ELECTRICAL ENGINEERING DEPARTMENT

B.Tech. ELECTRICAL

Course of Study & Scheme of Examination

2016-17

Maulana Azad National Institute of Technology

Bhopal

SCHEME & SYLLABUS OF B.TECH. ELECTRICAL ENGINEERING

First Semester

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
MTH111/ MTH121	Mathematics I / Mathematics II	3	-	-	3
CE112	Basic Civil Engineering	3	-	-	3
PHY113	Physics	3	-	-	3
HUM114	Communication Skill	3	-	-	3
CS115	Computer Programming	3	-	-	3
ME116	Engineering Graphics	2	2	-	3
CS117	Computer Programming Lab	-	-	3	2
PHY118	Physics Lab	-	-	3	2
				Total credit	22

Second Semester

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
MTH121/ MTH111	Mathematics II/Mathematics I	3	-	-	3
CHM122	Engineering Chemistry	3	-	-	3
CE123	Environment Engineering	3	-	-	3
EE124	Basic Electrical and Electronics Engineering	3	-	-	3
ME125	Basic Mechanical Engineering	3	-	-	3
AM126	Solid Mechanics	3	-	-	3
ME127	Workshop Practice	-	-	2	1
EE128	Basic Electrical and Electronics Lab	-	-	2	1
CHM129	Chemistry Lab	-	-	3	2
				Total credit	22

Third Semester

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
MTH211	Mathematics III	3	-	-	3
EE212	Electrical Materials & Electromagnetic Fields	3	-	-	3
EE213	Electrical Measurement	3	-	-	3
EE214	Networks	3	-	-	3
EE215	Electrical Machines I	3	-	-	3
EE216	Electronics I	3	-	-	3
EE217	Networks Lab	-	-	3	2
EE218	Electrical Machines I Lab	-	-	3	2
EE219	Electronics I Lab	-	-	3	2
EE-210	Electrical Measurement Lab	-	-	3	2
				Total credit 26	

Fourth Semester

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
EE221	Utilization of Electrical Energy	3	-	-	3
EE222	Power System I	3	-	-	3
EE223	Generation of Electrical Power	3	-	-	3
EE224	Electrical Machines II	3	-	-	3
EE225	Instrumentation	3	-	-	3
EE226	Electronics II	3	-	-	3
EE227	Instrumentation Lab	-	-	3	2
EE228	Electrical Machines II Lab	-	-	3	2
EE229	Electronics II Lab	-	-	3	2
				Total credit 24	

Fifth   Semester

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
EE311	Electrical Machines III	3	-	-	3
EE312	Power Electronics	3	-	-	3
EE313	Power System II	3	-	-	3
EE 331- EE342	Departmental Elective I	3	-	-	3
EE 331- EE342	Departmental Elective II	3	-	-	3
EE 351- EE361	Open Elective I	3	-	-	3
EE316	Electrical Machines III Lab	-	-	3	2
EE317	Power Electronics Lab	-	-	3	2
EE 318	Power System II Lab	-	-	3	2
				Total credit 24	

Sixth   Semester

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
EE321	Linear Control System	3	-	-	3
EE322	Electrical Drives	3	-	-	3
EE323	Microprocessor	3	-	-	3
EE 331- EE342	Departmental Elective III	3	-	-	3
EE 331- EE342	Departmental Elective IV	3	-	-	3
EE 351- EE361	Open Elective II	3	-	-	3
EE324	Linear Control System Lab	-	-	3	2
EE325	Microprocessors Lab	-	-	3	2
EE326	Minor Project	-	-	3	2
				Total credit 24	

List of Department Electives (V & VI Semesters)	List of Open Electives (V & VI Semesters)
EE331 Electrical Engineering Graphics	EE351 Modelling and Simulation of Electrical Systems
EE332 Installation, Commissioning and Testing of Electrical Equipments	EE352 Mechatronics
EE333 Reliability Engineering	EE353 Network Synthesis
EE334 Prime Mover	EE354 Optimization Techniques
EE335 Electrical Machine Design	EE355 Embedded System
EE336 Computer Applications in Power Systems	EE356 Biomedical Instrumentation
EE337 Energy Economics Modeling and Analysis	EE357 Project Management
EE338 Evolutionary Techniques	EE358 Intellectual Property Rights (shifted from departmental to open elective)
EE339 Renewable Energy Sources	EE359 Data Structure (CSE211)
EE341 EHVAC & DC	EE361 Analysis and Design of Algorithms (CSE225)
EE342 Digital Electronics	

Seventh Semester

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
EE411	Modern Control System	3	-	-	3
EE421	Power System Stability and Control	3	-	-	3
EE431-EE443	Departmental Elective V	3	-	-	3
EE451-EE463	Open Elective III	3	-	-	3
EE451-EE463	Open Elective IV	3	-	-	3
EE412	Modern Control System Lab	-	-	3	2
EE413	Major Project/Seminar	-	3	3	4
EE414	Educational Tour and Training	-	-	3	2
				Total credit	23

Eighth Semester

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
EE431-EE443	Departmental Elective VI	3	-	-	3
EE431-EE443	Departmental Elective VII	3	-	-	3
EE431-EE443	Departmental Elective VIII	3	-	-	3
EE451-EE463	Open Elective V	3	-	-	3
EE451-EE463	Open Elective VI	3	-	-	3
EE428	Major Project and Seminar	-	6	3	5
EE429	General Proficiency	-	-	3	3
				Total credit	23

List of Department Electives (VII & VIII Semesters)	List of Open Electives (VII & VIII Semesters)
EE431 Reactive Power Control and FACTS	EE451 Artificial Neural Network
EE432 Power Quality	EE452 Microcontroller and its Applications
EE433 Energy Conservation	EE453 Operating System
EE434 Entrepreneurship Development	EE454 Digital Signal Processor (TMS28XX Series)
EE435 Demand Side Management	EE455 Power Controller
EE436 Solar PV Applications	EE456 Fuzzy Logic System
EE437 Special Machines	EE457 System Engineering
EE438 Advanced Microprocessor	EE458 VLSI Design
EE439 Power System Deregulation	EE459 Robotics
EE441 Digital Signal Processing	EE461 Industrial Electronics
EE442 Electronics Instrumentation	EE462 Communication Engineering
EE443 High Voltage Engineering.	EE463 Digital Image Processing

FIRST SEMESTER

Course Number: EE124
Title of Course: BASIC ELECTRICAL & ELECTRONICS ENGG.
Designation as a required or elective course: Required
Pre-requisites: Engineering Physics
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Students will get an overview of fundamentals of Electrical and Electronics engineering.
Topics:
DC circuits: Voltage & Current sources, KCL, KVL, loop and nodal equations, Network theorems. Star Delta transformations, Simple series and parallel circuits, AC Circuits: Alternating quantities, RMS & average value, phase, phase difference Power and power factor, Series & Parallel AC circuits, resonance. Faraday's law of electromagnetic induction, Transformers: construction, principle of operation, phasor diagrams, equivalent circuit, tests, losses and efficiency, DC machines: Construction, emf equation and principle of operation. Semiconductor devices and applications: Characteristics of PN Junction Diode, Zener Effect, Zener Diode and its characteristics, half wave and full wave rectifiers, ripple factor, conversion efficiency, Bipolar Junction Transistor: Principle of operation, Input/output & transfer characteristics of BJT in CB, CE, CC configurations.

Reference Books:
1. D.P.Kothari & I.J. Nagrath, Basic Electrical Engineering, MC Graw Hill Education, 20 Jun 2006
2. V.N.Mittle, Basic Electrical Engineering, MC Graw Hill Education, 10 Sep 2005
3. Schaum's Outline Series, Electrical Circuits, 6th, MC Graw Hill Education, 1 Jan 2014
4. Boylestad & Nashelsky, Electronic Devices and circuit Theory, Pearson, 1 Jan 2009
5. Albert Malvino, Electronics principles, 7th, MC Graw Hill Education, 1 May 2006

THIRD SEMESTER

Course Number: **MTH211**
Title of Course: **MATHEMATICS III**
Designation as a required or elective course: Required
Pre-requisites: Knowledge of Engineering Mathematics
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Knowledge of soft computing techniques.
Topics:
Numerical Methods: Solution of algebraic and transcendental equations, Solution of linear Simultaneous Equations, Finite Differences, Interpolation and Extrapolation, Inverse Interpolation, Numerical Differentiation and Integration, Numerical solution of Ordinary & Partial Differential Equations. Statistics: Curve fitting, Correlation and Regression Analysis Probability Distribution, Sampling and Testing of Hypothesis.

Reference Books:
1. F.B. Hildebrand, Introduction to Numerical Analysis, 2 edition, Mcgraw Hill,1956
2. J.B. Scarborough, Numerical Mathematical Analysis, Oxford and IBH Publishing Company Pvt. Limited,1958
3. E. Balaguruswamy, Numerical Methods, Tata McGraw-Hill Education
4. M.K.Jain, Numerical Methods for scientific and Engineering, New Age International, 2003
5. M. Ray, Mathematical Statistic, Ram Prasad and Sons, 1966
6. John E. Freund, Mathematical Statistic, Pearson Education India, 2004

Course Number: **EE212**
Title of Course: **ELECTRICAL MATERIALS & ELECTROMAGNETIC FIELDS**
Designation as a required or elective course: Required
Pre-requisites: Knowledge of Vector Algebra, Differential Equations, Differentiation, Integration, Engineering Physics.
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Develops conceptual and analytical power to understand advanced subjects of Electrical Engineering.

Topics:
Electrostatic Fields **-**Coulomb's law, electric field intensity, Gauss's Law, boundary relations, physical concepts of divergence, gradient and curl. Electric potentials, electric boundary conditions, capacitance, continuity equation, Poisson's and Laplace's equations, Magnetic Fields - Biot–Savart's Law, Stoke's theorem, Ampere's circuital law, magnetic boundary conditions, energy storage in magnetic fields, Scalar and vector magnetic potential, Maxwell's equations, EM Wave, Propagation, Poynting theorem, instantaneous, average and complex, Polarization of waves, reflection and refraction of waves, Insulating & Dielectric Materials**,** Conducting Materials, Magnetic Materials, superconductivity.

Reference Books:
1. William & Haytt, Electromagnetic field, 7 edition, McGraw Hill Education, 25 April 2006
2. Jorden, Electromagnetics, 2 edition, Pearson India, January 6, 2015
3. C.S. Indulkar, Electrical Engineering Material, 4th Edn., S Chand & Company, 1 December 2006
4. Sadiku, Elements of Electromagnetics, 6 edition, Oxford Univ Press, 31 January 2014

Course Number: **EE213**
Title of Course: **ELECTRICAL MEASUREMENT**
Designation as required or elective course: Required
Pre-requisites: Concept of Basic Electrical Engineering
Contact Hours: 3
Type of Course: Lecture
Course Assessment Methods: Both Continuous and End-Semester Examination
Course Outcomes: To acquire knowledge of analog instruments and methods of measuring electrical and magnetic quantities.

Topics:
Indicating Instruments, Sources of errors, deflecting, controlling and damping torque, Moving Iron, Moving coil, Dynamometer. Induction & electrostatic type of instruments, Rectifier type instruments, Potentiometers, Measurement of Phase and Frequency, Ohm-meters, Megger, CRO, Measurement of Energy, Magnetic Measurements: B-H curve, determination of hysteresis loop, permeameters.

Reference Books:
1. E.W.Golding, Electrical Measurement & Measuring Instruments, Reem Publications Pvt. Ltd, 2011
2. A.K.Sawhney, Electrical Measurement, 14th, DhanpatRai & Sons Publication, 2005
3. Doebelin, Measurement system, 6 edition , McGraw-Hill Education (India) Pvt Limited, 15 June 2011
4. J.B.Gupta, A Course in Electronic and Electrical Measurements & Instrumentation, Reprint 2013 edition, S K Kataria and Sons, 2013

Course Number: **EE214**
Title of Course: **NETWORKS**
Designation as a required or elective course: Required
Pre-requisites: Differential equation, Laplace Transform and basic electrical.
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Analysis of networks, application of theorems.
Topics Covered
Circuit Concept, Network Topology, Coupled circuits, Steady State Analysis, Transient Analysis, Initial conditions, Laplace transform, Waveform synthesis, Network theorems, Network function-Poles & zeros, two port networks, Driving point & transfer impedances, Fourier series, Network synthesis, Conditions for realizing an immittance function of passive elements, Foster form & Cauer form of RC, RL & LC networks.

Reference Books :
1. Van Valkenberg, Network Analysis, Prentice-Hall,
2. Schaum's Outline Series, Circuit theory,
3. C.L.Wadhwa, Network Analysis & Synthesis, New Age International,
4. S.Ghosh, Network theory: analysis and synthesis, PHI,
5. Pankaj Swarnkar, Network Analysis and Synthesis, Satya Prakashan

Course Number: **EE215**
Title of Course: **ELECTRICAL MACHINES-I**
Designation as a required or elective course: Required
Pre-requisites: Fundamentals of Basic Electrical Engineering.
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Knowledge of Machines in electrical systems.
Topics:
Polyphase circuits: Three-phase systems with balanced & unbalanced load. Energy in electromagnetic system, DC Generators- emf equations, characteristics of DC generators, DC motors- Torque equation, characteristics, Losses & Efficiency of DC machine, testing of DC machine, Single phase Transformer: review, transformer tests: polarity test, Sumpner's test**,** Three phase transformers, 3 phase to 2 and 6 phase conversion, parallel operations of single & three phase transformers, load division between transformers in parallel.
IS codes & industrial testing of DC Machines and Transformer.

Reference Books:
1. P.S.Bhimbra, Electrical Machine, Khanna, 1 January 2011
2. G. Say, Performance & design of A.C. Machines, 3rd edition , CBS, 1 December 2005
3. Fitzerald Kingsley Otmans, Electrical Machines, 7 edition , McGraw-Hill Education, 1 March 2013
4. Nagrath & Kothari, Electrical Machines, 4 edition, McGraw Hill Education, 7 July 2010
5. Charles. I. Hubert, Electric Machine, 2 edition, Prentice Hall, 16 October 2001
6. J.R. Cogdell, Foundation of Electric Power, Pck edition , Addison Wesley Longman, May 1, 2003

Course Number: **EE216**
Title of Course: **ELECTRONICS-I**
Designation as a required or elective course: Required
Pre-requisites: Basic knowledge of semiconductor physics, basic electrical and circuit theory.
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Applications of semiconductor devices in regulator, amplifier.
Topics:
Special Purpose Diodes- Diode Applications, Zener voltage regulators, photodiode etc. Transistor Biasing -Purpose of biasing, dc operating point, dc load line, different biasing techniques Thermal Runaway, Thermal stability. Small Signal Amplifiers- Transistor as an amplifier, classification of amplifiers RC coupled CE-amplifier, ac equivalent circuits, analysis using h-parameters, frequency response, cascading, Analysis of transistor amplifier at high frequency, miller theorem, Gain band width product, function generator IC FET & MOSFET, FET biasing, The common source and common drain amplifier at low frequency and high frequencies, MOSFET as a switch, MOSFET driver circuits.
Prevailing trends in semiconductor devices and applications.

Reference Books:
1. Millman & Halkias, Electronic Devices, McGraw Hill Education, 1 September 1967
2. A.P.Malvino, Electronics Principles, 7th edition, McGraw-Hill Higher Education, May 1, 2006
3. Donald I. Schilling, Electronic Circuit Discrete and Integrated, 3rd Revised edition , McGraw-Hill Inc.,US, 1 March 1989
4. David Bell, Electronic Devices, Anna edition, OUP India, 11 October 2010

FOURTH SEMESTER

Course Number: **EE221**
Title of Course: **UTILIZATION OF ELECTRICAL ENERGY**
Designation as a required or elective course: Required
Pre-requisites: Knowledge of Basic Electrical & Electrical Machines
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Knowledge of illumination, electric welding and traction.
Topics:
Nature of light, units, sensitivity of the eye, luminous efficiency, glare, Production of Light, different types of lamps, polar curves, effect of voltage variation on efficiency and life of lamps, Distribution and control of light, factory lighting, flood lighting and street lighting, Electrical heating-advantages, methods and application, resistance over general construction, design of heating elements, efficiency and losses control. Induction heating: core type & core less furnaces and high frequency eddy current heating, dielectric heating: principle and special applications, arc furnaces, Different methods of electrical welding and electrical equipment for them, welding transformers, Advantages and disadvantages, system of electric traction, diesel electric locomotives, Mechanics of train movement: simplified speed time curves, average and schedule speed, tractive effort, specific energy consumption, factors affecting specific energy consumption.
Modern 25 KV AC single phase traction systems: advantages, equipment and layout of 25 KV, single phase power frequency AC traction.

Reference Books:
1. E.O. Taylor, Utilization of Elect. Energy, Blackie & Son Ltd., 1948
2. H. Pratab, Utilization of Elect. Energy, 2012 edition, S.K. Kataria & Sons, 2012
3. J.B. Gupta, Utilization of Elect. Energy, 2012 edition , S.K. Kataria & Sons, 2013
4. G. Weinberg & J.Mares, Traction , Portfolio , October 6, 2015

Course Number: **EE222**

Title of Course: **POWER SYSTEM I**

Designation as a required or elective course: Required

Pre-requisites: Knowledge of basic electrical engineering and circuit analysis.

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: Understanding of technical aspects of power system transmission and distribution system and its working.

Topics:

General Structure of Power System, Single line diagram, transmission line constants, performance of transmission lines, Power Transmission at different voltage level, mechanical design of overhead lines, Type of overhead conductors, Bundle conductors, Skin effect, Proximity effect, line insulators, corona loss, travelling waves on transmission line, , underground cables, distribution systems and their application, HVDC transmission system and its control.

Substation layout, Design of substation and power capacitors, selection of CB and isolator.

Reference Books:

1. C.L.Wadhwa, Electric Power System, John Wiley & Sons, 11 April 1984
2. Asfaq Husain, Electric Power System, 5 edition , CBS, 1 January 2010
3. William D.Stevenson, Elements of Power System Analysis, 4th Revised edition, McGraw Hill Higher Education , 1 September 1982
4. B.R.Gupta, Power System Analysis & Design, Re-issue edition , S. Chand & Company, 8 August 2005
5. D.P. Kothari and I.J.Nagrath, Power System Engineering, 2 edition, McGraw Hill Education, 9 July 2007

Course Number: **EE223**

Title of Course: **GENERATION OF ELECTRICAL POWER**

Designation as a required or elective course: Required

Pre-requisites: Knowledge of Prime movers, Electrical Machinery

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: Develops the knowledge of economical operation, maintenance and design of power plants which is useful in power industry.

Topics:

Introduction of electrical power generation and classification of conventional & non-conventional power generation, Hydro-Electric Stations**,** Thermal Power Stations: Choice of coal fired station site, arrangement of plant and principal auxiliaries, coal handling plant, Nuclear Power Stations-Nuclear Physics, Economic Aspects of Power Plant Operation**,** power factor improvement by static and synchronous capacitors, Economic Scheduling of Power Stations, Hydro power generation.

Reference Books:
1. B.R. Gupta, Generation of Electrical Energy, S Chand, 1 December 2010
2. G.D. Rai, Non-conventional Energy Sources, Khanna, 1 December 2004
3. M.V.Deshpande, Elements of power station design, Prentice Hall India Learning Private Limited , 2009
4. L. R. Kirchmare, Economic Load Dispatching, iitk

Course Number: **EE224**
Title of Course: **ELECTRICAL MACHINES II**
Designation as a required or elective course: Required
Pre-requisites: Concept of rotating electrical machines.
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Knowledge of rotating electrical machine and their applications.
Topics:
3-phase Induction Machine: Construction, Principle, Operation and applications, No-load and blocked rotor test, circle diagram, Starting & speed control of Induction Machines, Synchronous Generators- armature windings, e.m.f. equation, harmonics in the induced e.m.f., armature reaction, OC & SC tests, voltage regulation, parallel operation, operation on infinite bus**.** Two reaction theory, power expressions for cylindrical and salient pole machines, OC & SC characteristics, Synchronous motor: Principle of operation, starting methods, phasor diagram, torque angle characteristics, V-curves, power factor control of synchronous motor, Single Phase Induction Motor-Double revolving field theory, equivalent circuit, no load & block rotor tests, starting methods.
IS codes for testing of AC machines and their applications in electrical systems.

Reference Books:
1. P.S.Bhimbra, Electrical Machines, Khanna, 1 January 2011
2. M.G. Say, Performance & design of A.C. Machines, 3rd edition , CBS, 1 December 2005
3. Fitzerald Kingsley, Electrical Machines, 7 edition , McGraw-Hill Education, 1 March 2013
4. Nagrath & Kothari, Electrical Machines, 4 edition, McGraw Hill Education, 7 July 2010
5. Charles. I. Hubert, Electric Machine, 2 edition, Prentice Hall, 16 October 2001
6. J.R. Cogdell, Foundation of Electric Power, Pack edition , Addison Wesley Longman, May 1, 2003

Course Number: **EE225**
Title of Course: INSTRUMENTATION
Designation as required or elective course: Required
Pre-requisites: Basics of Engineering Physics, Electrical and Electronics Engineering.
Contact Hours: 3
Type of Course: Lecture
Course Assessment Methods: Both Continuous and End-Semester Examination
Course Outcomes: Knowledge of different techniques for measuring physical quantities.
Components measurement using standard methods and different types of signal generators.
TOPICS:
Transducers- Resistance, Inductance and Capacitance transducers, Measurement of Displacement, Strain, Force, Liquid level, Pressure, Temperature, Speed, Optical, Piezo-Electric Transducer, Hall Effect Devices, D.C. & A.C. Bridges, Instrument Transformers, Pulse and Square-Wave Generator, Harmonic Distortion Analyzer, Function Generator, Triangular Waveshape Generator.
Instrumentation using Virtual Instruments.

Reference Books:
1. A.K.Sawhney, Electrical Measurement, Dhanpat Rai & Sons Publication,
2. Kalsi, Electronic Instrumentation, 3 edition , McGraw Hill Education, 28 June 2010
3. Helfric and Cooper, Modern Electronic Instrumentation and Measurement Techniques, Prentice Hall India Learning Private Limited, 1992
4. Doeblin D.O., Measurement Systems- Applications and Design, 5 edition, McGraw-Hill Higher Education, 1 September 2003

Course Number: **EE226**
Title of Course: **ELECTRONICS II**
Designation as a required or elective course: Required
Pre-requisites: Knowledge of semiconductor devices and characteristics and Digital number system.
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Theoretical and practical exposure to semiconductor devices with their applications in analog and digital electronics devices.
Topics:
The differential amplifier, Amplifier and its applications- Op-Amp instrumentation amplifier, current to voltage and voltage to current converter, Feed back concept, topologies voltage series current series, voltage shunt and current shunt, Wien bridge oscillator RC phase shift, Hartley and Colpitt oscillator, Multivibrators - Astable, Monostable and Bistable, Large signal amplifiers class A, class B and basic idea of push pull action, distortion, the current mirror, darlington and complementary pairs. Number system, Boolean algebra, logic gates, Half/ Full Adder, Half/ Full Subtractor, Multiplexer/ Demultiplexer, Flip flops & their Application, Registers and Counters.
Audio power amplifier (LM 380), IC fabrication Process and Op-Amp application in Industry.

Reference Books :
1. Millman & Halkies, Electronic Devices & Circuits, , McGraw Hill Education , 1 September 1967
2. A. P. Malvino, Electronics Principles, 7th edition, McGraw-Hill Higher Education, May 1, 2006
3. Ramakant A. Gayakwad, Op-Amp & Linear Integrated Circuits, 3rd Revised edition edition , Prentice-Hall, 2 January 1993
4. William H.Gothmann, Digital Electronics, 9 edition, Pearson, July 28, 2011

FIFTH SEMESTER

Course number: EE311
Title of course: **ELECTRICAL MACHINES-III**
Designation as a required or elective course: Required
Pre-requisites: Knowledge of electrical machines
Contact hours: 3 Hours
Type of course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course outcomes: Knowledge of modeling and study sate and transient analysis of electrical machine.

Topics:
Kron's primitive machines, Park's transformations. Generalized model of DC machine, Interconnection of machines, Generalized model of 3-phase synchronous machine , steady state and transient analysis, generalized model for 3-phase induction machine, performance equation & steady state analysis, effect of voltage & frequency variations on the induction motor performance, operation of I.M. on unbalanced supply voltage, Induction motor starting analysis. Constructional features, working principle and analysis of Universal Motor, Stepper motor, Linear Induction Motor, Hysteresis motor, Reluctance motor, brushless DC motor, Schrage motor, repulsion motor.
Industrial applications of special machines.

Reference Books :
1. P.S.Bhimbra, Generalised Theory of Electrical Machines, Khanna publishers, July 2015
2. P.S.Bhimbra , Electrical Machines, , 7th Edition, Khanna publishers, 2011
3. J. Nagrath and D.P.Kothari,Electrical Machines, 4th Edition, Mcgraw Hill Education, 2010
4. Fitzgerald & Kingsley, Electric Machinery, 7th Edition, McGraw-Hill, 2013

Course Number : EE312

Title of Course : **POWER ELECTRONICS**

Designation as a required or elective course : Required

Pre-requisites : Knowledge of Basic Electrical Engg, Networks and Basic Electronics

Contact hours : 03

Type of Course : Lecture

Course Assessment methods : Both continuous and semester-end assessment

Course Outcomes : Application of power converters in electrical systems

Topics:

Introduction to SCR and Thyristor family, I-V Characteristics of self Commutated Self commutated switches such as MOSFET, IGBT etc., Basic concepts of firing and control circuit, gate/base drive circuits and protection, design of snubber circuit, AC/DC uncontrolled and Controlled converters, DC-DC, DC-AC and AC-AC converter circuits : topologies, operation, waveform analysis and applications,

Datasheet Ratings for Power Semiconductor Devices. Selection of devices/modules, thermal design, driver circuits etc.

Reference Books :
1. C W Lander, Power Electronics, 3rd Edition, McGraw-Hill, 1993
2. M. H. Rashid, Power Electronics : Circuits Devices and Application, 2nd Edition, 2006
3. P S Bimbhra, Power Electronics , Khanna Publishsers-Delhi, edition 2012
4. Ned Mohan Tore M. Undeland William P. Robbins, Power Electronics : Converters, Applications & Design, 3rd Edition, John Wiley & Sons
5. Joseph Vithayathil, Power Electronics: Principles and Applications, McGraw-Hilll

Course Number: **EE313**
Title of Course: **POWER SYSTEM II**
Designation as a required or elective course: Required
Pre-requisites: Knowledge of basic electrical engineering and power system structure and its
components
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: knowledge of switch gear and power system protection.
Topics Covered:
Faults in power system, Symmetrical components and sequential networks, Symmetrical and unsymmetrical faults, current limiting reactors, load flow solutions, various type of protective relays and their applications, transformer, generator and Bus Bar protection, protection of transmission line, Theory of current interruption, different types of circuit breakers and their applications, LT switch gears, HRC fuse.
Auto reclosure and multifunction relays.

Reference Books:
1. C.L.Wadhwa, Electrical Power Systems, New Age International, 6th Edition, 2010
2. Nagrath & Kothari, Modern Power System Analysis, 3rd Edition, Springer Verlag, 2003
3. Y.G.Paithankar & S.R.Bhinde, Fundamentals of power system protection, 2nd Edition, PHI LEARNING PVT. LTD-NEW DELHI, 2010
4. A.R.Van C.Warrington, Protective relays: Their theory and practice, Edition, Springer, 2013
5. P.M. Anderson, Power system protection, CBS PUBLISHERS & DISTRIBUTORS-NEW DELHI, Edition, 2012
6. B. Ram, Power system protection & Switchgear, 2nd Edition, Mcgraw Hill Education, 2011

SIXTH SEMESTER

Course Number: **EE321**
Title of Course: **LINEAR CONTROL SYSTEM**
Designation as a required or elective course: Required
Pre-requisites: Knowledge of Laplace transforms
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Mathematical analysis of system components, stability, design of controller and compensating network.
Topics:
System concept, mathematical modeling of system components, Transfer function of linear systems, Time response, relation between Time and frequency domain, different types of controllers, Stability analysis of linear systems using Routh Hurwitz, root locus, Nyquist and Bode plot, Design of compensating networks using Bode plots and root locus.
Modeling and design of process control system, servo application in industries.

Reference Books:
1. B. S. Manke, Linear control system, Khanna Publishers, January 2012
2. B.C.Kuo, Automatic control system, 9th Edition, Wiley India Pvt Ltd, October 2014
3. Nagrath Gopal, Control system Engineering, 5th Edition, New Age International, 2007
4. K Ogata, Modern control Engineering, 5th Edition, PHI LEARNING PVT. LTD-NEW DELHI, 2010
5. Pankaj Swarnkar, Automatic Control System, Satya Prakashan, 2015-2016
6. Dorf Bishop, Automatic Control System, 12th Edition, Pearson Education, January 2014.

Course Number: **EE322**
Title of Course: **ELECTRICAL DRIVES**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: Knowledge of Electrical Machines, Power Electronics & Control
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: To learn about the operation & control of Electrical Drives & their Industrial Applications.
Topics:
Introduction of Electrical Drives, Modes of operation, Dynamics of electrical drives, closed loop control of drives speed control of multi-motor drives, speed sensing, current sensing, phase locked loop (PLL) control. DC Motor Drives - Review of DC Motors & their performances, starting, braking & speed control by single-phase and three-phase controlled converter and chopper. Closed loop control of DC drive. Induction Motor Drives, Review of three-phase induction motor, Analysis & performance, starting, braking, speed control, Stator voltage control, frequency control, V/F control, current control, rotor-resistance control, slip-energy recovery control. Synchronous motor drives – review of synchronous motor, speed control by variable frequency, VSI, CSI and Cycloconverter, Energy conservation in Electrical Drives.
Industrial Applications of DC Motor & Induction Motor Drives.

Reference Books :
1. G.K.Dubey, Fundamental of Electrical Drives, 2nd Edition, CRC Press, 01-May-2002.
2. G.K.Dubey, Power Semiconductor controlled drives, Prentice Hall, 1 December 1988.
3. P.C.Sen, Thyristor DC Drives, Krieger Publishing Company,31 December 1991.
4. B.K.Bose, Power Electronics and AC Drives, Prentice Hall PTR, 2002.
5. Werner Leonhard, Control of Electrical Drives, 3rd Edition, Springer, 10 August 2001.

Course Number : EE323
Title of Course : MICROPROCESSORS
Designation as a required or elective course : Required
Pre-requisites : Knowledge of Electronics & Digital Electronics
Contact hours : 03
Type of Course : Lecture
Course Assessment methods : Both continuous and semester-end assessment
Course Outcomes : Fundamental knowledge and applications of Digital Controllers
Topics :
Evolution and overview of Microprocessor, 8-bit Microprocessor Architecture (viz 8-bit Intel 8085), timing and control signals, Instruction set and programming, Interrupts, Memory types and organization, Programmable Peripherals Interface (8255), Programmable Interval Timer 8253, A/D and D/A Converters and interfacing, Applications, 16-bit Microprocessor (viz – Intel 8086) and its internal architecture,.

Reference Books :
1. B.Ram, Fundamentals of Microprocessors and Microcomputers, Dhanpat Rai Publications, 2012
2. Ramesh Gaonkar, Microprocessors Architecture Programming and Applications, 6th Edition, Penram International Publishing, 1 October 2013
3. Roger L. Tokheim, Schaum's outline of Theory & Problems of Microprocessor Fundamentals, 2nd Revised Edition, Schaum Outline Series, 1 November 1989.
4. K J Ayala, The 8051 Microcontroller, 3rd Edition, Cenage Learning, 2007

LIST OF ELECTIVES THIRD YEAR (V& VI Semester)

List of Departmental Electives

EE331 Electrical Engineering Graphics
EE332 Installation , Commissioning & Testing of Electrical Equipments
EE333 Reliability Engineering
EE334 Prime Mover
EE335 Electrical Machine Design
EE336 Computer Applications in Power Systems
EE337 Energy Economics Modeling and Analysis
EE338 Evolutionary Techniques
EE339 Renewable Energy Sources
EE341 EHVAC & DC
EE342 Digital Electronics

List of Open Electives

EE351 Modelling & Simulation of Electrical Systems
EE352 Mechatronics
EE353 Network Synthesis
EE354 Optimization Techniques
EE355 Embedded System
EE356 Biomedical Instrumentation
EE357 Project Management
EE358 Intellectual Property Rights
EE359 Data Structure and Algorithms (CSE211)
EE361 Analysis and Design of Algorithms (CSE225)

DEPARTMENTAL ELECTIVES THIRD YEAR (V & VI Semester)

Course Number: EE331
Title of Course: **ELECTRICAL ENGINEERING GRAPHICS**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Fundamental of Engineering Graphics
Contact hours: 03
Type of Course: Lecture + Drawing Class
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Students will get an overview of drawing and designing of electrical equipments using software as well as manual.
Topics:
Introduction to general purpose graphics software: AutoCAD, Conventional Symbols and brief introduction to electrical equipments, measuring instruments, Sketches of transmission line structures, insulating equipments, Sectional drawing: Cables, overhead conductors. Wiring systems: domestic, staircase and godown wiring, wiring installation in small residences. Types of transformer and their parts, core construction, sectional view of 1-phase and 3-phase transformers, H.T. and L.T. windings, DC machine : construction of pole, yoke and field coils, commutator.
Design of layout of Primary and Distribution substations, Bus bar arrangement and substation equipments.

Reference Books:
1. K.L.Narang, Electrical Engineering Drawing, SATYA PRAKASHAN-NEW DELHI, 2014.
2. N.D.Bhatt, Engineering Drawing, 53rd Edition, CHAROTAR PUBLISHING HOUSE PVT.LTD., 2014.
3. T.Jayapoorva, Engineering Drawing and graphics with AutoCAD, 3rd Edition, Vikas Publishing, 2010
4. Surjit Singh, Electrical Engineering Drawing (Part I & II), S.K. Kataria & Sons, 2013
5. Autodesk Inc. CA, USA, User's Guide, AutoCAD 2012

Course number: EE-332

Title of course: INSTALLATION AND COMMISSIONING

Designation as a required or elective course: DEPARTMENTAL ELECTIVE

Pre-requisites: Knowledge of electrical machines, Engineering graphics and power system

Contact hours: 3 Hours

Type of course: Lecture

Course Assessment methods: both continuous and semester-end assessment

Course outcomes: Trends and practices knowledge of electrical equipments installation, testing and commissioning.

Topics:

Tools, accessories and instruments required for installation, maintenance and repair work, Substation and Earthing, Testing of electrical equipments, Domestic installation, Environmental pollution prevention, Electrical Accident & Safety measures, treatment of shock.

