



**St. JOSEPH'S COLLEGE OF ENGINEERING**  
**OMR, CHENNAI-119**  
**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

| S. No | Course code | AU Code | Subject Name                                   | Semester     |
|-------|-------------|---------|--|--------------|
| 1.    | C101        | MA5155  | Applied Mathematics For Electrical Engineers   | <b>SEM 1</b> |
| 2.    | C102        | PX5101  | Power Semiconductor Devices                    |              |
| 3.    | C103        | PX5151  | Analysis Of Electrical Machines                |              |
| 4.    | C104        | PX5152  | Analysis And Design Of Power Converters        |              |
| 5.    | C105        | IN5152  | System Theory                                  |              |
| 6.    | C106        | IN5091  | Soft Computing Techniques (Elective-I)         |              |
| 7.    | C107        | PX5111  | Power Electronics Circuits Lab                 |              |
| 8.    | C108        | PX5201  | Analysis And Design Of Inverters               | <b>SEM 2</b> |
| 9.    | C109        | PX5202  | Solid State Drives                             |              |
| 10.   | C110        | PX5251  | Special Electrical Machines                    |              |
| 11.   | C111        | PX5252  | Power Quality                                  |              |
| 12.   | C112        | PX5003  | Flexible Ac Transmission Systems               |              |
| 13.   | C113        | PX5004  | Modern Rectifiers And Resonant Converters      |              |
| 14.   | C114        | PX5211  | Electrical Drives Lab                          |              |
| 15.   | C115        | PX5212  | Mini Project                                   | <b>SEM 3</b> |
| 16.   | C201        | PS5092  | Solar And Energy Storage Systems               |              |
| 17.   | C202        | PX5071  | Wind Energy Conversion Systems                 |              |
| 18.   | C203        | PX5072  | Power Electronics For Renewable Energy Systems |              |
| 19.   | C204        | PX5311  | Project Work Phase I                           |              |
| 20.   | C205        | PX5411  | Project Work Phase II                          | <b>SEM 4</b> |

**COURSE CODE: C101**

**AU CODE/SUBJECT: MA5155 APPLIED**

**MATHEMATICS FOR ELECTRICAL ENGINEERS**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>   |
|------------------------|--|
| C101.1                 | Apply various methods in matrix theory to solve system of linear equations.  |
| C101.2                 | Maximizing and minimizing the functional that occur in electrical engineering discipline.  |
| C101.3                 | Computation of probability and moments, standard distributions of discrete and continuous random variables and functions of a random variable.   |
| C101.4                 | Could develop a fundamental understanding of linear programming models, able to develop a linear programming model from problem description, apply the simplex method for solving linear programming problems. |
| C101.5                 | Fourier series analysis and its uses in representing the power signals.  |

**COURSE CODE: C102**

**AU CODE/SUBJECT: PX5101 POWER SEMICONDUCTOR**

**DEVICES**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>  |
|------------------------|---|
| C102.1                 | Able to understand and analyse different types of power semiconductor devices and their switching characteristics.  |
| C102.2                 | Able to analyse and understand the operation and characteristics of controlled rectifiers   |
| C102.3                 | Able to analyse and understand the operation, switching techniques and basics topologies of DC-DC switching regulators.                                     |
| C102.4                 | Able to analyse and understand the different modulation techniques of pulse width modulated inverters and AC voltage controller and various configurations. |
| C102.5                 | Able to analyse and simulate the different types of power converter circuits  |

**COURSE CODE: C103**

**AU CODE/SUBJECT: PX5151 ANALYSIS OF ELECTRICAL**

**MACHINES**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>   |
|------------------------|--|
| C103.1                 | Ability to understand the various electrical parameters in mathematical form   |
| C103.2                 | Ability to analyze the steady state and dynamic state operation of DC machine through mathematical modelling   |
| C103.3                 | Ability to understand the different types of reference frame theories and transformation relationships.  |
| C103.4                 | Ability to analyze the steady state and dynamic state operation of three-phase induction machines using transformation theory based mathematical modelling                                   |
| C103.5                 | Ability to analyze the steady state and dynamic state operation of three-phase synchronous machines using transformation theory based mathematical modelling and digital computer simulation |

