|-------------------------------------------|----------------------|-----------|--------------|------------------|-------------------------|------------|-------------|-----------|
|              |              |                                           | Lecture              | Tutorial  | Practical    | Duration (Hours) | Theory/ Practical Marks | I.A. Marks | Total Marks |           |
| 1            | 15MAT31      | Engineering Mathematics – III             | 04                   |           |              | 03               | 80                      | 20         | 100         | 4         |
| 2            | 15ME32       | Materials Science                         | 04                   |           |              | 03               | 80                      | 20         | 100         | 4         |
| 3            | 15ME33       | Basic Thermodynamics                      | 03                   | 02        |              | 03               | 80                      | 20         | 100         | 4         |
| 4            | 15ME34       | Mechanics of Materials                    | 03                   | 02        |              | 03               | 80                      | 20         | 100         | 4         |
| 5            | 15ME35A/     | Metal Casting and Welding                 | 04                   |           |              | 03               | 80                      | 20         | 100         | 4         |
|              | 15ME35B      | Machine Tools and Operations              |                      |           |              |                  |                         |            |             |           |
| 6            | 15ME36 A/    | Computer Aided Machine Drawing            | 02                   |           | 4            | 03               | 80                      | 20         | 100         | 3         |
|              | 15ME36B      | Mechanical Measurements and Metrology     | 04                   |           |              |                  |                         |            |             |           |
| 7            | 15MEL37A/    | Materials Testing Lab/                    | 1                    |           | 2            | 03               | 80                      | 20         | 100         | 2         |
|              | 15MEL37B     | Mechanical Measurements and Metrology Lab |                      |           |              |                  |                         |            |             |           |
| 8            | 15MEL38A/    | Foundry and Forging Lab                   | 1                    |           | 2            | 03               | 80                      | 20         | 100         | 2         |
|              | 15MEL38B     | Machine Shop/                             |                      |           |              |                  |                         |            |             |           |
| <b>TOTAL</b> |              |                                           | <b>22/24</b>         | <b>04</b> | <b>08/04</b> |                  | <b>640</b>              | <b>160</b> | <b>800</b>  | <b>27</b> |

**B.E. Mechanical Engineering**

**IV SEMESTER**

| SL<br>N<br>o | Subject<br>Code           | Title                                     | Teaching Hours /Week |           |              | Examination         |                               |               |             | Credits   |
|--------------|---------------------------|-------------------------------------------|----------------------|-----------|--------------|---------------------|-------------------------------|---------------|-------------|-----------|
|              |                           |                                           | Lectur<br>e          | Tutorial  | Practical    | Duration<br>(Hours) | Theory/<br>Practical<br>Marks | I.A.<br>Marks | Total Marks |           |
| 1            | 15MAT41                   | Engineering Mathematics – III             | 04                   |           |              | 03                  | 80                            | 20            | 100         | 04        |
| 2            | 15ME42                    | Kinematics of Machinery                   | 03                   | 02        |              | 03                  | 80                            | 20            | 100         | 04        |
| 3            | 15ME43                    | Applied Thermodynamics                    | 03                   | 02        |              | 03                  | 80                            | 20            | 100         | 04        |
| 4            | 15ME44                    | Fluid mechanics                           | 03                   | 02        |              | 03                  | 80                            | 20            | 100         | 04        |
| 5            | 15ME45A/<br>15ME45B       | Metal Casting and Welding                 | 04                   |           |              | 03                  | 80                            | 20            | 100         | 04        |
|              |                           | Machine Tools and Operations              |                      |           |              |                     |                               |               |             |           |
| 6            | 15ME46 A/<br>15ME46B      | Computer Aided Machine Drawing            | 02                   |           | 4            | 03                  | 80                            | 20            | 100         | 03        |
|              |                           | Mechanical Measurements and Metrology     | 04                   |           |              |                     |                               |               |             |           |
| 7            | 15MEL47A<br>/<br>15MEL47B | Materials Testing Lab/                    | 1                    |           | 2            | 03                  | 80                            | 20            | 100         | 02        |
|              |                           | Mechanical Measurements and Metrology Lab |                      |           |              |                     |                               |               |             |           |
| 8            | 15MEL48A<br>/<br>15MEL48B | Foundry and Forging Lab                   | 1                    |           | 2            | 03                  | 80                            | 20            | 100         | 02        |
|              |                           | Machine Shop/                             |                      |           |              |                     |                               |               |             |           |
| <b>TOTAL</b> |                           |                                           | <b>19/21</b>         | <b>06</b> | <b>08/04</b> |                     | <b>640</b>                    | <b>160</b>    | <b>800</b>  | <b>27</b> |

