

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY  
BELAGAVI**



Scheme of Teaching and Examination and Syllabus

**B.E. ELECTRONICS AND INSTRUMENTATION  
ENGINEERING**

**III-VIII SEMESTER**

(Effective from Academic year 2018-19)

**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)**

**Programme: ELECTRONICS AND INSTRUMENTATION ENGINEERING**

**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                    | 18EI32     | Electronic Instrumentation and Measurements                 | EI                  | 2                    | 2         | --                 | 03                | 40         | 60         | 100        | 3           |
| 3            | PCC                    | 18EI33     | Analog Electronic Circuits                                  | EI                  | 2                    | 2         | --                 | 03                | 40         | 60         | 100        | 3           |
| 4            | PCC                    | 18EI34     | Digital Design and HDL                                      | EI                  | 2                    | 2         | --                 | 03                | 40         | 60         | 100        | 3           |
| 5            | PCC                    | 18EI35     | Transducers and Instrumentation                             | EI                  | 2                    | 2         | --                 | 03                | 40         | 60         | 100        | 3           |
| 6            | PCC                    | 18EI36     | Network Analysis  | EI                  | 3                    | 2         | --                 | 03                | 40         | 60         | 100        | 4           |
| 7            | PCC                    | 18EIL37    | Analog Electronic Circuits Lab                              | EI                  | --                   | 2         | 2                  | 03                | 40         | 60         | 100        | 2           |
| 8            | PCC                    | 18EIL38    | Digital Design and HDL Lab                                  | EI                  | --                   | 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)              |                     |                      |           |                    |                   |            |            |            |             |
|              |                        | <b>OR</b>  |   |                     |                      |           |                    |                   |            |            |            |             |
|              |                        | 18CPC39/49 | Constitution of India, Professional Ethics and Cyber Law    |                     | 1                    | --        | --                 | 02                | 40         | 60         |            |             |
| <b>TOTAL</b> |                        |            |   |                     | <b>13</b>            | <b>16</b> | <b>04</b>          | <b>24</b>         | <b>420</b> | <b>480</b> | <b>900</b> | <b>24</b>   |
|              |                        |            |   |                     | <b>OR</b>            | <b>OR</b> | <b>OR</b>          | <b>OR</b>         | <b>OR</b>  | <b>OR</b>  |            |             |
|              |                        |            |   |                     | <b>14</b>            | <b>18</b> |                    | <b>26</b>         | <b>360</b> | <b>540</b> |            |             |

**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.

**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 spread over the years, anytime during the semester weekends and holidays, as per the liking and convenience of the student from the year of entry to the programme. However, minimum hours' requirement should be fulfilled. Activity Points (non-credit) have no effect on SGPA/CGPA and shall not be considered for vertical progression.

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

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

**Programme: ELECTRONICS AND INSTRUMENTATION ENGINEERING**

**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                    | 18EI42     | Signal Conditioning and Data Acquisition Circuits        | EI                  | 2                    | 2         | --                 | 03                | 40        | 60         | 100        | 3           |           |
| 3   | PCC                    | 18EI43     | Embedded Controllers                                     | EI                  | 2                    | 2         | --                 | 03                | 40        | 60         | 100        | 3           |           |
| 4   | PCC                    | 18EI44     | Control Systems  | EI                  | 3                    | 2         | --                 | 03                | 40        | 60         | 100        | 4           |           |
| 5   | PCC                    | 18EI45     | Process Instrumentation                                  | EI                  | 2                    | 2         | --                 | 03                | 40        | 60         | 100        | 3           |           |
| 6   | PCC                    | 18EI46     | Scientific and Analytical Instrumentation                | EI                  | 2                    | 2         | --                 | 03                | 40        | 60         | 100        | 3           |           |
| 7   | PCC                    | 18EIL47    | Embedded Controllers Lab                                 | EI                  | --                   | 2         | 2                  | 03                | 40        | 60         | 100        | 2           |           |
| 8   | PCC                    | 18EIL48    | Instrumentation and Measurements Lab                     | EI                  | --                   | 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)           |                     |                      |           |                    |                   |           |            |            |             |           |
|   |                        | <b>OR</b>  |  |                     |                      |           |                    |                   |           |            |            |             |           |
|   |                        | 18CPC39/49 | Constitution of India, Professional Ethics and Cyber Law |                     | 1                    | --        | --                 | 02                | 40        | 60         |            |             |           |
| <b>Examination is by objective type questions</b> |                        |            |  |                     |                      |           |                    |                   |           |            |            |             |           |
| <b>TOTAL</b>                                      |                        |            |  |                     | <b>13</b>            | <b>16</b> |                    | <b>04</b>         | <b>24</b> | <b>420</b> | <b>480</b> | <b>900</b>  | <b>24</b> |
|   |                        |            |  |                     | <b>OR</b>            | <b>OR</b> |                    | <b>OR</b>         | <b>OR</b> | <b>OR</b>  |            |             |           |
|   |                        |            |  |                     | <b>14</b>            | <b>18</b> |                    | <b>04</b>         | <b>26</b> | <b>360</b> | <b>540</b> |             |           |

