Madhav Institute of Technology & Science Gwalior-5

Department : ELECTRICAL ENGINEERING				Year 2023-2024	
				CO Attainment	
S.No	Course		Course Outcome	Direct Attainment	Indirect Attainment	Total Attainment

S.No	Course		Course Outcome	Direct Attainment	Indirect Attainment	Total Attainment
1	2100025: Engineering Mathematics II	CO1	Explain the fundamental concepts of Complex Variables, Linear Programming	2.10	2.03	2.09
		CO2	Categorize the principles of Complex Variables, Linear Programming Problems,	2.14	2.02	2.12
		CO3	Solve complex engineering problems using Numerical methods & LPP.	2.23	2.15	2.21
		CO4	Evaluate the application of Complex Variables, Linear Programming Problems, and	1.97	2.20	2.02
		CO5	Create innovative strategies using Numerical Methods and Linear Programming to	1.92	2.00	1.94
2	130301: Electro Magnetic Field Theory	CO1	interpret Maxwell's equations in differential and integral forms, both in time and	2.10	2.20	2.12
		CO2	Define complex permittivity, permeability, conductivity and perfect electric and	2.10	2.10	2.10
		CO3	Derive Poyntings theorem from Maxwells equations and interpret the terms in the	2.30	2.41	2.32
		CO4	Apply vector calculus to understand the behavior of static electric fields in standard	2.30	1.90	2.22
		CO5	Solve engineering problems of Electromagnetic, Electrostatic and Magnetic to	2.50	1.90	2.38
		CO6	Formulate and solve engineering problems of Electromagnetic.	2.25	1.90	2.18
3	130302: Measurement & Instrumentation	CO1	Explain the basic concepts of electrical and electronic measurement and measuring	2.30	2.03	2.25
		CO2	Determine errors in a measurement system.	2.30	2.02	2.24
		CO3	Describe the construction and working of AC and DC bridges and their applications	2.20	2.15	2.19
		CO4	Select suitable measuring instrument, signal Generator, frequency counter, CRO	2.30	2.34	2.31
		CO5	Select appropriate passive, active transducers and A/D & D/A converters for	2.30	2.00	2.24
		CO6	Describe working principle of CT & PT and their applications	2.20	1.87	2.13
4	130302: Measurement & Instrumentation (LAB)	CO1	Handle an instrument and perform basic calibration	2.10	2.30	2.14
		CO2	Estimate the deviations in measurements due to possible errors and measures to	2.20	2.20	2.20
		CO3	Measure unknown resistance, inductance and capacitance	2.43	2.20	2.38
		CO4	Teamwork skills for working effectively in groups and develop analytical skills to	2.32	2.20	2.30
		CO5	Prepare and present an organized written engineering report on electronic testing of	2.30	2.00	2.24
		CO1	State different AC and DC networks laws & theorems.	2.20	2.40	2.24
		CO2	Apply the knowledge of basic circuital law and simplify the network using	2.20	2.40	2.24

S.No	Course		Course Outcome	Direct Attainment	Indirect Attainment	Total Attainment
5	130303: Network Analysis	CO3	Solve the complicated network using theorems	2.30	2.30	2.30
		CO4	Infer and evaluate transient response, steady state response and network functions.	2.30	2.30	2.30
		CO5	Analyze the series resonant and parallel resonant circuit,	2.51	2.39	2.49
		CO6	Evaluate two-port network parameters.	2.40	2.32	2.38
6	130303: Network Analysis (LAB)	CO1	Analyze the Thevenin's equivalent circuits and linear superposition and apply them	2.02	2.22	2.06
		CO2	Relate physical observations and measurements involving electrical circuits to	2.30	2.40	2.32
		CO3	Predict and measure the transient and sinusoidal steady-state responses of simple	2.37	2.18	2.33
		CO4	Teamwork skills for working effectively in groups and develop analytical skills to	2.42	2.49	2.43
		CO5	Prepare and present an organized written engineering report on electronic testing of	2.30	2.42	2.32
7	130304: Analog Electronics	CO1	Define working principles of electronic devices e.g. Diode, Zener Diode, LED,	2.19	2.31	2.21