Condition Monitoring and Maintenance of electrical equipments: transformers, machines, switchgears, cables, Fault location in cable and transmission / distribution feeders.

Reference Books:

1. P.P. Gupta, Installation, Commissioning & Maintenance of Electrical Equipment, Dhanpat Rai Publications, 2012
2. K. B. Bhatia, Fundamentals of Maintenance of Electrical Equipments, Khanna Publihers, 1983
3. S. Rao, Testing Commissioning Operation & Maintenance of Electrical Equipment, Khanna publishers, 1st January 2004.
4. S.L.Uppal, Electrical Power System, Khanna Publishers Delhi, 2009.
5. B.K.N.Rao, Hand book of condition monitoring, Elsevier Advanced Technology, 22 November 1996.
6. S. K. Shastri, Preventive Maintenance of Electrical Apparatus, Katson Publication House.
7. B. V. S. Rao, Operation & Maintenance of Electrical Equipment, Asia Pub. House, 1 April 1969.

Course Number: **EE333**
Title of Course: **RELIABILITY ENGINEERING**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Basic concepts of Probability theory
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Knowledge of reliability theory will enable students in understanding system planning with greater efficacy.
Topics:
Basic Concepts of Reliability-indices and criteria, use of probability theory for reliability evaluation, System Reliability Evaluation using Probability Distributions- series, parallel and series-parallel, MTTF, MTBF, concept of redundancy, Markov Modeling, Frequency and Duration techniques, Generating System Reliability Analysis-recursive model building, Distribution System Reliability analysis-application to radial networks, Effect of protection system and their failures.
Case studies concerning reliability analysis of power and distribution system.

Reference Books:
1. R. Billinton, R.N.Allan, Reliability Evaluation of Engg. System, Springer US, 1996
2. G.H.Sandler, System Reliability Engg.
3. Endreynil, Probabilistic Reliability Evaluation

Course Number: **EE334**
Title of Course: **PRIME MOVER**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Basics of Thermodynamics
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Application of prime movers in power generation.
Topics:
Expansion of Gases - Reciprocating Air Compressor, volumetric efficiency, Adiabatic and iso-thermal efficiency, Multistage compressor, Steam power cycles and Steam Nozzles, Carnot cycle, Ranking cycle analysis, Ranking engine, Regenerative feed heating cycle, Binary vapour cycle, Isotropic flow of steam through nozzles, Steam Turbine and Condensers, Turbine blades and different efficiencies. Condensing plant, Condensers, Vacuum and its measurement. Vacuum and condenser efficiency, Cooling water requirements, I.C. Engines, Turbines - Gas, Fluids & Hydraulic, Pelton, Francis Kaplan and Bulb.
Recent trends in turbine, compressor and IC engine design.

Reference Books:
1. Domkundwar, Thermodynamics and Heat Engines.
2. Mathur and Mehta,Thermal Engg., Jain Bros, 1 January 2002
3. R.K. Rajput, Thermal Engg. 10th Edition, Laxmi Publications, 2017.
4. P. L. Ballaney,Thermal Engg., 5th Edition, Khanna, 2005.
5. R.K. Bansal, Fluid Mechanics, 9th Edition, Laxmi Publications, 2017.

Course Number: **EE335**
Title of Course: **ELECTRICAL MACHINE DESIGN**
Designation as a required or elective course: Required
Pre-requisites: Knowledge of Electrical Machines and materials
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Knowledge of Design of Electrical machine.
Topics:
General concepts & considerations of electrical machine design: heating and cooling characteristics of machine, Magnetic circuit calculations. Design of DC machines: Output equation, specific loadings and number of poles, main dimensions of DC machines, winding design, Design of transformers: Output equation, determination of main dimensions, design of LV and HV winding, estimation of no load current, leakage reactance and voltage regulation. Design of induction motors: Output equation, main dimensions, Stator winding design, length of air gap, design of squirrel cage and wound rotor, estimation of no load current and leakage reactance, Design of Synchronous machine: Output equation, main dimensions, Stator winding design, design of rotor, Introduction to computer aided design.
Recent Industrial Trends in Electrical Machines design.

Reference Books:
1. Clayton, Design of DC Machines, CBS, 2 July 2004
2. M.G.Say, Performance and Design of A.C.Machines, 3rd Edition, CBS, 1 December 2005.
3. G.C.Jain, Design, Operation and Testing of Synchronous Machines, Asia Publishing House, February 1967
4. Say & Sinha, Computer aided design.
5. V.N.Mittle & A.Mittal, Performance & Design of Electrical Machines.
6. A.K.Sawhney, Design of Electrical Machines.
7. B.H.E.L, Transformer, Tata McGraw-Hill Education, 01-Jan-2003.
8. J.H. Walker, Large A.C. Machines: Design, Manufacture and operation, Oxford University Press, 1 August 1981.

Course Number: **EE336**
Title of Course: **COMPUTER APPLICATIONS IN POWER SYSTEM**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Basic knowledge of power system analysis
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Develops the skills to use computer programming in power system analysis.
Topics:
Power system components and representation, Load Flow Studies, Contingency evaluation, concept of security monitoring, Introduction to Optimal power flow analysis, calculation of loss coefficients, Sensitivity analysis, Transmission loss coefficients, transmission loss formula as a function of generation and loads.
State Estimation: power system monitoring, energy management system (EMS), SCADA, function of state estimator, maximum likelihood estimation.

Reference Books :
1. O.I. Elgerd, Electric Energy Systems Theory - An Introduction, McGraw-Hill, 1988.
2. J.J. Grainger and W.D. Stevenson, Power System Analysis, Mc Graw-Hill, New York, 1994.
3. I.J. Nagrath and D.P.Kothari, Power System Engineering, Tata Mc Graw Hill Publishing Co., 1994.
4. M.A. Pai, Computer Techniques in Power Systems Analysis, Tata Mc Graw Hill, June 18, 2014.
5. Stagg G.W. and E.L. Abiad A.H., Computer methods in power systems analysis, Mc Graw Hill, Apr 1968.

Course Number: EE337
Title of Course: **ENERGY ECONOMICS: MODELLING AND ANALYSIS**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: knowledge of energy related issues, linear programming
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: The course is designed to expose the students to major energy-economic modeling approaches and their applications to energy technology assessments and energy and environmental policy analysis.

Topics:
Models and modeling approaches, input-output analysis, energy aggregation, factor decomposition analysis, mathematical optimization techniques for energy modeling, energy system models, Formulation of Linear Programming (LP), modeling energy-economic and environmental interactions, model applications in energy technology assessment, Integrated assessment models, alternative energy resource assessment and energy and environmental policy analysis.
Energy and environmental policy analysis.

Reference Books:
1. H.G. Huntington and J.P. Weyant, Modeling Energy Markets and Climate Change Policy, Energy Modeling Forum, EMF OP 52, Stanford University, CA.
2. Intergovernmental Panel on Climate Change (IPCC), Fourth Assessment Report.
3. J-C. Hourcade, M. Jacard, C. Bataille, and F. Ghersi (eds.), Hybrid Modeling of Energy-Environment Policies: Reconciling Bottom-Up and Top-Down, The Energy Journal, Special Issue, International Association for Energy Economics, USA.
4. J.B. Taylor, Principles of Macroeconomics, South-Western College Pub., 6th edition.
5. N. G. Mankiw, Macroeconomics, 8th Edition, Worth Publishers, 1 June 2012

Course Number: EE338
Title of Course: **EVOLUTIONARY TECHNIQUES**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Concept of optimization techniques & engineering mathematics
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Student will learn to solve the non-linear optimization problem.
Topics:
Optimization: single objective, multi-objective and constraint problem, linear, non-linear and NP hard problem, combinatorial optimization, Conventional optimization method (lambda and differential). greedy optimization technique. Simple genetic algorithm, Multi-objective genetic algorithm. Artificial neural network, Fuzzy logic, Ant colony optimization. Particle swarm optimization. Basic simulated annealing, Basic tabu search method, Bacteria forging and Fish schooling optimization, Bee flying optimization. Teaching Learning based Optimization.
AI Application in Electrical Systems.

Reference Books:
1. J.M.Zurada, Introduction to Artificial Neural System, West Publishing Co, 1 April 1992
2. V.Rao & H.Rao, C++ Neural Networks and Fuzzy Logic, 2 Pap/Dsk edition, M & T Books, October 1995.
3. Marco Dorigo and Thomas Stutzle, Ant Colony Optimization, PHI
4. D.E. Goldberg, Genetic Algorithm in Search Optimization and machine learning, 13th Edition, Addison Wesley, 1 January 1989.

Course Number: **EE339**
Title of Course: **RENEWABLE ENERGY SOURCES**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: concept of Machines, generation and Power electronics.
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Renewable energy sources and their grid synchronization.
Topics:
Energy for sustainable development, Renewable and Non-renewable Energy sources, mini-micro hydro, small hydro systems, Different type of turbines, generators & controls, Wind energy: Wind Energy Conversion, Potential, Site selection, Types of wind turbines, Wind Generation and Control. Solar Radiation, Measurement and Estimation, Solar Thermal Conversion Devices and Storage and Applications, Solar Photovoltaic Conversion, applications of solar PV, Stand alone/grid connected, Energy Alternatives: The Nuclear Option, Wave and Tidal Energy, Geothermal, Bio energy, Ocean thermal energy systems, MHD & fuel cells.
Grid Interactive and stand alone / Distributed Renewable energy systems.

Reference Books :
1. Chetan Singh Solanki, Solar Photovoltaic's: Fundamental Technologies and applications, 2nd Edition, Prentice Hall India Learning Private Limited, 2011.
2. Chetan Singh Solanki, Renewable Energy Technologies: Practical Guide For Beginners, Prentice Hall India Learning Private Limited, 2008.
3. S. P. Sukhatme, Solar Energy - Principles of thermal collection and storage, McGraw-Hill Education (India), 13 January 2009.
4. J. A. Duffie and W. A. Beckman, Solar Engineering of Thermal Processes, 4th Edition, Wiley, April 2013
5. D. Y. Goswami, F. Kreith and J. F. Kreider, Principles of Solar Engineering, 2nd Edition, CRC Press, 2 March 2000.

Course Number: **EE341**
Title of Course: **EHV AC & DC TRANSMISSION**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Knowledge of Power System
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Knowledge of Extra High Voltage AC & DC Transmission System.
Topics:
EHV AC Transmission: Need of EHV transmission lines, power handling capacity and surge impedance loading, Problems of EHV transmission, bundled conductors, Electrostatic fields of EHV lines and their effects, corona effect, Methods of voltage control. Synchronous phase modifier, shunt capacitors and reactors, HVDC Transmission: Types of D.C. links Basic principles of DC link control and basic converter control characteristics, Application of HVDC transmission.
Mechanical oscillations and vibration in long transmission line, HV tower design.

Reference Books:
1. Begamudre, EHV AC & DC Transmission, New Age International, 01 Jan 2007
2. S. Rao, EHV AC & DC Transmission, 3rd Edition, Khanna Publication, 2008.
3. P.Kundur, H.V.D.C. Transmission, McGraw Hill Pub.
4. Thomas E. Kissell, Electricity, Electronics, and Control Systems for HVAC, 4th Edition, Pearson, 28 October, 2007.

Course Number: **EE342**
Title of Course: **DIGITAL ELECTRONICS**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Basic knowledge of Electronics Devices, Digital Number Systems.
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Knowledge of digital systems for real time applications.
Topics:
Combinational circuit: Full/half adder, Full/half subtractor, Parallel adder and subtractor, BCD adder, Excess 3 adder, Magnitude comparator, Look-ahead carry generator, Encoder/Decoder. Flip-Flop: RS, clocked RS, T, D, JK, Sequential circuits: State diagrams, Minimization of sequential circuit, Designing of sequential circuit-Registers, synchronous and asynchronous counter.

Digital to analog converter (DAC), analog to digital converter (ADC), Semiconductor memories Programmable Logic Devices & Arrays, simple active filter and sample and hold circuits.

Reference Books:
1. Morris Mano, Digital Electronics, First edition, Pearson Education India, 30 June 2016
2. R. P. Jain, Modern Digital Electronics, 4th edition, McGraw Hill Education, 27 July 2009.
3. Malvino and Leach, Digital Principles and Applications, 5th Edition, McGraw-Hill Inc.,US, 1 March 1994.
4. Gothman, Digital Electronics, Prentice Hall Publications
5. Anand Kumar, Fundamentals of Digital Circuits, 3rd Revised Edition, Prentice-Hall India, 30 November 2014

OPEN ELECTIVES THIRD YEAR (V & VI Semester)

Course Number: EE351
Title of Course: **MODELING & SIMULATION OF ELECTRICAL SYSTEMS**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: Fundamental knowledge of Basic Electrical and Electronics
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Modeling and Simulation of Electrical Systems.
Topics:
Simulation Mechanism and Simulation Tools, Modeling and simulation of electrical and electromechanical systems, Transient analysis of dynamic systems, study of dynamic system using state space approach, Simulation of Non-Linear System, Handling Arrays, Control Structures, File Handling, Functions and Function Files, Differential Equation Solver, Simulation of Electrical Networks with linear and nonlinear equations, Simulink Solution of Differential Equation, Solution using Laplace Transform Approach, Study of dynamic response.
MATLAB interface with Real Time Simulators and controllers such as dSPACE, FPGA, Simulation of industrial systems.

Reference Books:
1. MATLAB/Simulink Users Manual, MathWorks Inc
2. Rudrapratap Getting started with MATLAB, Oxford 28 May 2010
3. William D Paul, MATLAB 7, McGraw-Hill Higher Education, 2nd Edition August 2004
4. Shailendra Jain, Modelling and simulation using MATLAB-Simulink, Wiley India, 2nd edition Jan 2015

Course Number: **EE352**
Title of Course: **MECHATRONICS**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: Basic knowledge of Electrical and Electronics.
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Application of electronics for control of mechanical systems.
Topics:
Elements of Mechatronics System, Evolution of Mechatronics, Architecture of Mechatronics, Sensors and Transducers, Signal Conditioning, Various OP-AMP & other electronic circuits used in signal conditioning, Active & Passive Filters, Mechanical, Electrical Hydraulic and Pneumatic Actuators and Applications, Logic Building and Processing, Logic Gates, Combinational and Sequential Logic, Fuzzy Logic, Microprocessor, PLC, Applications in CNC and FMS.

References Books:
1. W. Bolton, Mechatronics, 4th Edition, Pearson Education, 2010
2. Beckwith and Beck, Mechanical Measurements, 6th Edition, Pearson Education India, 2013
3. Sirohi and Radhekrishnan, Mechanical Measurements, 3rd Edition, John Wiley & Sons, 11 June 1993
4. Appukuttan K.K. , Mechatronics, Oxford University Press, 2 August 2007

Course Number: **EE353**
Title of Course: **NETWORK SYNTHESIS**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: Knowledge of network analysis and basic electrical
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Students will be able to synthesis and analyze the electrical system and design of filters.
Topics:
Positive Real Functions: Driving point functions, Brune's Positive Real Function, Hurwitz Polynomial, Driving point synthesis with LC element, Foster and Cauer Form of RC and RL network, Foster and Cauer Form of LC network, Series and parallel realizations, symmetrical Lattice and Constant-Resistance Network.
Design and implementation of active and passive filters.

Reference Books:
1. S.P. Ghosh and A. K. Chakraborty, Network analysis and synthesis, McGraw Hill Education, 1 July 2013
2. Smarajit Ghosh, Network theory: analysis and synthesis, 1st Edition, Prentice Hall India Learning Private Limited, 2005
3. M.E. Van Valkenburg, Introduction to modern network synthesis, John Wiley & Sons, 1 January 1966
4. Franklin F. Kuo, John Wiley, Network Analysis and Synthesis, Wiley, Second Edition, 16 October 2009
5. Vanvalkenburg, Network Analysis, 3rd Edition, 2009
6. Lawrence P. Huelsman, Active and Passive Analog Filter Design, McGraw-Hill Inc.,US, 1 March 1993

Course Number: **EE354**
Title of Course: **OPTIMIZATION TECHNIQUES**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Knowledge of engineering mathematics
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Applications in various areas of engineering research.
Topics:

Optimization problem: Engineering applications and classification, classical optimization techniques: Linear programming, graphical method, simplex method, duality in LP, Non linear programming: Lagrangian's method, Kuhn Tucker conditions, quadratic programming, stochastic programming, Integer programming, branch and bound technique, dynamic programming, shortest path model, minimum spanning tree problem, maximal flow problem.

Reference Books:

1. N. D. Vohra, Quantitative Techniques in Management, 4th Edition, McGraw Hill Education, 28 October 2009
2. P.K. Gupta & D.S. Hira, Operation Research, SULTAN CHAND & SONS-NEW DELHI, 2014
3. H.M. Wagner, Principles of Operation Research, 2nd Edition, Prentice Hall India Learning Private Limited, 1980.

Course Number: **EE355**
Title of Course: **EMBEDDED SYSTEM**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: Knowledge of system modeling
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: knowledge of software and hardware of embedded system for engineering applications.

Topics:
Embedded systems & their characteristics, modeling of systems, system specifications, specification languages, study of specification example, Specification translation, translation of various features such as state transition, message passing communication, concurrency, exception handling, System partitioning- Introduction, partitioning issues, partitioning algorithms, functional portioning, hardware/software partitioning algorithms, functional partitioning for systems. Design quality estimation- Quality metrics, hardware estimation, software estimation, Specification refinement- Refining variable grouping, channel refinement, resolving access conflict, refining incompatible interfaces, refining hardware/software interfaces.
Study of a system design methodology and study of generic synthesis system.

Reference Books:
1. David D Gajski, Frandk vahid S. Narayan, J Garg, Specification and design of embedded systems, Pearson Education India, 2007
2. Heath Steve and Newns, Embedded system design, Second edition, Elsevier India, 17 May 2005
3. J.Gassle, Art of programming Embedded Systems, Academic Press, 3 February 1992

Course Number: **EE356**
Title of Course: **BIO-MEDICAL INSTRUMENTATION**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: Knowledge of Instrumentation
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Basic principle, construction and implementation of Biomedical Instrumentation.

Topics:
Introduction to the physiology, sources of biomedical signals, Medical instrumentation system, Potential, Electrodes, Cardiovascular measurement, Measurement of Blood Pressure, Blood Flow, ECG, Phonocardiography, Plethysmography, Pace-maker, Defibrillator, Measurement of Electrical Activities in Muscles and Brain, EMG, Measurement of Respiration rate, Instrumentation for Clinical Laboratory, Medical Imaging-Ultrasound Imaging, Radiography, MRI, Electrical Tomography and Applications, Biotelemetry.
Aspect of patient care monitoring, Electrical shock hazards and prevention.

Reference Books:
1. R. S. Khandpur, Handbook of Biomedical Instrumentation, 3rd Edition, McGraw Hill Edu., 4 Aug 2014
2. L. Cromwell, F. J. Weibell and E. A. Pfeiffer, Biomedical Instrumentation and Measurements, 2nd Edition, Prentice Hall India Learning Private Limited, 1990

Course Number: **EE357**
Title of Course: **PROJECT MANAGEMENT**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: knowledge of business organization and management
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: managerial skill to handle human resources in business organization.
Topics:

Management: Evolution, development, characteristics, principles, philosophy, Nature and function, (MBO), (MBE) their importance characteristics and applications, Organizational Behavior: Human behavior, group dynamics, Leadership theories, styles and modern philosophies, motivation approaches and theories, communication, barriers and breakdowns, management information system, use of Computer in Management, Employees, Personnel Management practices, methods, recruitment, selection, interviews, group discussions, training, placement and employees development, wages and incentives, labor welfare, conflict, Negotiations, best practices. Marketing: concept, principles, functions, market survey and research, concepts of sales and distribution, channels of distribution, salesmanship, sales promotions, methods of advertising, copy right, sales management practices. Financial Management: goals of financial management, Sources of finance, Permanent long term, Short term Sources, Interest rates, annuity cost of capital, capital structure, decisions, Break-even Analysis, Financial Planning.

Reference Books:
1. Stonner & Freeman, Management, 6th Edition, Pearson Education India, 2003
2. Philip Kotler, Principle of Marketing, European Edition, Prentice Hall, 1 Feb 1996
3. K.K. Ahuja, Industrial Management, Khanna Publisher, 2001
4. S.K. Banerjee, Financial Management

Course Number: EE358
Title of Course: **INTELLECTUAL PROPERTY RIGHTS**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: Technical knowledge and basic understanding of IPR laws is important
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: To know the legal process to file IPR, benefits of IPR, awareness about the international scenario in IPR, Indian laws and acts regarding IPR, offences and penalties in registration of IPR.

Topics:
Introduction to IPR: Introduction to IPR, Importance, need of IPR, Intellectual assets and value realization, Forms of IPR, Patent, Copyright, Trademarks, Protection of IC layout designs, Geographical Indicators, Protection of undisclosed information, control of anti competitive practices and industrial design. Patents: Concept of property and history of patents, Indian Patent Act and rules, Novelty, Inventiveness and usefulness, Patent application procedure, patent able and non-patent-able inventions including product vs process patents. Industrial Designs: Registration, concept of novelty, originality, utility, obviousness, rights, obligations and limitations of registration of design, offences and penalties.

Trade Marks & Copy Rights: Introduction, registration, concept of deceptive similarity, rights and limitations of trademarks, offences and penalties. International Treaties: Introduction to international treaties, conventions and organizations, TRIPS, PCT, Berne Convention, WIPO, EPO, UPOV, Introduction to WTO, Introduction to dispute settlement procedure (technical & legal), Indian position in global IPR structure, Facilitating technology transfer and Capabilities building.

Reference Books:

1. Brigitte, Anderson, Intellectual Property Right: Innovation, Governance and the Institutional Environment Edward Elgar Publishing, USA
2. Peter J.Groves, Intellectual Property Right & their Valuation, Wood head Publishing Ltd., 9 Oct 1997
3. Duncan Mathews, Globalizing Intellectual Property Rights, Rutledge Publishing
4. Jane, Lambert, Enforcing Intellectual Property Rights, Routledge Publishing Limited, 28 Feb 2009

Course Number: EE359 (CSE 211)

Title of Course: **DATA STRUCRURE**

Designation as a required or elective course: OPEN ELECTIVE

Pre-requisites: Technical knowledge and basic understanding of computer programming

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes:

Topics:

Introduction to Data Structures, Algorithm Evaluation, Arrays, Multi-dimensional, Sparse Matrices, Structure, Pointers. Stacks: applications of Stacks, Prefix, Postfix and Infix notations and conversion, Recursion, Tail Recursion, Towers of Hanoi. Queues: Types of Queue and its application. Linked lists: Types of Linked list, implementation of Stack and Queue using Linked list, Josephus Problem, Polynomial representation and Arithmetic. Trees: binary tree, n-ary Tree, Tree Traversal, Huffman Coding, Binary Search Tree, AVL Tree. Graphs: Representation, Traversing, Shortest path, Minimum Spaning Tree. searching: Sequential Search, Binary Search, Hashing, Other search techniques. Sorting:

External and Internal Sort, Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort and Heap Sort, Radix Sort, Bucket Sort.

Reference Books:
1. Aaron M. Tenenbaum, 'Data Structure Using C', Pearson Education India, 1990
2. Ellis Horowitz, Sartaj Sahni 'Fundamentals of Data Structures' Computer Science Press; Reprinted edition 1988.

Course Number: EE361 (CSE225)

Title of Course: **ANALYSIS AND DESIGN OF ALGORITHMS**

Designation as a required or elective course: OPEN ELECTIVE

Pre-requisites: Technical knowledge and basic understanding of computer programming

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes

Topics:

Fundamentals of algorithm, asymptotic complexity, recursive algorithms, recurrence relation, disjoint set structure. Algorithm Design Techniques their control abstractions and related problems: Divide and conquer, Greedy strategy dynamic programming, Backtracking, Branch and bound, least cost search. Introduction to lower-bound theory, Introduction to NP-Complete and NP Hard problems.

Reference Books:

1. Horowitz and Sahani, Computer algorithms, 2nd Edition, Universities Press, 2008
2. Cormen and Rivest, Introduction to algorithms, 3rd Edition, MIT Press, 4 Sep 2009

SEVENTH SEMESTER

Course Number: **EE411**

Title of Course: **MODERN CONTROL SYSTEM**

Designation as a required or elective course: Required

Pre-requisites: Linear control system

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: To acquire the knowledge of Advance control system.

Topics:

State space representation of systems, solving time invariant state equation, State Transition Matrix, Zero input and state response, Relationship between state equation and transfer function, eigen values, eigen vectors. Canonical forms, controllability and observability, pole placement, Z transform, Pulse transfer function, Data re-construction, Sampling Theorem, zero and first order hold, Time response of sampled data system, Bilinear transformation and Jury's stability criterion, stability analysis using Nyquist, Bode and root locus. Non linear systems, common physical non linearity, phase plane method, describing function method, stability analysis by describing function method, limit cycles, Liapunov and Popov's stability criterion.

Design and implementation of Modern controllers for digital and analogue systems

Reference Books:
1. K.Ogata, Discrete Time control system, 2nd Edition, Pearson Education India, 2015
2. B.C.Kuo, Automatic control system, 2nd Edition, Pearson Education India, 2015
3. Nagrath Gopal, Control system Engineering, New Age International, 2009

EIGHTH SEMESTER

Course Number: **EE421**
Title of Course: **POWER SYSTEM STABILITY & CONTROL**
Designation as a required or elective course: Required
Pre-requisites: power system
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: The student will have knowledge how to control the power system in normal operating condition of power system.
Topics:
Excitation system and their comparison, Basic concept of Governor Mechanism and their performance in steady state, Turbine and Generator model and their transfer function, Division of load between Generators, Generation and absorption of reactive power, relation between voltage, power and reactive power at a node, methods of voltage control, use of tap changing transformers, power angle curve, transfer reactance, swing equations, steady state stability, transient stability using equal area criterion and step by step method, Methods of improving stability using traditional techniques and new approaches, reduction of transmission system reactance, regulated shunt compensation.
Load frequency control at power generating station, Economic load dispatch.

Reference Books:
1. Nagarath & Kothari, Power system engineering, 2nd edition, mcgraw hill education, 2007
2. B.M.Weedy, Electric Power System,5th edition, wiley india pvt ltd, 2013
3. P.Kundur, Power System Stability & Control, 1ST edition, mcgraw hill education, 2006
4.C.L.Wadhwa, Power System Stability & Control, New Age International Private Limited, 2007

LIST OF ELECTIVES FINAL YEAR (VII & VIII Semester)

List of Departmental Electives

EE431 Reactive Power Control & FACTS
EE432 Power Quality
EE433 Energy Conservation
EE434 Entrepreneurship Development
EE435 Demand Side Management
EE436 Solar PV Applications
EE437 Special Machines
EE438 Advanced Microprocessor
EE439 Power System Deregulation
EE441 Digital Signal Processing
EE442 Electronics Instrumentation
EE443 High Voltage Engg.

List of Open Electives

EE451 Artificial Neural Network
EE452 Microcontroller & its Applications
EE453 Operating System
EE454 Digital Signal Processor (TMS28XX Series)
EE455 Power Controller
EE456 Fuzzy Logic System
EE457 System Engg.
EE458 VLSI Design
EE459 Robotics
EE461 Industrial Electronics
EE462 Communication Engg
EE463 Digital Image Processing

DEPARTMENTAL ELECTIVES FINAL YEAR (VII & VIII Semester)

Course Number: **EE431**
Title of Course: **REACTIVE POWER CONTROL AND FACTS**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Fundamental knowledge of Power System and Power Electronics
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Knowledge of Modern power controllers to enhance the stability and capability of existing network.
Topics:
Reactive Power Requirement and necessity of Compensation, Objectives in Load Compensation, Dynamic Power Compensation, Passive Compensation: SVC, TCR, Classification of FACTS devices, Shunt Compensators: STATCOM- Characteristics and Device selection (GTO/SCR/IGBTs), STATCOM Control Strategies and applications. Series Compensation: SSSC - Compensator characteristics and control Strategies, SSC applications. TCSC- Compensator characteristics and control Strategies, TCSC applications Series-shunt Compensation: UPFC - Principle of operation, configuration and control, Simulation of UPFC, Steady State Model of UPFC.
Sub synchronous resonance and its mitigation with FACTS devices, Power system Control using FACTS devices.

Reference Books:
1. T J E Miller, John Wiley, Reactive Power Control in Power Systems, Wiley India Pvt Ltd 28 January 2010
2. J Arriliga and N R Watson, Wiley, Computer modeling of Electrical Power Systems, Wiley India Pvt Ltd, 2009
3. N G Hingorani and L Gyugyi, Understanding FACTS, Wiley India Pvt Ltd, 18 March 2011
4. Y.H. Song and A.T. Johns, Flexible ac Transmission Systems (FACTS), IEEE Press, Institution of Engineering and Technology, June 1999
5. R Mohan Mathur and Rajiv K Varma, Thyristor based FACTS controller for electrical transmission system, Wiley-IEEE Press, 12 August 2011

Course Number : **EE432**
Title of Course : **POWER QUALITY**
Designation as a required or elective course : ELECTIVE
Pre-requisites : Fundamental knowledge of Power System and Power Electronics
Contact hours : 03
Type of Course : Lecture
Course Assessment methods : Both continuous and semester-end assessment
Course Outcomes : Monitoring and improvement of Power Quality
Topics:
Power Definition and Components with sinusoidal and non-sinusoidal voltage & current, Understanding Power quality, Causes and effects of power quality disturbances, Causes and effects of harmonics, converter configuration and their contribution to supply harmonics. Elimination/suppression of harmonics, classical solutions & their drawbacks, elimination/suppression of harmonics, passive and active solutions, topologies and their control methods, design of passive and active filters, EMI Issues, Wiring & Grounding,
PQ standards, Power quality monitoring and analysis of utilities, distribution system and industrial customers, Power quality measuring instruments

Reference Books :
1. R.C. Duggan, Mark F McGranaghan, H Wayne Beaty, Electrical Power System Quality, 3rd Edition, McGraw Hill Education, 7 June 2012
2. Derek A. Paice, Power Electronic Converter Harmonics, Wiley-Blackwell, 15 September 1999
3. Math H J Bollen, Understanding Power Quality Problems, Wiley India Pvt Ltd, 18 March 2011
4. J. Arrillga, Power system harmonics, Wiley India Exclusive, 2014
5. T J E Miller, Reactive Power Control in Electric Systems, Wiley India Pvt Ltd, 28 January 2010

Course Number: **EE433**
Title of Course: **ENERGY CONSERVATION & MANAGEMENT**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: Basic courses of power system and Electrical Machines
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: The course is designed to expose the students to the energy conservation and management options available in the electricity sector.

Topics:
Global and National Energy Scenario, Challenges and Future Options. Energy use patterns. Energy conservation methods in various sectors like residential, commercial, transportation, energy intensive industries, Co-Generation: Benefits, types of co-generation. Energy conservation in power sector, Measures for Reduction of losses in Transmission and distribution systems, Power factor improvement, Load curve analysis and load managements, Demand side management –Benefits, Demand side management Techniques, implementation of Demand side management programme, Tariff options of Demand side management. Energy efficient motor and drives-Motor efficiency, use of variable speed drives, Economics techniques, Discount rate, payback period, internal rate of returns, Risk analysis.

Reference Books:
1. L.C.Witte, P.S.Schmidt, D.R.Brown , Industrial Energy Management and Utilisation, Hemisphere Publ, Washington
2. Industrial Energy Conservation Manuals, MIT Press, Mass
3. I.G.C.Dryden, The Efficient Use of Energy, Butterworths, London
4. W.C.Turner, Energy Management Handbook, Wiley, New York
5. Technology Menu for Efficient energy use- Motor drive systems, Prepared by National Productivity Council and Center for & Environmental Studies- Princeton Univ
6. Dr. S.C.Tripathi, Electrical Energy Utilization & Conservation
7. Thumman, Energy Conservation and Audit
8. Energy Audit and Conservation, TERI

Course Number: EE434

Title of Course: **ENTREPRENEURSHIP DEVELOPMENT**

Designation as a required or elective course: DEPARTMENTAL ELECTIVE

Pre-requisites: basic understanding of socio-economic and political environment in the country and the world, if somebody has technical knowledge he/she is more beneficial from this subject (entrepreneurship).

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: it leads to innovation and new ideas among the youth, to start a new business, retain the talent inside the country, boost up leadership qualities, growth of employment and provide opportunities to the youth.

Topics:

The Entrepreneurship revolution, equity creation, The Timmons model, The Opportunity-Creation, Shaping, Recognizing and Seizing, Entrepreneurship and the internet, Creation of New Business, Entrepreneurial Thinking, Leadership and human behavior, manager, Principal and theories, management competencies, Team building, Issues of Integrity, Entrepreneurial approaches, business Plan, market surveys, preparation and planning, the business plan process and strategies, Developing a business plan, business borrowing, banking, legal issues and taxes, Entrepreneurial finance, cash flow, financial strategy framework, financial life cycle, Valuation, structure and negotiation of venture creation skills and deals. Venture growth and management, organizational paradigms, importance of Culture and organizational climate, new developments in entrepreneurial management, gestation period crisis, threats diagnosis, intervention, the turnaround plan, ESOP, Merger, Acquisition and Strategic Alliance.

Reference Books:
1. S.Anil, & K.Jayashree, Entrepreneurship Development, New Age International Publication, April 2009
2. Robert, D.Hisrich & Michel P.Peters, Entrepreneurship, 8th Edition, McGraw Hill-Higher Education, 2009
3. Harold P.Welsch, Rutledge, Entrepreneurship: The Way Ahead, 1st Edition, Routledge, 2003
4. Alison, J.Morrison, Butterworth-Heinemann, Entrepreneurship: An International Perspective, Butterworth-Heinemann, 22 July 1998

Course Number: **EE435**
Title of Course: **DEMAND SIDE MANAGEMENT**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Course in generation and power system operation
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: To learn importance of load curve flattening through various demand side management technologies with cost/benefit analysis.

Topics:
Concepts and Methods of DSM, DSM Planning, Designing DSM programs, Marketing, Impact Planning, Customer Load control: Direct, Distributed and local control, Interruptible load, Assessment of Impact on load shape, Strategic conservation and Load management technologies, Improving Building envelope, Air-conditioning and CCL calculations, Lighting, Energy efficient motors and other Industrial processes and equipments, Customer Incentives, Program Marketing Design and Assessment of Program Penetration, Hierarchical process for assessment of customer acceptance and program penetration, Impact of DSM Programs on load shapes.

Load management technologies and their Cost/Benefit analysis, Assessing feasibility of DSM programs, Demand management and Integrated Electric Utility Service under deregulated situation.