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

18KVK39/49Vyavaharika Kannada (Kannada for communication) is for non-Kannada speaking, reading and writing students and 18KAK39/49 Aadalitha Kannada (Kannada for Administration) is for students who speak, read and write Kannada.

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

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

((a)The mandatory non – credit courses Additional Mathematics I and II prescribed for III and IV semesters respectively, to the lateral entry Diploma holders admitted to III semester of BE/B.Tech programs, shall attend the classes during the respective semesters to complete all the formalities of the course and appear for the University examination. In case, any student fails to register for the said course/fails to secure the minimum 40 % of the prescribed CIE marks, he/she shall be deemed to have secured F grade. In such a case, the 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:** 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**  
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**(Effective from the academic year 2018 – 19)**

**Programme: ELECTRONICS AND INSTRUMENTATION ENGINEERING**

**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            | PCC                    | 18ES51  | Technological Innovation Management & Entrepreneurship | HSMC / EI                                | 2                    | 2         | --                 | 03                | 40         | 60         | 100         | 3         |
| 2            | PCC                    | 18EI52  | Fundamentals of Signals & DSP                          | EI                                       | 3                    | 2         | --                 | 03                | 40         | 60         | 100         | 4         |
| 3            | PCC                    | 18EI53  | Process Control Systems                                | EI                                       | 3                    | 2         | --                 | 03                | 40         | 60         | 100         | 4         |
| 4            | PCC                    | 18EI54  | Biomedical Instrumentation                             | EI                                       | 2                    | 2         | --                 | 03                | 40         | 60         | 100         | 3         |
| 5            | PCC                    | 18EI55  | Lasers and Optical Instrumentation                     | EI                                       | 2                    | 2         | --                 | 03                | 40         | 60         | 100         | 3         |
| 6            | PCC                    | 18EI56  | VLSI Design  | EI                                       | 2                    | 2         | --                 | 03                | 40         | 60         | 100         | 3         |
| 7            | PCC                    | 18EIL57 | Signal Conditioning Circuits and Data Acquisition Lab. | EI                                       | --                   | 2         | 2                  | 03                | 40         | 60         | 100         | 2         |
| 8            | PCC                    | 18EIL58 | Digital Signal Processing Lab.                         | EI                                       | --                   | 2         | 2                  | 03                | 40         | 60         | 100         | 2         |
| 9            | HSMC                   | 18CIV59 | Environmental Studies                                  | Civil/ Environmental                     | 1                    | --        | --                 | 02                | 40         | 60         | 100         | 1         |
|              |                        |         |  | [Paper setting: Civil Engineering Board] |                      |           |                    |                   |            |            |             |           |
| <b>TOTAL</b> |                        |         |  |  | <b>15</b>            | <b>16</b> | <b>04</b>          | <b>26</b>         | <b>360</b> | <b>540</b> | <b>900</b>  | <b>25</b> |

**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.

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**Programme: ELECTRONICS AND INSTRUMENTATION ENGINEERING**