		CO2	Categorize the different types of Diode, Power Amplifier, Oscillators and Op-Amp	2.20	2.16	2.19
		CO3	Explain the different types of characteristic of Diode, Transistor, Power Amplifier	2.30	2.34	2.31
		CO4	Illustrate the various mathematical model of transistor eg. Hybrid model, re model.	2.30	2.26	2.29
		CO5	Develop an ability and skill to design different types of diode rectifier, transistor	2.30	2.00	2.24
		CO6	Apply the various principles of electronics to design different types of Analog	2.20	2.27	2.21
8	130304: Analog Electronics (LAB)	CO1	Develop the understanding of diode biasing conditions.	2.20	2.22	2.20
		CO2	Investigate the operation of half-wave and full-wave rectifier, and find their	2.15	2.05	2.13
		CO3	Compare transistor configurations on the basis of input-output characteristics.	2.34	1.98	2.27
		CO4	Implement transistor based circuits (Darlington pair, differential amplifier and two-	2.00	2.10	2.02
		CO5	Explain operation of operational amplifier (Op-amp), and design Op-amp based	1.97	1.88	1.95
9	130305: Software Lab-I	CO1	Design engineering problem and validate the results using MATLAB environment.	2.20	1.95	2.15
		CO2	Validate the concepts of network theorems by writing MATLAB codes	2.13	2.31	2.16
		CO3	Analyze the waveforms on parameter variation of PV Array module using	2.27	2.49	2.31
		CO4	Compare the performance of basic converters using MATLAB environment	2.02	2.52	2.12
		CO5	Prepare and present an organized written engineering report on electronic testing of	1.95	2.10	1.98
10	130306 : Self	CO1	Refer various technical recourses available from multiple field	2.30	2.22	2.28
		CO2	Adhere to deadlines and commitment to complete the assignment	2.50	2.05	2.41

S.No	Course		Course Outcome	Direct Attainment	Indirect Attainment	Total Attainment
10	learning	CO3	Improve performance in self learning domain	2.20	1.98	2.16
		CO4	Acquire additional knowledge for competitive examinations	2.50	2.10	2.42
11	130309 : Summer Internship	CO1	Relate the theoretical aspects learned in classes into practical world	2.20	2.20	2.20
		CO2	Apply the new skills and supplement knowledge other than curriculum	2.40	2.20	2.36
		CO3	Practice communication and teamwork skills	2.27	2.15	2.24
		CO4	Apply the knowledge for placement & higher education	2.02	2.08	2.03
		CO5	Troubleshoot the problems related to particular experiment	2.10	2.31	2.14
12	100003:Mathematics- III	CO1	Formulate Complex Variable Functions	2.20	2.20	2.20
		CO2	Solve the Complex Integral Problems	2.50	2.20	2.44
		CO3	Find the Optimal Solution using Various Methods of Linear Programming Problem.	2.10	1.95	2.07
		CO4	Apply different numerical methods in engineering problem	2.02	1.99	2.01
		CO5	Solve Ordinary Differential Equation by Numerical Techniques	1.95	2.00	1.96
13	130402: Electrical Machines-I	CO1	Comprehend the principles and construction of different AC and DC machines.	2.30	1.90	2.22
		CO2	Demonstrate an understanding of the fundamental control practices such as starting,	2.30	2.10	2.26
		CO3	Distinguish between the application and performance of AC and DC machines.	2.05	1.79	2.00
		CO4	Develop the equivalent circuits and compute the induced emf, torque, efficiency,	1.98	2.20	2.02
		CO5	Describe the different test conducted for testing the performance of different AC	2.10	1.88	2.06
		CO6	Formulate the various performance parameters of machines under different	2.30	2.10	2.26
14	130402: Electrical Machines-I (LAB)	CO1	Estimate which apparatus at what rating is required for a particular experiment	2.42	2.20	2.38
		CO2	Utilise a DC machine for a specific purpose, requirement	2.39	2.20	2.35
		CO3	Predetermine the efficiency of any transformer, regulation of any transformer	2.14	1.50	2.01
		CO4	Prepare and present an organized written engineering report on electronic testing of	2.20	1.80	2.12