Reference Books:
1. Clark W. Gellings, John H. Chamberlin**,** Demand-side management : concepts and methods**,** 2nd Edition, Prentice Hall, 1 May 1993
2. Aníbal T. de Almeida, Arthur H. Rosenfeld, Demand-side management and electricity end use efficiency, 1st Edition, Springer, Softcover reprint of the original, 28 October 2011
3. R. K. Pachauri & P. Mehrotra , India Vision 2020

Course Number: **EE436**
Title of Course: **SOLAR PV APPLICATIONS**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Knowledge of semiconductor physics and power electronics
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: solar PV technologies and its application.
Topics:
Review of Renewable energy sources, Introduction of solar cell, Optimum design of solar cells, Solar cell and its I-V characteristics, fill factor, Solar cell Technologies: thin film, Group III-V cells, Quantum well solar cells, PV string, PV module, PV array, Balance of PV systems components, Types of PV system, design of a solar PV systems. PV cell modeling and model parameters assessment.
DC-DC Converter, Maximum Power Point Tracking Schemes, Solar PV Inverter, Solar PV system design and Applications.

Reference Books:
1. Chetan Singh Solanki, Solar Photovoltaic's: Fundamental Technologies and applications, 2nd Edition, Prentice Hall India Learning Private Limited, 2011
2. H.P. Garg & Prakash, Solar Energy-Fundamentals and applications, TMH Publication, 2000
3. Tomas Markvart Solar Electricity, 2nd Edition, John Wiley Publication, 12 May 2000
4. Michael boxwell, The Solar Electricity Handbook, Greenstream publishing, 2013

Course Number: **EE437**
Title of Course: **SPECIAL MACHINES**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Knowledge of conventional electrical machine and their operation.
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Knowledge of special machines: Constructional, operational and control features.
Topics:
Review of drives: Principle, construction, operation & control of special machines: switch reluctance motor, brushless DC motor, stepper motor, linear induction motor, hysteresis motor, Energy efficient motors.
Control and applications of special machines.

Reference Books:
1. T.J.E. Miller, Brushless magnet and Reluctance motor drives, Oxford University Press, 1989
2. R.Krishnan, Switched Reluctance motor drives, 1st Edition, CRC Press, 28 June 2001
3. T.Kenjo, Stepping motors and their microprocessor controls, Clarendon Press, 19 January 1995
4. K. Venkataratnam, Special Electric Machines, 1st Edition, CRC Press, 22 May 2009
5. B.K Bose, Modern Power electronics and AC drives, Prentice Hall, 12 October 2001
6. N.Mohan, Power Electronics, 3rd Revised Edition, Wiley, 8 November 2002
7. E.G.Janardanan, Special Electric Machines, Prentice Hall India Learning Private Limited, 2014

Course Number: **EE438**
Title of Course: **ADVANCED MICROPROCESSORS**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Knowledge of intel 8085 microprocessor.
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Knowledge of 8086 programming and peripherals programming used for electrical industries and power system relays.

Topics:
Introduction to 16-bit microprocessors, internal architecture of 8086, various types of segments used like CS, DS, ES & SS, study of various registers used in 8086, various types of addressing modes like immediate addressing, register addressing, direct addressing mode & indirect addressing modes. Instruction set of 8086, conversion of high level statements like assignment statement, if statements, for loops, while loops, procedures, functions etc. to 8086 statements, programming using 8086. Interrupts in 8086, maskable & non-maskable interrupts, hardware & software interrupts, conditional interrupts, type 0, type 1, type 2 and other such types of interrupts, timing diagrams for interrupts, steps for interrupt handling. Introduction to microcontroller 8051, architecture, instruction set, assembly language programming and applications. Introduction to PLC, architecture, programming & applications.
Application of 16-bit microprocessor to process & drives.

Reference Books:
1. R.Gaonkar, Microprocessor architecture, programming & applications with 8085, 6th Edition, Penram International Publishing, 1 October 2013
2. D.V.Hall, Microprocessors & interphasing, 2nd Revised Edition, McGraw-Hill Inc.,US, 1 September 1990
3. K.J. Ayala, Microcontroller, 3rd Edition, Cengage Learning, June 2004
4. A.Triebel, Avtar Singh ,The 8088 & 8086 Microprocessor-W, 4th Edition, Pearson, 8 September 2002
5. Peter Abbel, IBMPC & Intel processor
6. Badri Ram, Advanced Microprocessors & Interfacing, Tata Mcgraw Hill, 2001
7. A.K.Ray, K.M.Bhurchandi, Advanced Microprocessors & Peripherals, Tata Mcgraw Hill, 2006

Course Number: **EE439**
Title of Course: **POWER SYSTEM DEREGULATION**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Knowledge of Power System Generation, Transmission and Distribution
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: The course is designed to expose the students to the new era of power system deregulation and the new market based approach for the operation of power system.

Topics:
Introduction to Electric supply industry structure under Deregulation, Regulatory and policy Developments, Introduction of Market structure, Spot market, forward markets and settlements, Electricity sector structures and Ownership /management, the forms of Ownership and management, Monopoly model, Purchasing agency model, wholesale competition model, Retail competition model, Bilateral and pool markets, Transmission pricing, LMP based markets, Power wheeling transactions ,Congestion management methods, Ancillary Services and System Security in Deregulation. Classifications and definitions, Technical, economic, & Regulatory issues involved in the deregulation of the power industry, Competitive energy bidding and auction methods.
Transmission pricing, Technical & economic aspect, Competitive energy bidding and auction methods.

Reference Books:
1. J. Wood and B. F. Wollenberg, Power generation, operation and control, 3rd Revised Edition, WileyBlackwell, 24 December 2013
2. K. Bhattacharya, M.H.J. Bollen and J.E. Daalder, Operation of restructured power systems, 1st Edition, CRC Press, 6 June 2001
3. M. Shahidehpour, H. Yamin and Z. Li, Market operations in electric power systems, WileyIEEE Press, March 2002
4. N. S. Rau, Optimization principles: Practical Applications to the Operation and Markets of the Electric Power Industry, Wiley-IEEE Press, 22 September 2003
5. Sally Hunt and Graham Shuttleworth , Competition and Choice in Electricity, Wiley, May 1996

Course Number: EE 441
Title of Course: **DIGITAL SIGNAL PROCESSING**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Knowledge of Network Analysis and Z transform.
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: To acquire knowledge of processing of signals digitally and digital filters.
Topics:
Discrete time systems, linear time invariant (LTI) systems and important properties, Fourier Transform and Laplace transform, Z-transform, Signal flow graphs and digital system representation Discrete Fourier transform (DFT) and its properties, Fast Fourier transforms, Introduction to transformation matrices in a general form, Digital filters, FIR and IIR, FIR filters, structure, designs, IIR filters, Applications of DSP.

Reference Books:
1. S. Mitra, Digital Signal Processing, 4th Edition, McGraw-Hill Education, 13 September 2010
2. John C. Proakis & Dimities G. Manolakis, Digital Signal Processing, Algorithm and Applications, 4th Edition, Pearson Education, 2014
3. Steven W.Smith, Scientist and engineers guide to digital signal processing, 1st Edition, California Technical Pub, 1997
4. S.Salivehanan, Digital Signal Processing, TMHI, 3rd Edition, California Technical Pub, 2014

Course Number: EE442
Title of Course: **ELECTRONICS INSTRUMENTATION**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Knowledge of Analog and Digital Electronics.
Contact Hours: 3.
Type of Course: Lecture
Course Assessment Methods: Both Continuous and End-Semester Examination
Course Outcomes: Enhanced knowledge of Digital Instruments, Data Logging and
Telemetry.
Topics:
Rectifier Instruments, Electronic Voltmeter, Differential Voltmeters, Multimeters, Frequency Counter, D-A/A-D Conversion, Filers, Digital- Voltmeter, Frequency, Phase Meter, Period Measurement, Time Interval Measurement, Speedometer, Universal Counter, Measurement of Radio Frequency Power, Display devices, U-V and X-Y Recorders, Data Acquisition System (DAS), Data Logger, Methods of Data transmission, General telemetry systems, DC and AC telemetry system.
Data Acquisition System (DAS) and Data Logger.

Reference Books:
1. A. K. Sawhney, Electrical and Electronic Measurements and Instrumentation, Dhanpat Rai & Company, 2014
2. A. D. Helfrick and W. D. Cooper, Modern Electronic Instrumentation and Measurement Techniques, Pearson Education India, 2015
3. H. S. Kalsi Electronic Instrumentation, 3rd Edition, McGraw Hill Education, 28 June 2010
4. E.W.Golding, Electrical Measurement & Measuring Instruments, Reem Publications Pvt. Ltd. 2011

Course Number: **EE443**
Title of Course: **HIGH VOLTAGE ENGINEERING**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Knowledge of Power System and materials
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Application of high voltage for testing of electrical equipments.
Topics:

Causes of over voltages and their effects on power system, Lightning, switching and temporary over voltages, protection against over voltages, Insulation coordination, Gaseous breakdown in uniform and non-uniform fields, corona discharges, Vacuum breakdown, conduction and breakdown in pure and commercial liquids, breakdown mechanisms in solid and composite dielectrics, Generation of high DC, AC, impulse voltages and currents, tripping and control of impulse generators, Measurement of high voltages and high currents, digital techniques in high voltage measurement.

High voltage testing of electrical power apparatus, power frequency, impulse voltage and DC testing, International and Indian standards.

Reference Books:

1. M. Naidu, High Voltage Engineering, Tata McGraw Hill Education, 4th Edition, 10 November 2008
2. E.Kuffel and W.S. Zaengl, J.Kuffel, Newnes, High voltage Engineering fundamentals, Second Edition, ELSEVIER, 2008
3. C.L. Wadhwa, High Voltage Engineering, NEW AGE, 1 January 2010

OPEN ELECTIVES FINAL YEAR (VII & VIII Semester)

Course Number: EE451
Title of Course: **ARTIFICIAL NEURAL NETWORKS**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: knowledge of engineering mathematics
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Application of ANN in engineering research.
Topics:
Neuron models, Network architectures, Learning Processes. Single layer and Multi layer perceptrons, Backpropagation Algorithm, Generalization, Function Approximations, Network pruning techniques. Radial Basis Function (RBF) Networks, Regular izat ion theory, Generalized RBF Networks, Estimation of the Regularization parameters, Approximation properties of RBF networks, Comparison of RBF and Multi layer perceptrons, Recur rent Neural Networks, Computational power of recurrent neural networks, learning algorithms, back propagation through time, Real time recurrent learning, Engineering applications of ANN, System identification, Adaptive filter design, solving interpolation and extrapolation problems using ANN, Classification, Function approximation and pat tern recognition problems.

Reference Books:
1. Simon Haykin, Neural Networks and Learning Machines, 3rd edition, pearson education, 2008
2. M.H. Hassoun, Fundamentals of artificial Neural Networks, PHI Learning, 2010
3. J.M. Zurada, Introduction to artificial Neural Networks, Jaico Publication House, 25 January 1994
4. Satish Kumar, Neural Networks, Tata McGraw Hill Education, 2009

Course Number: **EE452**
Title of Course: **MICROCONTROLLER & ITS APPLICATIONS**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: Knowledge of 8-bit intel processor.
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Knowledge of assembly level language programming for 8051 processor.
Topics:
Comparison of Microprocessors and Microcontrollers, Architecture of 8-bit Microcontroller (viz Intel 8051 family), Basic Assembly Language Programming, Interfacing and Microcontroller Design, Applications, Architecture of Atmel Microcontrollers (89CXX), PIC Microcontroller.
Application of microcontrollers in process & drives.

Reference Books:
1. K Ayala, The 8051 Microcontroller, 3rd Edition, Cenage Learning, 2007
2. Myke Predko, Programming and Customizing the 8051 Microcontroller, McGraw Hill Education, 20 October 2000
3. A V Deshmukh, Microcontrollers – Theory and Applications, McGraw Hill Education

Course Number: **EE453**
Title of Course: **OPERATING SYSTEMS**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: knowledge of computer architecture
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Knowledge of operating system design & memory management.
Topics:

Introduction to System Programs & Operating Systems, Evolution of Operating System, Operating system services, Operating System Structure, System Call & System Boots, System Protection, Buffering & Spooling, Types of Operating Systems, CPU Scheduling, Basic Concepts – Scheduling Criteria, Scheduling Algorithms, System Model, Deadlock Characterization, Methods for handling Deadlocks ,Deadlock Prevention, Deadlock Avoidance, Storage Management, Virtual Memory, Demand Paging, Process creation, Page Replacement, Memory Hierarchy, Concepts of Memory Management, Directory Structure, File System Structure, Allocation Methods, Free-space Management.

Reference Books:
1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne,Operating System Concepts, 8th Edition, John Wiley & Sons, 13 Feb 2009
2. Andrew S. Tanenbaum,Modern Operating Systems, 3rd Edition, Prentice Hall of India Pvt. Ltd., 2015
3. Harvey M. Deitel,Operating Systems, 3nd Edition, Pearson India, 2007
4. William Stallings,Operating System, 4th Edition, Prentice Hall of India, November 2000
5. Pramod Chandra, P. Bhatt, An Introduction to Operating Systems: Concepts and Practice, 4th Edition, PHI, 2013

Course Number: **EE454**
Title of Course: **DIGITAL SIGNAL PROCESSOR (TMS28XX Series)**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: Knowledge of Digital Electronics, microprocessor/microcontroller.
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and end term assessment
Course Outcomes: To learn about architecture and programming aspects of modern digital processors and their applications as digital signal controller of drives and processes.

Topics:
Architectural overview, components of CPU and Emulation feature, Modified Harvard Architecture, Memory map, circular buffer, Memory interface, CPU Registers, Multiply and shift operations, CPU Interrupts and Reset, maskable & non-maskable interrupts, Concepts of Pipelining and pipeline protection, Different Addressing modes with examples, Types and alignment of 32 bit operations, Assembly language instructions, Clock prescalars, on-chip ADC with different modes of operation, Event manager, SCI & CAN.

Applications of Digital signal processor to control electric drives and processes.

Reference Books:
1. W.D.Stanley, Digital Signal Processing, 2nd Edition, Reston Publoshing, 1 August 1983
2. Ashok Ambardar, Analog & Digital Signal Processing, 2nd Edition, Nelson Engineering, 14 March 1999
3. System Control & Interrupts reference guide literature no. SPRU078 www.ti.com
4. Data Manual of TMS 320F2812 literature no. SPRS257 & SPRS1747 www.ti.com

Course Number: **EE455**
Title of Course: **POWER CONTROLLER**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: knowledge of power electronics
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Application of power electronics in electrical engineering.
Topics:
Review of power semiconductor devices, series-parallel operation, various firing/driving circuit, Switching loss calculations, SOA and Heat Sink design, Analysis of 1-ϕ / 3-ϕ AC/DC bridge converter with and without freewheeling diode, Effect of source impedance, Multi pulse (12,18,24) rectifier, PWM rectifier, Analysis of non-isolated Buck, Boost, Buck-boost, Sepic & Cuk Converter in CCM and DCM with ideal and non-ideal components, Analysis of Isolated flyback, forward, push-pull, full bridge, half-bridge, & current fed DC-DC converter with ideal components, Dynamic modelling of DC/DC converter and controller design. Analysis of 1-ϕ & 3-ϕ VSI (180° mode, 150° mode & 120° mode of conduction), Amplitude & harmonic control/reduction techniques, 1-ϕ and 3-ϕ CSI Inverter.
 Analysis of various 1-ϕ / 3-ϕ ac-ac regulator circuit..

Reference Books :
1. Dubey, Doradla, Joshi & Sinha, Power Controller, 2nd Edition, New Age International Pvt Ltd, 14 June 2010
2. P.S. Bhimbra, Power Electronics, Khanna Publication, 1 January 2012
3. Rashid, Power Electronics, 3rd Edition, Pearson Education India, 2014

Course Number: EE456
Title of Course: **FUZZY LOGIC SYSTEM**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: Knowledge of Basic Engineering & Control
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Implementation of fuzzy decision making.
Topics:
Fuzzy Logic Introduction, Advantages, Examples, Areas and applications, Fuzzy sets, membership functions and their design, Fuzzy Logic Systems, Fuzzification, Implication, Aggregation, Deffuzification, Fuzzy inference system, Design of Fuzzy control rules, Fuzzy controller design.
Implementation of Fuzzy Controllers for Industrial Applications.

Reference Books :
1. Yang, Fuzzy logic system
2. Zdenko K., Stjepan Bogdan, Fuzzy Controller Design, CRC Press, 12 Dec 2005

Course Number: **EE457**
Title of Course: **SYSTEM ENGINEERING**
Designation as a required or elective course: DEPARTMENTAL ELECTIVE
Pre-requisites: Knowledge of network theory, control system and soft computing Techniques
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Modelling of system components and Implementation of soft computing techniques to real time system.

Topics:
System modeling, analysis, classification, topological models, Analogy among different systems, linear graph theory, development of system model using branch formulation, interconnection equation and chord formulation and state space formulation, Modeling of systems with multi-terminal components, component graph, linear perfect couplers and Gyrators, model of two port components, system models using multi-terminal components using graph theoretic approval fuzzy logic, fuzzification, defuzzification, Applications of fuzzy logic control. Artificial Neural Network, Multilayer feed-forward networks, Applications & implementation of Neural Algorithms and systems, Stability, sensitivity, controllability, observability of the system, system optimization using linear and dynamic programming.
Load Forecasting Methods.

Reference Books:
1. I.J. Nagrath & M.Gopal, Systems Modelling and Analysis, McGraw Hill Education, 1 Jan 1983
2. M Gopal, Modern control system theory, New Age International Pvt Ltd, 1 Oct 2015
3. Koenig and Tokad, Analysis of Discrete Physical System,
4. J.M.Zurada, Introduction to Artificial Neural Systems, Jaico Publishing House, 25 Jan 1994
5. Simon Haykin, Neural Networks, PHI Pvt Ltd, 2003

Course Number: **EE458**
Title of Course: **VLSI DESIGN**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: knowledge of microprocessor
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Application of VLSI for chip design.
Topics:
Review of IC manufacturing, Basics of CMOS technology, well and pwell process, twin tube process, ASIC's, PLA & PAL, MOS transistor theory, basic physical design of simple logic gates, CMOS logic structure, circuits and system representations, inverters, power dissipation in CMOS, Design strategies, CMOS Chip design opt ions, program logic, program logic structure, Program interconnect, reprogrammable, gate arrays, Design Method behavioral synthesis, Flow diagram, clocked system, latches and registers, set-up and hold time, meta stability, clock skew, timing issues, constraints, static timing and dynamic timing analysis, FSM, Need of testing, manufacturing test principles, design strategies for test, chip level test techniques, system level test techniques.

Reference Books:
1. Wyne wolf , VLSI Technology, 4ᵗʰ Edition, PHI Learning Pvt Ltd, 2009
2. Allen & Homberg, CMOS design, 3ʳᵈ Edition, Oxford University Press, 3 Oct 2013
3. Neil H.E. Weste &Kamran Eharghian, Principles of CMOS VLSI design, 2ⁿᵈ Edition, 30 April 1993
4. J. baker, Harrywili , D. Boyce, CMOS Circuit design, Wiley India Pvt Ltd, 2009

Course Number: **EE459**
Title of Course: **ROBOTICS**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: knowledge of modern control system
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Application of mechatronics and system automation.
Topics:

Introduction: Automation and Robotics, CAD/CAM and Robotics – An over view of Robotics – present and future applications, Components of the Industrial Robotics, Architecture, number of degrees of freedom – Requirements and challenges of end effectors, determination of the end effectors, comparison of Electric, Hydraulic and Pneumatic types of locomotion devices, Motion Analysis, Manipulator Kinematics, Differential transformation and manipulators, Trajectory planning and avoidance of obstacles, Robot actuators and Feedback components, position sensors, Robot Application.

Reference Books:
1. M P Groover,Industrial Robotics, International Edition,McGraw Hill Edu., 1 March 1987
2. R K Mittal & I J Nagrath, Robotics and Control, TMH Edu., 6 Feb 2003
3. K S Fu, Robotics, McGraw Hill, 26 Aug 2008
4. Richard D. Klafter, Robotic Engineering , Prentice Hall, 4th April 1989
5. Asada and Slotine,Robot Analysis and Intelligence, Wiley Inter-Science, 27 Feb 2013
6. John J Craig, Introduction to Robotics, 3rd Edition, Pearson Edu., 2008
7. Mark W. Spong and M. Vidyasagar, Robot Dynamics & Control , John Wiley & Sons (ASIA), 4 Aug 2008

Course Number: **EE461**
Title of Course: **INDUSTRIAL ELECTRONICS**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: Basic knowledge of Power Electronic Devices, basic electrical and circuit theory.
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Practical application for power electronics converters in conditioning the power supply, welding and Heating circuit.
Topics:
Review of power devices with driver and protection circuits, Half controlled and fully controlled converters, Series and shunt Voltage regulators, Switched mode power supply, Online and offline UPS, Characteristics of AC and DC drives with their speed control & braking, Closed loop control schemes, Static rotor resistance control and Slip power recovery scheme of induction motor, Self control of synchronous motor, Principle and application of induction and dielectric heating with their industrial controller. Resistance welding and Seam Welding with their industrial controller, Flasher circuits, Time delay circuits, Fan regulator using Electronic timers and Digital counters.
Static Contactors and circuit breaker, Industrial timers.

Reference Books:
1. M. H. Rashid,Power Electronics Circuits, Devices and Application", 3rd edition, Pearson Edu. India, 2014
2. G. M. Chute and R. D. Chute, Electronics in Industry, 2nd Edition, McGraw Hill Ltd, 1 Jan 1979
3. F. D. Petruzulla, Industrial Electronics, McGraw Hill, 1st Feb 1995

Course Number: **EE-462**

Title of Course: COMMUNICATION ENGINEERING

Designation as a required or elective course: OPEN ELECTIVE

Pre-requisites: Knowledge of Engineering Mathematics and Analog and Digital Electronics.

Contact Hours: 3

Type of Course: Lecture

Course Assessment: Both Continuous and End-Semester Examination

Course Outcomes: To understand analog and digital communication techniques.

Topic Covered:

Need of Modulation, Modulations Techniques-Amplitude modulation, Introduction to SSB and VSB Transmission, Frequency and Phase Modulation, NBFM and WBFM, Bandwidth comparison of Modulation Techniques, Sampling of Signal, Sampling Theorem, Pulse Amplitude Modulation (PAM), Time Division Multiplexing (TDM), Channel Bandwidth for PAM-TDM signal, Introduction to Pulse Position and Pulse Duration Modulations, Digital Signal, Pulse Code Modulation, Signal to Noise Ratio, Companding, Data rate, Baud rate and Bit rate, Differential PCM (DPCM), Delta Modulation (DM), Adaptive Delta Modulation (ADM), Comparison of Various Systems, Digital Modulations Techniques-Generation, Detection, Equation and Bandwidth of Amplitude Shift Keying (ASK), Binary Phase Shift Keying (BPSK), Differential Phase Shift Keying (DPSK), Offset and Non-Offset Quadrature Phase Shift Keying (QPSK), M-Ary PSK, Binary Frequency Shift Keying (BFSK), M-Ary FSK Quadrature Amplitude modulation (QAM), MODEM.

Use of communication in electrical industries.

Reference Books:

1. Singh & Sapre, Communication System, 3rd Edition, TMH Edu., 6 July 2012
2. Taub & shilling, Communication System, 3rd Edition,TMH Edu., 5 Sep 2007
3. B.P. Lathi, Modern Digital and analog communication system, 4th Edition, Oxford University Press, 23 Feb 2011
4. Simon Haykins, Communication System, 4th Edition, John Willy Publication, 5 Aug 2006

Course Number: **EE463**
Title of Course: **DIGITAL IMAGE PROCESSING**
Designation as a required or elective course: OPEN ELECTIVE
Pre-requisites: knowledge of Digital Signal Processing
Contact hours: 03
Type of Course: Lecture
Course Assessment methods: Both continuous and semester-end assessment
Course Outcomes: Use of computer algorithms in image processing.
Topics:

Introduction, Digital Image Representation, fundamentals steps in Image processing, Elements of Image processing system, simple Image model, Sampling and Quantization, Basic relationship between pixels, Imaging geometry. Manipulation on image, image transformation: introduction to Fast Fourier transformation, Walsh transformation, Hadmard transformation, Hotelling transformation, DCT transform. Image Enhancement: Spatial domain method, frequency domain method, Enhancement by point processing, Image Restoration: Degradation model, effect of diagonalization on degradation models, Algebraic approach to restoration. Least mean square filter, interactive restoration, Geometric Transformation. Image Compression: Fundamentals, image compression model, lossy compression, loss–less compression, image compression standards. Image segmentation: Detection of discontinuation by point detection, line detection edge detection. Edge linking & boundary detection, Thresholding, Region oriented segmentation. Simple methods of representation : Representation Schemes, Signatures, boundary segments, skeleton of a region, Polygonal approximation, chain codes, Boundary descriptors and regional descriptors, recognition and interpretation.

Reference Books:
1. R.C.Gonzalez Richard E woods, Digital Image Processing, 3rd Edition, Pearson India, 23 June 2016
2. Chanda & Majumdar, Digital Image Processing & Analysis, 2nd Edition, PHI Learning Pvt Ltd, 2011

Home/About the Department:

The Electrical Engineering Department was established in the year 1960. The department offers under graduation, post graduation in Electrical Drives and in Power System and doctoral program. The department has highly qualified and competent faculty members and adequate facilities to support teaching and learning activity.

Programme Educational Objectives

To apply specialized knowledge for solving multi-disciplinary problems in the field of Electrical Engineering

To apply analytical and design skills to meet the challenges of constantly evolving technology in the area of Electrical Engineering to meet industrial requirement.

To promote research in the promising areas of Electrical Engineering through projects and dissertation based on green technology, industrial applications and environmental aspects.

To demonstrate leadership with moral & ethical values, team spirit and managerial skill.

PROGRAM OUTCOMES (POs):

PO1

Engineering Knowledge: Apply the knowledge of basic sciences and engineering fundamentals to solve engineering problems.

PO2

Problem Analysis: Analyze the complex engineering problems and give solutions related to chemical & allied industries.

PO3

Design/ development of solutions: Identify the chemical engineering problems, design and formulate solutions to solve both industrial & social related problems.

PO4

Conduct investigations of complex problems: Design & conduct experiments, analyze and interpret the resulting data to solve Chemical Engineering problems.

PO5

Modern tool usage: Apply appropriate techniques, resources and modern engineering & IT tools for the design, modeling, simulation and analysis studies.

PO6

The engineer and society: Assess societal, health, safety, legal and cultural issues and their consequent responsibilities relevant to professional engineering practice

PO7

Environment and sustainability: Understand the relationship between society, environment and work towards sustainable development.

PO8

Ethics: Understand their professional and ethical responsibility and enhance their commitment towards best engineering practices.

PO9

Individual and team work: Function effectively as a member or a leader in diverse teams, and be competent to carry out multidisciplinary tasks.

PO10

Communication: Communicate effectively in both verbal & non-verbal and able to comprehend & write effective reports.

PO11

Project management and finance: Understand the engineering and management principles to manage the multidisciplinary projects in whatsoever position they are employed.

PO12

Life-long learning: Recognize the need of self education and life-long learning process in order to keep abreast with the ongoing developments in the field of engineering.

Programme Outcomes

Ability to apply knowledge of science and engineering

Ability to validate and analyze theoretical knowledge through experiment

Ability to design and interpret data.

Ability to solve real life engineering problem through design, component identification and development process.

Ability to work as a team to achieve desired goal.

To achieve career growth with social and moral responsibilities.

Effective presentation and communication skill

Attitude towards lifelong learning

Vision

Building department into a knowledge hub, through its focus on education, research development and industrial consultancy by establishing efficient and effective mechanisms for managing innovations, technology development and its transfer.

Mission

To generate distinct engineering and self-confident manpower equipped with knowledge, human and social values in diversified areas of technologies, leadership, for the benefit of mankind and sustainable development of India.

- Promotion of international collaboration with world class international/national universities

- Developing in-house research capabilities with industrial collaboration.

- Enhancing resource generation through industrial collaboration, Training programs and STTPs etc.

- Implementation of Total Quality Management (TQM).

- To develop as an international centre for education and research.

- Development of strategies for resource mobilization - Centre of Excellence.

Maulana Azad National Institute of Technology, Bhopal – 462003

Electrical Engineering Department

M Tech in Power System

SCHEME OF STUDY (January 2021)

First Semester:

Course No.	Subjects	Scheme of studies period per week			Total Credits
		L	**T**	**P**	
PS 101	**Soft Computing Techniques in Power System**	3	-	-	3
PS 102	**Advanced Power System Analysis**	3	-	-	3
PS 103	**Advanced Power System Protection**	3	-	-	3
PS 104	**Reactive Power Compensation**	3	-	-	3
	Elective-1 (A)	3	-	-	3
	Elective-2 (B)	3	-	-	3
PS 105	**Soft Computing Lab.**	-	-	2	1
PS 106	**Seminar-1**	-	-	2	1
PS 107	**Communications Skill NPTEL/MOOC/ Humanities Deptt.**	2	-	-	2

Total Hours: 24 Total Credits: 22				Total Semester Credits	22

Second Semester:

Course No.	Subjects	Scheme of studies period per week			Total Credits
		L	T	P	
PS 201	Modern Control System	3	-	-	3
PS 202	Modern trends in power system operations	3	-	-	3
PS 203	Power System Stability	3	-	-	3
	Elective-3 (A)	3	-	-	3
	Elective-4 (A)	3	-	-	3
	Elective-5 (C)	3	-	-	3
PS 204	Advanced Power System Lab	-	-	2	1
PS 205	Research Methodology, Technical Report and Paper Writing	-	2	-	2
PS 206	Seminar-2	-	-	2	1
Total Hours: 24 Total Credits: 44		Total Semester Credits			22

Third Semester:

Course No.	Subjects	Scheme of studies period per week			Total Credits
		L	T	P	
PS 301	Dissertation Phase-I	-	-	32	16
Total Hours: 32 Total Credits: 60		Total Semester Credits			16

Fourth Semester:

Course No.	Subjects	Scheme of studies period per week			Total Credits
		L	T	P	
PS 401	Dissertation Phase-II	-	-	40	20
Total Hours: 40 Total Credits: 80		Total Semester Credits			20

List of Electives A		List of Electives B	
PS501	Computer Applications in Power Systems	ED101	Evolutionary Techniques
PS502	Power System Economics	ED102	Power Electronics Convertors
PS503	Modeling of Power System Components	ED103	Advanced Electrical Drives
PS504	Power System Planning and Management	ED104	Modeling & Analysis of Electrical Machines
PS505	Smart Grid Technologies	List of Electives C	

PS506	Power Quality Control Technologies	EN202	Solid Waste Management
PS507	High Voltage Engineering	GE203	Reinforced Soil Structures
PS508	Integrated Energy System	GI201	Basic Concepts of GIS
PS509	EHV AC and DC Transmission	HY201	Characteristics of Hydraulic Machines
PS510	Power System Transients	ST203	Theory of Plates & Shells
PS511	Optimization in Renewable Energy System	TR201	Highway Construction & Maintenance
PS512	Economics of Regulation and Restructuring of Energy Industry	WR203	Ground Water Engineering
PS513	Distributed Power Systems	ID203	Advanced Product Design
PS514	Power System Optimization	IT202	Failure Analysis & Prevention
PS515	Smart Energy Management Systems	AM202	Advanced Composite Materials
PS516	Wide Area Measurements and their applications	SV203	Theory of Vibration II
PS517	Energy Management Systems and SCADA	TH202	Thermal Environmental Engineering
PS518	Electrical Vehicular Technology	VE202	VLSI Technology
		DC203	Digital Image Processing
		AC203	Optimization Techniques
		AI202	Deep Learning
		CN203	Graph Theory & Network Algorithm
		IS201	Applied Cryptography
		MS202	Deformation Behavior of Materials

		CH203	Industrial Safety & Hazard Management
		HS1204	Housing Finance
		UP1203	Infrastructure Planning
		NT201	Nano Structures Characterization Techniques
		BI203	Optimization Techniques & Graph
		CSB201	Mathematical Modeling & Simulation of Biological Systems
		RE202	Solar Energy Systems
		ES202	Energy Management in Buildings
		BIO201	Cheminformatics & Drug Designing

Group A: Program Electives.

Group B: Departmental Electives.

Group C: Open Electives.

{It may also be opted as NPTEL Course after approval from Chairman Senate}

ELECTRICAL ENGINEERING DEPARTMENT

M.TECH. POWER SYSTEM

Course of Study & Scheme of Examination 2016-17

Maulana Azad National Institute of Technology,

Bhopal

SCHEME

M.TECH. (POWER SYSTEM)

First Semester

Course Number	Subject	Scheme of Studies Periods per week			Total Credits
		L	T	P	
PS511	Power System Analysis	3	-	-	3
PS 512	Advanced Power System Protection	3	-	-	3
PS513	Evolutionary Techniques	3	-	-	3
PS531-543	Departmental Elective - 1	3	-	-	3
PS531-543	Departmental Elective - 2	3	-	-	3
PS551-557	Open elective-1	3	-	-	3
PS514	Power System Lab	-	-	2	2
PS515	Seminar I	-	2	-	2
	Total credit 22				

Second Semester

Course Number	Subject	Scheme of Studies Periods per week			Total Credits
		L	T	P	
PS521	Modern Trends in Power	3	-	-	3

	System Operation				
PS522	**Advanced Control System**	**3**	**-**	**-**	**3**
PS523	**Power System Stability and** **Control**	**3**	**-**	**-**	**3**
PS531-543	**Departmental Elective - 3**	**3**	**-**	**-**	**3**
PS531-543	**Departmental Elective - 4**	**3**	**-**	**-**	**3**
PS551-557	**Open elective-2**	**3**	**-**	**-**	**3**
PS524	**Computer Applications in** **Power System Lab**	**-**	**-**	**2**	**2**
PS525	**Seminar II**	**-**	**2**	**-**	**2**
	Total credit 22				

Third Semester

Course Number	Subject	Scheme of Studies Periods per week			Total Credits
		L	**T**	**P**	
PS611	**Dissertation Phase-I**	**-**	**-**	**16**	**16**
	Total credit 16				

Fourth Semester

Course Number	Subject	Scheme of Studies Periods per week			Total Credits
		L	T	P	
PS621	Dissertation Phase-II	-	-	30	30
Total credit 30					

List of Departmental Electives

PS531 EHV AC and DC Transmission

PS532 Power Controller

PS533 Computer Aided Power System Analysis

PS534 Reactive Power Control and FACTS

PS535 Power Quality

PS536 Advanced Power Electronics

PS537 Modeling and Analysis of Electrical Machines

PS538 Power System Planning & Management

PS539 Power System Transients

PS541 DSP & its Applications

PS542 Advanced Electrical Drives

PS543 Smart Grid Technologies

List of Open Electives

PS551 Finite Element Method

PS552 Microcomputer & its Application

PS553 Power System Economics

PS554 Economics of Regulation and Restructuring of Energy Industries

PS555 Instrumentation

PS556 Reliability Engineering

PS557 Principle of Data Converter

SYLLABUS

Course Number: PS-511

Title of Course: POWER SYSTEM ANALYSIS

Designation as a required or elective course: Required

Pre-requisites: Preliminary knowledge of power system

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: Knowledge of power system analysis & operation Topics:

Power System components and their representation, Transmission line parameters, Modelling and performance of short, medium and long lines, Line compensation, Load flow studies, A.C. and D.C. Load flow methods, comparison of different load flow methods, Introduction of Optimal system operation, Economic Load Dispatch, , Power system management under normal & abnormal conditions, State estimation & Contingency analysis, Load Forecasting.