**COURSE CODE: C104      AU CODE/SUBJECT: PX5152 ANALYSIS AND DESIGN OF POWER CONVERTERS**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>   |
|------------------------|--|
| C104.1                 | Analyze various single phase and three phase power converters                                    |
| C104.2                 | Select and design dc-dc converter topologies for a broad range of power conversion applications. |
| C104.3                 | Develop improved power converters for any stringent application requirements.                    |
| C104.4                 | Design ac-ac converters for variable frequency applications.                                     |
| C104.5                 | Energy efficient and advanced designing of dc circuits   |

**COURSE CODE: C105      AU CODE/SUBJECT: IN5152 SYSTEM THEORY**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>  |
|------------------------|---|
| C105.1                 | Ability to represent the time-invariant systems in state space form as well as analyze, whether the system is stabilizable, controllable, observable and detectable.                |
| C105.2                 | Ability to design state feedback controller and state observers   |
| C105.3                 | Ability to classify singular points and construct phase trajectory using delta and isocline methods.  |
| C105.4                 | Use the techniques such as describing function, Lyapunov Stability, Popov's Stability Criterion and Circle Criterion to assess the stability of certain class of non-linear system. |
| C105.5                 | Ability to describe non-linear behaviors such as Limit cycles, input multiplicity and output multiplicity, Bifurcation and Chaos.   |

**COURSE CODE: C106      AU CODE/SUBJECT: IN5091 SOFT COMPUTING TECHNIQUES**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>  |
|------------------------|---|
| C106.1                 | Will be able to know the basic ANN architectures, algorithms and their limitations.       |
| C106.2                 | Also will be able to know the different operations on the fuzzy sets.                     |
| C106.3                 | Will be capable of developing ANN based models and control schemes for non-linear system. |
| C106.4                 | Will get expertise in the use of different ANN structures and online training algorithm.  |
| C106.5                 | Will be knowledgeable to use Fuzzy logic for modeling and control of non-linear systems.  |
| C106.1                 | Will be competent to use hybrid control schemes and P.S.O and support vector Regressive.  |

**COURSE CODE: C107      AU CODE/SUBJECT: PX5111 POWER ELECTRONIC  
CIRCUITS LABORATORY**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>   |
|------------------------|--|
| C107.1                 | Comprehensive understanding on the switching behaviour of Power Electronic Switches  |
| C107.2                 | Comprehensive understanding on mathematical modeling of power electronic system and ability to implement the same using simulation tools |
| C107.3                 | Ability of the student to use microcontroller and its associated IDE* for power electronic applications                                  |
| C107.4                 | Ability of the student to design and implement analog circuits for Power electronic control applications                                 |
| C107.5                 | Ability to design and fabricate a power converter circuit at an reasonable power level. Exposure to PCB designing and fabrication        |

**SEMESTER II**

**COURSE CODE: C108      AU CODE/SUBJECT: PX5201 ANALYSIS AND DESIGN OF  
INVERTERS**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>   |
|------------------------|--|
| C108.1                 | Will get expertise in the working modes and operation of inverters                                   |
| C108.2                 | Will be able to design single phase and three phase inverters  |
| C108.3                 | Will equip skills to formulate and design the inverters for generic loads and machine loads          |
| C108.4                 | Will acquire knowledge on multilevel inverters and modulation techniques                             |
| C108.5                 | Will be able to design energy efficient and optimum working inverters with real time implementations |

**COURSE CODE: C109      AU CODE/SUBJECT: PX5202 SOLID STATE DRIVES**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>  |
|------------------------|---|
| C109.1                 | Understand the various types of drives, load torque characteristics and Apply the multi quadrant dynamics in hoist load system.   |
| C109.2                 | Analyze the operation of steady state analysis of single phase and three phase fully controlled converter and Chopper fed separately excited dc motor drives and discuss the various control strategies of converter. |
| C109.3                 | Understand the operation and characteristics of various methods of speed control of converters fed induction motor drives.  |
| C109.4                 | Understand the operation and performance of Synchronous motor and permanent magnet synchronous motor drives   |
| C109.5                 | Design a current and speed controller for a closed loop solid state DC motor drives and develop the transfer function for DC motor, load and converter.   |