		CO5	Develop the ability to work is team and learns professional ethics.	2.10	2.50	2.18
15	130401: Digital Electronics & Microprocessor	CO1	Define Number systems and codes, Logic family, Digital circuits and	2.20	2.40	2.24
		CO2	Simplify the logic expressions using Boolean laws, map method and design them by	2.30	2.10	2.26
		CO3	Explain the concept of different number system, logic Families and Microprocessor.	2.50	2.30	2.46
		CO4	Illustrate different types of Number system, Combinational circuits, sequential	2.30	2.26	2.29

S.No	Course		Course Outcome	Direct Attainment	Indirect Attainment	Total Attainment
		CO5	Develop an ability to design combinational and sequential circuits using Logic gates	2.10	2.10	2.10
		CO6	Apply the various principle of digital electronics and programming skill to develop	2.00	2.10	2.02
16	130401: Digital Electronics & Microprocessor (LAB)	CO1	Develop skill to build, and troubleshoot digital circuits	2.20	2.32	2.22
		CO2	Correctly operate standard electronic test equipment such as oscilloscopes, signal	2.20	2.10	2.18
		CO3	Apply troubleshooting techniques to test digital circuits.	2.00	2.14	2.03
		CO4	Prepare and present an organized written engineering report on electronic testing of	2.30	2.20	2.28
		CO5	Develop the ability to work is team and learns professional ethics.	2.40	2.10	2.34
17	130403 : Control Systems	CO1	Develop mathematical models of mechanical system, electrical system and	2.30	2.28	2.30
		CO2	Represent the complex system into standard canonical form by signal flow graph	2.50	2.57	2.51
		CO3	Compute the time and frequency-domain responses of first and second-order	2.30	2.05	2.25
		CO4	Formulate control engineering problems in state-variable form	2.40	2.37	2.39
		CO5	Evaluate the stability of a closed-loop control system in time-domain as well as in	2.40	2.20	2.36
		CO6	Predict the nature of response for the given input	2.20	2.03	2.17
18	130404: Power System-I	CO1	Explain general structure of power systems.	2.30	2.43	2.33
		CO2	Develop the knowledge of generation of electricity based on conventional and	2.10	2.07	2.09
		CO3	Determine the transmission line parameters.	2.60	2.46	2.57
		CO4	Analyze the performance of overhead transmission line.	2.80	2.37	2.71
		CO5	Apply the concept of power plant economics.	2.10	2.00	2.08
		CO6	Compare different types of tariffs and power factor improvement methods	2.30	2.32	2.30
19	100004: Cyber Security	CO1	Explain basic terminologies of cyber security.	1.90	2.18	1.96
		CO2	Explain the basic concept of networking and internet.	2.30	2.27	2.29
		CO3	Apply various method used to protect data in the internet environment in real world	1.90	2.00	1.92
		CO4	Discover the concept of IP security and architecture.	2.20	2.03	2.17
		CO5	Compare various type of cyber security threats and vulnerabilities.	2.30	2.12	2.26
		CO6	Develop the understanding of cyber crime investigation and IT ACT 2000.	2.10	2.06	2.09
	130405: Simulation	CO1	Simulate the performance of DC motor using MATLAB Simulink environment	2.40	2.18	2.36
		CO2	Validate the concepts of Induction motor by writing MATLAB codes.	2.50	2.40	2.48

S.No	Course		Course Outcome	Direct Attainment	Indirect Attainment	Total Attainment
20	130405: Simulation Lab-II:	CO3	Analyze the waveforms on parameter variation of PV Array module using	2.30	2.00	2.24
		CO4	Compare the performance of renewable energy sources using MATLAB	2.40	2.03	2.33
		CO5	Design engineering problem and validate the results using MATLAB environment	2.40	2.12	2.34
21	100005: Ethics, Economics, Entreprenership & Management	CO1	Impart knowledge and awareness regarding	2.20	2.18	2.20
		CO2	Develop spoken ability in a student so that	2.20	2.27	2.21
		CO3	Predict the situation and to be good decision	2.20	2.00	2.16
		CO4	Develop a sound knowledge about economy and	2.30	2.03	2.25