# B.E. Mechanical Engineering

## V SEMESTER

| Sl No        | Subject Code | Title                                | Teaching Hours /Week |           |           | Examination      |                         |            |             | Credits   |
|--------------|--------------|--------------------------------------|----------------------|-----------|-----------|------------------|-------------------------|------------|-------------|-----------|
|              |              |                                      | Lecture              | Tutorial  | Practical | Duration (Hours) | Theory/ Practical Marks | I.A. Marks | Total Marks |           |
| 1            | 15ME51       | Management and Engineering Economics | 3                    | 2         | 0         | 03               | 80                      | 20         | 100         | 4         |
| 2            | 15ME52       | Dynamics of Machinery                | 3                    | 2         | 0         | 03               | 80                      | 20         | 100         | 4         |
| 3            | 15ME53       | Turbo Machines                       | 3                    | 2         | 0         | 03               | 80                      | 20         | 100         | 4         |
| 4            | 15ME54       | Design of Machine Elements - I       | 3                    | 2         | 0         | 03               | 80                      | 20         | 100         | 4         |
| 5            | 15ME55X      | Professional Elective-I              | 3                    | 0         | 0         | 03               | 80                      | 20         | 100         | 3         |
| 6            | 15ME56X      | Open Elective-I                      | 3                    | 0         | 0         | 03               | 80                      | 20         | 100         | 3         |
| 7            | 15MEL57      | Fluid Mechanics & Machinery Lab      | 1                    | 0         | 2         | 03               | 80                      | 20         | 100         | 2         |
| 8            | 15MEL58      | Energy Lab                           | 1                    | 0         | 2         | 03               | 80                      | 20         | 100         | 2         |
| <b>TOTAL</b> |              |                                      | <b>21</b>            | <b>06</b> | <b>04</b> |                  | <b>640</b>              | <b>160</b> | <b>800</b>  | <b>26</b> |

| Professional Elective-I |                                    | Open Elective-I |                         |
|-------------------------|------------------------------------|-----------------|-------------------------|
| 15ME551                 | Refrigeration and Air-conditioning | 15ME561         | Optimization Techniques |
| 15ME552                 | Theory of Elasticity               | 15ME562         | Energy and Environment  |
| 15ME553                 | Human Resource Management          | 15ME563         | Automation and Robotics |
| 15ME554                 | Non Traditional Machining          | 15ME564         | Project Management      |

- 1. Core subject:** This is the course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.
- 2. Professional Elective:** Elective relevant to chosen specialization/ branch
- 3. Open Elective:** Electives from other technical and/or emerging subject areas.

**B.E. Mechanical Engineering**

**VI SEMESTER**

| Sl. No       | Subject Code | Title                             | Teaching Hours /Week |          |           | Examination      |                         |            |             | Credits   |
|--------------|--------------|-----------------------------------|----------------------|----------|-----------|------------------|-------------------------|------------|-------------|-----------|
|              |              |                                   | Lecture              | Tutorial | Practical | Duration (Hours) | Theory/ Practical Marks | L.A. Marks | Total Marks |           |
| 1            | 15ME61       | Finite Element Analysis           | 3                    | 2        | 0         | 03               | 80                      | 20         | 100         | 4         |
| 2            | 15ME62       | Computer integrated Manufacturing | 4                    | 0        | 0         | 03               | 80                      | 20         | 100         | 4         |
| 3            | 15ME63       | Heat Transfer                     | 3                    | 2        | 0         | 03               | 80                      | 20         | 100         | 4         |
| 4            | 15ME64       | Design of Machine Elements -II    | 3                    | 2        | 0         | 03               | 80                      | 20         | 100         | 4         |
| 5            | 15ME65X      | Professional Elective-II          | 3                    | 0        | 0         | 03               | 80                      | 20         | 100         | 3         |
| 6            | 15ME66X      | Open Elective-II                  | 3                    | 0        | 0         | 03               | 80                      | 20         | 100         | 3         |
| 7            | 15MEL67      | Heat Transfer Lab                 | 1                    | 0        | 2         | 03               | 80                      | 20         | 100         | 2         |
| 8            | 15MEL68      | Modeling and Analysis Lab(FEA)    | 1                    | 0        | 2         | 03               | 80                      | 20         | 100         | 2         |
| <b>TOTAL</b> |              |                                   | <b>21</b>            | <b>6</b> | <b>04</b> |                  | <b>640</b>              | <b>160</b> | <b>800</b>  | <b>26</b> |

| Professional Elective-II |                                  | Open Elective-II |                          |
|--------------------------|----------------------------------|------------------|--------------------------|
| 15ME651                  | Computational Fluid Dynamics     | 15ME661          | Energy Auditing          |
| 15ME652                  | Mechanics of Composite Materials | 15ME662          | Industrial Safety        |
| 15ME653                  | Metal Forming                    | 15ME663          | Maintenance Engineering  |
| 15ME654                  | Tool Design                      | 15ME664          | Total Quality Management |
| 15ME655                  | Automobile Engineering           |                  |                          |