**COURSE CODE: C110      AU CODE/SUBJECT: PX5251 SPECIAL ELECTRICAL MACHINES**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>   |
|------------------------|--|
| C110.1                 | To Understand the construction, working of different types of stepper motor and to analyse the complete drive system for the motor operation                   |
| C110.2                 | Able to understand the concepts, working and applications of switched reluctance motor and their types and different converter control configuration.          |
| C110.3                 | Able to understand the concepts, working and applications of switched reluctance motor and their types and different converter control configuration.          |
| C110.4                 | Analyse and understand the design aspects, construction, principle of operation, applications, methods of speed control of permanent magnet synchronous motor. |
| C110.5                 | Able to understand the concepts, working and applications of Hysteresis motor, synchronous reluctance motor, Linear Induction motor and Repulsion motor        |

**COURSE CODE: C111      AU CODE/SUBJECT: PX5252 POWER QUALITY**  
**COURSE CODE:      AU CODE/SUBJECT: PX5252 POWER QUALITY**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>   |
|------------------------|--|
| C111.1                 | Ability to formulate, design and simulate power supplies for generic load and machine loads.             |
| C111.2                 | Ability to conduct harmonic analysis and load tests on power supplies and drive systems.                 |
| C111.3                 | Ability to understand and design load compensation methods useful for mitigating power quality problems. |
| C111.4                 | To understand the active compensation techniques used for power factor correction.                       |
| C111.5                 | To understand the active compensation techniques used for load voltage regulation.                       |

**COURSE CODE: C112      AU CODE/SUBJECT: PX5003 FLEXIBLE AC TRANSMISSION SYSTEMS**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>  |
|------------------------|---|
| C112.1                 | Understand the concepts of flexible AC transmission and the associated problems in designing and solution to various power Generation, transmission and distribution systems. |
| C112.2                 | Ability to model and design various static shunt controllers to enhance the system stability and damping.   |
| C112.3                 | Ability to model and design various static series controllers for stability studies and improving stability limit.  |
| C112.4                 | Ability to design and model emerging FACTS controllers in finding solution for successful operation and planning of power system.   |
| C112.5                 | Ability to coordinate various FACTS controllers and understanding various control technique to optimize the performance of the power system.                                  |

**COURSE CODE: C113  
AND RESONANT CONVERTERS**

**AU CODE/SUBJECT: PX5004 MODERN RECTIFIERS**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>   |
|------------------------|--|
| C113.1                 | Understand the standards for supply current harmonics and its significance.            |
| C113.2                 | Ability to analyze and design power factor correction rectifiers for UPS applications. |
| C113.3                 | Simulate and design the operation of resonant converter and its importance             |
| C113.4                 | Identify the importance of linear system, state space model, PI controller             |
| C113.5                 | Design the DC power supplies using advanced techniques.                                |

**COURSE CODE: C114  
LABORATORY**

**AU CODE/SUBJECT: PX5211 ELECTRICAL DRIVES**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>   |
|------------------------|--|
| C114.1                 | Identify relevant information to supplement to the Electric Drives (EE 701) course.  |
| C114.2                 | Set up control strategies to synthesize the voltages in dc and ac motor drives.  |
| C114.3                 | Develop testing and experimental procedures applying basic knowledge in electronics, electrical circuit analysis, electrical machines, microprocessors, and programmable logic controllers.  |
| C114.4                 | An ability to use standard methods to determine accurate modeling/simulation parameters for various general-purpose electrical machines and power electronics devices required for designing a system and solve drives related problems        |
| C114.5                 | Estimate constraints, uncertainties and risks of the system (social, environmental, business, safety issues etc.). Combine the use of computer-based simulation tools relevant to electrical Drives with practical laboratory experimentation. |