		CO5	Work out needs so as to develop a	2.10	2.12	2.10
		CO6	Find out ways of solving / overcoming hurdles that crop up while establishing /	2.10	2.06	2.09
22	130501: Signals & Systems	CO1	Explain the process of sampling and the effects of under sampling.	2.10	2.22	2.12
		CO2	Classify systems based on their properties and determine the response of LSI system	2.40	2.05	2.33
		CO3	Apply the concepts of linear algebra to signals.	2.30	2.40	2.32
		CO4	Analyze the spectral characteristics of continuous-time periodic and a periodic	2.42	2.00	2.34
		CO5	Analyze system properties based on impulse response and Fourier analysis.	2.29	2.03	2.24
		CO6	Apply the Laplace transform and Z- transform for analysis of continuous-time and	2.34	2.12	2.30
23	130502: Power System II	CO1	Explain the concepts of single line diagram and per unit system	2.45	2.07	2.37
		CO2	Apply different load flow techniques to solve load flow problem	2.30	2.26	2.29
		CO3	Perform fault calculations for symmetrical and unsymmetrical faults	2.18	2.37	2.22
		CO4	Explain the theoretical and practical aspects of Power System Stability, and its	2.30	2.27	2.29
		CO5	Elucidate the automatic generation control reactive power, voltage control, series	2.60	2.32	2.54
		CO6	Discuss the insulation resistance, capacitance of various types of cables and the	2.15	2.20	2.16
24	130502: Power System II (Lab)	CO1	Demonstrate the performance EHVAC transmission on simulation panel.	2.20	2.43	2.25
		CO2	Determine transmission line parameters.	2.20	2.07	2.17
		CO3	Simulate the different types of faults in transmission line using MATLAB.	2.20	2.25	2.21
		CO4	Prepare report for presentation.	2.30	1.64	2.17
		CO5	Display team work.	2.20	2.00	2.16
		CO1	Analyze the performance of 3-phase induction and synchronous machines using	2.30	2.24	2.29

S.No	Course		Course Outcome	Direct Attainment	Indirect Attainment	Total Attainment
25	130503: Electrical Machine-II	CO2	Explain the constructional details and working principle of three phase transformer	2.30	2.38	2.32
		CO3	Develop phasor diagram and determine voltage regulation of an alternator and its	2.30	2.28	2.30
		CO4	Determine time constant, various sequence reactance and equivalent circuit	2.30	2.14	2.27
		CO5	Analyze the behavior of synchronous machine connected to infinite bus and parallel	2.30	2.21	2.28
		CO6	Analyze the performance of 3-phase induction and synchronous machines using	2.30	2.24	2.29
26	130503:Electrical Machine-II (Lab)	CO1	Demonstrate an understanding of the fundamental control practices associated with	2.23	1.76	2.14
		CO2	Use accepted national and international standards (such as NEMA, IE Code) to	1.40	1.20	1.36
		CO3	Conduct testing and experimental procedures on different types of electrical	1.90	1.24	1.77
		CO4	Develop the ability to work is team and learns professional ethics	2.30	1.76	2.19
		CO5	Prepare an organized written report	2.34	1.20	2.11
27	130504 : Power Electronics	CO1	Explain static & dynamic characteristics of power electronics devices like Diode	2.20	2.20	2.20
		CO2	Explain the configuration of different commutation methods.	2.40	2.17	2.35
		CO3	Describe the configuration of AC to DC converter, Dual converter, chopper, cyclo-	2.30	2.13	2.27
		CO4	Classify converters and identify their applications.	2.10	2.17	2.11
		CO5	Develop different model of different converters to calculate their performance	2.30	2.03	2.25
		CO6	Identify the problems/limitations of power electronics devices, converters and	2.25	2.10	2.22
28	130504: Power Electronics (Lab)	CO1	Demonstrate VI characteristics of Semiconductor Devices and Various Firing	2.40	2.20	2.36
		CO2	Demonstrate the performance of various converters AC to DC and DC to AC	3.00	2.17	2.83
		CO3	Compare the performance of single and three phases VSI Inverter.	2.30	2.13	2.27
