



**KRUPAJAL ENGINEERING COLLEGE, BHUBANESWAR**

**DEPARTMENT OF : ELECTRICAL ENGINEERING & ELECTRICAL AND ELECTRONICS ENGINEERING**

**Course Articulation Matrix of BASIC ELECTRICAL ENGINEERING-BEE (RBE2B201) (2ND Semester)**

COs	Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	Understanding of Basic concept of circuit laws and 1 Phase circuit	3	3	2	1	1	2	1	-	-	2	-	3	3	1	3
C02	Illustrate concepts of 3 phase AC circuit	3	3	2	1	1	2	1	-	-	-	2	1	2	1	3
C03	Understanding of magnetic circuit	3	3	2	1	1	2	1	-	1	1	-	3	2	2	3
C04	Explanation of working principle of electrical machines as Transformer induction Motor and DC machines	3	3	2	1	1	2	1	-	-	1	-	1	1	1	3

**Course Articulation Matrix of NETWORK THEORY-REE3C002 (3RD Semester)**

COs	Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	Understanding of concept of network theorem and its application	3	3	2	1		1	1	-	-	-	-	3	3	-	2
CO2	Understanding of first and second order network with transient and steady state response	3	3	2	1	1	1	1	-	-	-	-	3	3	-	2
CO3	Analysis of electrical circuit using Laplace Transforms	3	3	3	1	1	1	1	-	-	-	-	3	3	-	3
CO4	Evaluation of different parameters of Two-port Network	3	3	3	1		1	1	-	-	-	-	3	3	-	3

**Course Articulation Matrix of ELECTRICAL MACHINE-1 (REL4C002) (4TH Semester)**

COs	Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	Understand the concepts of magnetic field circuits.	3	3	3	1	1	1	-	-	-	-	-	3	3	-	3
C02	Analyse the concepts of electromagnetic force, torque and its application.	3	3	3	1	1	1	-	-	-	-	-	3	3	-	3
C03	Understanding the construction of DC machines and Evaluate the different characteristics.	3	3	3	2	1	1	-	-	-	-	-	3	3	2	3
C04	Understand and analyse the concepts of single phase and three phase transformers circuits.	3	3	3	2	1	1	-	-	-	-	-	3	3	2	3

**Course Articulation Matrix of POWER ELECTRONICS (REL4C003) (4TH Semester)**

COs	Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	Understand the basics of various power switching devices.	3	3	3	1	1	1	-	-	-	-	1	3	3	3	3
C02	Learning of operation of Rectifiers and their performance parameters.	3	3	3	1	1	1	-	-	-	-	1	3	3	3	3
C03	Analyse the operation of various DC choppers.	3	3	3	2	1	1	-	-	-	-	1	3	3	3	3
C04	Understand the operation of VSI and PWM technique.	3	3	3	2	1	1	-	-	-	-	1	3	3	3	3

**Course Articulation Matrix of ELECTROMAGNETIC THEORY (REL4D001) (4TH Semester)**

COs	Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	Understand theorems of magnetic circuits and its application to analyse complex magnetic fields and circuits.	3	3	2	1	-	1	-	-	-	-	-	3	3	2	2
C02	Application of Faraday's law and Maxwell equation to electrostatic fields.	3	3	2	1	-	1	-	-	-	-	-	3	3	2	2
C03	Understand one-dimensional wave equation.	3	3	2	1	-	1	-	-	-	-	1	3	3	2	2
C04	Understand and analyse transmission lines.	3	3	2	1	-	1	-	-	-	-	1	3	3	2	2

**Course Articulation Matrix of ELECTRICAL AND ELECTRONIC MEASUREMENT (REL4D003) (4TH Semester)**

COs	Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	Understand the concept of various measuring instruments.	3	3	2	1	1	1	-	-	-	-	1	3	3	1	3
C02	Evaluation of parameters like resistance, inductance and capacitance.	3	3	2	1	1	1	-	-	-	-	1	3	3	1	3
C03	Understand the working of Galvanometer and Potentiometer etc.	3	3	2	2	1	1	-	-	-	-	1	3	3	1	3
C04	Explain the principles of Instrument transformers and electronic instruments.	3	3	2	2	1	1	-	-	-	-	1	3	3	1	3

**Course Articulation Matrix of ELETRICAL POWER TRANSMISSION AND DISTRIBUTION (REL5C001) (5TH Semester)**

COs	Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	Understand the power generation and it's associated economical terms	3	3	2	1	1	1	2	-	-	-	2	3	3	1	2
C02	Determine the parameters of transmission line.	3	3	2	2	1	1	-	-	-	-	2	3	3	1	2
C03	Understand the significant components used in transmission lines	3	3	2	2	1	1	1	-	-	-	2	3	3	1	2
C04	Understand the role of insulators and able to calculate the string efficiency	3	3	2	2	1	1	-	-	-	-	1	3	3	1	2