**COURSE CODE: C115**

**AU CODE/SUBJECT: PX5212 MINI PROJECT**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>  |
|------------------------|---|
| C115.1                 | Ability to design a simple system to demonstrate the knowledge of engineering and updating with the cutting edge technology                 |
| C115.2                 | Ability to work as a team to provide simple solutions to meet the challenges in the society through his/ her engineering knowledge.         |
| C115.3                 | Ability to prepare a effective report on the system through collaborative research work and disclose the same to his/her subordinate groups |
| C115.4                 | Ability to acquire knowledge in various streams and meet the demands in the field of engineering and technology.                            |
| C115.5                 | Ability to continually improve in the field of study and develop feasible solutions to meet the challenges in the dynamic society.          |

**COURSE CODE: C201**  
**STORAGE SYSTEMS**

**AU CODE/SUBJECT: PS5092 SOLAR AND ENERGY**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>   |
|------------------------|--|
| C201.1                 | Students will develop more understanding on solar energy storage systems                           |
| C201.2                 | Students will develop basic knowledge on standalone PV system                                      |
| C201.3                 | Students will understand the issues in grid connected PV systems                                   |
| C201.4                 | Students will study about the modelling of different energy storage systems and their performances |
| C201.5                 | Students will attain more on different applications of solar energy                                |

**COURSE CODE: C202**  
**CONVERSION SYSTEMS**

**AU CODE/SUBJECT: PX5071 WIND ENERGY**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>  |
|------------------------|---|
| C202.1                 | Acquire knowledge on the basic concepts of Wind energy conversion system.                                     |
| C202.2                 | Understand the mathematical modelling and control of the Wind turbine   |
| C202.3                 | Develop more understanding on the design of Fixed speed system  |
| C202.4                 | Study about the need of Variable speed system and its modelling.  |
| C202.5                 | Able to learn about Grid integration issues and current practices of wind interconnections with power system. |

**COURSE CODE: C203**  
**ELECTRONICS FOR RENEWABLE ENERGY SYSTEMS**

**AU CODE/SUBJECT: PX5072 POWER**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>   |
|------------------------|--|
| C203.1                 | Discuss and analyze the various types of renewable energy sources  |
| C203.2                 | Analyze the performance of IG,PMSG,SCIG AND DFIG   |
| C203.3                 | Design different power converters namely AC to DC,DC to DC and AC to AC converters for renewable energy sources      |
| C203.4                 | Analyze various operating modes of wind electrical generators and solar energy systems                               |
| C203.5                 | Understand the need of hybrid systems, to develop maximum power point tracking algorithms for solar and wind systems |

**COURSE CODE: C204**

**AU CODE/SUBJECT: PX5311 Project Work Phase I**

**Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>                                 |
|------------------------|--|
| C204.1                 | Apply the concepts of Electrical engineering     |
| C204.2                 | Apply advanced software tools                    |
| C204.3                 | Develop the report writing skills                |
| C204.4                 | Analyze the practical industry oriented problems |
| C204.5                 | Develop communication skills and team work       |

**COURSE CODE: C205****AU CODE/SUBJECT: PX5411 Project Work Phase II****Enlistment of Course Outcomes:**

| <b>Course Outcomes</b> | <b>STATEMENT</b>  |
|------------------------|---|
| C205.1                 | Ability to research the solution for any practical problems arising in their field of study with the knowledge acquired through their course of study.                          |
| C205.2                 | Ability to plan, evaluate and design a solution to meet the dynamic change in needs of the society with insight knowledge of professional and ethical codes.                    |
| C205.3                 | Ability to meet the core competencies and demonstrate the knowledge of work with a cutting edge technology.   |
| C205.4                 | Ability to meet the goals within a time limit in multidisciplinary fields by working individually or with a peer group and disclose the same with an effective report writing . |
| C205.5                 | Ability to update the skill through different domains and create an innovative solution to the future growth of the society.  |