		CO4	Demonstrate the performance of converters in its different modes of operation.	2.40	2.17	2.35
		CO5	Prepare an organized written report.	2.30	2.03	2.25
		CO6	Develop the ability to work is team and learns professional ethics.	2.25	2.10	2.22
29	130505: Minor Project-I	CO1	Formulate the real-world problems.	2.40	2.24	2.37
		CO2	Express the technical ideas, strategies and methodologies.	2.10	2.38	2.16
		CO3	Utilize the new tools, algorithms, techniques to obtain solution of the project.	2.30	2.28	2.30
		CO4	Prepare oral demonstrations.	2.00	2.14	2.03
		CO1	Know the characteristics of industrial environment.	2.53	2.20	2.46

S.No	Course		Course Outcome	Direct Attainment	Indirect Attainment	Total Attainment
30	130506: Summer Internship Project-II	CO2	Apply the technical knowledge in real industrial situations.	2.64	2.17	2.55
		CO3	Write the report in technical work/project.	2.30	2.13	2.27
		CO4	Show engineer's responsibilities & ethics.	2.53	2.17	2.46
31	130507:Seminar/Self Study	CO1	Refer various technical recourses available from multiple field.	2.40	2.08	2.34
		CO2	Adhere to deadlines and commitment to complete the assignment.	2.30	2.15	2.27
		CO3	Improve his/her performance in self-learning domain.	1.98	2.23	2.03
		CO4	Acquire additional knowledge helpful for competitive examinations.	2.10	2.12	2.10
32	130601: Switchgear & Protection	CO1	Explain the concepts, theories and features associated with protective devices and	2.30	2.08	2.26
		CO2	Classify relays and circuit breakers based on criterion such as construction, type of	2.30	2.15	2.27
		CO3	Select relays and circuit breakers for specific equipments and applications.	2.30	2.23	2.29
		CO4	Design protection schemes for generators, motors, transformers and transmission line	2.30	2.12	2.26
		CO5	Analyze the behavior and performance of relays under different loading levels and	2.10	2.04	2.09
		CO6	Select the protective devices and their locations for protecting power systems	2.20	2.00	2.16
33	130601: Switchgear & Protection Lab	CO1	Operate the Over/Under voltage & over current relays and observe the performance	2.39	2.17	2.35
		CO2	Analyze the effect of time and current settings on the operating characteristics of an	2.30	2.13	2.27
		CO3	Validate the characteristics of percentage biased differential relay for different bias	2.74	2.17	2.63
		CO4	Prepare an organized written report.	2.30	2.03	2.25
		CO5	Develop the ability to work is team and learns professional ethics.	2.25	2.10	2.22
34	130602: Electrical Engineering Materials	CO1	Describe properties and applications of conducting materials	2.30	2.12	2.26
		CO2	Explain behavior of semiconductor materials, their classification and applications.	2.50	2.08	2.42
		CO3	Explain application of magnetic materials, different terms, classification, hysteresis	2.45	2.15	2.39
		CO4	Explain dielectric materials, their behavior in different fields, polarization and	2.10	2.23	2.13
		CO5	Select appropriate material depending upon specific requirement	2.20	2.12	2.18
35	130611 : Computer Aided Power System Analysis (DE-1)	CO1	Explain unit commitment and different methods for Solving UC problem	2.40	1.90	2.36
		CO2	Apply direct method and lamda iteration method for solving economic dispatch	2.10	2.17	2.83
		CO3	Discuss the concept of reactive power, control of active power and reactive power	2.30	2.40	2.27
		CO4	Solve the AGC problem in isolated and interconnected power systems	2.30	2.17	2.83

S.No	Course		Course Outcome	Direct Attainment	Indirect Attainment	Total Attainment
	(DE-1)	CO5	Illustrate Operations Control Centre functions, System monitoring and Contingency	2.30	2.40	2.25
		CO6	Describe various types of ANN and their applications to power system.	2.25	2.60	2.22
36	130612:Industrial Automation (DE1)	CO1	Analyze architecture of industrial automation system	2.30	2.12	2.26