Reference Books:

1. **Glenn W. Stagg & Ahmed H.El-Abiad ,Computer Methods In Power System Analysis,1968**

2.   **M.A.Pai,Computer Methods In Power Sytem Analysis**

3.   **George L.Kusic, Computer Aidded Power Sytem Analysis**

4.   **O.Elgerd Electrical Energy System, 2nd , Mc-Graw Hill Education, 19 February 2001**

5.   **L.P.Singh ,Advanced Power System Analysis And Dynamics, 6th , New Age International Publishers Ltd.-New Delhi, 2012**

6.   **J.Duncan Gluver & Mulukuata S. Sharma ,Power System Analysis And Design, 3rd, Prentice Hall Inc., 2002**

7.   **Yong Hua Song, Modern Optimization Techniques In Power System, 1st , Kluwer Academic Publisher, (5 December 2010)**

: PS-512

: ADVANCED POWER SYSTEM PROTECTION

Designation as a required or elective course: Required

Pre-requisites: Preliminary knowledge of power system

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: Knowledge of power system protection & coordination Topics:

General Philosophy of Production, Protective Relays-, different types of electromagnetic and static relay characteristics, operating equations and their applications, phase and amplitude comparators and their analysis, differential relays, protection of generator, transformer and bus bar, protection of transmission lines using over current and distance relays, Carrier schemes for HV and EHV lines, numerical protection- fourier analysis of analog signals, digital filtering, numerical over current protection, transformer and line protection using numerical relays, testing and maintenance of relays.

Reference Books :

1.   **B.Ram, Power System Protection And Switchgear, 2nd, Tata Mc-Graw Hill Publication, 20 July 2011**

2.   **M.V.Deshpande, Switchgear Protection, Tata Mc-Graw Hill Publication**

3.   **R.Ravindra Nath & M.Chander, Power System Protection And Switchgear,Willey Eastern Ltd.**

4.   **Arun G. Phadke & James S. Thorp, Computer Relaying For Power System, Johns Willey**

5.   **M.A.Date, Power System Protection, Bharti Prakashan Vallabh Vidya Nagar,Gujrat**

: PS-513

: EVOLUTIONARY TECHNIQUES

Designation as a required or elective course: Required

Pre-requisites: Knowledge of mathematical modelling

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment Course Outcomes: Student will learn to solve the non-linear optimization problem.

Topics:

Optimization: single objective, multi-objective and constraint problem, linear, non-linear and NP hard problem, combinatorial optimization, Conventional optimization method (lambda and differential). greedy optimization technique, Simple genetic algorithm, Multi-objective genetic algorithm. Artificial neural network. Fuzzy logic. Ant colony optimization. Particle swarm optimization, Basic simulated annealing, Basic tabu search method, Bacteria forging and Fish schooling optimization. Bee flying optimization. Teaching, Learning based Optimization.

AI Application in Electrical Systems.

Reference Books :

1. **M.A.Date, Introduction To Artificial Neural Systems, 1ˢᵗ , Jaico Pub House Bombay, 5 December 2010**

2. **V.Rao & H.Rao, C++ Neural Networks And Fuzzy Logic, Bps Delhi**

3. **V.Rao & H.Rao, Ant Colony Optimization, Springer,2002 Edition, Prentice -Hall Of India, New Delhi, 12 August 2002**

4. **D.E. Goldberg, Genetic Algorithm In Search Optimization And Machine Learning,**

Addition Wesley Publication Co. Inc. New York

: PS-521

: MODERN TRENDS IN POWER SYSTEM OPERATION

Designation as a required or elective course: Required

Pre-requisites: Knowledge of power system

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: Latest trends in power system operation and control Topics:

Distribution automation: Supervisory Control and Data Acquisition (SCADA), Consumer

Information systems (CIS), Geographical Information Systems (GIS), Advances in online control of Power System – Application of Internet and GPS in power system control, Deregulation of Electric Utilities, new environment, Competitive electricity market, Introduction to Smart Grid, Application of Artificial Neural Networks, Fuzzy, Neuro-fuzzy, Genetic Algorithms and Experts systems in Power System operation and Control.

Central Control centre/ regional control centre.

Reference Books:

1. **Loi Lei Lai, Power System Restructuring And Deregulation:Trading Performance And Information Technology, John Wiley, 2001**

2. **Proceedings Of Ieee, February 2000**

3. **Steve Stoft, Power System Economics, Ieee Press, 2002.**

: PS 522

: ADVANCED CONTROL SYSTEM

Designation as a required or elective course: Required

Pre-requisites: Linear control system

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment Course Outcomes: Students will acquire the knowledge of Advance control system Topics:

Controllers and compensators, state space representation, Transfer matrix, state model for linear continuous time systems, Eigen values, eigen vectors, Solution of state equation, concept of controllability and observability. Pole placement by state feedback, Discrete time control systems, time domain approach and z domain approach. Pulse transfer function, Controllability and observability of discrete time systems, stability analysis in z plane, Different types of nonlinearities, limit cycles, phase plane methods, Describing functions,

popov criterion, Liapunov functions, Various techniques of system model order reduction, Introduction to adaptive control system, Principle of optimality, Linear optimal regulator problem, Hamilton Jacobi equation, Riceati equation (Algebraic & differential), steady state solutions (LQR), optimal state estimation, Kalman filter, Output feedback control (LQG).

Design and implementation of Modern controllers for digital and analogue systems.

Reference Books:

1. **M. Gopal, Digital Control Engineering, 2nd , New Age International Private Limited, 2014**

2. **A.P.Sage & Landue, Adaptive Optimal Control**

3. **A.P.Sage, Optimal Control, 1971**

4. **Katsuniko Ogata, Discrete Time Control System, 5th , Prentice Hall India Learning Private Limited.**

5. **Nagrath Gopal, Modern Control Engineering**

: PS-523

: POWER SYSTEM STABILITY AND CONTROL

Designation as a required or elective course: Required

Pre-requisites: Knowledge of power system

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment Course Outcomes: knowledge of power system stability analysis and methods of control.

Topics:

Power System Structure and Operating states, Governors, Excitation system, Effect of exciter and governor, Control of Power and Frequency, Control of voltage and Reactive Power, Power system stability, Dynamic and transient stability analysis of single machine and multi-machine systems, Power system stabilizer design and analysis for stability problem, Techniques for the improvement of stability.

Reference Books:

1.   Prabha Kundur, Power System Stability And Control, , 1st , Mc- Graw Hill Inc,New York, 1993

2.   Taylor C.W, Power System Voltage Stability, Mc- Graw Hill Inc,New York, 1993

3.   Nagrath I.J., Kothari D.P, Power System Engineering, 2nd , Tata Mc- Graw Hill,New Delhi, 1994

4.   Weedy B.M, Electric Power System , 3rd , John Wiley & Sons, 1998

5.   P.S.R.Murthy, Power System Operation And Control, , Tata Mc- Graw Hill,New Delhi, 1984

DEPARTMENTAL ELECTIVES

Course Number: PS-531

Title of Course: EHV AC & DC TRANSMISSION

Designation as a required or elective course: Departmental Elective

Pre-requisites: Knowledge of Power System

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment Course Outcomes: Knowledge of Extra High Voltage AC & DC Transmission System Topics:

Long line theory, corona power loss and audible noise. Series & Shunt Compensation on EHV AC lines, FACTs devices, Sequential impedances of AC systems and Modes of Propogation, Problems associated with EHVAC Transmission, Electrostatic field of EHV Lines, Effect of High Electrostatic field on Humans, Animals, Plants, Theory of travelling waves & standing waves, Design problems on EHVAC long lines, Sub-synchronous resonance problem and counter measures, High voltage testing of AC equipments, Comparison of EHV AC & DC transmission HVDC system configuration and components conversion and inversion, Analysis of three phase bridge converter and Performance equations, Control of HVDC system, Principle of DC link control, current and Extinction angle control, Transmission power control, alternative inverter control modes, Harmonics and AC/DC filters, Interaction responses to DC and AC system faults. Modelling of HVDC system.

Reference Books:

1.	**Begmudre R.D, Ehvac Transmission Engineering, Willy Eastern Limited**

2.	**P.Kundur, Power System Stability And Control, 1st , Mc Graw Hill Publication, 1993**

3.	**Arrilaga, Hvdc Transmission, Peter Peregrinus Publication**

4.	**Rao S., Ehvac &Dc Transmission Systems, 3rd , Khanna Publication, 2008**

5.	**Padiyar K.R. , Hvdc Power Transmission Systems, 3rd , Willy Eastern Ltd.**

Course Number : PS-532

Title of Course : POWER CONTROLLER

Designation as a required or elective course : Departmental Elective

Pre-requisites : Fundamental knowledge of Basic Electrical, Electronics and Control

Contact hours : 03

Type of Course : Lecture

Course Assessment methods : Both continuous and semester-end assessment

Course Outcomes : Acquire knowledge of power converters and applications Topics:

Review of power semiconductor devices, series-parallel operation, various firing/driving circuit, Switching loss calculations, SOA and Heat Sink design, Analysis of 1-□ / 3-□ AC/DC bridge converter with and without freewheeling diode, Effect of source impedance, Multi pulse (12,18,24) rectifier, PWM rectifier, Analysis of non-isolated Buck, Boost, Buck-boost, Sepic & Cuk Converter in CCM and DCM with ideal and non-ideal components, Analysis of Isolated flyback, forward, push-pull, full bridge, half-bridge, & current fed DC-DC converter with ideal components. Interleaved Converters, Dynamic modelling of DC/DC converter and controller design. Analysis of 1-□ & 3-□ VSI (180□ mode, 150□ mode & 120□ mode of conduction), Amplitude & harmonic control/reduction techniques, 1-□ and 3-□ CSI Inverter. Analysis of various 1-□ / 3-□ ac-ac regulator circuit.

Reference Books :

1. **G.K.Dubey,Doradla,Joshi Sinha ,Thyristerised Power Controllers, 2nd , New Age International Private Limited, 2010**

2. **C.W.Lander, Power Electronics**

3. **Rashid M.H., Power Electronics, , 2nd Revised (2 November 2006), Academic Press Inc**

4. **B.R.Pelly, , Thyristerised Power Controlled Converters And Cycloconverter**

5. **N.Mohan,, Power Electronics, 3rd Revised, 8 November 2002**

6. **Vithiyathil J.,Power Electronics**

7. **Philip Kranes,Power Electronics, Oxford University Press, 2009**

Course Number: PS-533

Title of Course: COMPUTER AIDED POWER SYSTEM ANALYSIS

Designation as a required or elective course: Departmental Elective

Pre-requisites: Basic knowledge of power system analysis

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: Develops the skills to use computer programming in power system analysis Topics:

Introduction to Modern Power Systems operation , control and analysis. Modeling of Power System Components, Digital computers in power system simulations, Computer aided Power Flow Solution Algorithms, Sparse Matrices, Solution Algorithms - LU Factorization. Fault Analysis of Large Power Systems, Security Analysis: Basic Concepts, Static Security Analysis

at Control Centers, Contingency Analysis and Selection, state estimation and optimal power flow.

Reference Books:

1. **O.I.Elgerd, Electrical Energy Systems Theory**

2. **A.H.El.Abiad, Computer Methods in Power system Analysis**

3. **O.I. Elgerd, Electric Energy Systems Theory - An Introduction, McGraw-Hill, 1988.**

4. **J.J. Grainger and W.D. Stevenson, Power System Analysis, Mc Graw-Hill, New York, 1994. (PG)**

5. **I.J. Nagrath and D.P . Kothari, Power System Engineering, Tata Mc Graw Hill Publishing Co., 1994.**

6. **M.A. Pai, Computer Techniques in Power Systems Analysis, Tata Mc Graw Hill. Revised with dheman chatergy update**

7. **S.A Soman, computational meth**

8. **Marisa crow**

9. **Vijay vital (UG also)**

Course Number: PS-534

Title of Course: REACTIVE POWER CONTROL AND FACTS

Designation as a required or elective course: Departmental Elective

Pre-requisites: Fundamental knowledge of power system and power electronics

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: Knowledge of Modern power controllers to enhance the stability and capability of

existing network.

Topics:

Reactive Power Requirement and necessity of Compensation, Objectives in Load Compensation, Dynamic Power Compensation, Passive Compensation: SVC, TCR, Classification of FACTS devices. Shunt Compensators: STATCOM - Characteristics and Device selection (GTO/SCR/IGBTs), STATCOM Control Strategies and applications, Series Compensation: SSSC - Compensator characteristics and control Strategies, SSC applications. TCSC- Compensator characteristics and control Strategies, TCSC applications Series-shunt Compensation: UPFC - Principle of operation, configuration and control, Simulation of UPFC, Steady State Model of UPFC.

Sub synchronous resonance and its mitigation with FACTS devices, Power system Control using FACTS devices.

Reference Books :

1. **T J E Miller, Reactive Power Control In Power Systems', John Wiley, 1982**

2. **Prabha Kundur, Power System Stability And Control**

3. **N G Hingorani And L Gyugyi, Understanding Facts', IEEE Press, 2000**

4. **Y.H. Song And A.T. Johns,, Flexible Ac Transmission Systems (Facts)', IEEE Press, 1999**

5.   **Yong-Hua Song And Xi-Fan Wang, Operation Of Market Oriented Power Systems**

Springer-Verlag Londan, Springer-Verlag Londan

Course Number : PS-535

Title of Course : POWER QUALITY

Designation as a required or elective course : ELECTIVE

Pre-requisites : Fundamental knowledge of Power System and Power Electronics

Contact hours : 03

Type of Course : Lecture

Course Assessment methods : Both continuous and semester-end assessment

Course Outcomes : Monitoring and improvement of Power Quality Topics:

Power Definition and Components with sinusoidal and non-sinusoidal voltage & current, Understanding Power quality, Causes and effects of power quality disturbances, Causes and effects of harmonics, converter configuration and their contribution to supply harmonics. Elimination/suppression of harmonics, classical solutions & their drawbacks, elimination/suppression of harmonics, passive and active solutions, topologies and their control methods, design of passive and active filters, EMI Issues, Wiring & Grounding,

PQ standards, Power quality monitoring and analysis of utilities, distribution system and industrial customers, Power quality measuring instruments.

Reference Books :

1.   **R.C. Duggan, Mark F Mcgranaghan, H Wayne Beaty, Electrical Power Systems Quality, Mc-Graw-Hill, 2012**

2.   **Derek A. Paice, Power Electronic Converter Harmonics, Wiley-Blackwell, 1999**

3.   **Math H J Bollen, Understanding Power Quality Problems, Wiley-Blackwell, 1999**

4.   **J. Arrillga, N R Watson, Power System Harmonics,Wiley-Blackwell, 2003**

5.   **T J E Miller, Reactive Power Control In Electric Systems, Wiley Blackwell, 1983.**

Course Number : PS536

Title of Course : ADVANCED POWER ELECTRONICS

Designation as a required or elective course : Departmental Elective

Pre-requisites : Fundamental knowledge Power Electronics, Basic Electronics and Control

Contact hours : 03

Type of Course : Lecture

Course Assessment methods : Both continuous and semester-end assessment

Course Outcomes :

- **To learn drawbacks of power electronic converters and their solutions**

- **Learn and understand applications of Power Electronic converters**

- **Study and understanding of new breed of power converters Topics:**

Review of 1-phase and 3-phase Controlled Converters, Harmonics and Power Factor Calculations, High Power Factor Converters, DC-DC Switch Mode converter, Power Supplies, Switching Mode Inverters, Multilevel Inverter, Resonant Converters, Design and selection of components.

Reference Books :

1.   **N. Mohan, Power Electronics : Converters, Applications & Design, 3rd , John Wiley & Sons, Pearson Education.**

2.   **M. H. Rashid, Power Electronics : Circuits Devices And Application, 2nd, Academy Press Inc.**

3.   **Joseph Vithayathil, Power Electronics: Principles And Applications, Mcgraw-Hill**

4.   **Philip T Krein, Elements Of Power Electronics, Oup Usa, 2009**

5.   **P S Bimbhra, Elements Of Power Electronics, Khanna Publisher.**

: PS537

: MODELLING AND ANALYSIS OF ELECTRICAL MACHINES

Designation as a required or elective course: Departmental Elective

Pre-requisites: Knowledge of electrical machines, Steady state and transient analysis Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: To acquire knowledge of electrical machine model for performance evaluation under normal and abnormal conditions.

Topics:

Review: Primitive machine, voltage and torque equation, Concept of transformation change of variables & m/c variables and transform variables. Steady state and transient analysis, equation of cross field commutator machine, Induction Machine: Analysis of 1-☐ & 3-☐ Induction Motor. Synchronous Machine: Detail analysis, Operational Impedances, Reactance's and Time Constants. Unbalanced operation of 3-☐ transformer & Vector groups, Steady state of electrical machine.

Transient analysis of electrical machine.

Reference Books:

1. **P.C.Krause, Analysis Of Electric Machinery, 2nd Edition.**

2. **B.Adkins, The General Theory Of Electrical Machines.**

3. **B.Adkins & R.G.Harley, The General Theory Of Ac Machines.**

4. **P.S.Bhimbra, Generalised Theory Of Electrical M/C.**

5. **White & Woodson, Electro Mechanical Energy Conversion.**

: PS-538

: POWER SYSTEM PLANNING AND MANAGEMENT

Designation as a required or elective course: Departmental Elective

Pre-requisites: Power system analysis

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment Course Outcomes: To acquire the knowledge of power system economics and regulation Topics:

Introduction of power planning, Electricity Regulation, Electrical Forecasting, Generation planning, Transmission and distribution planning, Power system Economics, Power supply Reliability, online power flow studies, Computer aided planning, wheeling, Environmental effects, Optimal power system expansion planning.

Reference Books :

1. **X Wang, J R MCDonald, Modern Power System Planning, MCgraw hill**

2. **A.S.Pabla, Electrical Power System Planning, Machmillan India Ltd**

3. **M. Tllic, F.Faliana and L Fink, Power System Restructuring Engineering and Economics, Kulwar Academic Publisher**

4. **L.L. Lie, Power system Restructuring and Deregulation, John Willey & Sons UK, 2001**

: PS-539

: POWER SYSTEM TRANSIENTS

Designation as a required or elective course

Pre-requisites: Knowledge of power system

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment Course Outcomes: knowledge of power system transients and insulation coordination Topics:

Origin and nature of transients and surges, Current chopping in circuit breakers, Control of transients, Lightning phenomena, Travelling waves in distributed parameter multi-conductor lines, Simulation of surge diverters in transient analysis, Bergeron methods of analysis and use of EMTP and EMTDC/PSCAD package, Insulation Coordination.

Experience of effect of transient.

Reference Books:

1. **Vanikov, Power System Transients**

2. **C.S. Indulkar and D.P. Kothari, Power System Transients, 2nd, PHI learning, 2010**

3. **Flurscheim C.H., Power Circuit breaker theory and design, Institution of Engineering and**

Technology; Rev Sub edition, (30 June 1982)

4. **EMTP Rulebook**

5. **EMTDC/PSCAD Rulebook**

Course Number : PS541

Title of Course : DSP & ITS APPLICATIONS

Designation as a required or elective course

Pre-requisites : Fundamental knowledge of digital electronics and microprocessor

Contact hours : 03

Type of Course : Lecture

Course Assessment methods : Both continuous and semester-end assessment

Course Outcomes : Acquire knowledge of modern digital controllers and their industrial applications Topics:

Architectural Overview & Central Processing Unit, Memory map, CPU Architecture of TMS320F2812, Details of CPU Registers & Accumulator, Introduction to Interrupts of TMS320F2812, Emulation Logic, CPU Interrupts Overview, CPU Interrupt Vectors and Priorities, Maskable Interrupts, Nonmaskable Interrupts, Pipeline: Pipelining of Instructions, Instruction-Fetch Mechanism, Address Counters FC, IC, and PC, Pipeline Protection, Avoiding Unprotected Operations, Addressing Modes: Types of Addressing Modes, details of various Addressing Modes, Alignment of 32-Bit Operations. Assembly Language Instructions and emulation: Instruction Set Summary (Organized by Function), Register Operations, Overview of Emulation Features, Debug Interface.

Applications of DSP for Power Electronics & Drives Control.

Reference Books:

1. **W.D.Stanley, Digital Signal Processing**

2. **Ashok Ambardar, Analog & Digital Signal Processing**

3. **S. Mitra, Digital Signal Processing, 3rd, McGraw hill education, 2007**

4. **Reference manual from Texas Instruments**

5. **www.ti.com**

Course Number : PS542

Title of Course : ADVANCED ELECTRICAL DRIVES

Designation as a required or elective course

Pre-requisites : Fundamental knowledge of Electrical Machines and power electronics

Contact hours : 03

Type of Course : Lecture

Course Assessment methods : Both continuous and semester-end assessment

Course Outcomes : Application of Power Electronic Converters and Control System in Industrial Drives

Topics:

Introduction to Electrical Drives: Their dynamics & control, Induction Motor Drives. Starting & braking, VSI control, CSI control, Synchronous Motor and Brushless Dc Motor Drives, Brushless dc drive, Permanent Magnet SM Drive, control fundamentals, converter configuration, synchronization, trapezoidal and sinusoidal drive control structure, performance, Switched Reluctance Motors, performance characteristics, Stepper motor and switch reluctance motor drives, solar and battery powered drives.

Reference Books :

1. **G.K.Dubey, Power semi conductor controlled drives, Prentice Hall, 1988**

2. **G.K.Dubey, Fundamentals of Electrical Drives, 2nd, AlphaScience International Ltd., 2001**

3. **B. K. Bose, Power electronics and variable frequency drives, Wiley-Blackwell, 1996**

Course Number: PS543

Title of Course: SMART GRID TECHNOLOGIES

Designation as a required or elective course: Deptt. Elective course Pre-requisites: Distribution systems and Measuring instruments.

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: After undergoing the course, the students would get acquainted with the smart technologies, smart meters and power quality issues in smart grids.

Topics:

Evolution of Electric Grid, Concept, Definitions and Need for Smart Grid, Smart grid drivers, functions, opportunities, challenges and benefits, Difference between conventional & Smart Grid, Concept of Resilient & Self Healing Grid, Present development & International policies in Smart Grid, Diverse perspectives from experts and global Smart Grid initiatives.

Smart energy resources, Smart substations, Wide area monitoring, Protection and control, Phasor Measurement Unit (PMU), Intelligent Electronic Devices(IED) & their application for monitoring & protection Distribution systems: DMS, Volt/VAR control, Fault Detection, Isolation and service restoration, Outage management, Phase Shifting Transformers.

Plug in Hybrid Electric Vehicles (PHEV). Introduction to Smart Meters, Advanced Metering infrastructure (AMI) drivers and benefits, AMI protocols, standards and initiatives, AMI needs in the smart grid. Power Quality Conditioners for Smart Grid, Web based Power Quality monitoring, IP based Protocols, Cyber Security for Smart Grid.

Reference Books :

1.   **StuartBorlase, 'SmartGrid:Infrastructure,Technologyand Solutions', CRC Press 2012.**

2.   **Janaka Ekanayake, Nick Jenkins, KithsiriLiyanage, Jianzhong Wu, Akihiko Yokoyama, 'Smart Grid: Technology and Applications',Wiley, 2012.**

3.   **Vehbi C. Güngör, DilanSahin, TaskinKocak, Salih Ergüt, Concettina Buccella, Carlo Cecati, and Gerhard P. Hancke, 'Smart Grid Technologies: Communication**

Technologies and Standards' IEEE Transactions On Industrial Informatics,Vol. 7, No.4, November 2011.

4.   **Xi Fang, Satyajayant Misra, Guoliang Xue, and Dejun Yang 'Smart Grid – The New and Improved Power Grid: A Survey', IEEE Transaction on Smart Grids, 2011.**

Course Number: PS551

Title of Course: FINITE ELEMENT METHODS

Designation as a required or elective course: Open Elective

Pre-requisites: Fundamental Knowledge of mathematics and system theory

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment Course Outcomes: Analysis and Simulation of electrical system using FEM approach Topics:

Various approaches in FEM, direct stiffness method, energy approach and galerkin's approach, detailed method for stress and vibration analysis problems, various elements, development of element stiffness matrices. Applications to bar, beam, truss, spring, shafts, plates and shells. Isoparmetric elements, plate bending and shell elements, Axi-symmetric problem, vibration problem, software such as IDEAS, ANSYS, Norton, used in FEM, Nonlinear FEA.

Reference Books :

1.   **O.C. Zienciwicz, Finite element method, 7th, Butterworth-Heinemann, 2013**

2.   **C.S. Krishnamurthy, Finite element method, 2nd, McGraw Hill, 2001**

3. **Logon, Finite element method, 5th, Cengage Learning, 2010**

4. **Heubner, Finite element method, 4th, John Wiley & Sons, 2001**

: PS-552

: MICROCOMPUTER AND ITS APPLICATIONS

Designation as a required or elective course: Open Elective

Pre-requisites: Fundamental Knowledge of digital electronics and microprocessor

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: Application of digital controllers in electrical systems Topics:

Programmable Peripheral Devices: PPI 8255, various operating modes, fixing diagram, PIT 8253, programming and modes of operation, PIC 8259, operating modes. Interfacing: Interfacing of peripherals, A/D & D/A converters, 8255, 8253, 8259 with 8/16 bit microprocessor/Data Acquisition system, Microcontroller - 8051 Architecture, Counter/Timers, Instructions, Programming, Interfacing, Applications, Comparison of 8085, 8086, 8057, Programmable logic controller: PLC Architecture, programming, Counter/Timers and its applications. Applications of Microcontroller and PLC for Drives Control.

Reference Books:

1. **Gaonkar, Microprocessor Architecture programming & applications, 6th, Penram International, 2013**

2. **D.V.Hall, Microprocessors & interfacing, McGraw Hill, 2006**

3. **K.J.Ayala, The 8051 Microcontroller,3rd, Cengage Learning, 2004**

4. **Gary Dunning, Introduction to programmable logic controller, 3rd, Thomson/Delmar Learning, 2005.**

: PS-553

: POWER SYSTEM ECONOMICS

Designation as a required or elective course: Open Elective

Pre-requisites: Power system deregulation

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: Restructuring and economic evaluation of power system Topics:

Fundamental of Economics, Power market fundamentals, Competition & Deregulation in Electricity market, Market Architecture, Market Power, Transmission Pricing and Open Access, Transmission Pricing methods, Transmission issues and Effect in the New market environment, Economics and reliability, Regulation approaches, Distribution pricing, AT & C losses, Demand Side Management, Competitive Bidding Strategies in Power Markets.

Reference Books:

1.	**Steven Stoft, Power System Economics Designing Markets for Electricity, IEEE Press, 2002**

2.	**Fundamentals of Power System Economics**

3. Daniel S. Kirschen and Goran Strbac, Power System Economics, Willey-Blackwell, 2004

: PS-554

: ECONOMICS OF REGULATION AND RESTRUCTURING OF ENERGY INDUSTRIES

Designation as a required or elective course: Open Elective

Pre-requisites: Power system deregulation

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: To acquire the knowledge of power system restructuring and economics of

regulation Topics:

Introduction to economic regulation, principles of regulation, Monopoly, competition and its Regulation, Traditional regulation, rate of return regulation, problems with rate of return regulation, restructuring options and understanding restructuring issues, Transmission Network and Wholesale Market Institutions, Retail Competition and Customer Choice, The Economics and Politics of Government Ownership, Concept of economic regulation of energy industries.

Reference Books:

1. **S. Hunt, Making competition work in electricity, John Wiley & Sons, 2002**

2. **S. Hunt, and G.Shuttleworth, Competition and Choice in electricity, Wiley, 1996**

3. **Privatisation, restructuring and regulation of network Utilities, Newbery, DMG, MIT Press, 2000**

4. **Viscusi, WK, JM, Vernon and JE Harrington, Economics of Regulation and Anti-trust,**

3rd, MIT Press, 2000

: PS-555

: INSTRUMENTATION

Designation as a required or elective course

Pre-requisites: Basic knowledge of measurement and instrumentation

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: Knowledge of different advanced techniques for electrical measurement.

Topics:

Transducers - Measurement of Displacement. Resistive potentiometers, strain gauges, differential transformer, synchros, induction potentiometers, piezoelectric, optical, Digital

displacement transducers, Magnetic, speed, torque, voltage, current, power, frequency, power factor and phase angle measurement. Signal Conditioning - Necessity, Instrumentation amplifiers, chopper stabilized amplifiers, Impedance converters, Noise problems, shielding and grounding, Active & Passive filters, Dynamic compensation, Linearization, Concept of A/D and D/A Converters, Sample/hold amplifiers, Microprocessor applications in signal conditioning, Data Transmission & Recording, Microprocessor Based Measurement of Electrical Quantities, Computerized Data Acquisition System.

Reference Books:

1. **Ernest O.Docben, Measurement systems, Application and Design, 4th, McGraw Hill, 1990**

2. **A.K. Shawney, Electrical and electronic measurement, Dhanpat Rai, 2014**

3. **B.Ram., Fundamental of microprocessor and microcomputers, Dhanpat Rai, 2012**

: PS556

: RELIABILITY ENGINEERING

Designation as a required or elective course

Pre-requisites: Basic concepts of Probability theory

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: Knowledge of reliability theory will enable students in understanding system

planning with greater efficacy.

Topics:

Basic Concepts of Reliability-indices and criteria, use of probability theory for reliability evaluation, System Reliability Evaluation using Probability Distributions- series, parallel and series-parallel, MTTF, MTBF, concept of redundancy, Markov Modeling, Frequency and Duration techniques, Generating System Reliability Analysis-recursive model building, Distribution System Reliability analysis-application to radial networks, Effect of protection system and their failures.

Case studies concerning reliability analysis of power and distribution system.

Reference Books:

1. R. Billinton, R.N.Allan, Reliability Evaluation of Engg. System, 2nd, Springer, 1992 2. R. Billinton, R.N.Allan, Reliability Evaluation of Power systems,2nd, Springer, 1996

3.   **G.H.Sandler, System Reliability Engg.**

4.   **Endreynil, Probabilistic Reliability Evaluation**

: PS-557

: PRINCIPLE OF DATA CONVERTERS

Designation as a required or elective course

Pre-requisites: Knowledge of Discrete system and Electronics devices.

Contact hours: 03

Type of Course: Lecture

Course Assessment methods: Both continuous and semester-end assessment

Course Outcomes: Knowledge of data converters employed in Processors and embedded systems. .

Topics:

Review of Discrete Time Signals, Fourier Series and Transforms, Z-transform. Nyquist

Sampling Theorem, Different types of Sample and Hold circuits, Voltage References. Design Fundamentals for Analog ICs: MOSFETs and MOS devices, Op-Amp circuits design. Advanced Filters: Gm-C Filters, MOSFET-C Filters. Switched Capacitor Circuits: Switched Capacitor Amplifiers, Integrators and Switched Capacitor Filters. Nyquist Rate ADC: Flash, Interpolating, Folding Flash, SAR and Pipelined architectures.

Nyquist Rate DAC: Voltage, Current and Charge mode converters, Hybrid and Segmented Converters. Oversampled A/D and D/A converters, Delta-Sigma data converters, Data Converters in □C, DSP and Embedded systems.

Reference Books:

1. R. Jacob Baker: CMOS Mixed Signal Circuits Design, Willey-IEEE 2nd edition 2008 2. R. Gregorian and Ternes: Analog MOS integrated circuits for signal processing, JosseyBass, 1986.