**COURSE CODE: C101****AU CODE/SUBJECT: MA5155 APPLIED****MATHEMATICS FOR ELECTRICAL ENGINEERS****Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| <b>Course Outcomes</b> | <b>Program Outcomes</b> |          |          |          |          |          |          |          |          |           | <b>Program Specific Outcomes</b> |          |          |          |
|------------------------|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|----------------------------------|----------|----------|----------|
|                        | <b>1</b>                | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> | <b>7</b> | <b>8</b> | <b>9</b> | <b>10</b> | <b>1</b>                         | <b>2</b> | <b>3</b> | <b>4</b> |
| C101.1                 | 3                       | 3        | 2        | 2        | 2        | 2        | 2        | 1        | 2        | 1         | 3                                | 2        | 2        | 1        |
| C101.2                 | 3                       | 3        | 2        | 2        | 2        | 2        | 1        | 1        | 2        | 1         | 3                                | 2        | 2        | 2        |
| C101.3                 | 3                       | 3        | 2        | 2        | 1        | 1        | 2        | 1        | 1        | 1         | 3                                | 2        | 1        | 1        |
| C101.4                 | 3                       | 2        | 1        | 2        | 1        | 1        | 1        | 1        | 1        | 1         | 2                                | 2        | 2        | 2        |
| C101.5                 | 3                       | 3        | 2        | 2        | 1        | 1        | 2        | 0        | 2        | 1         | 3                                | 1        | 2        | 2        |

**COURSE CODE: C102****AU CODE/SUBJECT: PX5101 POWER SEMICONDUCTOR****DEVICES****Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| <b>Course Outcomes</b> | <b>Program Outcomes</b> |          |          |          |          |          |          |          |          |           | <b>Program Specific Outcomes</b> |          |          |          |
|------------------------|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|----------------------------------|----------|----------|----------|
|                        | <b>1</b>                | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> | <b>7</b> | <b>8</b> | <b>9</b> | <b>10</b> | <b>1</b>                         | <b>2</b> | <b>3</b> | <b>4</b> |
| C102.1                 | 3                       | 3        | 2        | 2        | 1        | 0        | 1        | 0        | 0        | 0         | 3                                | 3        | 0        | 1        |
| C102.2                 | 3                       | 3        | 2        | 2        | 2        | 0        | 1        | 0        | 0        | 0         | 3                                | 3        | 0        | 1        |
| C102.3                 | 3                       | 3        | 3        | 3        | 2        | 0        | 2        | 0        | 0        | 1         | 3                                | 3        | 0        | 1        |
| C102.4                 | 3                       | 2        | 3        | 3        | 3        | 0        | 2        | 0        | 0        | 0         | 3                                | 3        | 0        | 1        |
| C102.5                 | 3                       | 2        | 3        | 3        | 3        | 0        | 3        | 0        | 0        | 0         | 3                                | 3        | 0        | 1        |



**COURSE CODE: C103      AU CODE/SUBJECT: PX5151 ANALYSIS OF ELECTRICAL MACHINES**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C103.1          | 3                | 3 | 3 | 1 | 2 | 1 | 1 | 2 | 1 | 1  | 3                         | 2 | 1 | 1 |
| C103.2          | 3                | 3 | 3 | 1 | 2 | 1 | 1 | 2 | 1 | 1  | 3                         | 2 | 1 | 1 |
| C103.3          | 3                | 3 | 3 | 1 | 2 | 1 | 1 | 2 | 1 | 1  | 3                         | 2 | 1 | 1 |
| C103.4          | 3                | 3 | 3 | 1 | 2 | 1 | 1 | 2 | 1 | 1  | 3                         | 2 | 1 | 1 |
| C103.5          | 3                | 3 | 3 | 1 | 2 | 1 | 1 | 2 | 1 | 1  | 3                         | 2 | 1 | 1 |

**COURSE CODE: C104      AU CODE/SUBJECT: PX5152 ANALYSIS AND DESIGN OF POWER CONVERTERS**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C104.1          | 3                | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 2  | 3                         | 3 | 2 | 2 |
| C104.2          | 3                | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 2  | 3                         | 3 | 2 | 2 |
| C104.3          | 3                | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 2  | 3                         | 3 | 2 | 2 |
| C104.4          | 3                | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 2  | 3                         | 3 | 2 | 2 |
| C104.5          | 3                | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 2  | 3                         | 3 | 2 | 2 |