**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                    | 18EI61   | Analog and Digital Communication Systems          | EI  | 4                    | --        | --                 | 03                | 40         | 60         | 100         | 4         |
| 2            | PCC                    | 18EI62   | Power and Industrial Electronics                  | EI  | 4                    | --        | --                 | 03                | 40         | 60         | 100         | 4         |
| 3            | PCC                    | 18EI63   | Java Programming                                  | EI  | 4                    | --        | --                 | 03                | 40         | 60         | 100         | 4         |
| 4            | PEC                    | 18EI64X  | Professional Elective -1                          | EI  | 2                    | 2         | --                 | 03                | 40         | 60         | 100         | 3         |
| 5            | OEC                    | 18EI65X  | Open Elective -A                                  | EI  | 2                    | 2         | --                 | 03                | 40         | 60         | 100         | 3         |
| 6            | PCC                    | 18EIL66  | Power Electronics, Controls and Communication Lab | EI  | --                   | 2         | 2                  | 03                | 40         | 60         | 100         | 2         |
| 7            | PCC                    | 18EIL67  | Java Programming Lab                              | EI  | --                   | 2         | 2                  | 03                | 40         | 60         | 100         | 2         |
| 8            | MP                     | 18EIMP68 | Mini-project                                      | EI  | --                   | --        | 2                  | 03                | 40         | 60         | 100         | 2         |
| 9            | Internship             | --       | Internship  | To be carried out during the vacation/s of VI and VII semesters and /or VII and VIII semesters. |                      |           |                    |                   |            |            |             |           |
| <b>TOTAL</b> |                        |          |   |   | <b>16</b>            | <b>08</b> | <b>06</b>          | <b>24</b>         | <b>320</b> | <b>480</b> | <b>800</b>  | <b>24</b> |

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

**Professional Elective -1**

| Course code under 18EI64X | Course Title                 |
|---------------------------|------------------------------|
| 18EI641                   | Aeronautical Instrumentation |
| 18EI642                   | Digital Image Processing     |
| 18EI643                   | Operating Systems            |
| 18EI644                   | Robotics and Automation      |

**Open Elective -A**

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 belongs to.

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

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**Programme: ELECTRONICS AND INSTRUMENTATION ENGINEERING**

**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                    | 18EI71  | Automation in Process Control                   |  | 2                    | 2         | --                 | 03                | 40         | 60         | 100        | 3           |
| 2            | PCC                    | 18EI72  | ARM Processor                                   |  | 2                    | 2         | --                 | 03                | 40         | 60         | 100        | 3           |
| 3            | PEC                    | 18EI73X | Professional Elective - 2                       |  | 2                    | 2         | --                 | 03                | 40         | 60         | 100        | 3           |
| 4            | PEC                    | 18EI74X | Professional Elective - 3                       |  | 2                    | 2         | --                 | 03                | 40         | 60         | 100        | 3           |
| 5            | OEC                    | 18EI75X | Open Elective -B                                |  | 2                    | 2         | --                 | 03                | 40         | 60         | 100        | 3           |
| 6            | PCC                    | 18EIL76 | Process Control and Virtual Instrumentation Lab |  | --                   | 2         | 2                  | 03                | 40         | 60         | 100        | 2           |
| 7            | PCC                    | 18EIL77 | ARM Processor Lab                               |  | --                   | 2         | 2                  | 03                | 40         | 60         | 100        | 2           |
| 8            | Project                | 18EIP78 | Project Work Phase - 1                          |  | --                   | --        | 2                  | --                | 100        | --         | 100        | 1           |
| 9            | 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 ) |                      |           |                    |                   |            |            |            |             |
| <b>TOTAL</b> |                        |         |   |  | <b>10</b>            | <b>14</b> | <b>06</b>          | <b>21</b>         | <b>380</b> | <b>420</b> | <b>800</b> | <b>20</b>   |

**Note:** PCC: Professional core, PEC: Professional Elective, OEC: Open Elective

**Professional Elective - 2**

| Course code under 18EI73X | Course Title                   |
|---------------------------|--------------------------------|
| 18EI731                   | Mechatronics                   |
| 18EI732                   | Power Plant Instrumentation    |
| 18EI733                   | Advanced Control Systems       |
| 18EI734                   | Electrical Machines and Drives |