		CO2	Select appropriate sensors	2.63	2.24	2.55
		CO3	Acquire PLC knowledge	2.10	2.38	2.16
		CO4	Acquire the knowledge of PID control technique	2.60	2.28	2.54
		CO5	Develop small application using PLC & transducer,	2.30	2.14	2.27
		CO6	Compare AC and DC drives for particular applications	2.30	2.12	2.26
37	130603: Minor Project-II	CO1	Formulate the real-world problems.	2.20	2.08	2.18
		CO2	Express the technical ideas, strategies and methodologies.	2.45	2.15	2.39
		CO3	Utilize the new tools, algorithms, techniques to obtain solution of the project.	1.90	2.23	1.97
		CO4	Prepare oral demonstrations.	1.90	2.12	1.94
38	130651: Non Conventional Energy Resources DE2(SWAYAM/ NPTEL)	CO1	Identify energy demand and relate with available energy resources	2.20	2.30	2.22
		CO2	Analyze harnessing of solar energy.	2.20	2.30	2.22
		CO3	Analyze harnessing of wind energy	2.20	2.30	2.22
		CO4	Analyze harnessing of Biomass energy	2.20	2.30	2.22
		CO5	Analyze harnessing of Geothermal and Ocean energies.	2.20	2.30	2.22
		CO6	Analyze Magneto hydrodynamics and Fuel cell technology	2.20	2.30	2.22
39	100007:Disaster Management	CO1	Propose disaster prevention and mitigation approaches.	2.20	2.24	2.21
		CO2	Classify global and national disasters, their trends and profiles.	2.10	2.30	2.14
		CO3	Appreciate the impacts of various disasters.	2.40	2.28	2.38
		CO4	Apply Disaster Risk Reduction in management.	2.20	2.40	2.24
		CO5	Find the linkage between disasters, environment and development	2.30	2.12	2.26
40	900103: (OC1) Energy Conservation & Management	CO1	Explain the basic concepts of Energy Audit & its various terminologies, rules and	2.30	2.12	2.26
		CO2	Acquire fundamental knowledge on the science of energy and on both the	2.30	2.08	2.26
		CO3	Describe different energy auditing methods and the implementation procedures	2.23	2.15	2.21
		CO4	Identify present scenario of energy utilization, management and corresponding ACT	2.10	2.23	2.13

S.No	Course		Course Outcome	Direct Attainment	Indirect Attainment	Total Attainment
		CO5	Recognize process billing, energy tariff and power factor improvements to achieve	2.20	2.12	2.18
41	130711: Electrical Drives (DE3)	CO1	Describe various components of a drive system along with modes of operation,	2.20	2.20	2.20
		CO2	Explain various drives & loads, their characteristics and control methods under	2.40	2.17	2.35
		CO3	Explain performance analysis & control of dc drives	2.30	2.13	2.27
		CO4	Explain performance analysis & control of ac drives	2.20	2.17	2.19
		CO5	Employ the various static converters for speed control of different types of drives	2.30	2.03	2.25
		CO6	Illustrate the functioning of solar, battery powered and traction drives and explain	2.25	2.10	2.22
42	130712: Renewable Energy System (DE3)	CO1	Evaluate the environmental impacts of conventional energy sources and the need of	2.20	2.30	2.22
		CO2	Explain the process of PV generation, wind power generation	2.40	2.30	2.38
		CO3	Describe stand-alone and grid connected configuration	2.36	2.30	2.35
		CO4	Explain the process of fuel cell power generation and its applications.	2.28	2.30	2.28
		CO5	Identify the need of hybrid energy systems.	2.41	2.30	2.39
43	130714: Intelligent Sensors and Instrumentation (DE3)	CO1	Describe transduction principle of sensor based on various energy forms.	2.20	2.20	2.20
		CO2	Explain Smart Sensor Technologies	2.30	2.00	2.24
		CO3	Explain the MEMS, Intelligent and Network Sensors	2.20	2.10	2.18
		CO4	Identify the component of sensor networking	2.28	2.20	2.26
		CO5	Discuss Intelligent Instrumentation techniques	2.30	2.30	2.30
44	130713: IoT in MicroGrid (DE3)	CO1	Identify the role and significance of microgrid in future power systems	2.10	2.17	2.11
		CO2	Describe different types and modes of operation of Microgrids	2.20	2.13	2.19