**COURSE CODE: C105      AU CODE/SUBJECT: IN5152 SYSTEM THEORY**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C105.1          | 2                | 3 | 3 | 2 | 1 | 3 | 2 | 1 | 2 | 2  | 3                         | 2 | 2 | 1 |
| C105.2          | 2                | 2 | 3 | 2 | 1 | 2 | 1 | 1 | 3 | 2  | 3                         | 3 | 2 | 1 |
| C105.3          | 3                | 2 | 3 | 2 | 1 | 3 | 1 | 2 | 2 | 2  | 3                         | 3 | 2 | 1 |
| C105.4          | 2                | 3 | 2 | 2 | 1 | 3 | 1 | 2 | 2 | 3  | 3                         | 3 | 2 | 1 |
| C105.5          | 2                | 3 | 3 | 2 | 1 | 3 | 2 | 1 | 2 | 2  | 3                         | 3 | 2 | 1 |

**COURSE CODE: C106**

**AU CODE/SUBJECT: IN5091 SOFT COMPUTING**

**TECHNIQUES**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C106.1          | 3                | 3 | 3 | 3 | 3 | 2 | 1 | 3 | 3 | 1  | 3                         | 2 | 2 | 2 |
| C106.2          | 3                | 3 | 3 | 2 | 3 | 2 | 1 | 3 | 3 | 2  | 3                         | 3 | 2 | 2 |
| C106.3          | 3                | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2  | 3                         | 3 | 2 | 2 |
| C106.4          | 3                | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 1  | 3                         | 3 | 2 | 2 |
| C106.5          | 3                | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 1  | 3                         | 3 | 2 | 2 |

**COURSE CODE: C107**

**AU CODE/SUBJECT: PX5111 POWER ELECTRONIC**

**CIRCUITS LABORATORY**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C107.1          | 3                | 3 | 2 | 2 | 1 | 0 | 1 | 0 | 0 | 0  | 3                         | 3 | 0 | 1 |
| C107.2          | 3                | 3 | 2 | 2 | 2 | 0 | 1 | 0 | 0 | 0  | 3                         | 3 | 0 | 1 |
| C107.3          | 3                | 3 | 3 | 3 | 2 | 0 | 2 | 0 | 0 | 1  | 3                         | 3 | 0 | 1 |
| C107.4          | 3                | 2 | 3 | 3 | 3 | 0 | 2 | 0 | 0 | 0  | 3                         | 3 | 0 | 1 |
| C107.5          | 3                | 2 | 3 | 3 | 3 | 0 | 3 | 0 | 0 | 0  | 3                         | 3 | 0 | 1 |

**SEMESTER II**

**COURSE CODE: C108**

**AU CODE/SUBJECT: PX5201 ANALYSIS AND DESIGN OF**

**INVERTERS**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C108.1          | 3                | 3 | 2 | 2 | 3 | 1 | 1 | 1 | 1 | 3  | 3                         | 2 | 2 | 1 |
| C108.2          | 3                | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 3  | 3                         | 3 | 3 | 1 |
| C108.3          | 2                | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 3  | 3                         | 3 | 3 | 1 |
| C108.4          | 3                | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 3  | 3                         | 3 | 3 | 1 |
| C108.5          | 3                | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 3  | 3                         | 3 | 3 | 1 |

**COURSE CODE: C109**

**AU CODE/SUBJECT: PX5202 SOLID STATE DRIVES**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C109.1          | 3                | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 1  | 3                         | 2 | 2 | 1 |
| C109.2          | 3                | 3 | 1 | 2 | 0 | 1 | 1 | 2 | 0 | 2  | 3                         | 3 | 2 | 1 |
| C109.3          | 3                | 2 | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 2  | 3                         | 3 | 2 | 1 |
| C109.4          | 3                | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 2  | 3                         | 3 | 2 | 1 |
| C109.5          | 3                | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 1  | 3                         | 2 | 2 | 1 |