- 1. Core subject:** This is the course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.
- 2. Professional Elective:** Elective relevant to chosen specialization/ branch.
- 3. Open Elective:** Electives from other technical and/or emerging subject areas.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**  
**SCHEME OF TEACHING AND EXAMINATION 2015-2016**

B.E. Mechanical Engineering

**VII SEMESTER**

| Sl. No       | Subject Code | Title                       | Teaching Hours /Week |          |           | Examination      |                         |            |             | Credits   |
|--------------|--------------|-----------------------------|----------------------|----------|-----------|------------------|-------------------------|------------|-------------|-----------|
|              |              |                             | Lecture              | Tutorial | Practical | Duration (Hours) | Theory/ Practical Marks | I.A. Marks | Total Marks |           |
| 1            | 15ME71       | Energy Engineering          | 3                    | 2        | 0         | 03               | 80                      | 20         | 100         | 4         |
| 2            | 15ME72       | Fluid Power Systems         | 4                    | 0        | 0         | 03               | 80                      | 20         | 100         | 4         |
| 3            | 15ME73       | Control Engineering         | 3                    | 2        | 0         | 03               | 80                      | 20         | 100         | 4         |
| 4            | 15ME74X      | Professional Elective - III | 3                    | 0        | 0         | 03               | 80                      | 20         | 100         | 3         |
| 5            | 15ME75X      | Professional Elective-IV    | 3                    | 0        | 0         | 03               | 80                      | 20         | 100         | 3         |
| 6            | 15MEL76      | Design Lab                  | 1                    | 0        | 2         | 03               | 80                      | 20         | 100         | 2         |
| 7            | 15MEL77      | CIM Lab                     | 1                    | 0        | 2         | 03               | 80                      | 20         | 100         | 2         |
| 8            | 15MEP78      | Project Phase - I           | -                    | -        | -         | -                | -                       | 100        | 100         | 2         |
| <b>TOTAL</b> |              |                             | <b>18</b>            | <b>4</b> | <b>04</b> |                  | <b>560</b>              | <b>240</b> | <b>800</b>  | <b>24</b> |

| Professional Elective-III |                              | Professional Elective-IV |                        |
|---------------------------|------------------------------|--------------------------|------------------------|
| 15ME741                   | Design of Thermal Equipments | 15ME751                  | Automotive Electronics |
| 15ME742                   | Tribology                    | 15ME752                  | Fracture Mechanics     |
| 15ME743                   | Financial Management         | 15ME753                  | Mechatronics           |
| 15ME744                   | Design for Manufacturing     | 15ME754                  | Advanced Vibrations    |
| 15ME745                   | Smart Materials & MEMS       |                          |                        |

- 1. Core subject:** This is the course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.
- 2. Professional Elective:** Elective relevant to chosen specialization/ branch

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**  
**SCHEME OF TEACHING AND EXAMINATION 2015-2016**

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**VIII SEMESTER**

| Sl. No       | Subject Code | Title                              | Teaching Hours /Week |           |           | Examination      |                         |            |             | Credits   |
|--------------|--------------|------------------------------------|----------------------|-----------|-----------|------------------|-------------------------|------------|-------------|-----------|
|              |              |                                    | Lecture              | Tutorial  | Practical | Duration (Hours) | Theory/ Practical Marks | I.A. Marks | Total Marks |           |
| 1            | 15ME81       | Operations Research                | 3                    | 2         | 0         | 03               | 80                      | 20         | 100         | 4         |
| 2            | 15ME82       | Additive Manufacturing             | 4                    | 0         | 0         | 03               | 80                      | 20         | 100         | 4         |
| 3            | 15ME83X      | Professional Elective - V          | 3                    | 0         | 0         | 03               | 80                      | 20         | 100         | 3         |
| 4            | 15ME84       | Internship / Professional Practice | Industry Oriented    |           |           | 03               | 50                      | 50         | 100         | 2         |
| 5            | 15ME85       | Project Phase – II                 | -                    | 6         | -         | 03               | 100                     | 100        | 200         | 6         |
| 6            | 15ME86       | Seminar                            | -                    | 4         | -         | -                | -                       | 100        | 100         | 1         |
| <b>TOTAL</b> |              |                                    | <b>10</b>            | <b>12</b> | <b>-</b>  |                  | <b>390</b>              | <b>310</b> | <b>700</b>  | <b>20</b> |

| Professional Elective-V |                               |
|-------------------------|-------------------------------|
| 15ME831                 | Cryogenics                    |
| 15ME832                 | Experimental Stress Analysis  |
| 15ME833                 | Theory of Plasticity          |
| 15ME834                 | Green Manufacturing           |
| 15ME835                 | Product life cycle management |

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- 2. Professional Elective:** Elective relevant to chosen specialization/ branch
- 3. Internship / Professional Practice:** To be carried out between 6<sup>th</sup> & 7<sup>th</sup> semester vacation or 7<sup>th</sup> & 8<sup>th</sup> semester vacation.