**Professional Electives - 3**

| Course code under 18EI74X | Course Title                                  |
|---------------------------|---|
| 18EI741                   | Smart Sensors and Intelligent Instrumentation |
| 18EI742                   | Biomedical Signal Processing                  |
| 18EI743                   | Computer Communication Networks               |
| 18EI744                   | Internet of Things                            |

**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.

**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.

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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                    | 18EI81  | Neural Network and Fuzzy Logic Systems | EI   | 2                    | 2         | --                 | 03                | 40         | 60         | 100         | 3         |
| 2            | PEC                    | 18EI82X | Professional Elective - 4              | EI   | 2                    | 2         | --                 | 03                | 40         | 60         | 100         | 3         |
| 3            | Project                | 18EIP83 | Project Work Phase - 2                 | EI   | --                   | --        | 2                  | 03                | 40         | 60         | 100         | 8         |
| 4            | Seminar                | 18EIS84 | Technical Seminar                      | EI   | --                   | --        | 2                  | 03                | 100        | --         | 100         | 1         |
| 5            | Internship             | 18EII85 | Internship                             | Completed during the vacation/s of VI and VII semesters and /or VII and VIII semesters.) |                      |           |                    | 03                | 40         | 60         | 100         | 3         |
| <b>TOTAL</b> |                        |         |  |  | <b>04</b>            | <b>04</b> | <b>04</b>          | <b>15</b>         | <b>260</b> | <b>240</b> | <b>500</b>  | <b>18</b> |

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

**Professional Electives - 4**

| Course code under 18EI82X | Course Title                                       |
|---------------------------|--|
| 18EI821                   | Medical Imaging Techniques                         |
| 18EI822                   | Industrial Process Instrumentation                 |
| 18EI823                   | Instrumentation Buses and Industrial Data Networks |
| 18EI824                   | Artificial Intelligence and Machine Learning       |

**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. ELECTRONICS AND INSTRUMENTATION ENGINEERING (EI)**  
**Outcome Based Education (OBE) and Choice Based Credit System (CBCS)**  
**SEMESTER - VI**

**OPEN ELECTIVE - A**

|                             |         |            |    |
|-----------------------------|---------|------------|----|
| Course Code                 | 18EI65X | CIE Marks  | 40 |
| Teaching Hours/Week (L:T:P) | (2:2:0) | 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,

- 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.

| Sl.NO. | Board and the Department offering the Electives |   | Course  |                    | Course Title                              |
|--------|---|---|---------|--------------------|---|
|        |   |   | Sl. No. | code under 18EI65X |   |
|        | EI/<br>BM/<br>ML                                | Electronics and Instrumentation Engineering | 1       | 18EI651            | Transducers and Instrumentation           |
|        |   |   | 2       | 18EI652            | Scientific and Analytical Instrumentation |
|        |   |   | 3       | 18EI653            | Lasers and Optical Instrumentation        |

**B.E. ELECTRONICS AND INSTRUMENTATION ENGINEERING (EI)**  
**Outcome Based Education (OBE) and Choice Based Credit System (CBCS)**  
**SEMESTER - VII**

**OPEN ELECTIVE - B**

|                             |         |            |    |
|-----------------------------|---------|------------|----|
| Course Code                 | 18EI75X | CIE Marks  | 40 |
| Teaching Hours/Week (L:T:P) | (2:2:0) | 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,

- 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.

| Sl. NO. | Board and the Department offering the Electives |   | Course  |                    | Course Title                                  |
|---------|---|---|---------|--------------------|---|
|         |   |   | Sl. No. | code under 18EI75X |   |
|         | EI/<br>BM/<br>ML                                | Electronics and Instrumentation Engineering | 1       | 18EI751            | Biomedical Instrumentation                    |
|         |   |   | 2       | 18EI752            | Robotics and Automation                       |
|         |   |   | 3       | 18EI753            | Smart Sensors and Intelligent Instrumentation |

