

**DEPARTMENT OF ELECTRICAL ENGINEERING  
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**

Program Code : **XXX M.Tech. (Power System Engineering)**  
 Department : **Department of Electrical Engineering**  
 Year : **I**  
 Model : **2**

| Teaching Scheme             |              |  |              |           | Contact Hours/Week |   |   | Exam Duration |           |
|-----------------------------|--------------|--|--------------|-----------|--------------------|---|---|---------------|-----------|
| S.No.                       | Subject Code | Course Title                                     | Subject Area | Credits   | L                  | T | P | Theory        | Practical |
| <b>Semester-I (Autumn)</b>  |              |  |              |           |                    |   |   |               |           |
| 1.                          | EEC-501      | Computer Aided Power System Analysis             | PCC          | 4         | 3                  | 0 | 2 | 3             | 0         |
| 2.                          | EEC-503      | Power System Operation and Control               | PCC          | 4         | 3                  | 0 | 2 | 3             | 0         |
| 3.                          | EEC-505      | HVDC Transmission Systems                        | PCC          | 4         | 3                  | 1 | 0 | 3             | 0         |
| 4.                          | EEC-507      | Advanced Digital Protection                      | PCC          | 4         | 3                  | 0 | 2 | 3             | 0         |
| 5.                          |              | Social Science Course                            | SSC          | 2         | -                  | - | - | -             | -         |
|                             |              | <b>Total</b>                                     |              | <b>18</b> |                    |   |   |               |           |
| <b>Semester-II (Spring)</b> |              |  |              |           |                    |   |   |               |           |
| 1.                          |              | Program Elective-I                               | PEC          | 4         | -                  | - | - | -             | -         |
| 2.                          |              | Program Elective-II                              | PEC          | 4         | -                  | - | - | -             | -         |
| 3.                          |              | Program Elective-III                             | PEC          | 4         | -                  | - | - | -             | -         |
| 4.                          |              | Program Elective-IV                              | PEC          | 4         | -                  | - | - | -             | -         |
| 5.                          |              | Science, Technology, and Advanced Research-tools | STAR         | 3         | -                  | - | - | -             | -         |
| 6.                          | EEC-700      | Seminar  | SEM          | 2         | -                  | - | - | -             | -         |
|                             |              | <b>Total</b>                                     |              | <b>21</b> |                    |   |   |               |           |

**DEPARTMENT OF ELECTRICAL ENGINEERING  
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Program Code : **XXX M.Tech. (Power System Engineering)**  
 Department : **Department of Electrical Engineering**  
 Year : **II**  
 Model : **2**

| Teaching Scheme             |              |                            |              |           | Contact Hours/Week |   |   | Exam Duration |           |
|-----------------------------|--------------|----------------------------|--------------|-----------|--------------------|---|---|---------------|-----------|
| S.No.                       | Subject Code | Course Title               | Subject Area | Credits   | L                  | T | P | Theory        | Practical |
| <b>Semester-I (Autumn)</b>  |              |                            |              |           |                    |   |   |               |           |
| 1.                          | EEC-691      | Internship Social Activity | ISA          | 3         | -                  | - | - | -             | -         |
| 2.                          | EEC-701A     | Thesis Stage-I             | THESIS       | 10        | -                  | - | - | -             | -         |
|                             |              | <b>Total</b>               |              | <b>13</b> |                    |   |   |               |           |
| <b>Semester-II (Spring)</b> |              |                            |              |           |                    |   |   |               |           |
| 1.                          | EEC-701B     | Thesis Stage-II            | THESIS       | 14        | -                  | - | - | -             | -         |
|                             |              | <b>Total</b>               |              | <b>14</b> |                    |   |   |               |           |

| Summary                     |           |    |    |    |
|-----------------------------|-----------|----|----|----|
| Semester                    | 1         | 2  | 3  | 4  |
| Semester-wise Total Credits | 18        | 21 | 13 | 14 |
| <b>Total Credits</b>        | <b>66</b> |    |    |    |