**COURSE CODE: C110**

**AU CODE/SUBJECT: PX5251 SPECIAL ELECTRICAL**

**MACHINES**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C110.1          | 3                | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 3  | 3                         | 3 | 3 | 1 |
| C110.2          | 2                | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 3  | 3                         | 3 | 3 | 1 |
| C110.3          | 3                | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 3  | 3                         | 3 | 3 | 1 |
| C110.4          | 3                | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 3  | 3                         | 3 | 3 | 1 |
| C110.5          | 3                | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 3  | 3                         | 3 | 3 | 1 |

**COURSE CODE: C111**

**AU CODE/SUBJECT: PX5252 POWER QUALITY**

**COURSE CODE:**

**AU CODE/SUBJECT: PX5252 POWER QUALITY**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C111.1          | 3                | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 3 | 2  | 3                         | 2 | 2 | 1 |
| C111.2          | 3                | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2  | 3                         | 2 | 2 | 1 |
| C111.3          | 3                | 3 | 3 | 3 | 3 | 1 | 2 | 1 | 3 | 2  | 3                         | 2 | 2 | 2 |
| C111.4          | 3                | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 3 | 2  | 3                         | 2 | 1 | 2 |
| C111.5          | 3                | 3 | 3 | 3 | 3 | 1 | 2 | 1 | 3 | 2  | 3                         | 2 | 1 | 2 |

**COURSE CODE: C112**  
**TRANSMISSION SYSTEMS**

**AU CODE/SUBJECT: PX5003 FLEXIBLE AC**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C112.1          | 3                | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1  | 3                         | 3 | 3 | 3 |
| C112.2          | 3                | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2  | 3                         | 2 | 2 | 2 |
| C112.3          | 3                | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2  | 3                         | 2 | 2 | 2 |
| C112.4          | 3                | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2  | 3                         | 3 | 2 | 3 |
| C112.5          | 3                | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2  | 2                         | 2 | 2 | 3 |

**COURSE CODE: C113**  
**AND RESONANT CONVERTERS**

**AU CODE/SUBJECT: PX5004 MODERN RECTIFIERS**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C113.1          | 3                | 3 | 3 | 1 | 2 | 1 | 1 | 3 | 1 | 1  | 3                         | 2 | 2 | 1 |
| C113.2          | 3                | 3 | 3 | 1 | 2 | 1 | 1 | 3 | 1 | 1  | 3                         | 2 | 2 | 1 |
| C113.3          | 3                | 3 | 3 | 1 | 2 | 1 | 1 | 3 | 1 | 1  | 3                         | 2 | 2 | 1 |
| C113.4          | 3                | 3 | 3 | 1 | 2 | 1 | 1 | 3 | 1 | 1  | 3                         | 2 | 2 | 1 |
| C113.5          | 3                | 3 | 3 | 1 | 2 | 1 | 1 | 3 | 1 | 1  | 3                         | 2 | 2 | 1 |

**COURSE CODE: C114**  
**LABORATORY**

**AU CODE/SUBJECT: PX5211 ELECTRICAL DRIVES**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C114.1          | 3                | 3 | 2 | 2 | 1 | 0 | 1 | 0 | 0 | 0  | 3                         | 3 | 0 | 1 |
| C114.2          | 3                | 3 | 2 | 2 | 2 | 0 | 1 | 0 | 0 | 0  | 3                         | 3 | 0 | 1 |
| C114.3          | 3                | 3 | 3 | 3 | 2 | 0 | 2 | 0 | 0 | 1  | 3                         | 3 | 0 | 1 |
| C114.4          | 3                | 2 | 3 | 3 | 3 | 0 | 2 | 0 | 0 | 0  | 3                         | 3 | 0 | 1 |
| C114.5          | 3                | 2 | 3 | 3 | 3 | 0 | 3 | 0 | 0 | 0  | 3                         | 3 | 0 | 1 |