3.   R.Gregorian: Introduction to CMOS OP-AMPs and comparators, John-Wiley, 1999.

4.   D.Johns and K.Martin: Analog integrated circuit design, John-Wiley, 1997.

5.   B.Razavi: Monolithic Phase-locked loops and clock recovery circuits: Theory and design, Wiley-IEEE Press, 2008.

6. **R. J. Baker: CMOS: Mixed-Signal Circuit Design, (2nd edition) 2008**

Dr. Rajesh Kumar Nema

Designation	Professor
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Google Scholar Link	https://scholar.google.com/citations?user=JTBE5pYAAAAJ&hl=en
Date of Birth	**02-09-1963**
Educational Qualification	**Ph.D (Photovoltaic Inverter.), M.Tech (Heavy Electrical Equipments), B.E.(Electrical Engineering)**
Experience	**30 Years**
Specialization	Solar PV Controller, MPPT, Solar PV Inverter, FACTS, Muti **Level Inverter**
Publication	**1. 63 Paper in International Journals** **2. 52 Paper in the National Level Conference.**

	3. 36 Paper in International Level Conference.
Member of professional bodies	1. Member IEEE 2. Member solar Energy society of India 3. Member ISTE 4. Member Advisory Council PDTC (power distribution training centre) MPEB
Country Visited	France, UK, Switzerland, Thailand, Germany
Number of P.G. PhD guided	14 PhD (Completed), 04 PhD (Ongoing), 70 M.Tech Thesis, 80 B.Tech Projects
Project/ Consultancy undertaken	1. Co investigator, Interior, Electrical and Air conditioning of PDTC building. MPMKVVCL, Nishtha Parisar, Bhopal 2. Co investigator, Preparation of Projected electrical load table, design and development of 33/0.433 kV power Sub-station and laying of power lines of proposed SPA campus at Bhouri. Bhopal 3. Co investigator IFFCO TOKIO General Insurance Company Ltd Wind Generator Damage Assessment of 1 MW Permanent Magnet Synchronous Generator of M/s Extol Industries Ltd., Mandideep, 4. Investigator Energy Audit of IGRMS, Indira Gandhi Rashtriya Manav Sangrahalaya, Bhopal 5. Investigator Estimation of Power Consumption of Rice Mills Based on Milling Cpacity , MP State Civil Supplies Corporation, Bhopal 6. Performance evaluation of Bargi Hydel Project, M.P., Sikasar Hydel Project, Chattisgarh, Canal based Sidhana Hydel Project , Punjab, Korba Hydel Project, Chattisgarh, Hydro Electric Plant Chittri and Hydro Electric PlantKumbi
Administrative work done	1. Chairman, Library 2. NBA Coordinator 3. Chairman DRPC

	4. Coordinator Institutional Reforms(TEQIP) 5. Ex Head of the Department 6. Ex Advisor: Contract Deployment 7. Ex Advisor: Electrical Maintenance 8. Ex Controller of Examination 9. Ex Joint Controller of Examination
Conferences/ workshops/STTP Organised	1. IEEE Conference on Electrical Power and Energy Systems Dec 2016 2. Organizing Secretary of National Conference on Solar Energy & Systems 1998 3. Organizing Secretary of National Conference on Wind Energy & Commercialization 1999 4. Technical coordinator of National conf. On Thermal power plant operation and maintenance strategies, 2001 5. Technical Coordinator of International Conference on Recent Advances in Solar Energy Conversion System. 2002 Workshops Conducted : 02 STTP Conducted : 08
Any other information	• Recipient of Colombo award in which the training in the area of Solar Photovoltaics is imparted at the University of Loughborough, UK under Indo-UK RECs project for a period of Six months. • Deputed by Govt. of India as visiting Professor at AIT Bangkok in year 2010 • Deputed by Govt. of India as visiting Professor at AIT Bangkok in year 2015

Dr. Yogendra Kumar

Dr. Yogendra Kumar

Designation	Professor
Address Phone E-mail	Department of Electrical Engineering,MANIT Bhopal India +91-0755-4051407, Mob : +91-8959662996 ykmact[at]yahoo[dot]co[dot]in,
Date of Birth	10th January 1965
Educational Qualification	Ph.D (Power System), M.Tech, (Heavy Electrical Engg.) B.Sc. Engineering (Electrical)

	S.No	Name of Post	Nature of work	Duration		Institutio
				From	To	
Experience	1	Lecturer	Teaching under graduate(UG) and post graduate(PG) class, research guidance to PG students and all teaching related work like designing the syllabus and administrative work given time to time	1st July 1992	31st June 2003	Maulana National of Techn (MANIT) India.
	2		--------------do--------------	1st July 2003	31st June 2006	MANIT, India.
	3	Associate Professor	--------------do----------------	1st July 2006	31st June. 2010	MANIT, India
	4	Professor	--------------do----------------	1st July 2010	Till date	MANIT, India
	5	HOD		7 Jule 2013- 6 July 2015	Till date	MANIT, India
	6	Dean SW		31 August	Till date	MANIT, India

				2016 till date		

Publication	1. 32 International Journals 2. 25 National Level Conference. 3. 22 International Level Conference. 4. Research paper published: 63 **More Infomation**
Country Visited	Stokhom, Bangkok, Hongkong,
Number of P.G. Projects guided	07 Ph.D (Completed), 05 Ph.D (In progress),

Project/Consultancy undertaken		Title	Client	Month & year of completion	Amou
	1	Soil resistivity testing	Project manager PIU, UWSEI Project Bhopal	28-10-2009	Rs. 2(
	2	Soil resistivity testing	Public Health Engineering Dept. Narmada Project Division-2, Shahganj, Sehore	15-01-2008	Rs. 2(
	3	Checking of Electrical Design and drawing of motor, capacitor, transformer, cables and other accessories to be used in water supply system	Municipal council, Sanawad, Distt. Khargone	01-12-2009	Rs. 5!

	4	Welding Transformer Testing	Miscellaneous	Miscellaneous	Rs. 10000/-	

	S.No	Nature of duty	Duration		Total d
			From	to	
	1	Course Coordinator Ph.D.	22-5-2007	22-11-2007	06 mor
	2	Prof. I/C Ph.D.	10-6-2010	Till date	3 mont
	3	Committee member of Ph.D. Entrance exam.	20-9-2010	Till date	2 mont
	4	HOD (Electrical)	30-11-2010	7-12-2010	07 Day
	5	Deputy Superintendent of Examination	16-10-2010	Till date	
	6	Valuation Coordinator	16-4-2010	16-10-2010	6 mont
Administrative work done	7	Member of interview committee Ph.D. Admission	20-10-2009	19-10-2010	01 year
	8	PG Coordinator	04-8-2009	10-8-2009	01 year
	9	Coordinator scrutiny of application form	10-3-2008	15-12-2010	01 year
	10	Coordinator M. Tech tabulation	23-7-2007	27-12-2008	01 year
	11	Coordinator M. Tech tabulation	07-5-2007	06-02-2008	09 mor
		Co-coordinator Ph.D./PG Committee	02-01-2007	6-5-2007	4 r
	S.No	Nature of duty	Duration		Total

			From	to	
	1	Incharge TEQIP Training	6-3-2007	Till date	03 yea month
	2	Incharge community Development cell	6-3-2007	Till date	03 yea month
	3	Incharge TEQIP Tribal Development cell	6-3-2007	Till date	03 yea month
	4	Admission Committee member	24-6-2009	23-6-2010	One ye
	5	Vice Chairman, Co-operative store	25-8-2009	30-06-2011	Two y month
	6	Chairman, Co-operative store	1-7-2011	Till date	
	7	Head of Department	8-7-2013	7-7-2015	2 years
	8	Dean (Student Welfare)	1-8-2015	Till Date	
	9	Prof. I/C (Electrical Maintenance)	1-6-2015	Till Date	

Dr. Manisha Dubey

Professor & Dean (Institutional Development & International Relations)

Organization	Start Date	End Date	Designation	Nature of Work
MANIT,Bhopal	Jul 1, 2010	Till Date	Professor	Teaching, Research, Consultancy, Guiding UG Projects, M. Tech Dissert PhD Scholars, Member of Electrical Department Academic Program Co Purchase Committee, Administrative work as Dean (Institutional Deve Relations)
MANIT, Bhopal	Jul 1, 2006	Jun 30, 2010	Associate Professor	Teaching, Research & Consultancy
MANIT, Bhopal	Jul 1, 2003	Jun 30, 2006	Assistant Professor	Teaching, Research & Consultancy
MANIT, Bhopal	Jul 1, 1998	Jun 30, 2003	Senior Lecturer	Teaching, Research & Consultancy
MANIT, Bhopal	Jul 1, 1992	Jun 30, 1998	Lecturer	Teaching, Research & Consultancy
U.G	Basic Electrical & Electronics Engineering, Power System Stability & Control, Reactive Power Control & FACTS,			
P.G	Power System Stability & Control, Advance Power System Analysis, Modeling & Analysis of Electrical Machines			

Teaching Experience

Name of the Student	Topic	Year of Award
Anoop Arya	Fault Section Estimation & detection for Distributed Network	19.08. 2013
Amit Shrivastava	Power System Stabilizing Controllers for Stability Enhancement	28.01.2014
Arun K Dutta	Study & Analysis of self starting mechanism of synchronous machine with solid state devices	27.09.2015
Aashish Bohre	Optimal Planning of Distributed Generation with Different Load Models using Soft Computing	03.06.2016
Gaurav Gupta	Transmission Pricing Analysis in Restructured Power System	13.09.2019
Tarun Kumar Tailor	Congestion Management in Deregulated Power System Using Evolutionary Techniques	16.10.2019
Somendra Pratap Singh Mathur	A Techno-Economic Approach to Optimize Bidding Strategy in a Competitive Electricity Market	31.10.2019
Jaydeep Lakwal	Investigation on Multilevel Inverters for Railway Traction	18.02.2021
Alka Nimbhorkar	Sensorless Speed Control of Three Phase Induction Motor Using Intelligent Techniques	15.09.2021
Vidhya Fulmali	Intelligent Control Based MPPT Techniques for Solar Photovoltaic System	26.04.2022

Anil Gupta	Control of Small Hydro Power Generation System and Their Integration with Other Energy Sources	In Progress RDC Completed (Reg 29.07.2019)
Jatoth Rajender	Modeling and Control of Renewable Energy Based EV Charging Systems	In Progress RDC Completed (Registration date 30

Ph.D. Supervised/Ongoing

Title	Sponsoring Agency	Duration
Design and Development of a Grid Interactive Residential Rooftop PV System with Islanding/Re-synchronization Capabilities (June 2022) **(Ongoing)**	**NaMPET Phase III, MeiTY, Govt. of India**	**1.5 Year**
Design &Implementation of Single Phase Microgrid using Renewable Energy Sources **(2021)** **(Completed)**	**SERB, DST, Govt. of India, New Delhi**	**03 Years**
Modernization & Up gradation of Instrumentation Laboratory of Electrical Department New	**AICTE, Delhi**	**02 Years**
Development & Up gradation of Instrumentation Laboratory **(Completed)**	**TEQIP**	**01 Year**
Covid-19 Research Project titled IOT Based Device for Quarantine monitoring of infected people (2019) **(Completed)**	**NITSER Council**	**01 Year**
Covid-19 Research Project titled IOT based health data collection and its analysis (2019) **(Completed)**	**NITSER Council**	**01 Year**

Dr. Manisha Dubey

Designation: Professor

Qualification: Ph.D.

Academic Performance: BE (Electrical)(Ist Rank, M.Tech, PhD.

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 Sponsored Research Projects (Completed/Ongoing)

Title	Sponsoring Agency	Duration	Amount	Co-Investigator (if any)
Soil Resistivity Test at Substation	Kirloskar Koya Vatech (JV)	02 Months	Rs 20,000/	Dr Yogendra Kumar
Soil Resistivity Test for Electrical Substation at Koulva	Project Implementing Unit, UWSEI(ADB) Project Bhopal	One Year	Rs 25,000/	Dr Mukesh Kirar
Vetting of Electrical components of 65 MLD STP GwaliorLtd.	Jayantisuper Construction Pvt. LtdConsultancy Services, Gwalior	One Year	Rs 50,000/	Dr Mukesh Kirar
Checking of PLC based design and drawing of 12MLD STP	RBIPPL-SRCCJV	One Year	Rs 25,000/	Dr Mukesh Kirar
Checking of Electrical Design & Drawings of Sewage Treatment plants of Bhopal City (Shahpura, Bhojwet & Kolar)	Ankita Construction, 103, Maruti Titanium Ring Road Nikol, Ahmedabad	One Year	Rs 40,000/	Dr Mukesh Kirar
Vetting of Drawing and Design of PLC/SCADA system Architecture for Chhatarpur water supply scheme	Concrete Udyog Limited Swaroop Nagar Kanpur	One Year	Rs 50,000/	Dr Mukesh Kirar
Vetting of Electrical Design & Drawing	Heliosvento Power Infra Pvt Ltd.	One Year	Rs 60,000/	Dr Mukesh Kirar

 Major Consultancy Projects

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus	IMPACT FACTOR
Vidhya Fulmali, Manisha Dubey, Gaurav Gupta	Deep Belief Network-Based Investigation of A New Fast MPPT Technique For PV Systems Under Non-Uniform Irradiation Conditions	Webology (ISSN: 1735-188X)	Volume18, Number 5 Page: 544-553	2021	Scopus	1.61
Anil Gupta, Manisha Dubey ISSN: 0011-9342	State of Art & Comprehensive Study in The Area of Three Phase Self Excited Induction Generator	Design Engineering Journal	Vol 2021 Issue 7 Page: 13264 - 13277	2021	Scopus	0.101
Jaydeep Lakwal , Manisha Dubey , Gaurav Gupta	Fuzzy Logic Controller for An Asymmetric Multilevel Inverter in Railway EMUs with Different Motor Loading Effects	International Journal of Modern Agriculture	9(4) Page: 773-786,	2020	Scopus	
Jaydeep Lakwal, Manisha Dubey	Fuzzy Logic Based Control of Multilevel Inverter for Railway Traction System	International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958,	Volume-9 Issue-3, Page: 1867-1873	2020	Scopus	5.97
Jaydeep Lakwal, Manisha Dubey	An Asymmetric Extended Modular Transistor Clamped Multilevel Inverter – An Energy Efficient Systems	International Journal of Advanced Science and Technology	Vol. 29, No. 03, Page: pp. 4558 – 4572.	2020	Scopus	0.251

Jaydeep Lakwal, Manisha Dubey, Gaurav Gupta	Investigation on Multilevel Inverter applied for Railways Traction Systems: Economically efficient	International Journal of Mechanical and Production Engineering Research and Development (IJMPERD) ISSN(P): 2249–6890; ISSN(E): 2249–8001	Vol. 10, Issue 3, Page: 4881–4896	2020	Scopus/ Web of Science	3.05
Arya, A., Mathur, S.P.S. & Dubey, M.	Optimal generator side bidding with carbon emission trading and risk management.	CSI Transactions on ICT	8 Page: 235–240	2020	Springer	0.2
Arya, A., Gupta, G. & Dubey, M.	Enhancement of electricity wheeling charges by incorporating FACTS controller in restructured power system,	CSI Transactions on ICT	8 Page: 205–211	2020	Springer	0.2
Vidhya Fulmali, Manisha Dubey	An Intelligent Control Techniques for MPPT in Solar Photovoltaic System	International Journal of Advanced Science and Technology,	29(2) Page: 830 – 845	2020	Scopus	0.251
Vidhya Fulmali, Manisha Dubey,	Design a Novel Model for Improving MPPT in Solar Photovoltaic System	Journal of TEST Engineering & Management	83 Page: Page No.25224-25233	2020	Scopus	0.416

Manisha Dubey, Gaurav Gupta, Anoop Arya	Influence of Power Flow Controller on Energy Transaction Charges in Restructured Power System	World Academy of Science, Engineering and Technology International Journal of Energy and Power Engineering	13 (8) Page: 592-597	2019	Referred	
Somendra P.S. Mathur, Anoop Arya, Manisha Dubey	Impact of Emission Trading on Optimal Bidding of Price Takers in a Competitive Energy Market	Advances in Intelligent System and computing, Springer	741 Page: 171-180	2019	Referred (Springer)	0.64
Tarun Kumar Tailor, Yogendra Kumar, Manisha Dubey	Congestion Management by Optimal Generation Rescheduling Using Sine Cosine Algorithm	International Journal of Engineering & Technology, ISSN 2227-524X	7 (4) Page: 4962-4967	2018	Scopus	0.205
Gaurav Gupta, Manisha Dubey ,Anoop Arya	Cost allocation of reactive power using Matrix methodology in transmission network	International Journal of Advances in Applied Sciences (IJAAS)	7 Page: 226-232	2018	Referred (Secondary Document in Scopus)	1.70
Alka Nimbhorkar, Manisha Dubey	Design of Neural Network Based Sensorless Induction Motor Speed Control Drive	International Journal of Innovative research in Science, Engineering and Technology (IJIRSET)	6(2) Page: 2447-2454	2017	Referred	

Alka Nimbhorkar, Manisha Dubey	Sensorless Induction Motor Drive using Intelligent Techniques	International Journal of Innovative research in Science, Engineering and Technology (IJIRSET)	6(2) Page: 2447-2454	2017	Referred	8.423
Gaurav Gupta, Manisha Dubey ,Anoop Arya	Transmission Loss Minimization and Cost allocation Model in Restructured Power System	International Journal of Current Trends in Engineering & Technology	3 Page: 402-405	2017	Referred	Index Copernicus Value ICV 2016: 74.69
S. Mathur, A. Arya, M.Dubey	Optimal bidding strategy for price takers and customers in a competitive electricity market	Cogent Engineering , Taylor Francis online	1(4) Page: 42005	2017	Referred (Taylor& Francis) Scopus Q2	3.2
Jaydeep Lakwal, Manisha Dubey	Fuzzy Logic Controller for Sensorless Induction Motor Drive	Journal of Electrical Engineering and Electronic Technology (JEEET), A Scitechnol Journal ISSN:2325-9833	9(3) Page: 1867-1873	2017	Scopus Q2	
Alka Nimbhorkar, Manisha Dubey	Simulation of Microcontroller based Induction Motor Drive for Sensorless Approach (paper ID: IJRASET11454)	International Journal for Research in Applied Science and Engineering	5(11) Page: 1819-1827	2017	Referred	

		Technology, (IJRASET) ISSN: 2321-9653,				
Aashish Kumar Bohre, Ganga Agnihotri, Manisha Dubey	Distributed generation planning including load models using different optimization techniques	Journal of Electrical Engineering (JEE)	vol. 2016, no. 1 Page: 45261	2016	Scopus	1.9
Aashish Kumar Bohre, Ganga Agnihotri, Manisha Dubey	Optimal Sizing and Sitting of DG with Load Models using Soft Computing Techniques in Practical Distribution System	IET Generation, Transmission & Distribution	10(6) Page: 42370	2016	Scopus	2.503
Aashish Kumar Bohre, Ganga Agnihotri, Manisha Dubey	The OPF and Butterfly-PSO (BF-PSO) technique based optimal location and sizing of distributed generation in mesh system	Electrical and Electronics Engineering: An International Journal (ELELIJ)	4(2) Page: 127-141	2015	Scopus	1.869
Aashish Kumar Bohre, Ganga Agnihotri, and Manisha Dubey	The Optimal Distributed Generation Placement and Sizing Using Novel Optimization Technique	Middle-East Journal of Scientific Research (MEJSR)	23(6) Page: 1228-1236	2015	Referred	0.39
Aashish Kumar Bohre, Ganga Agnihotri, Manisha Dubey, and Shilpa Kalambe	Assessment of intricate DG planning with practical load models by using PSO	Electrical & Computer Engineering: An International Journal (ECIJ)	4(2) Page: 15-22	2015	Referred	2.27

Aashish Kumar Bohre, Ganga Agnihotri, Manisha Dubey, and Shilpa Kalambe	Impacts of the Load Models on Optimal Sizing and Siting of Distributed Generation in Distribution System	World Applied Sciences Journal (WASJ)	33(7) Page: 1197-1205	2015	Referred	
Aashish Kumar Bohre, Ganga Agnihotri, Manisha Dubey	The Butterfly-Particle Swarm Optimization (Butterfly-PSO/BF-PSO) Technique and Its Variables	International Journal of Soft Computing, Mathematics and Control (IJSCMC)	4(3) Page: 23-39	2015	Referred	
Aashish Kumar Bohre, Ganga Agnihotri, Manisha Dubey, and Shilpa Kalambe	Impacts of the Load Models on Optimal Planning of Distributed Generation in Distribution System	Advances in Artificial Intelligence, Hindawi	vol. 2015 Page: 45200	2015	Referred	
Aashish Kumar Bohre, Ganga Agnihotri, Manisha Dubey	The optimal planning of distributed generation using OPF and Butterfly-PSO (BF-PSO) technique	Journal of Electrical Engineering (JEE)	vol. 2015, no. 4 Page: 45261	2015	Referred	0.92
Alka Nimbhorkar, Manisha Dubey	Application of Fuzzy Control Algorithms and Simulation using MATLAB for Speed Control of Sensorless Drive of Induction Motor	International journal of research in advent technology	3(3) Page: 312-318	2015	Referred	3.528
Alka Nimbhorkar, Manisha Dubey	Series Operation of Power IGBT's for Gate Drive Circuit for Three Phase Inverter using	Advanced Research in Electrical and Electronic	2(3) Page: 224-227	2015	Referred	0.976

	OrCAD Applicable in Induction Motor Speed Control Drive	Engineering (AREEE) Journal				
Alka Nimbhorkar, Manisha Dubey	Design Algorithm of Artificial Intelligence for Speed Control of 3-phase Squirrel-Cage Induction Motor (SCIM)	Advanced Research in Electrical and Electronic Engineering (AREEE) Journal	2(3) Page: 244-248	2015	Referred	0.976
Arun Kumar Datta, Manisha Dubey, Shailendra Jain	Effect of Static Power Supply in Alternator Used for Short-Circuit Testing-Observation of Shaft Voltage	IEEE Transactions on Power Electronics	29(11) Page: 6074-6080	2014	SCI	5.967
Sharad Goyal Manisha Dubey	Comparison of Sensor based and Sensorless Technique to Estimate Rotor Position	International Journal of Industrial Electronics and Electrical Engineering	2(3) Page: 45017	2014	Referred	IJIFACTOR 4.12
P N H Phanindra kumar D M Deshpane, Manisha Dubey	Modeling of Vector Controlled Induction Motor in Different Reference Frames	International Journal of Innovative Research in Science, Engineering and Technology	2(3) Page: 71-78	2014	Referred	8.423
P N H Phanindra kumar D M Deshpane , Manisha Dubey	Model Reference Adaptive System (MRAS) Based Speed Sensorless	International Journal on Recent and Innovation Trends in	2(6) Page: 1554-1559	2014	Referred	1.376

	Vector Control of Induction Motor Drive	Computing and Communication				
Anoop Arya, Yogendra Kumar, Manisha Dubey	Non-dominated Sorting Particle Swarm Optimization based Fault Section Estimation in Distribution Networks	Advances in Intelligent Systems and Computing, Springer-Verlag	2 Page: 471-487	2014	Referred	0.63
Arun Kumar Datta, Manisha Dubey, Shailendra Jain	Modelling and Simulation of Static Excitation System in Synchronous Machine Operation and Investigation of Shaft Voltage	Advances in Electrical Engineering, Hindawi Publishing Corporation	vol. 2014, Article ID 727295 Page: 9 pages	2014	Referred	0.976
Aashish Kumar Bohre, Ganga Agnihotri, Manisha Dubey, and Jitendra Singh Bhadoriya	A novel method to find optimal solution based on modified butterfly particle swarm optimization	International Journal of Soft Computing, Mathematics and Control (IJSCMC)	3(4) Page: 41640	2014	Referred	
Manisha Dubey	Simulation of Static Frequency Converter for Synchronous Machine Operation and Investigation of Shaft Voltage	International Journal of Electrical and Computer Engineering	Page:	2014	SCI	0.376
Amit Shrivastava Manisha Dubey	Enhancement Of Power System Dynamic Stability Using Interactive Artificial Bee Colony	International Journal of Electrical Electronics and Telecommunication Engineering	44(2) Page: 1150-1156	2013	SCIE	0.167

	Based Power System Stabilizer					
Amit Shrivastava Manisha Dubey	Damping of Power System Low Frequency Oscillations Using Interactive Artificial Bee Colony Based Multiband Power System Stabilizer	International Journal of Current Engineering Sciences	3(2) Page: 20-27	2013	SCI	7.155
Amit Shrivastava Manisha Dubey, Yogendra Kumar	Optimization Techniques Based Power System Stabilizer's: An Overview	International Journal on Emerging Technologies	4(1) Page: 50-54	2013	SCI	0.632
Pureti Veera Brahmam, Daravath Bharath, Manisha Dubey	Solar Based Three Level T-Type Converter For Low Voltage Application	International Journal of ChemTech Research CODEN (USA): IJCRGG	5(5) Page: 2449-2455	2013	Scopus	
Arun Kumar Datta, Manisha Dubey, Shailendra Jain	Study of Shaft Voltage on Short Circuit Alternator with Static Frequency Converter	WASET: International Journal of Electrical, Electronic Science and Engineering	7(11) Page: 692-698	2013	Referred	
Arun Kumar Datta, Manisha Dubey, Shailendra Jain	Investigation of Bearing Currents in Dual Mode Operation of Synchronous Machine With Static Excitation System	Electrical and Electronics Engineering: An International Journal (ELELIJ)	2(4) Page: 45-53	2013	Referred	

Anoop Arya, Yogendra Kumar, Manisha Dubey	Computational Intelligence Techniques applied to Distribution Service Restoration - A survey of the state of the art	International Review on Modelling and Simulation, Praiseworthy Prize Publications	5(2) Page: 702-713	2012	SCIE	0.283
Amit Shrivastava Manisha Dubey, Yogendra Kumar	Power System Stabilizer Based On Different Methods & Technique: A Review	International Journal of Electrical, Electronics and Computer Engineering	1(2) Page: 65-71	2012	SCI	0.376
Anoop Arya, Yogendra Kumar, Manisha Dubey, Radharaman Gupta	Multi-Objective Fault Section Estimation in Distribution Systems using Elitist NSGA	Advances in Intelligent Systems and Computing, Springer- Verlag	202 Page: 211-219	2012	Scopus	0.63
Anoop Arya, Yogendra Kumar, Manisha Dubey	Reconfiguration of Electric Distribution Network using Modified Particle Swarm Optimization	International Journal of Computer Applications, Foundation of Computer Science USA	34(6) Page: 54-62	2011	SCI	0.381
Manisha Dubey Nikos E. Mastorakis	Genetic Algorithm based fuzzy logic power system stabilizers in multi-machine power system	WSEAS Transactions on Systems and Control	5(5) Page: 312-322	2010	Scopus	0.172

Manisha Dubey Nikos E. Mastorakis	Design of fuzzy logic power system stabilizers in multimachine power system using genetic algorithm	WSEAS Transactions on Systems and Control	5(5) Page: 312-322	2010	Scopus	0.172
Manisha Dubey Nikos E. Mastorakis	Tunning of Fuzzy Logic Power System Stabilizers using Genetic Algorithm in Multi-machine Power System	WSEAS Transactions on Power Systems	4(3) Page: 105-114	2009	SCIE	0.71
Manisha Dubey, Gayatri Agnihotri, Avdhesh Sharma	Design of Robust fuzzy logic based damping controller using genetic algorithms	DIAS Technology Review – The International Journal for Business and IT	2(2) Page: 19-25	2006	Scopus	
Manisha Dubey, Gayatri Agnihotri, Avdhesh Sharma	Optimal Tuning of Parameters of Fuzzy Logic Power System Stabilizer using Genetic Algorithm	WSEAS Transactions on Systems and control	4(3) Page: 225-232	2006	Referred	0.172
Manisha Dubey Nikos E. Mastorakis	Design of Genetic Algorithm based Power System Damping Controller	WSEAS Transactions on Power Systems	1(5) Page: 917-923	2006	SCIE	0.71
Manisha Dubey Aalok Dubey, Nikos E. Mastorakis	Robust Design of Fuzzy Logic Power System Stabilizer using Multi-objective Genetic Algorithm ”	WSEAS Transactions on Power Systems	1(6) Page: 1069-1076	2006	SCIE	0.71

Manisha Dubey Aalok Dubey, Nikos E. Mastorakis	Simultaneous Stabilization of Multi-machine Power System using Genetic Algorithm based Power System Stabilizers	WSEAS Transactions on Systems and Control	1(2) Page: 247-252	2006	Referred	0.172
Manisha Dubey, Pankaj Gupta	Design of Genetic-Algorithm Based Robust Power System Stabilizer	International Journal of Computational Intelligence, Turkey	2(1) Page: 48-52	2005	SCIE	2.259
Manisha Dubey, Gayatri Agnihotri, Avdhesh Sharma	Optimization of Conventional Power System Stabilizer	Journal of MANIT	Volume 37, ISSN 0379-5144, pp.45-55	2005,	Referred	
Manisha Dubey, Gayatri Agnihotri, Avdhesh Sharma	Design and Performance analysis of Power System Stabilizer using Different Optimization Techniques	Journal of MANIT		2007	Referre	

 Publication

 Citations

	h-index	i-10 index	Total Citations
Google Scholar	13	21	672
Vidwan Profile	7	-	255

Dr. Savita Nema

Professor Qualifications: PhD

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Subjects Taught

U.G	**Control Systems**
	Network Analysis
	Renewable Energy, System Enginering
P.G	**Advance Control System**
	Modelling and Analysis of Electrical Machines
	Renewable Energy

Subjects Taught

Teaching Experience

Organization	Start Date	End Date	Designation

MACT Bhopal	July 1994	13.7. 1999	Lecturer
MACT Bhopal	July 1999	13.7. 2004	Sr. Lecturer
MACT Bhopal	July 2004	13.7. 2007	Assistant Professor
MANIT Bhopal	July 2007	04.9.2011	Associate Professor
MANIT Bhopal	Sept 2011	Till date	Professor

 Ph.D. Supervised/Ongoing

Name of the Student

Title	Sponsoring Agency	Duration	Amount	Co-PI (if any)
Wind solar Hybrid Emulator	TEQIP Ph II	1 Year	Rs 14.25 lacs	--
Smart micro Grid Hybrid Power System	TEQIP Ph II	1 Year	Rs 18.0 lacs	--
DSP Application in electrical drives	MHRD	1 Year	Rs. 11.0 lacs	Dr. R. K. nema
Development of high frequency PCU for residential PV application	MHRD	1 Year	Rs. 10.0 lacs	Dr. R. K. nema
Development and analysis of Hybrid Power System	MHRD	1 Year	Rs 6.0 lacs	Dr. R. K. nema

Renewable Energy research Lab	MHRD	1 Year	39.00 L	Dr. Suresh Gawre Dr. Priyanka Paliwal
Development & Upgradation of Control System Laboratory	TEQIP Phase I	1 Year	Rs 5.00 lacs	--

sponsored Research Projects (Completed/Ongoing)

Name of the sponsoring agency	Project title	Amount sanctioned	Period of the project		Status
			From	To	
TEQIP Ph II	Wind solar Hybrid Emulator	Rs 14.25 lacs	Aug 2015	Aug 2016	In Progress
TEQIP Ph II	Smart micro Grid Hybrid Power System	Rs 18.0 lacs	April 2013	Till date	In Progress
MHRD	DSP Application in electrical drives	Rs. 11.0 lacs	April 2010	March 2012	Completed
MHRD	Development of high frequency PCU for residential PV application	Rs. 10.0 lacs	April 2010	March 2012	Completed
MHRD	Development and analysis of Hybrid Power System	Rs 6.0 lacs	April 2012	March 2014	Completed
MHRD	Renewable Energy research Lab	39.00 L	July 2011	March 2012	Completed

TEQIP Phase I	Development & Upgradation of Control System Laboratory	Rs 5.00 lacs	2005	2006	Completed

Major Consultancy Projects

Title	Sponsoring Agency	Duration	Amount	Co-Investigator (if any)
Advice in installation of lightning arrestor in Bithi Sankul Building of IGRMS, Bhopal	Indira Gandhi Rashtriya Manav Sangrahalaya, Bhopal	3 Months	Rs. 0.3 Lakhs+ST	Dr. R. K. Nema Dr. Shai;endra Jain
Vetting of SLD & Switch yard Layout for intake well & WTP area for Majhgain Multi Village Ruler Water Supply Scheme Panna	WPIL Ltd	3 Months	250000/-	Dr. Tripta Thakur Dr. Priyanka Paliwal Dr.Aamit Ojha Dr. Mukesh Lirar

Vetting of SLD & Switch yard Layout for intake well & WTP area for Badonkalan Multi Village Ruler Water Supply Scheme Datia, M.P	WPIL Ltd Kolkatta	3 Months	100000/-	Dr. Tripta Thakur Dr. Priyanka Paliwal Dr.Aamit Ojha Dr. Mukesh Lirar
Electro-Mech 14 MLD for the design of sawage treatment plant at Dewas	M/s laxmi Constructions Dewas	3 Months	59000	Dr. Prashant Baredar Dr. Anil Kumar
Checking and approval of design and drawing of 14 MLD for the design of sawage treatment and disbursment	M/s laxmi Constructions Dewas	3 Months	59000	Dr. Prashant Baredar Dr. Anil Kumar

note plant at Dewas				
Checking and approval of design and drawing of mechanical and electrical equipment for sawage treatment and disbursment note plant at Dewas	M/s laxmi Constructions Dewas	3 Months	59000	Dr. Prashant Baredar Dr. Anil Kumar
3rd party inspection of 03 numbers of CNG Crematorium at Chakrateerth Ujjain	Ujjain Smart City Limited, Ujjjain	3 Months	1.39 Lakhs	Dr. R. K. Nema Dr. G. Dixit Dr. Rajesh Gupta

Publication

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/Scop
Kumar, N., Kumar, T., Nema, S., & Thakur, T.	Reliability oriented techno-economic assessment of fast charging stations with photovoltaic and battery systems in paired distribution & urban network.	*Journal of Energy Storage* 72 (2023): 108814.	72 pp 1-24	2023	SCI
Ansari, Md Kaisar Azam, and Savita Nema	A data driven based adaptive unit protection for transmission line integrated with large penetrated wind farms	*Electric Power Systems Research* (2023): 109732.	224 Pp 1-12	2023	SCI
Kumar, T., Kumar, N., Thakur, T., & Nema, S	A State-of-the-Art Holistic Charge Scheduling for Direct Charging and Battery Swapping Station under a Collaborative Environment.	*IETE Journal of Research*	Pp 1-15	224	SCI
Khare, Vikas, Savita Nema, and	Path towards sustainable energy development: Status of	Cleaner Energy Systems, Elsevier	Volume 3 pp 1-17	2022	scop

Prashant Baredar	renewable energy in Indian subcontinent				
Kumar, D., Nema, R. K., Gupta, S., Nema, S., & Dewangan, N. K	A New Fault-Tolerant Multilevel Inverter Topology with Enhanced Reliability for PV Application	Arab J Sci Eng .	PP 1-18	2022	SCI
D Verma, S Nema, R Agrawal, Y Sawle, A Kumar	A Different Approach for Maximum Power Point Tracking (MPPT) Using Impedance Matching through Non-Isolated DC-DC Converters in Solar Photovoltaic Systems."	*Electronics*	11, no. 7 PP 1-19	2022	SCI
Kumar, T., Kumar, N., Thakur, T., & Nema, S	Charge scheduling framework with multiaggregator collaboration for direct charging and battery swapping station in a coupled distribution-transportation network.	International Journal of Energy Research.	pp 1-24	2022	SCI

Authors	Title	Journal	Volume/Pages	Year	Index
Kumar, N., Kumar, T., Nema, S., & Thakur, T.	A comprehensive planning framework for electric vehicles fast charging station assisted by solar and battery based on Queueing theory and non-dominated sorting genetic algorithm-II in a co-ordinated transportation and power network	2022 Journal of Energy Storage	Volume 49, 104180, PP 1-29	2022	SCI
Khare, V., Khare, C. J., Nema, S., & Baredar, P	Current status of electric vehicles in India: an overview'	Int. J. Electric and Hybrid Vehicles, Inderscience	Vol. 13, Nos. 3/4, pp 240-255.	2021	SCO
Kumar, N., Kumar, T., Nema, S., & Thakur, T.	A multiobjective planning framework for EV charging stations assisted by solar photovoltaic and battery energy storage system in coupled power and transportation network	International Journal of Energy Research	PP 1-32	2021	SCI
Sharma, H. K., Nema,	Normograms preparation and	International Transactions on	31(4)	2021	SCI