**M.Tech. (Power System Engineering)**

**Program Elective Courses**

| Teaching Scheme |              |   |              |         | Contact Hours/Week |   |   | Exam Duration |           |
|-----------------|--------------|---|--------------|---------|--------------------|---|---|---------------|-----------|
| S.No.           | Subject Code | Course Title  | Subject Area | Credits | L                  | T | P | Theory        | Practical |
| 1.              | EEL-661      | Power System Planning                               | PEC          | 4       | 3                  | 1 | 0 | 3             | 0         |
| 2.              | EEL-667      | Power System Reliability                            | PEC          | 4       | 3                  | 1 | 0 | 3             | 0         |
| 3.              | EEL-663      | Flexible AC Transmission Systems                    | PEC          | 4       | 3                  | 1 | 0 | 3             | 0         |
| 4.              | EEL-669      | Power System Dynamics                               | PEC          | 4       | 3                  | 0 | 2 | 3             | 0         |
| 5.              | EEL-670      | Substation Automation                               | PEC          | 4       | 3                  | 1 | 0 | 3             | 0         |
| 6.              | EEL-671      | Power System Deregulation                           | PEC          | 4       | 3                  | 1 | 0 | 3             | 0         |
| 7.              | EEL-612      | Electrical Transient in Power System                | PEC          | 4       | 3                  | 1 | 0 | 3             | 0         |
| 8.              | EEL-672      | Smart Grid Technologies                             | PEC          | 4       | 3                  | 0 | 2 | 3             | 0         |
| 9.              | EEL-695      | Modelling and Control of Sustainable Energy Systems | PEC          | 4       | 3                  | 1 | 0 | 3             | 0         |
| 10.             | EEL-520      | Cyber Physical Power System                         | PEC          | 4       | 3                  | 0 | 2 | 3             | 0         |
| 11.             | EEL-513      | Microgrid Systems                                   | PEC          | 4       | 3                  | 0 | 2 | 3             | 0         |
| 12.             | EEL-522      | AI Techniques to Power System                       | PEC          | 4       | 3                  | 0 | 2 | 3             | 0         |
| 13.             | EEL-523      | Synchro-phasor Technology                           | PEC          | 4       | 3                  | 0 | 2 | 3             | 0         |
| 14.             | EEL-524      | Power System State Estimation                       | PEC          | 4       | 3                  | 0 | 2 | 3             | 0         |

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Program Code : **XXX Master of Science (by Research) in Power System Engineering**  
 Department : **Department of Electrical Engineering**  
 Year : **I**  
 Model : **3**

| Teaching Scheme             |              |                                      |              |           | Contact Hours/Week |   |   | Exam Duration |           |
|-----------------------------|--------------|--------------------------------------|--------------|-----------|--------------------|---|---|---------------|-----------|
| S.No.                       | Subject Code | Course Title                         | Subject Area | Credits   | L                  | T | P | Theory        | Practical |
| <b>Semester-I (Autumn)</b>  |              |                                      |              |           |                    |   |   |               |           |
| 1.                          | EEC-501      | Computer Aided Power System Analysis | PCC          | 4         | 3                  | 0 | 2 | 3             | 0         |
| 2.                          | EEC-503      | Power System Operation and Control   | PCC          | 4         | 3                  | 0 | 2 | 3             | 0         |
| 3.                          | EEC-505      | HVDC Transmission Systems            | PCC          | 4         | 3                  | 1 | 0 | 3             | 0         |
| 4.                          | EEC-507      | Advanced Digital Protection          | PCC          | 4         | 3                  | 0 | 2 | 3             | 0         |
| 5.                          |              | Social Science Course                | SSC          | 2         | -                  | - | - | -             | -         |
|                             |              | <b>Total</b>                         |              | <b>18</b> |                    |   |   |               |           |
| <b>Semester-II (Spring)</b> |              |                                      |              |           |                    |   |   |               |           |
| 1.                          |              | Program Elective-I                   | PEC          | 4         | -                  | - | - | -             | -         |
| 2.                          | EEC-751A     | Thesis Stage-I                       | THESIS       | 14        | -                  | - | - | -             | -         |
|                             |              | <b>Total</b>                         |              | <b>18</b> |                    |   |   |               |           |