**Course Articulation Matrix of CONTROL SYSTEM (REL5C002) (5TH Semester)**

COs	Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	Describe the role of various control blocks and components in feedback systems.	3	3	2	1	1	2	1	1	-	-	1	1	3	1	3
C02	Analyse the time and frequency domain responses of the linear systems.	3	3	2	1	1	2	1	-	-	-	-	1	2	1	3
C03	Apply different method to check the stability of the system	3	3	2	1	1	2	1	-	-	-	-	1	2	2	3
C04	Study of controller and its application	3	3	2	1	1	2	1	-	-	-	-	1	1	1	3

**Course Articulation Matrix of ELECTRICAL MACHINE-II (REL5C003) (5TH Semester)**

COs	Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	Understand concepts of windings in AC machines and production of magnetic field	3	3	2	2	-	1	2	-	-	-	-	3	3	-	2
C02	Analyse operation of 3ph Induction motor and its control	3	3	2	2	-	1	1	-	-	-	-	3	3	-	2
C03	Learning of features of Single Phase induction motor with parameter determination	3	3	2	2	-	1	1	-	-	-	-	3	3	-	2
C04	Understanding of concepts behind synchronous machine	3	3	2	2	-	1	1	-	-	-	-	3	3	-	2

**Course Articulation Matrix of INDUSTRIAL PROCESS CONTROL AND DYNAMICS (REL5D003) (5TH Semester)**

COs	Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	Understand the Process control block diagram and analog signal controlling	3	3	2	2	1	1	-	-	-	-	-	3	3	2	2
C02	Understand the basics of Digital Conditioning and Thermal , Mechanical sensors	3	3	2	2	1	1	-	-	-	-	-	3	3	2	2
C03	Understand basics of Optimal sensor and analysis of final control and discrete state process control	3	3	2	2	1	1	-	-	-	-	-	3	3	2	2
C04	Discussion of analog and digital controllers	3	3	2	2	1	1	-	-	-	-	-	3	3	2	2

**Course Articulation Matrix of ELECTRIC DRIVES (REL5D004) (5TH Semester)**

COs	Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	Fundamentals of AC drives, DC drives, thermal model of heating and cooling.	3	3	2	3	1	1	-	-	-	-	-	3	3	3	2
C02	Analyse of Speed control of DC/AC drives and induction drives	3	3	2	3	1	1	-	-	-	-	-	3	3	3	2
C03	Understanding of synchronous motor drives and basics of electric traction	3	3	2	3	1	1	-	-	-	-	-	3	3	3	2
C04	Application of drives in different means and functions of microprocessor in drive technology	3	3	3	3	1	1	-	-	-	-	-	3	3	3	2

**Course Articulation Matrix of POWER SYSTEM OPERATION AND CONTROL (REL6C001) (6TH Semester)**

COs	Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	Remembering structure of power system, its component and numerical methods for solution of non linear algebraic equation	3	3	3	3	1	1	-	-	-	-	-	3	3	-	2
C02	Analysis of economic operation and management of power system	3	3	3	3	-	1	-	-	-	-	-	3	3	-	2
C03	Understand voltage and frequency control of various power system component.	3	3	3	3	-	1	-	-	-	-	-	3	3	-	2
C04	Study of power system stability through Swing equation.	3	3	3	3	1	1	-	-	-	-	-	3	3	-	2



**Course Articulation Matrix of ELECTRICAL POWER SYSTEM PROTECTION (REL6D001) (6TH Semester/7TH Semester)**

COs	Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	Understand and remember the concept of protective schemes and faults.	3	3	2	1	1	1	1	-	-	-	1	3	3	2	3
C02	Understand Principle and construction of relays.	3	3	2	1	1	1	1	-	-	-	1	3	3	2	3
C03	Understand apparatus protection in power system	3	3	2	1	1	1	1	-	-	-	1	3	3	2	3
C04	Understand switch gear and circuit breakers for protection.	3	3	2	1	1	1	1	-	-	-	1	3	3	2	3

**Course Articulation Matrix of HIGH VOLTAGE DC TRANSMISSION (REL7D002) (7TH Semester)**

COs	Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	Understand the designing, planning and layout of HVDC system.	3	3	2	1	1	-	-	-	-	-	1	3	3	1	3
C02	Understanding the concept of high voltage generation and safety measures.	3	3	2	1	1	-	-	-	-	-	1	3	3	1	3
C03	Understand and remember HVDC transmission system	3	3	2	1	1	-	-	-	-	-	1	3	3	1	3
C04	Understand reactors and Multi-terminals DC systems	3	3	2	1	1	-	-	-	-	-	1	3	3	1	3

**Course Articulation Matrix of SMART GRID (REL7D003) (7TH Semester)**

COs	Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	Understand concept and functions of smart grid.	3	3	2	1	1	1	2	-	-	-	2	3	3	1	2
C02	Understand measurement systems and protections used in microgrids	3	3	2	1	1	1	2	-	-	-	2	3	3	1	2
C03	Understand the operation of various distributed generations schemes.	3	3	2	1	1	1	2	-	-	-	2	3	3	1	2
C04	Understand power quality issues of on-grid renewable sources.	3	3	2	1	1	1	2	-	-	-	2	3	3	1	2