Authors	Title	Journal	Details	Year	Index
S., & Nema, R. K	interpretation for 400/800 kV class of converter transformers/reactors with and without oil using sweep frequency response analysis (SFRA)	Electrical Energy Systems			
Khare, Vikas, Cheshta J. Khare, Savita Nema, and Prashant Baredar.	Modeling, cost optimization and management of grid connected solar powered charging station for electric vehicle	*International Journal of Emerging Electric Power Systems*,	vol. 23, no. 4, , pp. 587-603	2021	SCO
Sharma, H. K., Nema, S., & Nema, R. K	Improving Dielectric Dissipation Factor Of 420 Kv Class Oil-Sf6 Rip Bushings At Site.	International Journal of Power and Energy Systems	41(1)..203-0254	2021	SCO
Khare, Vikas, Savita Nema, and Prashant Baredar	Renewable energy system paradigm change from trending technology: a review	International Journal of Sustainable Energy	vol. 40, no. 7, pp. 697–718,	2021	SCO

Beig, Hikmat, Savita Nema, and Suresh Kr Gawre	Development of Error Consolidator Tool for On-Board Diagnostic Errors	2020 International Journal of Computer Applications	Volume: 176, Number: 17	2021	-
Sharma, H. K., Nema, S., & Nema, R. K	Recent Trends in Emerging 765kV/800kV Power Transformers	Journal of Recent Technology and Engineering (IJRTE)	Volume-8 Issue-5, Pp 5084-5092	2021	SCO
Kumar, D., Raj, R. A., Nema, R. K., & Nema, S	A Novel Higher Level Symmetrical and Asymmetrical Multilevel Inverter for Solar Energy Environment	IETE Journal of Research	pp. 1–13	2020	SCI
Kumar, Nikhil, Savita Nema, Rajesh K. Nema, and Deepak Verma	A state-of-the-art review on conventional, soft computing, and hybrid techniques for shading mitigation in photovoltaic applications	International Transactions on Electrical Energy Systems,	30(9)	2020	SCI
Khare, Vikas, Savita	Game theory based framework of solar-	Journal Of The Institution of Engineers (India):	100(6) PP 575-587	2019	SCO

Nema, and Prashant Baredar	wind renewable energy system"	Series B.Springer Publications			
Sachan, S., Swarnkar, P., & Nema, S	Design of Smoothing FOPID Sliding Mode Controlled Robotic Manipulator for Robotic Assisted Surgery"	International Journal of Recent Technology And Engineering (IJRTE)	Volume-8, July	2019	SCO
Khare, Vikas, Savita Nema, and Prashant Baredar	Reliability analysis of hybrid renewable energy system by fault tree analysis	Energy & Environment Sagepub	PP 1–14	2018	SCI
Khare, Vikas, Savita Nema, and Prashant Baredar	Analysis and assessment of smart grid: a review	Int. J. Smart Grid And Green Communications Inderscience Publications	Vol. 1, No. 4, Pp 329-362	2018	-
Das, S. K., Verma, D., Nema, S., & Nema, R. K	Shading mitigation techniques: State-of-the-art in photovoltaic applications	Renewable And Sustainable Energy Reviews	369–390 Vol. 78	2017	SCI

Khare, Vikas, Savita Nema, and Prashant Baredar	Optimisation of the hybrid renewable energy system by HOMER, PSO and CPSO for the study area	International Journal of Sustainable Energy, Taylor And Francis	Vol 36, no. 4 : PP 326-343	2017	SCO
Khare, Vikas, Savita Nema, and Prashant Baredar	Solar-Wind Hybrid Renewable Energy System: A Review Renewable & Sustainable Energy Reviews,	International Journal of Renewable And Sustainable Energy (RSER) Reviews Elsevier	Vol 58: PP 23-33	2016	SCI
Verma, D., Nema, S., Shandilya, A. M., & Dash, S. K.	[A Different Approach to Design Non-isolated DC-DC Converters for Maximum Power Point Tracking (MPPT) in Solar Photovoltaic Systems](#)	Journal Of Circuits System And Computers (World Scientific)	Vol 25 Issue 08	2016	SCI
Verma, D., Nema, S., Shandilya, A. M., & Dash, S. K.	Maximum power point tracking (MPPT) techniques: Recapitulation in solar photovoltaic systems.	Renewable And Sustainable Energy Reviews, Elsevier	Vol 54, Pp.1018-1034	2016	SCI
Khare, Vikas, Savita Nema, and	Optimization of Hydrogen based hybrid renewable energy	International Journal of Hydrogen Energy, Elsevier	Vol 41	2016	SCI

Prashant Baredar	system using HOMER, BB BC AND GAMBIT				
Verma, D., Nema, S., Shandilya, A. M., & Dash, S. K	Matlab (SIMSCAPE) simulation and experimental validation of solar photovoltaic system for performance analysis under varying environmental and mismatch condition.	Electrical And Electronics Engineering: An International Journal (ELELIJ),	Vol 4(3), Pp 39-54	2015	--
Verma, D., Nema, S., Shandilya, A. M., & Dash, S. K.	Comprehensive analysis of maximum power point tracking techniques in solar photovoltaic systems under uniform insolation and partial shaded condition	Journal Of Renewable And Sustainable Energy 7, AIP Publishing	2015	2015	SCI
Kumar Dash, Soubhagya, Savita Nema, R. K. Nema, and Deepak Verma	A comprehensive assessment of maximum power point tracking techniques under uniform and non-uniform irradiance and its impact on photovoltaic systems: A review,	AIP Int Journal of Renewable And Sustainable Energy	7 2015	2015	SCI

B.Madan lal, U.Raja Kiran, Sushma Gupta, Savita Nema	Solar Power Fed Adjustable Speed Drive System	International Journal of Research In Engineering And Technology	Vol.3, Issue No. 4 816-820	2014	---
Lal, B. M., Rao, D. V., Nema, S., & Gupta, S	Speed Control of Solar Powered Induction Motor Drive using SVPWM," Paper Id: IJRITCC_JUNE-034	International Journal on Recent And Innovation Trends In Computing And Communication	-	2014	
Khare, Vikas, Savita Nema, and Prashant Baredar	Status of solar wind in renewable energy in India, ISSN: 0960-1481	International Journal of Renewable And Sustainable Energy Reviews Elsevier Publication	Vol. 27	2013	SCI
Khare, Vikas, Savita Nema, and Prashant Baredar	Power Quality disturbances in grid connected solar system & its prevention ISSN: 2277-3754, Issue 5,	International Journal of Engineering And Innovative Technology (Online)	Volume 1Issue 5	2012	--
Khare, Vikas, Savita	Application of Game theory in Solar Wind Hybrid energy	International Journal of Electrical Electronics Research	Vol. 2 Issue 4	2012	--

Nema, and Prashant Baredar	Renewable Energy System ISSN 2250-155x	Transsteller Journal Publications			
Nema, Savita, R. K. Nema, and Gayatri Agnihotri.	Inverter topologies and control structure in PV applications : A review	International Journal of Renewable And Sustainable Energy, American Institute Of Physics (AIP)	Vol. 3, Issue: 1, ,PP.1 -23	2011	SCI
Nema, Savita, R. K. Nema, and Gayatri Agnihotri.	Design, Development and Simulation of PC Based Scheme for Characterization of Solar Photovoltaic Modules	Inderscience International Journal Of Power Electronics (IJPELEC)	Pp. 304-325, Vol. 2, Number 3	2010	SCO
Nema, Savita, R. K. Nema, and Gayatri Agnihotri.	Matlab/Simulink Based Study of Photovoltaic Cells/Modules/Array and Their Experimental Verification	International Journal of Energy & Environment	Vol. 1, Issue 3	2010	--
Nema, Savita, R. K. Nema, and Gayatri Agnihotri.	A new approach to classification of utility interactive photovoltaic inverter,	International Journal Advanced Engineering And Applications.		2010	--

Nema, Savita, R. K. Nema, and Gayatri Agnihotri	Computer Simulation Based Study of Photovoltaic Cells/Modules and their Experimental Verification	International Journal of Recent Trends In Engineering;	Issue: 1 Pp. 108-202	2009	--

Citations

	h-index	i-10 index	Total Citations
Google Scholar	22	34	3210
Vidwan Profile	14	-	1556

Dr. Shailendra Jain

 Professor

 Qualifications: Ph.D.B.E.(Elect), M.E.(Power Electronics)

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Subjects Taught

	Power Electronics	Microprocessor & Microcontroller
U.G	**Electrical Machines**	**Basic Electrical & Networks**
	Electrical Drives	**Basic Electronics**
P.G	**Power Electronics**	**Advanced Power Electronics**
	Power Quality	**Microcontrollers & Its Applications**

Teaching Experience

Organization	Start Date	End Date	Designation	Nature of Work
MANIT Bhopal	**July 2023**	**Till date**	**Professor (HAG)**	**Teaching & Research**
	Nov 2017	**July 2023**	**Director, SLIET** **(on deputation)**	**Academic administration**
	Sept 2010	**Oct 2017**	**Professor**	**Teaching & Research**
	Aug 2007	**Aug 2010**	**Asso Professor**	
	Aug 2004	**July 2007**	**Asstt Professor**	
MACT Bhopal (REC)	**06.08.1994**	**July 2004**	**Lecturer/** **Sr. Lecturer**	**UG/PG Teaching**

Ph.D. Supervised/Ongoing

Name of the Student	Topic	Year of Award	Co-Supervisor (if any)
Paramjeet Singh Jamwal PEI-1803	Multilevel inverter fed induction motor drive for battery electric vehicle SLIET/Dean(Academics)/PhD/1255-61, dt 21.07.23	2023	Dr. Shailendra Jain Dr Sanjeev Singh
Vinay Kumar PEI-1810/NDF	Investigations of fault tolerant operation of multilevel inverters SLIET/Dean(Academics)/PhD/6196,dt 20.10.22	2022	Dr. Shailendra Jain Dr Sanjeev Singh
Shirish Murthy PT/143213017	Magnetic Load Offset and Linear Motors for High Speed Transit System PICE/PhD/2084, 08.04.2022	2022	Dr. Shailendra Jain Dr Amit Ojha
Nisha Prashad FT/163113101	Modeling and design of linear switched reluctance motor for high speed transit system (PICE/PhD/1899, 18.10.2021)	2021	Dr. Shailendra Jain Dr. Sushma Gupta
Rekha Agarwal FT/133113101	*Reduced Device Count Multilevel Inverters for Grid Interface (ADE/PhD/1066 dt 7ʰ Mar 2018)*	2018	Dr. Shailendra Jain
Lalit Kumar FT/113113102	*Development of Power Electronic Interface for Electric Propulsion System* (COE/2015/PhD/25, Dated 23.05.2016)	2016	Dr. Shailendra. Jain

K. K. Gupta FT/093113101	*Investigations on Multilevel Inverters with Reduced Device Count* (COE/2014/PhD/1716, Date 03.03.2014)	2014	Dr. Shailendra. Jain
J K Tandekar FT/143113103	Implementation of Multilevel Inverter Based Active Harmonics Filtering in Distribution System (PICE/PhD/1201, 09.10.2020)	2020	Dr. Amit Ojha Dr. Shailendra Jain
Saji T. Chacko PT/113213104	*Performance Enhancement of Vector Controlled Induction Motor Drives using Artificial Intelligence* (COE/PhD/2016-17/735, dated 25.09.2017)	2017	Dr. Shailendra Jain Dr R K Nema Dr. C S Bhende
Sachin Tiwari PT/113213102	*Harmonics and Reactive Power Compensation using Series Active Power Filter* (COE/2015/PhD/176, Dated 20.09.2016)	2016	Dr. Sushma Gupta Dr. Shailendra Jain Dr. Bhim Singh
Bhavana Jain PT/073213111	Wavelet based power quality monitoring in wind energy conversion system (COE/2015/PhD/558, Dated 18.06.2015)	2015	Dr. Shailendra Jain Dr.R.K.Nema
Sanjay Kumar Jain PT/073214118	Detection and analysis of human body odour as an alternative biometric (COE/2015/PhD/330 10.02.2015)	2015	Dr. Jyoti Singhai Dr. Shailendra. Jain
Arun Dutta	Investigations on Shaft Voltage and Bearing Currents in Machine with Static	2015	Dr. Manisha Dubey

PT/093213101	Drive and Excitation System (COE/2015/PhD/796, Dated 29.09.2015)		Dr. Shailendra Jain
Amit Ojha PT/083213101	*Investigations on Back-to-Back Connected Multilevel Converter Fed Induction Motor Drive (COE/2014/PhD/1702,Date 24.02.2014)*	**2014**	Dr. Shailendra Jain P. Chaturvedi A Mittal
Taruna Jain PT/063213104	*Investigations on Hybrid Active Power Filters for Power Quality Improvement in Wind Power Generation System (COE/2013/PhD/1467 Dt. 21.08.2013)*	**2013**	Dr. Shailendra Jain Dr.Ganga Agnihotri
Bhoopendra Singh PT/073213102	*Investigations on High Performance Direct Torque Controlled IM Drive (COE/2013/PhD/1466 Dt. 21.08.2013)*	**2013**	Dr. Shailendra Jain Dr. Sanjeet Dwivedi
Smita Shrivastava PT/073213108	*Development of Improved Islanding Detection Scheme in Distributed Generation Environment (COE/2013/PhD/1337, Dt. 23.04.2013)*	**2013**	Dr.R.K.Nema Dr. Shailendra. Jain
Pankaj Swarnakar PT/073213109	*Investigations on Adaptive Control Schemes for Improved System Response (COE/2013/PhD/1376 Dt. 05.06.2013)*	**2013**	Dr.R.K.Nema Dr. Shailendra. Jain

A.Kirubakaran FT/073113103	*Investigations on Power Conditioning System for Fuel Cell based Distributed Generation (COE/2011/PhD/, Dt. 04.02.2011)*	2011	Dr. Shailendra. Jain Dr.R.K.Nema
P. Chaturvedi PT/053113102	*Investigations on Multilevel Inverters for Harmonic Free High Voltage Applications (COE/2010/PhD/404, ,Dt. 31.08.10)*	2010	Dr. Shailendra Jain Dr. P. Agarwal
S.Meikandasivam FT/073113104	*Micro Tuning of Transmission Line Reactance using Split TCSC (COE/2010/PhD/483, Dt. 10.12.10)*	2010	Dr.R.K.Nema Dr. Shailendra. Jain
Deepika Masand 05/RFS/Elect/01	*Investigations on Distribution Static Compensator for Reactive Power Compensation (COE/2009/PhD/117, Dt. 11.05.09)*	2009	Dr. Shailendra Jain Dr. Gayatri Angihotri
Vijay Jain PT/053113101	*Analysis and Management of Electrical Energy Distribution System (COE/2009/PhD/229, Dt. 08.12.09)*	2009	Dr. Shailendra Jain Dr. D. M. Deshpand

Sponsored Research Projects (Completed/Ongoing)

Title	Sponsoring Agency	Duration	Amount	Co-PI (if any)
Design, Implementation and Performance Evaluation of SEIG based Small Hydro Turbine in Micro Grid System" (No. SB/S3/EECE/182/2013, Dated Nov 20, 2013)	DST (SERB)	28.8 Lacs	3 Years	Dr. Sushma Gupta
Modernization & Strengthening of Machines & Drives, Power Electronics and Control lab (Dean(R&C)/2011/3593, Dt. 12.07.2011)	MHRD-MANIT Scheme	34.0 Lacs	1 Year	-
Development of Electrical Drives Lab (OA/09/6481, Dt. 27.04.2010)	MHRD-MANIT Scheme under R & D Plan	37.0 Lacs	1 Year	-
Development of Power Conditioner for Fuel Cell Based Distributed Generation (Dean R&C/2010/217, 16/02/10)	MHRD-MANIT Scheme under R & D Plan)	13.5 Lacs	1 Year	-

Development of DSP Controlled Multilevel Inverter (F.26-11/04 TSV, Dt. 31.03.05)	MHRD (R & D)	15.0 Lacs	3 Years	-
DSP Controlled Active Power Filter for Power Quality Improvement (F.26-14/03, TSV, Dt. 14.01.04)	MHRD (R & D)	10.0 Lacs	3 Years	Dr. Ganga Agnihotri
AICTE Sponsored Career Award for Young Teachers (F.No. 1-51/FD/CA/(011)/2003-04, Date 22.01.2004)	AICTE, New Delhi	10.5 Lacs	3 Years	-

Major Consultancy Projects

Title	Sponsoring Agency	Duration	Amount	Co-Investigator (if any)
Vetting of Design and Drawing of Electrical Substation for Baneta, Sehore Multi village Water Supply System, (ICSC Project No. EE/2016-17/SJ/742, dated 05.08.16)	JITF Water Infrastructure Ltd, New Delhi,	Oct 2016	1.5 Lacs + ST	
Vetting of Design and Drawing of Electrical Substation for Majholi, Sidhi, Multi village Water Supply System, (ICSC Project No. EE/2016-17/SJ/797, dated 16.11.16)	JITF Water Infrastructure Ltd, New Delhi,	Oct 2016	2.5 Lacs +ST	
Vetting of Design and Drawing of Electrical Substation for Manpur, Umaria, Multi village Water Supply System, (ICSC Project No. EE/2016-17/SJ/798, dated 16.11.16)	JITF Water Infrastructure Ltd, New Delhi,	Nov 2016	2.5 Lacs +ST	

Breakdown and damage analysis of 1 MW Wind Generator, (ICSC Project No. EE/2015-16/SJ/674, dated 09.03.2016)	IFFCO TOKIO Insurance Company Ltd., Bhopal	May 2016	1.25 Lacs +ST
Technical Assessment of Deviation/variation of Electrical Work at AIIMS Bhopal (ICSC/Elect./2014-15/SJ/401 Dt. 20/08/14)	AIIMS Bhopal	2014-15	6.53 Lacs
Technical Opinion of 2 x 2.5 MW + 20% COL, Balsio Hydel Power Project	Flovel Energy, Delhi	Feb-Mar 2015	1.5 Lacs
3-Phase Symmetrical Short Circuit Test on 1 MW PMSG (Extol-Wind^{TM} Make) (ICSC/2012-13/Elect./178 Dt. 15.02.2013)	Extol Industries Ltd., Mandideep	2013-14	1.64 Lacs
Preparation of projected electrical load table, Design and	SPA Bhopal (an autonomous	2013-2018	43.86 Lacs

Development of 33/0.433 kV Power Sub-Station and laying of power lines of Proposed SPA Campus at Bhouri (SPAB/IWD/2012/1675 Dt. 12.12.2012) (ICSC/2012-13/Elect./164 Dt. 22.01.2013)	institution of MHRD)		
Technical Assistance for Transmission line interconnection and routing for grid interface for 500 MW Wind Farm	VIPO Energy, Pittasburg, USA	March. 2010	1.00 Lac

Publication

- **National Journal**   15
- **International/National Conferences**   96

Web of Sc. ID   : A-7499-2017   Orcid.ID :0000-0002-3391-1711

Scopus Author ID: 7404324285   Google Sch ID : uc83rt4AAAAJ

Vidwan ID   :61656

Patents

Title	Year	Agency	Co-Investigator(if any)	Published/Granted
Cascaded Multilevel Inverter	29.04.2021	The Patent Office (India) Journal Page No. 28545, No. of Pages : 30 No. of Claims : 5	Dr K K Gupta	Granted 1829/MUM/2013 dated 24/05/2013

 Citations

	h-index	i-10 index	Total Citations
Google Scholar	34	78	7227
Vidwan Profile	32	-	7121

Dr. Tripta Thakur Highest Qualifications: B.Tech., M.Tech.,Ph.D.

Email :- tripta_thakur[at]yahoo[dot]co[dot]in

Phone: +91-9425660696

Designation	Professor
Address **Phone** **E-mail** **Google Scholar Link**	93, Chatrapati Shivaji Colony, Chunabhatti , Bhopal (O) 0755-4051411, (R) 0755-2424941 (M) 09425660696 thakurt[at]manit[dot]ac[dot]in , tripta_thakur[at]yahoo[dot]co[dot]in https://scholar.google.co.in/citations?user=Zo2Qc6EAAAAJ&hl=en
Date of Birth	08-03-1967
Educational Qualification	• Ph.D (IIT Delhi.), M.Tech (IIT Kanpur), B.E. (MITS, Gwalior)
Experience	• 26 Years
Specialization	• Electrical Power System, Power System Economics and Management, Smart Grid and Renewable Energy
Publication	• 31 Papers in International Journals • 20 Papers in the National Level Conference.

	• **50 Papers in International Level Conference.** • **Total 101 Papers Published**
Member of professional bodies	• **Member IEEE, Chairperson Women IEEE Cell of MANIT-Bhopal** • **Member International Association of Energy Economics (IAEE)** • **Member SEG 4, International Electrotechnical Commission (IEC)** • **Life Member IE**
Country Visited	• **USA, UK, Hong Kong, France, Germany, Czech Republic, Austria, Shri Lanka, Thailand, Cambodia, Pakistan**
Number of P.G. Projects guided	• **05 PhD (Completed), 03 PhD (Ongoing), 31 M.Tech Thesis, and 70 B.Tech Projects**
Project/ Consultancy undertaken	• **Consultant for technical opinion on Balsio Hydro Electric Project (2 x 2500 kW + 20% COL) for M/s. Flovel Energy Pvt. Ltd., Faridabad** • **Consultant for the technical evaluation of rehabilitation of Sardar Sarovar Project appointed by the Supreme Court of India** • **Consultant for South Asia issues for SAFMA for common electricity market in SARRC nations** • **Consultant for South Asia issues for SAFMA for Energy Security issues in SARRC nations.** • **Project, " Smart Grid Innovation Lab", TEQIP-II**

	- Project, " Performance Evaluation of Electricity Generating Companies of India", MANIT Bhopal - Project, "Restructuring Of Industrial Drives Lab By Using Computer Controlled Approach", MHRD, GoI - Project, "Application Of Digital Signal Processing In Power Electronics And Drives", MHRD, GoI - Project, "Biomedical Instrumentation", MHRD, GoI - Project, "High Performance Drives", MHRD, GoI
Administrative work done	- Chairman, Career Development Cell, MANIT - Head of the MBA Department, MANIT Bhopal - Professor I/C Legal Cell - Professor I/C Student Advisor - Professor I/C Electrical Association - Senior Warden Girls Hostel - Warden Girls Hostel - Professor I/C SPICMACAY
Any other information	- Common wealth Split Site Ph.D Scholarship University of Dundee, UK Scotland - Common wealth Academic Fellowship, Durham Business School, Durham University, UK, awarded by Common wealth Commission UK - COFUND Senior research fellow, Durham Energy Institute (DEI), Durham University, UK - Visiting faculty at AIT Bangkok under the Faculty Secondment Scheme of MHRD, GOI

	Reviewer for Energy Policy Journal **Reviewer for Annals of Operational Research** **Reviewer for International Journal of Energy Technology and Policy** **Organized 03 Workshops and 03 STTP as Coordinator.** **Organized IEEE International Conference on Electric Power System and Energy Systems, Dec 14-16, 2016** **Published two books; (i) Performance Evaluation of Electric Supply Utilities in India, India Core Publishing, 2009 (ii) Handbook of Research on Emerging Technologies for Electrical Power Planning, Analysis, and Optimization (Advances in Computer and Electrical Engineering), 2014** **Delivered more than 50 expert lectures at various organizations like** **IIT Kanpur** **BHEL Bhopal,** **MP Electricity board, Gwalior** **MP Electricity Regulatory Commission, Bhopal** **MITS, Gwalior** **Government Engineering College Jabalpur** **National Institute of Technical Teachers' Training & Research (NITTTR) Bhopal** **Institute for Excellence in Higher Education (IEHE) Bhopal**

Dr.N. P. Patidar

Professor Qualifications: B.E., M.Tech. ,Ph.D.

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Phone: +91-8839477653

Subjects Taught

U.G	**Electro-Magnetic Fields and Materials**
	Generation of Electrical Power
	Power Systems
	Electrical Machines
P.G	**Advanced Power System Protection**
	Computer Application in Power System
	HVDC & HVAC Transmission

	Power System Analysis

Teaching Experience

Organization	Start Date	End Date	Designation
KDKCE Nagpur	July 1995	Feb 1998	Sr. Lecturer
MANIT Bhopal	March 1998	19/05/ 2010 19/05/ 2010 to 31/05/2013	Assistant Professor Associate Professor
NITTTR Bhopal	31/05/2013	16/05/2016	Professor (On Lien)
MANIT Bhopal	16/05/2016	28/12/2018 28/12/2018 to Till date	Associate Professor Professor

Ph.D. Supervised/Ongoing

Name of the Student	Topic	Year of Award	Co-Supervisor (if an
Mr. J. S. Yadav	Model Order Reduction Using Modern Heuristic Optimization Techniques for Controller Design.	2011	Dr. Jyoti Singhai
Ms Anuprita Mishra	Development of Transmission Charge Approaches Utilizing Utility Factor Methods in Electric Power System	2012	Dr. Ganga Agihotri

Mr. D K Agrawal	"Demand Response in electricity Markets"	2013	Dr. R K Nema
Ms Priyanka Paliwal	Reliability and Cost Evaluation of Hybrid Power System.	2013	Dr. R K Nema
Mr. Devang Bhatt	Application of Clonal algorithm to solve the Economic Load Dispatch Problem	2014	Dr. Y Kumar
Mr. Rishi Kumar Singh	Power System Transient Stability Improvement with FACTS Controllers Using Evolutionary Techniques	2015	--
Ms. Ruchi Solanki	Economic Load Dispatch using Artificial Intelligence	2016	Dr. K T Chaturvedi F
Mr. Suresh Gawre	Investigations on Detection and Classifications of Power Quality Disturbances	2016	Dr. R K Nema
Mr. A S Walkey	Evaluation of Reactive Power Pricing in Deregulated Power System	2016	--
Mr. A K Sharma	Performance Evaluation of SFIG using Ant colony Search Algorithm	2018	Dr. Ganga Agnihotr
Mr. P K Khampariya	Coordinated FACTS & Fuzzy Logic Based WADC for Small Signal Stability Enhancement of Multi-Machine Power System.	2018	Dr. R P Singh

Mr. Sanjiv Kumar Jain	Power System Voltage Security Event Classification and Corrective Action Using Fuzzy Decision Tree	2020	Dr. Y Kumar
Mr. Arun Rathore	Optimal Planning of Autonomous Hybrid Power System	2021	--
Mr. Satyam Patel	Planning of Hybrid Power System Incorporating Distributed Generation	Ongoing	--
Ms Ritu Verma	Investigation on Protection Schemes in Solar PV Integrated Grid	Ongoing	Dr. Suresh Gawre
Mr. Vaibhav Sharma	Demand Response	Ongoing	--
Mr. Tanmay Shukla	Design and Analysis of Power Electronic Converters for Battery Charging & PMBLDC Motor Drive of EV Systems	Ongoing	Dr. U Kalla

Major Consultancy Projects

Title	Sponsoring Agency	Duration	Amount	Co-Investigator (if any)
Opinion regarding VFD for 1000 MW pumps of Hirwar Micro	Phalodi Construction & Infrastructure Pvt Ltd. Indore	01 month	1,00,000/-	Dr. S Gawre

Irrigation Project in District Shahdol(MP)				
Proof Checking and vetting of Design documents and drawings related to EPC TAMAS MVS Project under MPJNM	Ms NCC Limited, Satna (MP)	01 month	1,00,000/-	Dr. Amit Ojha & Dr. S Gawre

Publication

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus	IMPACT FACTOR
N. P. Patidar ,J.D.Sharma	A CBR-PNN Approach for Real-Time Voltage Security Assessment of	International Journal of Energy Tech. and policy	Vol. 5, No. 6, pp. 658-672	2007		

	Power System					
N. P. Patidar, J D Sharma	A Hybrid Decision Tree Model for Fast Voltage Contingency Screening and Ranking	International Journal of Emerging Electric power system	Vol. 8, Iss. 4, Art.7	2007		
N. P. Patidar and J. D. Sharma	Power Systems Voltage Security Assessment and Optimal Load Shedding Using CBR Approach	IEEJ Transactions	Vol. 128, No. 11, pp. 1304-1312.	2008		
N. P. Patidar and J. D. Sharma	Fast Voltage Contingency	International Journal of Reliability and Safety	Vol. 2, No. 1, pp. 36-50.	2008		

	Analysis of Power Systems Using Model Trees					
N. P. Patidar and J. D. Sharma	Voltage Security Assessment and Optimal Load Shedding of Power System Using the Case-Based Reasoning Approach	International Journal of Reliability and Safety	Vol. 2, No. 2, pp. 19-35	2008		
S. Panda, N. P. Patidar and R. Singh	Simultaneous Tuning of Static Var Compensator and Power System Stabilizer	International Journal of Electrical Power and Energy Systems Engineering, World Academy of	vol. 1, No. 4, pp. 240-248	2008		

	Employin g Real-Coded Genetic Algorithm	Science, Engineering and Technology				
S. Panda, N. P. Patidar and R. Singh	Robust coordinat ed Design of Excitation and STATCOM-Based Controller Using Genetic Algorithm	Internationa l Journal of Innovative Computing and Applications	Vol. 1, No. 4, pp. 244-251	2008		
S. Panda, J. S. Yadav, N. P. Patidar and C. Ardil	Evolution ary Technique s for Model Order Reduction of Large Scale Linear Systems	Internationa l Journal of Applied Science, Engineering and Technology	Volum e 5, No. 1, pp. 22-28,	Winter 2009		

J. S. Yadav, N. P. Patidar, J. Singhai, S. Panda, and C. Ardil	A Combined Conventional and Differential Evolution Method for Model Order Reduction	International Journal of Computational Intelligence	Volume 5, No. 2, pp. 111-118,	Spring 2009		
S. Panda, N P Patidar and R. Singh	A Multi-Objective Algorithm Approach for Adaptive PSS and TCSC-Based Controller Design	International Journal of Adaptive and Innovative Systems		2009.		
Anuprita Sandeep Mishra, Ganga Agnihotri and N.P.Patidar,	Transmission and Wheeling Service Pricing: Trends in Deregulat	Journal of Advances in Engineering Science	Vol.-3, Issue-1, pp. 1-16	2010		

	ed Electricity Market					
Anuprita Sandeep Mishra, Ganga Agnihotri and N.P.Patidar	Impacts of Distributed Generation in Restructured Power System: A Review	International Journal of Information Technology and Knowledge Management	Vol.-3, No. 2	July-Dec., 2010		
Anuprita Sandeep Mishra, Ganga Agnihotri and N.P.Patidar	Trends of Wheeling Service Charges with DG in Deregulated Electricity Market	International journal of Power System Optimization and Control,	Vol.-2, No.-1, pp. 7-14,	Jan.-June 2010		
Priyanka Paliwal and N.P. Patidar	Investigating Storage Options for	International journal of Power System and Power	Vol.-2, no.-1,pp. 219-224	Jan.-June 201		

	Renewable Energy Based Distributed Generation	Electronics Engineering				
Devang Kirtikumar Bhatt, Yogendra Kumar and N. P. Patidar	Solution of Combined Emission Economic Load Dispatch Problem Using AIS Based Clonal Algorithm	International Journal of Power System and Power Electronics Engineering	Vol.-2, No.1 ,pp. 175-186	Jan.-June 2010.		
Agrawal D.K., Patidar N.P., Nema R.K.	Identification of Options of Demand Response Using Load Pattern	International Journal of Advanced Engineering Sciences and Technologies	Vol No. 10, Issue No. 1, pp. 111 – 118, ISSN: 2230-7818	2011		

	Diversity Factor					
Agrawal D.K., Patidar N.P., Nema R.K.	Demand Shifting Bidding in a Hybrid System with Volatile Wind Power Generation	TELKOMNIKA Indonesian Journal of Electrical Engineering Indonesian Journal of Electrical Engineering	Vol.10 No.1, ISSN: 1693-6930.	Apr 2012		
Suresh K. Gawre, N P Patidar and R. K. Nema	Application of wavelet Transform in power Quality: A Review	International Journal of Computer Applications	Volume 39–No.18	February 2012		
Suresh K. Gawre, N P Patidar and R. K. Nema	De-noising of Voltage Sag using Wavelet Transform	International Journal of Computer Applications	, Volume 74–No.18	July 2013		

A S Walkey, N P Patidar	Reactive Power Cost Evaluation Considering Voltage Security Margins	Journal of Engg. Science & Management Education	Vol. 6(I),pp. -80-87	Feb. 2013		
Anuprita Sandeep Mishra, Ganga Agnihotri, N.P.Patidar and Baseem Khan	Coordination of Participants in Pool Market using Game Theory to Allocate Fixed Cost	Electrical and Electronics Engineering: An International Journal (ELELIJ)	Vol 3, No 2	May 2014		
Ashok Kumar Sharma, N. P. Patidar, G. Aganihotri and D. K. Palwalia	Artificial bee colony based determination of excitation capacitance	Vitivinicola A Science and Technology Journal, Portugal	vol.29, no. 6,	2014		

	requirements of self-excited induction generator					
Ashok Kumar Sharma, Narayan Prasad Patidar, Ganga Aganihotri and Dheeraj Kumar Palwalia	Artificial bee colony based steady state analysis of self-excited induction generator	Wulfenia Journal, Klagenfurt, Austria	vol.21, no. 6,	2014		
Priyanka Paliwal, N P Patidar and R K Nema	Determination of Reliability Constrained Optimal Resource Mix for an Autonomous Hybrid Power	International Journal Renewable Energy (Elsevier Publication)	Vol. 63, pp-194-204	March-2014.		

	System using Particle Swarm Optimization					
Priyanka Paliwal, N P Patidar and R K Nema	A Novel Method for Reliability Assessment of Autonomous PV-Wind-Storage System using Probabilistic Storage Model	International Journal of Electric Power and Energy Systems (Elsevier Publication)	Vol. 55, pp. 692-703,	Feb. 2014.		
Priyanka Paliwal , N. P. Patidar , R.K. Nema	Planning of grid integrated distributed generators: A	Int. J. of Sustainable Energy Reviews(Elsevier Publication)	Volume 40, Pages 557–570	December 2014		

	review of technology, objectives and techniques					
Ruchi Solanki, N P Patidar, KT Chaturvedi	Different Penalty Handling Techniques Based New Modified Particle Swarm Optimization for Nonconvex Economic Power Dispatch	Wulfenia Journal, Klagenfurt, Austria	volume 22	May 2015		
Ruchi Solanki, N P Patidar, KT Chaturvedi	Nonconvex Economic Dispatch using Passive	Wulfenia Journal, Klagenfurt, Austria	volume 22, No.6	Jun 2015.		