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Program Code : **XXX Master of Science (by Research) in Power System Engineering**  
 Department : **Department of Electrical Engineering**  
 Year : **II**  
 Model : **3**

| Teaching Scheme             |              |                  |              |           | Contact Hours/Week |   |   | Exam Duration |           |
|-----------------------------|--------------|------------------|--------------|-----------|--------------------|---|---|---------------|-----------|
| S.No.                       | Subject Code | Course Title     | Subject Area | Credits   | L                  | T | P | Theory        | Practical |
| <b>Semester-I (Autumn)</b>  |              |                  |              |           |                    |   |   |               |           |
| 1.                          | EEC-751B     | Thesis Stage-II  | THESIS       | 15        | -                  | - | - | -             | -         |
|                             |              | <b>Total</b>     |              | <b>15</b> |                    |   |   |               |           |
| <b>Semester-II (Spring)</b> |              |                  |              |           |                    |   |   |               |           |
| 1.                          | EEC-751C     | Thesis Stage-III | THESIS       | 16        | -                  | - | - | -             | -         |
|                             |              | <b>Total</b>     |              | <b>16</b> |                    |   |   |               |           |

| <b>Summary</b>                     |           |    |    |    |
|------------------------------------|-----------|----|----|----|
| Semester                           | 1         | 2  | 3  | 4  |
| <b>Semester-wise Total Credits</b> | 18        | 18 | 15 | 16 |
| <b>Total Credits</b>               | <b>67</b> |    |    |    |

## Master of Science (by Research) in Power System Engineering

### Program Elective Courses

| Teaching Scheme |              |   |              |         | Contact Hours/Week |   |   | Exam Duration |           |
|-----------------|--------------|---|--------------|---------|--------------------|---|---|---------------|-----------|
| S.No.           | Subject Code | Course Title  | Subject Area | Credits | L                  | T | P | Theory        | Practical |
| 1.              | EEL-661      | Power System Planning                               | PEC          | 4       | 3                  | 1 | 0 | 3             | 0         |
| 2.              | EEL-667      | Power System Reliability                            | PEC          | 4       | 3                  | 1 | 0 | 3             | 0         |
| 3.              | EEL-663      | Flexible AC Transmission Systems                    | PEC          | 4       | 3                  | 1 | 0 | 3             | 0         |
| 4.              | EEL-669      | Power System Dynamics                               | PEC          | 4       | 3                  | 0 | 2 | 3             | 0         |
| 5.              | EEL-670      | Substation Automation                               | PEC          | 4       | 3                  | 1 | 0 | 3             | 0         |
| 6.              | EEL-671      | Power System Deregulation                           | PEC          | 4       | 3                  | 1 | 0 | 3             | 0         |
| 7.              | EEL-612      | Electrical Transient in Power System                | PEC          | 4       | 3                  | 1 | 0 | 3             | 0         |
| 8.              | EEL-672      | Smart Grid Technologies                             | PEC          | 4       | 3                  | 0 | 2 | 3             | 0         |
| 9.              | EEL-695      | Modelling and Control of Sustainable Energy Systems | PEC          | 4       | 3                  | 1 | 0 | 3             | 0         |
| 10.             | EEL-520      | Cyber Physical Power System                         | PEC          | 4       | 3                  | 0 | 2 | 3             | 0         |
| 11.             | EEL-513      | Microgrid Systems                                   | PEC          | 4       | 3                  | 0 | 2 | 3             | 0         |
| 12.             | EEL-522      | AI Techniques to Power System                       | PEC          | 4       | 3                  | 0 | 2 | 3             | 0         |
| 13.             | EEL-523      | Synchro-phasor Technology                           | PEC          | 4       | 3                  | 0 | 2 | 3             | 0         |
| 14.             | EEL-524      | Power System State Estimation                       | PEC          | 4       | 3                  | 0 | 2 | 3             | 0         |