**COURSE CODE: C115**

**AU CODE/SUBJECT: PX5212 MINI PROJECT**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C115.1          | 3                | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2  | 3                         | 2 | 2 | 2 |
| C115.2          | 2                | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3  | 2                         | 3 | 3 | 3 |
| C115.3          | 2                | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3  | 1                         | 2 | 3 | 3 |
| C115.4          | 3                | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2  | 3                         | 3 | 3 | 2 |
| C115.5          | 3                | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 2  | 3                         | 2 | 2 | 2 |

**Semester III**

**COURSE CODE: C201**

**AU CODE/SUBJECT: PS5092 SOLAR AND ENERGY**

**STORAGE SYSTEMS**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C201.1          | 3                | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 1  | 2                         | 1 | 1 | 1 |
| C201.2          | 3                | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 1  | 3                         | 3 | 2 | 1 |
| C201.3          | 3                | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 1  | 3                         | 3 | 2 | 1 |
| C201.4          | 3                | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 1  | 3                         | 3 | 2 | 1 |
| C201.5          | 3                | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 1  | 3                         | 3 | 2 | 3 |

**COURSE CODE: C202**

**AU CODE/SUBJECT: PX5071 WIND ENERGY**

**CONVERSION SYSTEMS**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C202.1          | 3                | 3 | 3 | 3 | 1 | 1 | 1 | 2 | 3 | 2  | 3                         | 1 | 2 | 3 |
| C202.2          | 3                | 3 | 3 | 3 | 1 | 1 | 1 | 2 | 3 | 2  | 3                         | 1 | 2 | 3 |
| C202.3          | 3                | 3 | 3 | 3 | 1 | 1 | 1 | 2 | 3 | 2  | 3                         | 1 | 2 | 3 |
| C202.4          | 3                | 3 | 3 | 3 | 1 | 1 | 1 | 3 | 3 | 3  | 3                         | 1 | 3 | 3 |
| C202.5          | 3                | 3 | 3 | 3 | 1 | 1 | 1 | 2 | 3 | 2  | 3                         | 1 | 2 | 3 |

**COURSE CODE: C203**                      **AU CODE/SUBJECT: PX5072 POWER ELECTRONICS FOR RENEWABLE ENERGY SYSTEMS**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C203.1          | 1                | 2 | - | - | - | 1 | 3 | - | - | 3  | 3                         | - | 1 | - |
| C203.2          | 3                | 3 | 3 | 3 | 1 | 1 | 2 | 2 | - | -  | 3                         | 3 | - | - |
| C203.3          | 3                | 3 | 3 | 3 | 1 | 2 | 2 | 2 | - | -  | 3                         | 3 | 3 | - |
| C203.4          | 3                | 3 | 3 | 3 | 3 | 1 | 2 | 1 | - | -  | 3                         | 3 | 3 | - |
| C203.5          | 3                | 3 | 1 | 3 | - | 2 | 2 | 2 | - | 3  | 3                         | 3 | 3 | 3 |

**COURSE CODE: C204**                      **AU CODE/SUBJECT: PX5311 Project Work Phase I**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C204.1          | 3                | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2  | 3                         | 3 | 3 | 2 |
| C204.2          | 3                | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3  | 3                         | 3 | 3 | 2 |
| C204.3          | 3                | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2  | 3                         | 3 | 3 | 3 |
| C204.4          | 3                | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3  | 3                         | 3 | 3 | 3 |
| C204.5          | 2                | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2  | 2                         | 3 | 3 | 2 |

**COURSE CODE: C205**                      **AU CODE/SUBJECT: PX5411 Project Work Phase II**

**Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:**

| Course Outcomes | Program Outcomes |   |   |   |   |   |   |   |   |    | Program Specific Outcomes |   |   |   |
|-----------------|------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|
|                 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1                         | 2 | 3 | 4 |
| C205.1          | 3                | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2  | 3                         | 3 | 3 | 2 |
| C205.2          | 3                | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3  | 3                         | 3 | 3 | 2 |
| C205.3          | 3                | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2  | 3                         | 3 | 3 | 3 |
| C205.4          | 3                | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3  | 3                         | 3 | 3 | 3 |
| C205.5          | 2                | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2  | 2                         | 3 | 3 | 2 |