		CO3	Explain the different control strategies available for Microgrid	2.30	2.17	2.27
		CO4	Select proper energy storage devices for smooth operation of microgrid	2.30	2.03	2.25
		CO5	Describe applications of IoT in Microgrid	2.20	2.10	2.18
45	130751: Introduction to Smart Grid DE4) (NPTEL)	CO1	Apply advanced knowledge of electrical power system operations and control to	2.10	2.03	2.09
		CO2	Conceptualize the design of smart grid by selecting appropriate communication	2.10	2.03	2.09
		CO3	Describe the principles and requirements of the next generation future power	2.10	2.03	2.09
		CO4	Describe the latest trends in IoT for power systems	2.10	2.03	2.09
		CO1	Discuss the various types of electrical equipments and their suitable applications.	2.20	2.00	2.16

S.No	Course		Course Outcome	Direct Attainment	Indirect Attainment	Total Attainment
46	900201:Applications of Electrical Motor & Equipment	CO2	Describe the various schemes of AC, DC drives, traction schemes and different	2.10	2.28	2.14
		CO3	Explain the basics of lighting and illumination and its parameters and able to design	2.20	2.10	2.18
		CO4	Apply the concepts of power electronics technology in efficient utilization of	2.32	2.20	2.30
		CO5	Identify the area for research in field of electric traction & utilization of Electric	2.20	2.13	2.19
47	130701:Control System Lab	CO1	Discuss the need of MATLAB to illustrate modeling and simulation of any system	2.40	2.20	2.36
		CO2	Classify and evaluate the performance parameters of a system and then with	2.40	2.00	2.32
		CO3	Prepare professionals in laboratory to compute or to predict the characteristics of a	2.23	2.17	2.22
		CO4	Evaluate possible causes of discrepancy in practical experimental observations in	2.30	1.80	2.20
		CO5	Demonstrate the ability to interact via team work	2.40	1.90	2.30
48	130702: Summer Internship Project	CO1	Formulate the real world problems.	2.30	2.30	2.30
		CO2	Express the technical ideas, strategies & methodologies.	2.30	2.40	2.32
		CO3	Utilize the new tools, algorithms, techniques to obtain solution of the project.	2.30	2.19	2.28
		CO4	Test & validate the developed prototype/results.	2.20	2.30	2.22
		CO5	Write a project report.	2.30	2.40	2.32
		CO6	Prepare oral demonstrations.	2.50	2.50	2.50
49	130703: Creative Problem Solving	CO1	Identify real time problems	2.10	2.30	2.14
		CO2	Practice various methods to solve problems	2.10	2.40	2.16
		CO3	Produce solutions to various problems	2.10	2.30	2.14
		CO4	Demonstrate various problems solving skills	2.10	2.20	2.12
50	100008:Intellectual Property Rights(IPR)	CO1	Imbibe the knowledge of Intellectual Property and its protection through various	2.40	2.20	2.36
		CO2	Apply the knowledge of IPR for professional development	2.45	2.15	2.39
		CO3	Develop a platform for protection and compliance of Intellectual Property Rights	2.10	2.23	2.13
		CO4	Create awareness amidst academia and industry of IPR and Copyright compliance	2.20	2.12	2.18
		CO5	Deliver the purpose and function of IPR and patenting.	2.60	2.30	2.54
51	130801 :	CO 1	Formulate the real world problems.	2.30	2.42	2.32
		CO 2	Express the technical ideas, strategies & methodologies.	2.20	2.37	2.23
		CO 3	Utilize the new tools, algorithms, techniques to obtain solution of the project.	2.30	2.40	2.32

S.No	Course		Course Outcome	Direct Attainment	Indirect Attainment	Total Attainment
51	Internship/ Project	CO 4	Test & validate the developed prototype/results.	2.50	2.25	2.45
		CO 5	Write a project report.	2.50	2.44	2.49
		CO 6	Prepare oral demonstrations.	2.20	2.51	2.26
52	130802 : Professional Development	CO 1	Develop intellectual curiosity, competency and skills	2.30	2.42	2.32
		CO 2	Develop critical thinking, creativity and effective communication	2.10	2.37	2.15
		CO 3	Display professionalism and ownership of professional growth and learning	2.40	2.40	2.40