	Congregation based Particle Swarm Optimization with Self-organizing hierarchical approach					
A S Walkey, N P Patidar	Cost Evaluation of Reactive Power with FACTS Devices in Deregulated Power Systems	Journal of Engg. Science & Management Education, NITTTR Bhopal, India	Vol. 8(II), pp.-100-110	July 2015		
K. L. Mokariya, V. A. Shah, N. P. Patidar	Charging electrical vehicles on the Indian power grid:	International Journal of Engineering Research and Technology	Vol 11, pp. 219-241	2018		

	Analysis, challenges, and solutions					
D.M.Sajnekar,M.L.Kolhe, S.B.Deshpande, N.P. Patidar,K.Ogura	Design of PID controller for automatic voltage regulator and validation using hardware in the loop technique	International Journal of Smart Grid and Clean Energy	vol. 7, pp. 75-89	2018		
M.LKolhe, N.P Patidar, L Nagar, A Sharma, V.K.Singh	Optimum placement of PMU for wide area measurement systems	Int. Journal of Smart Grid and Clean Energy	vol.7, pp. 159-169	2018		

S. R Nandanwar, M.L Kolhe, S.B Warkad, N.P. Patidar, V.K.Singh	Voltage Security Assessment by Using PFDT and CBR Methods in Emerging Power System	Energy Procedia, pp. 170-181		2018		
Arun Rathore and N. P. Patidar	Interval type-2 fuzzy logic based determination of battery charging efficiency applied to standalone hybrid power system	Journal of Intelligent & Fuzzy Systems,	Vol. 35, pp. 1621-1632	2018		
Arun Rathore and N. P. Patidar	Reliability assessment using	International Journal of Electrical	Vol. 106,	March 2019		

	probabilistic modelling of pumped storage hydro plant with PV-Wind based standalone microgrid	Power & Energy Systems (Elsevier Publications),	pp. 17-32,			
Arun Rathore, N P Patidar	Reliability Constrained Socio-Economic Analysis of Renewable Generation Based Standalone Hybrid Power System with Storage for off-grid	IET Renewable Power Generation,	Volume 14, Issue 12, pp. 2142-2153,	Sept. 2020.		

	Communities					
Priyanka Paliwal, N P Patidar, R K Nema	**Probabilistic indices for analysing the impact of penetration of distributed energy resources on system reliability**	**IET Renewable Power Generation,**	**Volume 14, Issue12,September pp. 2154-2165,**	**Sept. 2020.**		
Arun Rathore and N. P. Patidar	**Optimal sizing and allocation of renewable based distribution generation with gravity energy storage consideri**	**Journal of Energy Storage (Elsevier Publications),**	**Vol. 35, pp. 1-18,**	**March 2021**		

	ng stochastic nature using particle swarm optimization in radial distribution network					
Jain Sanjiv Kumar, Narayan Prasad Patidar, Yogendra Kumar, and Shweta Agrawal	Real-time voltage security assessment using adaptive fuzzified decision tree algorithm	International Journal of Engineering Systems Modelling and Simulation	Vol 13, no. 1, pp. 85-95	2022		
Pramod Kumar Bhatt & Narayan Prasad Patidar	Intelligent transformer tap controller for harmonic eliminatio	Journal of Engineering Optimizatio n		Apr 2022		

	n in photovoltaic interfaced micro-grid network					
Arun Rathore, Anupam Kumar and N. P. Patidar	Techno-socio-economic and sensitivity analysis of standalone micro-grid located in central India	International Journal of Ambient Energy, Taylor & Francis, on-line published		Feb. 2023		
Sonali Nandanwar a, Narayan Prasad Patidar b, M. Deva Brinda c, Mohan Lal Kolhe	Real-time computing of power flows and node voltages in electrical energy	Int. Journal of Cleaner Engineering and Technology(Elsevier Publications)	Vol. 15	July 2		

	network using decision trees			

Patents

Title	Year	Agency	Co-Investigator(if any)	Published/Granted
SYSTEM AND METHOD FOR A HYBRID FUZZY PD-PI PLUS FUZZY P CONTROLLER FOR FREQUENCY REGULATION OF ELECTRICAL POWER SYSTEM	2023	Indian Patent	Sonali Nandanwar N P Patidar D K Palwalia Siddhartha Panda	Publishe

Citations

	h-index	i-10 index	Total Citations
Google Scholar	19	38	1711

Dr. Sushma Gupta

Professor Designation: Professor & HOD

Qualifications: B.E., M.Tech. ,Ph.D.

Email: sush_gupta[at]yahoo[dot]com

Subjects Taught

U.G	Instrumentation, Electronic Instrumentation, Power Electronics and Electrical Drives

P.G	Advanced Electrical Drives, Advanced Power Electronics and Non-Conventional Energy

Teaching Experience

Organization	Start Date	End Date	Designation
Rewa Engineering College	February 1994	June 1997	Lecturer
UIT-RGPV, Bhopal	1st July 2005	20th May 2010	Lecturer
MANIT, Bhopal	21st May 2010	28th December 2018	Associate Profess
MANIT, Bhopal	28th December 2018	Till Date	Professor

Ph.D. Supervised/Ongoing

Name of the Student	Topic	Year of Award	Co-Supervisor (if any)
Sweeka Meshram	Investigation on PV/Hydro Hybrid System for Maximising Their Utilization	2014	Dr. Ganga Agnihotri
Monika Jain	Design, Implementation and Performance Evaluation of SEIG based Micro-grid System	January 2017	Dr. Gaytri Agnihotri

Sachin Tiwari	Series Compensation of Self Excited Induction Generator For Distributed Power Generation	September 2016.	Dr. Shailendra Jain
Rakeshwari Pal	Solar PV Based Dynamic Voltage Restorer (DVR) for Grid Connected Distribution System	November 2019	No
Mohd Salim Qureshi	Improved Adaptive Sliding Mode Controller for Application in Robotic Manipulator	September 2019	Dr. Pankaj Swarnkar
Saurabh Gupta	Power Quality Improvement of DFIG Based Wind Energy Conversion System	November 2020	Dr. S.C. Choubey
Manju Gupta	Analysis of Load Management Techniques for Smart Grid Applications using Deviation Settlement Mechanism and Demand Response	May 2021	No
Nisha Prasad	Modelling and Design of Linear Switched Reluctance Motor for High Speed Transit System	October 2021	Dr. Shailendra Jain

Dhananjay Kumar	Investigations on Emerging Fault-Tolerant Multilevel Inverter Topologies	August 2022	Dr. R. K. Nema
Somanna Banothu	Enhancing the performance of hybrid grid using AI techniques	Ongoing	No
Uliya Mitra	Modelling and optimization of Proton Exchange Membrane Fuel Cell using Parameter Estimation Technique for Power Generation	Ongoing	Dr. Anoop Arya

Sponsored Research Projects (Completed/Ongoing)

Title	Sponsoring Agency	Duration	Amount	Co-PI (if any)
Design, Implementation and Performance Evolution of SEIG based small Hydro Turbine in Micro Grid System	SERB	Three Years	Rs. 28,87,080/-	Dr. Shailendra Jain Dr. Tripta Thakur
Development of Fast Bidirectional Battery Chargers for Electric Vehicles Considering Power Quality Aspects	MPCST	Two Years	7,40,000	Dr. Shailendra Kumar Dr. Sanjeev Singh

Dr. Sanjeev Singh

Professor

Qualifications: PhD

Research Area : Power Electronics and Drives, Electric Vehicles and Micro-grids
Email : sschauhan[at]manit[dot]ac[dot]in, sschauhan.sdl[at]gmail[dot]com
Phone : 1405(O), +91-9465237795

Subjects Taught

U.G	Electrical Machines I, II and III, Power Electronics, Electrical Machine Design, Basic Electrical Engineering, Network Analysis and Synthesis, Modeling and Simulation of Electrical Machines, Energy Management, Measurement and Instrumentation, Electrical Drives, Industrial Analysis, Special Machines.
P.G	Advanced Power Electronics, Advanced Electrical Drives, DSP Applications to Electrical Drives, Evolutionary Techniques, Soft Computing Techniques, Research Methodology, Optimization

Teaching Experience

Organization	Start Date	End Date	Designation	
SLIET Longowal, Punjab	06.01.2000	21.11.2013	Assistant Professor	
SLIET Longowal, Punjab	22.11.2013	09.01.2019	Associate Professor	

MANIT Bhopal, M.P.	10.01.2019	23.02.2020	Associate Professor
MANIT Bhopal, M.P.	24.02.2020	Current Date	Professor

Ph.D. Supervised/Ongoing

Name of the Student	Topic	Year of Award	Co-Supervisor (if any)
Sachin Singh	Position Sensorless Control of PMBLDC Motor	2016	
Ruchi Agarwal	Analysis Design and Control of Voltage Source Converter based HVDC System	2016	
Umesh Chand Rathore	Design and Development of Voltage and Frequency Controller for Micro/Pico Hydro Power Generation System	2018	
Charanjiv Gupta	Design and Performance Evaluation of Microgrid based on conventional and Renewable Energy Sources	2019	

Jaspreet Singh	Impact Analysis of Power Quality Problems of Transformers	2020	Dr Amanpreet Singh
Manoj Kumar	Analysis, Design and Development of High Frequency Converter based Power Factor Controller for Welding Application	2020	
Vinay Kumar	Investigations on Fault Tolerant Operation of Multilevel Inverters	2022	Dr Shailendra Jain
Rheesabh Dwivedi	Investigations on Fast Charging Converter for Electric Vehicle Application	2023	Dr Bhim Singh
Paramjeet Singh Jamwal	Multilevel Inverter fed Induction Motor Drive for Battery Electric Vehicle	2023	Dr Shailendra Jain

Ph.D Ongoing

Name of the Student	Topic	Year of Registration	Co-Supervisor (if any)
Siddhant Gudhe	Multi-Source Bidirectional Converter Topologies for Electric Vehicles	2019	

Rahul Arora	Design and Analysis of Power Electronic Converters and their Control for BLDC Motor Drives	2020	Dr Ujjwal K Kalla
Dheeraj Kumar	Investigations on SPV Systems with Grid Interactive and Islanding Operation Facility	2022	Dr Shailendra Kum

Title	Sponsoring Agency	Duration	Amount	Co-PI (if any)
Development of reliable, efficient and cost-effective controller for permanent magnet brushless DC motor drive with reduced sensors and improved power quality at utility mains	**AICTE New Delhi under research promotion scheme (RPS)**	**2013-2016**	**Rs.15 Lakhs**	--
Design and Implementation of single phase Microgrid using Renewable energy sources	**SERB, DST New Delhi under EMR**	**2019-2022**	**Rs.62.99 Lakhs**	As Co-PI with Dr Ujjwal Kalla and Dr Manisha Dubey
Development of Fast Bidirectional Battery Chargers for Electric Vehicles Considering Power Quality Aspects	**MPCST Bhopal**	**2022-2024**	**Rs.7.4 Lakhs**	As Co-PI with Dr Shailendra Kumar, Dr Sushma Gupta
Design and Development of Grid Interactive Residential Rooftop PV System with Islanding/Resynchronization Capabilities	**National Mission on Power Electronic Technology (NaMPET) through Nodal Centre CDAC Thiruvananthapuram**	**2022-2023**	**Rs.41.21 Lakhs**	Dr Shailendra Kumar, Dr Manisha Dubey

Sponsored Research Projects (Completed/Ongoing)

Publication

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus	IMPACT FACTOR
M. Rezkallah, Félix Dubuisson, Sanjeev Singh, Bhim Singh, Ambrish Chandra, Hussein Ibrahim and Mazen Ghandour	Coordinated Control Strategy for Hybrid off-Grid System Based on Variable Speed Diesel Generator	IEEE Transactions on Industry Applications	vol. 58, no. 4, pp. 4411-4423	2022	SCI	4.079
M. Rezkallah, Sanjeev Singh, B. Singh, A. Chandra, H. Ibrahim and M. Ghandour	Implementation of Two-Level Coordinated Control for Seamless Transfer in Standalone Microgrid	IEEE Transactions on Industry Applications	vol. 57, no. 1, pp. 1057-1068	2021	SCI	4.079

M. Rezkallah, Sanjeev Singh, A. Chandra, M. Saad, B. Singh, M. Tremblay and H. Geng	Comprehensive Controller Implementation for Wind-PV-Diesel based Standalone Microgrid	IEEE Transactions on Industry Applications	vol. 55, no. 5, pp. 5416-5428	2019	SCI	4.079
M. Rezkallah, Ambrish Chandra, Bhim Singh and Sanjeev Singh	Microgrid: Configurations, Control and Applications	IEEE Trans. Smart Grid	vol. 10, no. 2, pp. 1290-1302	2019	SCI	9.6
Sanjeev Singh and Bhim Singh	Optimized Passive Filter Design using Modified Particle Swarm Optimization Algorithm for a 12-Pulse Converter fed LCI-Synchronous Motor Drive	IEEE Transactions on Industry Applications	vol.50, no.4, pp.2681-2689	2014	SCI	4.079

Sanjeev Singh and Bhim Singh	A Voltage Controlled PFC Cuk Converter based PMBLDCM Drive for Air-Conditioners	IEEE Transactions on Industry Applications	vol. 48, no. 2, pp 832-838	2012	SCI	4.079
Bhim Singh, Sanjeev Singh, Ambrish Chandra and Kamal Al-Haddad	Comprehensive Study of Single-Phase AC-DC Power Factor Corrected Converters with High Frequency Isolation	IEEE Transactions on Industrial Informatics	vol. 7, no. 4, pp. 540-556	2011	SCI	11.648
Bhim Singh, Sanjeev Singh and Hemanth Chender S.P.	Harmonics Mitigation in LCI fed SM Drives	IEEE Transactions on Energy Conversion	vol.25, no.2, pp.369-380	2010	SCI	4.877
Bhim Singh, Sanjeev Singh and Hemanth Chender S.P.	Power Quality Improvements in LCI fed SM Drives	IET Power Electronics	vol.3, no.3, pp.411-428	2010	SCI	2.112
Bhim Singh and Sanjeev Singh	Single Phase PFC Topologies for Permanent	IET Power Electronics	vol. 3, no. 2, pp.147-175	2010	SCI	2.112

	Magnet Brushless DC Motor Drives					
Rheesabh Dwivedi, Sanjeev Singh and Bhim Singh	Design and development of three-phase EV charger based on the integration of voltage-oriented pulse width modulation control and water cycle algorithm fractional-order PI controller	International Journal of Ambient Energy	vol.44, no.1, pp.157-170,	2023	Scopus	3.63
Vinay Kumar, Sanjeev Singh and Shailendra Jain	Single-phase cross-connected sources asymmetric T-type multilevel inverter with fault tolerant capabilities	*Int. J. Power Electronics*	Vol. 17, No. 3, pp.280-298	2023	Scopus	0.128
Siddhant Gudhe, Sanjeev Singh, Miloud Rezkallah	Dynamic Control of Traction Motor for EV Fed via Dual Source Inverter with a	Energies	16, 1754	2023	SCIE	3.2

and Ambrish Chandra	Two Battery System					
M. Rezkallah, H. Ibrahim, F. Dubuisson, A. Chandra, Sanjeev Singh, B. Singh and M. Issa	Hardware Implementation of Composite Control Strategy for Wind-PV-Battery Hybrid Off-Grid Power Generation System	Clean Technologies	vol. 3, no.4, pp 821-843	2021	ESCI	3.8
M. Rezkallah, Sanjeev Singh, A. Chandra, B. Singh and H. Ibrahim	Off-Grid System Configurations for Coordinated Control of Renewable Energy Sources	Energies	vol.13, no.18, 4950, pp.1-25	2020	SCIE	3.2
Jaspreet Singh Maan, Sanjeev Singh and Amanpreet Singh	Impact of Harmonics on Power Transformer Losses and Capacity Using Open DSS	International Journal of Emerging Electric Power Systems	vol. 20, no. 4	2019	ESCI	0.26

Jaspreet Singh, Sanjeev Singh and Amanpreet Singh	Distribution transformer failure modes, effects and criticality analysis (FMECA)	Engineering Failure Analysis	vol.99, pp.180-191	2019	SCIE	3.634
Ruchi Agarwal and Sanjeev Singh	Controller Optimization Algorithm for a 12-pulse Voltage Source Converter based HVDC System	Journal of Electrical Engineering and Technology (JEET)	vol. 12, no. 2, pp. 643-653	2017	SCI	1.9
Umesh Chand Rathore and Sanjeev Singh	Experimental Evaluation of Harmonics Mitigation Transformers for PQ control in 3ph SEIG feeding Isolated Domestic Load	International Journal of Electrical Engineering	vol. 24, no. 6, pp. 247-256	2017	Scopus	0.12
Ruchi Agarwal and Sanjeev Singh	Optimized Controller Design for a 12-Pulse Voltage Source Converter based HVDC System	Springer Journal of Institution of Eng. India Ser. B	vol. 98, no. 6, pp. 567-577	2017	Scopus	0.3

Ruchi Agarwal and Sanjeev Singh	Power Quality Control of Voltage Source Converter based HVDC System using Particle Swarm Optimization	International Journal of Power and Energy Conversion	vol.8, no. 4, pp.435 – 452	2017	Scopus	0.225
Sachin Singh and Sanjeev Singh	Position Sensorless Control for PMBLDC Motor Drive using Digital Signal Processor	Journal of Circuits Systems and Computers (JCSC)	vol. 25, no. 7	2016	SCIE	1.278
Sanjeev Singh and Bhim Singh	A PFC Based PMBLDCM Drive for Air-Conditioner using Half-Bridge Buck Converter	International Journal on Energy Technology and Policy (IJETP)	vol.8, nos. 3/4/5/6, pp 255-266	2012	Scopus	1.22
Sanjeev Singh and Bhim Singh	Particle Swarm Optimization for Power Quality Improvement of A 12-pulse Rectifier-Chopper fed LCI - Synchronous Motor Drive	International Journal of Intelligent Systems Technologies and Applications (IJISTA)	Vol.11, No.3/4, pp.267 – 285	2012	Scopus	0.72

Sanjeev Singh and Bhim Singh	A PFC Bridge Converter for Voltage Controlled Adjustable Speed PMBLDCM Drive	Journal of Electrical Engineering and Technology (JEET)	vol. 6, no. 2, pp. 215-225	2011	SCI	1.9
Sanjeev Singh and Bhim Singh	An Adjustable Speed PMBLDCM Drive for Air Conditioner using PFC Zeta Converter	*Int. J. Power Electronics*	vol. 3, no. 2, pp.171-188	2011	Scopus	0.128
Sanjeev Singh and Bhim Singh	PFC buck-boost Converter Based Voltage Controlled Adjustable Speed PMBLDCM Drive for Air-Conditioning	European Transaction on Electric Power (ETEP)	Vol. 21, Issue 1, pp.424-438	2010	SCIE	2.639
Sanjeev Singh and Bhim Singh	Modelling, Simulation and Design of Single-stage PFC Forward Boost Converter based Adjustable Speed PMBLDCM	*IE (I) Journal-EL*	vol. 91, pp.55-62	2010	Scopus	0.3

	Drive for Small Air-conditioner					
Bhim Singh and Sanjeev Singh	State-of-Art on Permanent Magnet Brushless DC Motor Drives	Journal of Power Electronics	vol. 9, no. 1, pp.1-17	2009	SCIE	0.91

Patents

Title	Year	Agency	Co-Investigator(if any)	Published/Granted
Power Factor Correction (PFC) based FLYBACK Converter for Permanent Magnet Brushless DC Motor Drive for Fan Applications	2022	Indian Patent Office	Dr Bhim Singh	Granted Patent No. 394299

Citations

	h-index	i-10 index	Total Citations
Google Scholar	13	23	1696
Vidwan Profile	11	-	1133

Dr. S.C.Gupta

Associate Professor Qualifications:B.E., M.Tech. ,Ph.D.

Email: scg.nit.09[at]gmail[dot]com,

Phone: (R)+91-755 2670452 (M) +91-9826249170

Subjects Taught

U.G	1. Power System- I, 2. Power System-II, 3. EHV AC/DC Transmission, 4. Reactive Power control, 5. Basic Electrical Engineering, 6. Electrical Machines
P.G	1. Advanced Power System Protection, 2. EHV AC/DC Transmission, 3. Reactive Power Compensation, 4. Power System Stability

Teaching Experience

Organization	Start Date	End Date	Designation
B .N.C.O.E Pusad(MS)	02.07.86	29.07.93	Lecturer
B .N.C.O.E Pusad(MS)	30.7.93	11.3.97	Astt Professor
MACT ,Bhopal(M.P)	14.03.1997	14.03.2002	Lecturer
MANIT ,Bhopal(M.P)	14.03.2002	14.03.2007	Sr.Lecturer
MANIT , Bhopal(M.P)	14.03.2007	14.03.2010	Assistant Professor
MANIT, Bhopal(M.P)	14.03.2010	Till date	Associate Professor

Ph.D. Supervised/Ongoing

Name of the Student	Topic	Year of Award	Co-Supervisor (if any)
Yaswant Sawale	A Novel Methodology for scrutiny of Autonomous Hybrid Renewable Energy System	April 2018	-
Vaishali Sohoni	Investigation on wind speed and wind turbine power curve models for site specific energy assessment	Nov 2020	Dr. R.K. Nema
Tarun Shrivastava	Design of superconducting fault current limiting system	Dec 2021	Dr. A. M. Shandilya

	for application in VSC-HVDC system		
Akanksha Jain	Performance Evaluation of Transactive Energy Control in Distribution System	Ongoing	-
Gautam Yadav	Design and Modelling of Protection Techniques for Microgrid	Ongoing	Dr. Mukesh Kirar
Verendra Singh Kharkwal	A Novel residential load forecasting technique based on deep learning technique(Tentative)	Ongoing	-

Major Consultancy Projects

Title	Sponsoring Agency	Duration	Amount	Co-Investigator (if any)
Vetting of QAP of SCADA and PLC(Instrumentation and control) of water supply system	The Indian Hume Pipe Co.	Two month	0.70 lakh	Dr. Mukesh Kirar, Dr. Suresh Gawre

Publication

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus	IMPACT FACTOR
Yashwant Sawle, S.C. Gupta, Aashish Kumar Bohre	Review of hybrid renewable energy systems with comparative analysis of off-grid hybrid system	Renewable and Sustainable Energy Reviews	Vol.81,No.2 p.2217-2235	2008	SCIE	1.72
Yashwant Sawle, SC. Gupta, Aashish Kumar Bohre	Socio-techno-economic design of hybrid renewable energy system using optimization techniques	Renewable energy	Vol.119 p.459-472	2018	SCIE	8.634
Yashwant Sawle, SC. Gupta, Aashish Kumar Bohre	A novel Methodology for scrutiny of off Grid Hybrid Renewable System	International Journal Of Energy Research	Vol.42, No.2 p.570-586	2017	SCIE	4.672

Yashwant Sawle, S.C. Gupta, Aashish Kumar Bohre	PV-wind hybrid system: A review with case study	Cogent Engineering Journal	Vol. 3, No.1 p.1-31	2016	ESCI	1.9
Prasant Khare, Raju More, S C Gupta	Liberalized automatic generation control of interconnected thermal-hydro-gas system using firefly algorithm optimized PID controller	International journal of numerical modelling : Electronics Network, Devices and Field/early View	Vol.25,No.4	2023	SCIE	1.436
Vaishali Sohoni, Shivcharan Gupta, and Rajeshkumar Nema	A comparative analysis of wind speed probability distributions for wind power assessment of four sites	Turkish Journal of Electrical Engineering & Computer Sciences	Vol.24,No.6 p.4724-4735	2016	SCIE	0.853

S.C.Gupta Y.Kumar and Gayatri Agnihotri	REAST: Renewable energy analysis and sizing tool	Journal of Electrical Systems(JES)	Vol.17 No.2	2011	Scopus	0.187
Tarun Shrivastava, S.C.Gupta, AM Shandilya	A GWO Implementation for Free FEM++ and Its Utilization in Optimization of RoebelCable for SFCL Applications	Journal of Advanced Research in Dynamical & Control Systems	Vol.12,No.5 p.308-321	2020	Scopus	-
Akanksha Jain, S.C.Gupta	Evaluation of Energy Forecasting in Trends of Demand Using Machine Learning Algorithms	Journal of North-eastern University	Vol.25,No.4 p.3322-3342	2022	Scopus	0.156
Vaishali Sohoni, Shivcharan Gupta, and Rajeshkumar Nema	Design of PV-wind based stand-alone energy system for three sites in central India	ECTI transaction on electrical engineering electronics and communication	Vol.17,No. 1 p.24-34	2019	Scopus	0.91

Tarun Shrivastava, S.C.Gupta, AM Shandilya	FEM Based Modeling And Optimization Of Roebel Cable For SFCL Applications Using PSO	International Journal of Advanced Science and Technology	Vol.29,No.12 p.1430-1443	2020	Scopus	-
Satya prakash,S C Gupta	Fuzzy logic based trained fault locating mechanism in power distribution network	International Journal of Emerging Technology and advanced Engineering	Vol.2,No.7 p.129-135	2012	Scopus	0.44
Tarun Shrivastava, S.C.Gupta, AM Shandilya	NSGA-II Based Multi Objective Design Optimization of Resistive Superconducting Fault Current Limiters	International Journal of Recent Technology and Engineering (IJRTE)	Vol.8,No.6 p.2812-2817	2020	Scopus	

Citations

	h-index	i-10 index	Total Citations
Google Scholar	16	16	1559
Vidwan Profile	17	-	1382

Dr. Anoop Arya

Associate Professor

Qualifications : Ph.D. (Power System)

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Subjects Taught

U.G	**Power System Deregulation**
	Demand Side Management
	Basic Electrical & Electronics Engg.
P.G	**Power System Economics**
	Advanced Power System Analysis

	EMS and SCADA

Teaching Experience

Organization	Start Date	End Date	Designation
M.A.N.I.T, BHOPAL (M.P.)	30-01-2003	29-01-2013	Assistant Professor,
M.A.N.I.T, BHOPAL (M.P.)	30-01-2013	27-12-2018	Assistant Professor-II
M.A.N.I.T, BHOPAL (M.P.)	28-12-2018	Till Date	Associate Professor

Ph.D. Supervised/Ongoing

Name of the Student	Topic	Year of Award	Co-Supervisor (if any)
Gaurav Gupta	Transmission Pricing in Restructured Power Market	2019	Dr. Manisha Dubey
Somendra P.S. Mathur	Bidding Strategy for Power Producers in competitive Electricity Market	2019	Dr. Manisha Dubey

Prateek Mundra	Impact Assessment of Penetration of Renewable Energy Sources in Indian Power Sector	2023	Dr. S.K. Gawre
Shweta Mehroliya	Optimal Service Restoration in Radial Distribution System employing Renewable Distributed Generators	Ongoing	No
Uliya Mitra	Modelling and optimization of Proton Exchange Membrane Fuel Cell using Parameter Estimation Technique for Power Generation	Ongoing	Dr. Sushma Gupta

Title	Sponsoring Agency	Duration	Amount	Co-PI (if any)
Development of Miniaturized Pressure Regulators (Non-moving type) for Low Flow Rate Application	ISRO-MANIT Space Technology Incubation Centre	2 years	Rs. 12.27 Lakhs	Dr. Vilas Warudkar Dr. N.L. Gajbhiye Dr. Pragati Agrawal
Young Faculty Research Fellowship, In the area of Renewable purchase Obligations.	Ministry of Electronics and I.T. (Under PhD Visvesaraya Scheme)	2 years	Rs. 14.8 Lakhs	N.A.
DST-NIMAT Project (Entrepreneurship Development) 2017-18	NSTEDB, DST New Delhi Through EDI, Ahmadabad	1 year	Rs. 16 Lakhs	Dr. Manoj Arya Dr. Manish Vishwakarm

Vivek Kumar	Research Area – Micro grid Control	Ongoing	No	

 Sponsored Research Projects (Completed/Ongoing)

 Major Consultancy Projects

Title	Sponsoring Agency	Duration	Amount	Co-Investigator (if any)
Specification Preparation, Sample testing and Pre delivery Inspection for Purchase of Audio Systems and Projector	M.P. Jan Abhiyan Parishad, Bhopal	6 months	1,30,000/- + GST	Dr. Mukesh K.Kirar Dr. Manoj Arya
Electro-Mech 12 MLD Sewage treatment plant(STP) based on SBR technology at Dewas , M.P.	M/S Laxmi Construction Ahmadabad	6 months	57,500/- (including taxes)	Dr. Prashant Baredar Dr. Anil Kumar
Verification of Design /Drawing for Automation of Water Supply Scheme Project under Municipal	The Indian Hume Pipe Co. Ltd. , Mumbai	6 months	40,000/- + GST	N.A.

Corporation Katni (M.P.)				
Third party inspection and THD evaluation of LED Street Lights	Bhopal Municipal Corporation (Electrical Division)	3 months	18,400/- (including taxes)	Dr. Pankaj Swarnka

 Publication

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus	IMPA FACT
Shweta Mehroliya, Anoop Arya, Anshul Verma, Shilpi Tomar	Optimized Placement of Distributed Generator in Radial Distribution System Using Whale Optimization Technique	SN Computer Science	4, 626 (1-11)	2023	Scopus	0.6
Shweta Mehroliya Shilpi Tomar, Anoop Arya, Anshul Verma	A Novel Hybrid GA-PSO Algorithm-Based Optimization	SN Computer Science	4, 690 (1-11)	2023	Scopus	0.6

	of Transmission and Expansion Planning					
Uliya Mitra, Anoop Arya, Sushma Gupta, Priyanka Paliwal, Anshul Verma	[Parameter Estimation of Proton Exchange Membrane Fuel Cell Model Using Chaotic Embedded Particle Swarm Optimization Technique](#)	SN Computer Science	4, 473 (1-09)	2023	Scopus	0.6
Uliya Mitra, Anoop Arya, Sushma Gupta	A comprehensive and comparative review on parameter estimation methods for modelling proton exchange membrane fuel cell	*Fuel, Elsevier*	Vol. 335	2023.	A.	8.03

Prateek Mundra, Anoop Arya, SK Gawre	An Efficient Model for Forecasting Renewable Energy Using Ensemble LSTM Based Hybrid Chaotic Atom Search Optimization	*Neural Processing Letters*	•	2023.	A.	2.56
Prateek Mundra, Anoop Arya, SK Gawre, S Biswal, FV Lopes, OP Malik	[Taylor series based protection starting element for STATCOM compensated transmission line](#)	*Electric Power Systems Research, Elsevier*	vol. 204	2022.	A.	3.81
Mundra, Prateek, Anoop Arya, Suresh Kumar Gawre	A Multi-Objective Optimization Based Optimal Reactive Power Reward for Voltage Stability Improvement	Journal of Electrical Engineering & Technology, Springer	1.	2021.	A.	1.9

	in Uncertain Power System					
Prateek Mundra, Anoop Arya, and Suresh K. Gawre.	Assessing the Impact of Renewable Purchase Obligation on Indian Power Sector	International Journal of Power and Energy Systems	40, 208-212	2020	Scopus	0.3
Somendra P.S. Mathur, Anoop Arya, Manisha Dubey	Impact of emission trading on optimal bidding of price takers in a competitive energy market	[Harmony Search and Nature Inspired Optimization Algorithms](#), Advances in Intelligent Systems and Computing , Springer	741, 171-180	2019	Scopus	0.63
Somendra P.S.Mathur, [Anoop Arya](#) ,[Manisha Dubey](#)	Optimal bidding strategy for price takers and customers in a competitive	Cogent Engineering, Taylor & Francis	Vol.4, 01-15	2017.	○	0.38

	electricity mark					
[Anoop Arya](), [Yogendra Kumar](), [Manisha Dubey]()	Non-dominated Sorting Particle Swarm Optimization Based Fault Section Estimation in Radial Distribution Systems	Advances in Intelligent Systems and Computing , Springer	259, 471-487	2014	Scopus	0.63
[Anoop Arya](), [Yogendra Kumar](), [Manisha Dubey](), [Radharaman Gupta]()	Multi-Objective Fault Section Estimation in Distribution Systems using Elitist NSGA	Advances in Intelligent Systems and Computing , Springer	202, 211-219	2012	Scopus	0.63
[Anoop Arya](), [Yogendra Kumar](), [Manisha Dubey]()	Computational Intelligence Techniques applied to Distribution Service Restoration - A	International Review on Modelling and Simulation, Praiseworthy Prize, Italy	5, 702-713	2012	Scopus	2.8

	survey of the state of the art			

Patents

Title	Year	Agency	Co-Investigator(if any)	Published/Granted
Processing System for Microgrid expansion	2022	The Patent Office, Govt. of India	Dr.Priyanka Paliwal, Dr. Tripta Thakur, Dr. Anoop Arya, Rajkumar B.R.	Granted
Artificial Intelligence Based Smart Electric Vehicle Battery Management System	2021	IP Australia, Australian Govt.	Dr.Priyanka Paliwal, Dr. Tripta Thakur, Dr. Anoop Arya, Dr. Vilas Warudkar, Dr. Manoj Arya, Dr. Amit Bhagat	Granted

Citations

	h-index	i-10 index	Total Citations
Google Scholar	9	8	234
Vidwan Profile	5	-	102

Dr. SURESH KUMAR GAWRE

Associate professor Designation: Associate Professor

Qualifications: M.Tech. Ph.D

Research Area:- Power Quality Analysis, Solar PV Systems, Machine learning and IoT application in Electrical Engg,Electronic circuits

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Subjects Taught

U.G	**Basic Electrical Engineering**
	Digital Electronics
	Electronic Device and circuits
P.G	**Solar Photo voltaic**
	Non Conventional Energy Sources
	Machine Learning and deep learning application for Smart Grid
	Power Quality

Teaching Experience

Organization	Start Date	End Date	Designation
MANIT, Bhopal	**21/12/2023**	**Till date**	**Associate Professor**
MANIT, Bhopal	**04/02/2011**	**20/12/2023**	**Assistant Professor**

NIT, Raipur	29/02/2009	03/02/2011	Assistant Professor
MANIT, Bhopal	27/05/2003	27/05/2009	Assistant Professor

Ph.D. Supervised/Ongoing

Name of the Student	Topic	Year of Award
Prateek Mundra	Impact Assessment of Penetration of Renewable Energy Sources on Indian Power Sector	2023
Sanjeev Kumar Bhukesh	Simulation, Modeling and Experimental Validation of Semiconductor Based Thermoelectric Generator	2023
Ritu Verma	Investigations on Protection Schemes for Solar PV integrated Grid	Ongoing
Sonali Meena	Solar PV fault Analysis	Ongoing

Sponsored Research Projects (Completed/Ongoing)

Title	Sponsoring Agency	Duration	Amount
1. Weather Station	MHRD	2012	10,000,00
2. Smart Micro-Grid	TEQIP-II	2014	18,000,00

Hybrid System			

Major Consultancy Projects

Title	Sponsoring Agency	Duration	Amount	Co-Investigator (if any)
1. Feasibility study and Opinion regarding VFD for 1000 MW pumps of Hirwar	Micro Irrigation Project in District Shahdol (M.P.).	2019	1,00,000	Dr. N. P. Patidar

Publication

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus	IMPACT FACTOR

Ritu Verma, Suresh K. Gawre, N.P. Patidar, Sonali Nandanwar	A state of art review on the opportunities in automatic generation control of hybrid power system,	Electric Power Systems Research	226, ,109945	2024	SCI	3.9
Sanjeev Kumar Bhukesh, Suresh Kumar Gawre and Anil Kumar	Review on advancement in solar and waste heat based thermoelectric generator,	Energy Sources, Part A: Recovery, Utilization, and Environmental Effects	45:2 4982-5002	2023	SCIE	2.9
Mundra, P., Arya, A. and Gawre, S.K.	An Efficient Model for Forecasting Renewable Energy Using Ensemble LSTM Based Hybrid Chaotic Atom Search Optimization	Neural Processing Letters	55 1625–1647	2023	SCIE	3.1
Prateek Mundra, Anoop Arya, Suresh K	Taylor series based protection	Electric Power Systems Research	0378-7796	2022	SCIE	3.9

Gawre, Sandeep Biswal, Felipe V. Lopes, Om P. Malik	starting element for STATCOM compensated transmission line,					
B. Patnaik, S. Kumar and S. Gawre	Recent Advances in Converters and Storage Technologies for More Electric Aircrafts: A Review	*IEEE Journal on Miniaturization for Air and Space Systems*	78-87	2022	SCOPUS	NA
Mundra, P., Arya, A. & Gawre, S.K.	A Multi-Objective Optimization Based Optimal Reactive Power Reward for Voltage Stability Improvement in Uncertain Power System	. J. Electr. Eng. Technol.	NA	2021	SCIE	1.9

Sanjeev Kumar Bhukesh, Anil Kumar, Suresh Kumar Gaware	Bismuth telluride (Bi2Te3) thermoelectric material as a transducer for solar energy application	Materials Today: Proceedings	3131-3137	2020	Scopus	NA

Citations

	h-index	i-10 index	Total Citations
Google Scholar	11	13	556
Vidwan Profile		-	

Dr. Priyanka Paliwal

AssociateProfessor

Designation: Associate Professor

Qualifications: M.Tech. Ph.D.

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Subjects Taught

U.G	Electrical Machines, Electrical Machine Design, Reactive Power Compensation
	Basic Electrical Engineering
P.G	Modern Trends in Power System Operation Power System Control and Stability EHVAC-HVDC, Reactive Power Compensation

Teaching Experience

Organization	Start Date	End Date	Designation
Maulana Azad National Institute of Technology, Bhopal.	July 2005	December 2018	Assistant Professor 2
Maulana Azad National Institute of Technology, Bhopal.	December 2018	Till Date	Assistant Professor I

Ph.D. Supervised/Ongoing

Name of the Student	Topic	Year of Award	Co-Supervisor (if any)
Renuka Kamdar	Multi-Agent PSO based Service Restoration in Electric Distribution System	2019	Dr. Y. Kumar

Narayan Prasad Gupta	Control and Management of hybrid microgrid	2021	Sole supervision
Sumeet Kumar Wankhede	Planning and Control of Distributed Energy Resources in Smart Grid Network	Submitted in 2023	Dr. Mukesh Kirar
Nishant Thakkar	Microgrid planning in MCDM Framework	Submitted in 2023	Sole supervision

Sponsored Research Projects (Completed/Ongoing)

Title	Sponsoring Agency	Duration	Amount	Co-PI (if any)	Satus
Ministry of Panchayati Raj, Government ofIndia	SuRAJ(Sun for Rural Jan), Gram Urja Swaraj	900	18 months	Co-PI	Ongoing
Government of Madhya Pradesh	Solar Rooftop in State's Technical Institutions	1500	12 months	Co-PI	Ongoing
FDDI, Ministry of Commerce and Industry, Government of India	Solar Rooftop in FDDI	2000	12 months	Co-PI	Ongoing
National Power Training Institute, Ministry of Power, Government of India	Solar Rooftop in NPTI	900	12 months	Co-PI	Ongoing
National Project Implementation Unit(NPIU)	Development Of Renewable Integrated Smart Micro Grid Console With Intelligent Controller	17.32	One year June 2019-September 2020	Co-PI	Completed
MPCST	Implementation and Prototyping of IoT module for	5.925	01 Year	PI	Ongoing

	demand side management and improved efficiency			(Dr. Tripta Thakur)	
MHRD-MANIT	Renewable Energy Research Lab	33	12	Co-PI	Completed

Major Consultancy Projects

Title	Sponsoring Agency	Amount	From	To
Vetting of SLD & Switch yard Layout for intake well of WTP area for Datehra Multi Village Rural Water Supply Scheme District Morena, M.P.	IELM JV Pvt. Ltd. Gurgaon Haryana	100000/-	July 2018	July 2018
Vetting of SLD & 33kV Switch yard Layout for intake well & WTP area for Badonkalan Multi Village Rural Water Supply Scheme under MP JNM	HuWPIL Ltd. Kolkata	100000/-	March 2018	May 2018

Vetting/Approval of Electrical Load List for Bansagar MP JNM Project	WPIL Ltd. Kolkata	175000/-	Aug 2019	Oct 2020
Approval/Verification of SCADA system for water supply at Datia (M.P)	Banco Construction Pvt. Ltd.	60000/-	July 2018	Jan 2019
Approval/Verification of Electrical Design & Drawing of 92.5 MLD STP	Eco Protection Engineers Pvt. Ltd.	175000/-	Oct 2018	Jan 2019

Approval/Verification of Electrical Design & Drawing of 92.5 MLD STP (Upgradation)	Eco Protection Engineers Pvt. Ltd.	50000/-	Sep 2020	Oct 2020
Vetting of Design and Drawing of 1600kVA, 630 kVA and 315 kVA, Transformer of Chhatarpur Water Supply Project under AMRUT	Concrete Udyog Limited	50000/-	Dec 2020	Jan 2021
Approval/Verification of SCADA system for water supply at Hoshangabad (M.P)	M/S ICAM SYSTEMS LLP, NOIDA, Uttar Pradesh, 201305	42000/-	Jan 2019	Feb 2019
Developing tools for enhancing Hand Hygiene for All: Installation and capacity building in the State of Madhya Pradesh	UNICEF M.P.	1628000/-	Sept 2021	May 2022

Review of Preliminary Design of Statue of Oneness Project at Omkareshwar, MP	**MPSTDC - Bhopal**	**2372880/-**	**Oct 2021**	**Sept 2022**

Publication Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus
N.Thakkar, Priyanka Paliwal	Multi-criteria Valuation for Sustainable Autonomous Micro grid Planning: A comparative Analysis of Technology Mix with Different MADM Techniques	Iranian Journal of Science and Technology- Transactions of Electrical Engineering	https://doi.org/10.1007/s40998-023-00615-8	2023	SCI
Uliya Mitra, Anoop Arya, Sushma Gupta & Priyanka Paliwal	Parameter Estimation of Proton Exchange Membrane Fuel Cell Model Using Chaotic Embedded Particle Swarm Optimization Technique	SN Computer Science	Vol. 4	2023	SCOPUS
Mukund Subhash Gole, Priyanka	Nowcasting Central Controller with	Arabian Journal for Science and Engineering	https://doi.org/10.1007/s13369-023-07696-x	2023	SCI

Paliwal & Tripta Thakur	Continuous RTP for Residential Device Scheduling using Swap-Based BFPSO.				
N.Thakkar, Priyanka Paliwal	Quad-Level MCDM Framework to Analyse Technology Combinations for Sustainable Micro-grid Planning in Uncertainty Domain	Arabian Journal for Science and Engineering	Vol. 48	2023	SCI
N Thakkar, Priyanka Paliwal	Sensitivity Analysis Based Comparative Assessment of Resource Mix Using MCDM Technique: A Case Study of Thar Desert, India.	Iranian Journal of Electrical and Electronic Engineering	Vol. 18	2022	SCOPUS

Author	Title	Journal	Volume	Year	Index
Priyanka Paliwal, Webber, Julian L., Abofazl, Mehbodniya, Mohd Anul Haq, Anil Kumar & Prem Kumar Chaurasia	Multi-agent-based approach for generation expansion planning in isolated micro-grid with renewable energy sources and battery storage	The Journal of Supercomputing	Vol. 78	2022	SCI
Jatin Sharma, Sameer Soni, Priyanka Paliwa, Shaik Saboo, Prem K, Churasiya, Mohsen Sharifpur, Nima Khalilpoor, Asif Afzal	A novel long term solar photovoltaic power forecasting approach using LSTM with Nadam optimizer: a case study of India.	Energy Science and Engineering	Vol.10	2022	SCI
Nishant Thakkar & Priyanka Paliwal	Hydrogen storage based micro-grid: A comprehensive	International Journal of Green Energy	Vol. 20	2022	SCI

	review on technology, energy management and planning techniques,					
Priyanka Paliwal	Bi-stage planning framework for a solar-battery based micro-grid using techno-socio-economic evaluation.	Energy Sources, Part B: Economics, Planning, and Policy.	Vol.17		2022	SCI
S. K. Wankhede, Priyanka Paliwal and M. K. Kirar	Bi-Level Multi-Objective Planning Model of Solar PV-Battery Storage-Based DERs in Smart Grid Distribution System,"	IEEE Access	vol. 18		2022	SCI
Priyanka Paliwal	Multi-Stage Framework for Analyzing	Iranian Journal of Electrical and	Vol. 18		2022	SCOPUS

	[Penetration of Stochastic Distributed Energy Resources and Storage](#)	Electronic Engineering			
Priyanka Paliwal	Securing Reliability Constrained Technology Combination for Isolated Micro-Grid Using Multi-Agent Based Optimization	Iranian Journal of Electrical and Electronics Engineering	Vol. 18	2022	SCOPUS
Priyanka Paliwal	A Technical Review on Reliability and Economic Assessment Framework of Hybrid Power System with Solar and Wind Based Distributed Generators	International journal of integrated engineering	*Vol. 13*	2021	SCOPUS

Narayan Prasad Gupta and Priyanka Paliwal	Design and operation of smart hybrid microgrid	International Journal of Emerging Electric Power Systems	Vol. 22	2021	SCOPUS
Priyanka Paliwal, NP Patidar, R Nema	[Probabilistic Indices for Analyzing the Impact of DER Penetration on System Reliability](#).	IET Renewable Power Generation	Vol. 14	2020	SCI
Priyanka Paliwal,	Reliability constrained planning and sensitivity analysis for Solar-Wind-Battery based Isolated Power System	International journal of sustainable energy planning and management	Vol. 29	2020	SCOPUS
Priyanka Paliwal	Comprehensive Analysis of DER Penetration and Placement using Probabilistic Framework	IET Renewable Power Generation.	Vol.15	2021	SCI

S.K. Wankhede, Priyanka Paliwal, M.K. Kirar	Increasing Penetration of DERs in Smart Grid Framework: A State-of-the-Art Review on Challenges, Mitigation Techniques and Role of Smart Inverter	Journal of Circuits, Systems, and Computers (JCSC),	Vol 29		2020	SCI
N.P. Gupta, Priyanka Paliwal	Regulation of hybrid micro grid under transient operations	International Journal Power Electronics	Vol. 13		2021	SCOPUS
N.P. Gupta, Priyanka Paliwal	Novel droop integrated technique for regulation of islanded and grid connected hybrid microgrid	International Journal of Power and Energy Conversion	Vol. 12		2021	SCOPUS
R Kamdar, P Paliwal, Y Kumar	A Hybrid Multi-Agent-Based BFPSO	Journal of Circuits, Systems and Computers	Vol.29		2020	SCI

	Algorithm for Optimization of Benchmark Functions				
R Kamdar, P Paliwal, Y Kumar	**A state of art review on various aspects of multi-agent system**	**Journal of Circuits, Systems and Computers,**	**Vol. 27**	**2018**	**SCI**
R Kamdar, P Paliwal, Y Kumar	**LabVIEW based Multi-Agent Approach towards Restoration in Smart Grid**	**Materials Today: Proceeding**	**Vol. 5**	**2018**	**SCOPUS**
Priyanka Paliwal, NP Patidar, R Nema	**Planning of grid integrated distributed generators: A review of technology, objectives and techniques**	**Renewable and sustainable energy reviews**	**Vol. 40**	**2014**	**SCI**
Priyanka Paliwal, NP Patidar, R Nema	**Determination of reliability constrained optimal**	**Renewable energy**	**Vol. 63**	**2014**	**SCI**

	resource mix for an autonomous hybrid power system using particle swarm optimization				
Priyanka Paliwal, NP Patidar, R Nema	A novel method for reliability assessment of autonomous PV-wind-storage system using probabilistic storage model	International Journal of Electrical Power & Energy Systems	Vol. 55	2014	SCI
PGV Peri, P Paliwal, FC Joseph	ACMC-based hybrid AC/LVDC micro-grid	IET Renewable Power Generation	Vol. 11	2016	SCI
P Paliwal, NP Patidar	Distributed generator placement for loss reduction and improvement in reliability	World Academy of Science, Engineering and Technology	Vol. 69		SCOPU

Patents

Title	Year	Agency	Co-Investigator(if any)	Published/Granted
Artificial Intelligence Based Smart Electric Vehicle Battery Management System	2021.	Australian Patent number: 2021101964	Tripta Thakur, Anoop Arya	Granted
Processing System For Microgrid Expansion	2022.	Australian Application No.202121032491 A Patent number: 408211	Tripta Thakur, Anoop Arya	Granted

Citations

	h-index	i-10 index	Total Citations
Google Scholar	13	19	998
Vidwan Profile	11	-	611

Dr. Pankaj Swarnkar

You are here

Home » Dr. Pankaj Swarnkar

Dr. Pankaj Swarnkar

Associate Professor

Qualifications: M.Tech, Ph.D.

Email:- p_swarnkar[at]yahoo[dot]co[dot]in, pankaj.swarnkar.manit[at]nic[dot]in

Phone:- +91-9754129339. +91-7554051417

Subjects Taught

U.G	**Linear, Control System**
	Modern Control system
	Electro- magnetic Field Theory
	Network Analysis
	EMEC-III
	Fuzzy Logic Systems
P.G	**Advanced Control system**
	Modelling and Analysis of Electrical machines
	Power System Stability and Control

Teaching Experience

Organization	Start Date	End Date	Designation
MANIT, Bhopal	18 July 2005	Till Date	Assistant Professor
UIT, RGPV, Bhopal	05 July 2005	18 July 2005	Lecturer
Technocrats Institute of Technology, Bhopal	06 August 2001	05 July 2005	Assistant Professor a
Oriental Institute of Technology, Bhopal	28 July 1999	21 July 2001	Lecturer

Sponsored Research Projects (Completed/Ongoing)

Title	Sponsoring Agency	Duration	Amount	Co-PI (if any)
Application of AI Techniques for Modern Process Control	Institution of Engineers	3 years	50,000/-	Dr. R. K. Nema Dr. Shailendra Jain
Modernization and strengthening of Machines & Drives, Power Electronics and Control Lab	MHRD	01 year	34,00,000/-	Dr. Shailendra Jain Dr. Sushma Gupta Dr. Amit Ojha
Intelligent Control Techniques for Robotic Manipulator in the Application of Robotic Assisted Surgery	TEQIP Collaborative Research Scheme of National project implementation unit of MHRD	02 year	14,37000/-	Mohd. Salim Qureshi,

Design of Controller for Robotic Manipulator used in Medical Science	**Medical Education M.P. Bhopal**	**ongoing**	**1,55,000/-**	**Dr. Rishi Singh, Dr. Ar**

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus	IMPACT FACTOR
Pankaj Swarnkar, Shailendra Jain, R.K. Nema	Effect of adaptation gain on system performance for model reference adaptive control scheme using MIT rule	International journal of World Academy of Science, Engineering and Technology	Vol 4, No 10, issue 70, pp 621-627	2010	SCOPUS	1.5
Pankaj Swarnkar, Shailendra Jain, R.K. Nema	Effect of adaptation gain in model reference adaptive controlled second order system	International journal of ETASR - Engineering, Technology & Applied Science Research	Vol. 1, No. 3, pp 70-75	2011	ESCI	1.5
Pankaj Swarnkar, Shailendra Jain, R.K. Nema	Comparative study of power quality improvement using Active and Passive filters	International journal of Electronics Communication and Computer Engineering	Vol. 2, issue 1	2011		0.9
Pankaj Swarnkar, Shailendra Jain, R.K. Nema	Comparative analysis of MIT rule and Lyapunov rule in Model Reference Adaptive Control Scheme	International Journal of Innovative Systems Design and Engineering	Vol. 2, No 4, pp 154-162	2011	SCI	
M. Jagath Vallabhai, Pankaj Swarnkar, D.M. Deshpande	PI control based vector control strategy for induction motor drive	International Journal of Electronics Communication and Computer Engineering	Vol. 3, Issue 2, pp 137-144	2012		0.9

Author(s)	Title	Journal	Volume/Issue	Year	Indexing	Impact
M. Jagath Vallabhai, Pankaj Swarnkar, D.M. Deshpande	Comparative analysis of PI control and model reference adaptive control based vector control strategy for induction motor drive	International Journal of Engineering Research and Applications	Vol. 2, Issue 3	2012	SCOPUS	
Pankaj Swarnkar, Shailendra Jain, R.K. Nema	Adaptive Control Schemes for Improving the Control System Dynamics: A Review	IETE Technical Review (published by Taylor & Francis)	Vol. 31, No. 1, pp 17-33	2014	SCI	1.932
S. Das, M. S. Qureshi and P. Swarnkar	Design of integral sliding mode control for DC-DC converter	Material stoday Proceedings, Elsevier Journal	Volume 5, issue 2, pp 4290-4298	2018	SCOPUS	
M.S. Qureshi, S. Das, P. Swarnkar and S. Gupta	Design and implementation of sliding mode control for uncertain systems	Material stoday Proceedings, Elsevier Journal	Volume 5, issue 2, pp 4299-4308	2018	SCOPUS	
P. Gupta, P Swarnkar	Intertied AC-DC Hybrid system power sharing through intelligent droop controller	International journal of ETASR - Engineering, Technology & Applied Science Research	Vol 8, No. 1, pp 2609-2615	2018	ESCI	
M.S. Qureshi, P. Swarnkar and S. Gupta	Fuzzy PID sliding mode control for Robotics: An application to Surgical Robot	Recent Advances in Electrical & Electronic Engineering	Volume 11	2018	SCOPUS	
M.S. Qureshi, P. Swarnkar and S. Gupta	A Supervisory On-line tuned Fuzzy Logic based Sliding Mode Control for Robotics: An Application to Surgical Robots	Robotics and Autonomous Systems	109, pp 68-85	2018	SCI	4.3
M.S.Qureshi, GopiNath Kaki, P.Swarnkar and S.Gupta	Robust Control Techniques for Master-Slave Surgical Robot Manipulator	Advances in Intelligent Systems and Computing, AISC Series of Springer	741,pp 599-608	2019	SCOPUS	0.6
Harsh Goud, P.Swarnkar	Analysis and Simulation of the Continuous Stirred Tank Reactor System using Genetic Algorithm	Advances in Intelligent Systems and Computing,AISC series of Springer	741, pp 1141-115	2019	SCOPUS	

Goud, Harsh & Swarnkar Pankaj	Signal Synthesis Model Reference Adaptive Controller with Artificial Intelligent Technique for a Control of Continuous Stirred Tank Reactor	International Journal of Chemical Reactor Engineering	7(2), pp 1-11	2018	SCI	1.6
Goud, Harsh & Swarnkar Pankaj	Signal Synthesis Model Reference Adaptive Controller with Genetic Algorithm for a Control of Chemical Tank Reactor	International Journal of Chemical Reactor Engineering	Vol 17, issue 7, pp 1-11	2019	SCI	1.6
Goud, Harsh & Swarnkar Pankaj	Investigations on Metaheuristic Algorithm for Designing Adaptive PID Controller for Continuous Stirred Tank Reactor	MAPAN-Journal of Metrology Society of India	34(1), pp 113-119	2019	SCI	1
Jitendra Kumar Tandekar, Amit Ojha, Souvik Das, Pankaj Swarnkar, Shailendra Jain	SEIG based Renewable Power Generation and Compensation in MVDC Ship Power System	International Transactions on Electrical Energy Systems, John Wiley & Sons	Vol. 29, issue 4	2019	SCI	2.64
Pankaj Swarnkar, Shailendra Jain, R.K. Nema	Advanced controlling schemes for active power filter: A review	International Journal on Emerging Technologies	Vol 10(1), pp 114-120	2019	SCOPUS	3.1
Ghosh, S., Swarnkar, P., Deshpande, D.M.	Control strategies governing induction motors as industrial drives – A technical review	International Journal on Emerging Technologies	Vol 1(1), pp 97-105	2019	SCOPUS	3.1
Preeti Gupta, Pankaj Swarnkar	Review of Control Techniques in Intertied AC- DC Hybrid Power System	International Journal on Emerging Technologies	10(2), pp 8-14	2019	SCOPUS	3.1

Authors	Title	Journal	Volume	Year	Index	Impact
S. Ghosh, P. Swarnkar, D. M. Deshpande	Comparative Analysis based on Simulation & Design Aspects of Three Phase Four Switch Inverter for Industrial Applications	International Journal of Mathematical, Engineering and Management Sciences	vol. 4, No. 6, 1325–1340	2019	SCOPUS	1.6
Shailu Sachan, Pankaj Swarnkar, SavitaNema	Design of Smoothing FOPID Sliding Mode Controlled Robotic Manipulator for Robotic-Assisted Surgery	International Journal of Recent Technology and Engineering	Volume-8 Issue-2, pp 5002-5007	2019	SCOPUS	
Preeti Gupta, Pankaj Swarnkar	Intelligent power sharing control for Hybrid system	Intelligent Computing Techniques for Smart Energy Systems. Lecture Notes in Electrical Engineering	vol 607,Springer	2020	SCOPUS	
Aishwarya Varma, ShailuSachan, Pankaj Swarnkar and SavitaNema	Comparative analysis of Conventional and Meta-Heuristic Algorithm Based Control Schemes for Single Link Robotic Manipulator	Intelligent Computing Techniques for Smart Energy Systems. Lecture Notes in Electrical Engineering	vol 607. Springer	2020	SCOPUS	
Preeti Gupta, Pankaj Swarnkar	Adaptive power sharing in multi-voltage multi-frequency intertied hybrid power system	International Transactions on Electrical Energy Systems, John Wiley & Sons	Vol 30, issue 8	2020	SCI	2.64
Qureshi, Mohd Salim, Pushpendra Singh, Pankaj Swarnkar, Harsh Goud	Robotics Solutions to Combat Novel Corona Virus Disease-2019 (COVID-19)	SSRN		2020		
Pankaj Swarnkar, Harsh Goud,	Design of Fuzzy Adaptive PI Controller for Inherently Unstable System	SSRN		2020		
Preeti Gupta, Pankaj Swarnkar	A New Approach towards Integration of Multi-frequency,	European journal of Electrical Engineering	22(3), pp 241-253	2020	SCI	

Author	Title	Journal	Volume/Pages	Year	Index	
	Multi-voltage Intertied Hybrid Power System					
Shailu Sachan, Pankaj Swarnkar, SavitaNema	Design of Smoothing FOPID Sliding Mode Controlled Robotic Manipulator for Robotic-Assisted Surgery	International Journal of Recent technology and Engineering	Vol 8(2), PP 5002-5007	2019	SCOPUS	
Madhusudhan Pamujula, Amit Ojha, Pankaj Swarnkar, R.D. Kulkarni, A. Mittal	A novel cascaded H bridge based multilevel inverter with reduced losses and minimum THD	Advances in Clean Energy Technologies (Book), Springer, Singapore	pp 627-639	2021	SCOPUS	
Shailu Sachan, Pankaj Swarnkar	Review on Conventional and Advanced Sliding Mode Control Schemes for Uncertain Dynamic System	Advances in Clean Energy Technologies (Book), Springer, Singapore	pp 115-125	2021	SCOPUS	
Harsh Goud, Prakash Chandra Sharma, Pankaj Swarnkar, VenkateshGauri Shankar, Vijay Prakash Sharma, Anil Kumar Sahu	A Comparative Analysis of Conventional PID Tuning Techniques for Single Link Robotic Arm	Solid State Technology	Vol 64, issue 2, pp 565-574	2021	SCOPUS	0.2
Sudeshna Ghosh, Harsh Goud, Pankaj Swarnkar, Dinesh M Deshpande	Design of an optimized adaptive PID controller for induction motor drive	Mechatronic Systems and Control	Vol. 49, No. 3	2021	SCOPUS	0.4

Preeti Gupta, Pankaj Swarnkar	Adaptive power sharing in Flexible frequency, Flexible voltage Hybrid power system	International Journal of Power Electronics	Vol 14, No. 4, pp 470-500	2021	SCOPUS	
Harsh Goud, P. C. Sharma, K. Nisar, Mohd R Haque, Ag Asri Ag Ibrahim, N. S. Yadav, Pankaj Swarnkar, Manoj Gupta, Laxmi Chand	Metaheuristics Algorithm for Tuning of PID Controller of Mobile Robot System	CMC-Computers Materials & Continua, Tech Science Press	Vol 72, issue. 2, pp 3481-3492	2022	SCI	
Pankaj Swarnkar, Harsh Goud	A Recursive PID Tuning Approach for the Inherently Unstable System	Planning of Hybrid Renewable Energy Systems, Electric Vehicles and Microgrid (Book), Springer, Singapore	pp 585-599	2022	SCOPUS	
Pankaj Swarnkar, Suresh Kumar Gawre, Gagnesh Akodiya	Comparative Analysis of Conventional and Sliding Mode Control Techniques for DC-DC Boost Converter for PV System Under Transient Conditions	Recent Advances in Power Electronics and Drives (Book), Springer, Singapore	pp 587-600	2022	SCOPUS	
Shailu Sachan, Harsh Goud, Pankaj Swarnkar	Performance and Stability Analysis of Industrial Robot Manipulator	Intelligent Computing Techniques for Smart Energy Systems (Book), Springer, Singapore	pp 473-481	2022	SCOPUS	
Amogh Narwaria, Pankaj Swarnkar, Sushma Gupta	A Review on Multi-Input DC-DC Converter and Its Controlling for Hybrid Power System	Intelligent Computing Techniques for Smart Energy Systems (Book), Springer, Singapore	pp 277-288	2022	SCOPUS	
Harsh Goud, Prakash Chandra Sharma, Kashif	PSO Based Multi-Objective Approach for Controlling PID Controller	Computers, Materials & Continua	Vol 71, issue. 3, pp 4409-4423	2022	SCI	3.1

Nisar, Ag Ibrahim, Ag Asri, Muhammad Reazul Haque, Narendra Singh Yadav, Pankaj Swarnkar, Manoj Gupta, Laxmi Chand						
Qureshi Mohd Salim, Pushpendra Singh, Pankaj Swarnkar	Intelligent fuzzy logic based sliding mode control methodologies for pick and drop operation of robotic manipulator	International journal of Computational vision and Robotics (inderscience publishers)	12 (5), pp 549-571	2022	SCI	
Shailu Sachan, Pankaj Swarnkar	Robust Motion Planning in Robot-Assisted Surgery for Nonlinear Incision Trajectory	electronics, MDPI	Vol. 12, issue 3	2023	SCI	2.9
Shailu Sachan, Pankaj Swarnkar	Intelligent Fractional Order Sliding Mode Based Control for Surgical Robot Manipulator	electronics, MDPI	Vol. 12, issue 3	2023	SCI	2.9
Shailu Sachan, Pankaj Swarnkar	Investigations on Meta-heuristic Algorithms for Intelligent Speed Regulation of Mobile Robot	Results in Control and Optimization, Elsevier		2023	SCOPUS	
Darshita Ahuja, Pankaj Swarnkar, Rajesh Kumar Nema	Study ofVarious Charging Technologies of Electric Vehicles: A Review	Renewable Resources and Energy Management, CRC Press	pp 251-260	2023	SCOPUS	

Patents				
Title	**Year**	**Agency**	**Co-Investigator(if any)**	**Published/Granted**
IOT based automated sliding mechanism to prevent infant fall from bed	2022	Intellectual property India, patents journals	Mr. Deevesh, Dr. P.C. Sharma, Dr. R. Jain, Dr. Harsh Goud, Dr. K. Patidar, Mr. Rakesh Jain	Published

Dr. Amit Ojha

Associate Professor

Qualification: Ph.D (Multilevel Converters), M.Tech, B.E. Electrical Engineering

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Phone:- +91-9826028251

Subjects Taught

U.G	Electrical Machines I
	Electrical Machines II
	Electrical Machines III
	Power Quality
	Basic Electrical & Electronics Engineering
P.G	Advance Power Electronics
	Power Electronics Converters

| | Hybrid Electrical Vehicle |
| | Power Quality Improvement in Electrical Drives |

Teaching Experience

Organization	Start Date	End Date	Designation
Department of Electrical Engineering, MANIT, Bhopal	19 Aug 2005	Till Date	Assistant Professor
Department of Electrical Engineering, MITS, Gwalior	17 Jan 2003	18 Aug 2005	Lecturer
Department of Electrical Engineering, Truba, Bhopal	15 Jun 2002	16 Jan 2003	Lecturer
Department of Electrical Engineering, TIT, Bhopal	29 Oct 2001	14 Jun 2002	Lecturer

Ph.D. Supervised/Ongoing

Name of the Student	Topic	Year of Award
Shirish Murthy	Magnetic Load Offset and Linear Motors for High Speed Transit System	2022
Manoj Kumar	Implementation of Sensorless Control for Permanent Magnet Synchronous Motor based E-Rickshaw	2022
Janardhan Kavali	Design, Development and Performance Evaluation ofMicro Multilevel Inverter for Solar PV System	2021
Jitendra Kumar Tandekar	Implementation of Multilevel Inverter based Active Harmonics Filtering in Distribution Network	2020
Pragya Gawhade	Design and Development of Efficient Multilevel Inverter for Renewable Energy Source	Ongoing
Jyoti Chauhan	Performance Investigations of Multilevel Inverter with Reduced Switch Count for Hybrid Energy System	Ongoing
Aditya Sirsa	Performance Investigation on Standalone Solar PV System with Fault Tolerant MLI	Ongoing

Anchal Raghuwanshi	Electric Vehicle	Ongoing

Sponsored Research Projects (Completed/Ongoing)

Title	Sponsoring Agency	Duration	Amount
Performance Investigation of Grid Connected Micro Multilevel Inverter Based Solar Photovoltaic System	DST-SERB Core Research Grant	42 Months	47.25 Lakhs
Design of Controller for Robotic Manipulator used in Medical Science	Department of Madhya Pradesh Medical Education, Bhopal	24 Months	1.55 Lakhs

Major Consultancy Projects

Title	Sponsoring Agency	Duration	Amount	Co-Investigator (if any)
Design and Commissioning of 33kV/0.44kV of SPA Bhouri Campus	School of Planning and Architecture, Bhopal	10 Years	39.47 Lakhs	1) Prof. Shailendra Kumar Jain (Principal Investigator) 2) Prof. R.K Nema
Technical Assessment of Deviation/Variation of Electrical Work at AIIMS, Bhopal	AIIMS, Bhopal	5 Years	6.29 Lakhs	Prof. Shailendra Kumar Jain (Principal Investigator)
Vetting of Electrical Design and Drawing of Majholi, Siddhi	JIFT Water Infrastructure Ltd. Delhi	2 Months	2.50 Lakhs	1) Prof. Shailendra Kumar Jain (Principal Investigator) 2) Dr. Mukesh Kirar
Vetting of Electrical Design and Drawing of Manpur Umaria	JIFT Water Infrastructure Ltd. Delhi	2 Months	2.50 Lakhs	1) Prof. Shailendra Kumar Jain (Principal Investigator) 2) Dr. Mukesh Kirar

Publication

TITLE OF THE PAPER	NAME OF JOURNAL	VOL. NO., PAGE NO	YEAR	INDEXED IN	IMPACT FACTOR

Title	Journal	Volume, Pages	Year	Index	Impact Factor
A Novel Design of Basic Module-based Multilevel Inverter for Symmetrical/Asymmetrical Sources	International Journal of Circuit Theory and Application	51, 1-19	2023	SCIE	2.378
Linear Switched Reluctance Motor for Traction Propulsion System using Configuration of Electric Locomotive	Mechatronics	89, 1-13	2023	SCIE	3.379
Analyzing Modeled Configuration using Finite Element Analysis for Performance Prediction of LSRM	Neural Computing and Applications	39, 21175-21189	2022	SCIE	5.102
Recent Advances in Synchronization Techniques for Grid-tied PV System: A Review	Energy Reports	7, 6581-6599	2021	SCIE	4.937
Position Sensorless Control of PMSM with Innovative Regenerative Braking for e-Rickshaw	Design Engineering	635-650	2021	Scopus	0.101
Suitability of Linear Switched Reluctance Motor for Advanced Electric Traction System	Mechatronic Systems and Control	49, 142-148	2021	Scopus	3.379
Advancements in Converter Topology and Control Strategies for Switched Reluctance Motors: Recent Contributions	Mechatronic Systems and Control	49, 101-108	2021	Scopus	3.379
Design of Control System Using Online Tuning of PI	Journal Européen des Systèmes Automatisés	53, 869-882	2020	Scopus	1.02

Controllers for Three-phase Active Front End Neutral Point Clamped Three-Level Converter					
Performance Investigation of Stand-alone Solar Photovoltaic System with Single Phase Micro Multilevel Inverter	Energy Reports	6, 2044-2055	2020	SCIE	4.937
A Symmetrical Multilevel Inverter Topology with Minimal Switch Count and Total Harmonic Distortion	Journal of Circuits, Systems and Computers	29	2020	SCIE	NA
Application of Linear Switched Reluctance Motor for Sustainable Electric Vehicular System	International Journal of Power and Energy Systems	40, 46-54	2020	Scopus	5.659
Adaptive Position Sensorless Control of Permanent Motor Synchronous Motors-A State of Art	International Journal of Recent Technology and Engineering (IJRTE)	8, 10071-10077	2019	Referred	0
SEIG-Based Renewable Power Generation and Compensation in MVDC Ship Power System	International Transactions on Electrical Energy Systems	29	2018	SCIE	2.639
Five-Level Cascaded H-Bridge MLC-Based Shunt Active Power Filter for Active Harmonics Mitigation in Distributed Network	Journal of Circuits, Systems and Computers	28	2019	SCIE	NA
SEIG-Based Renewable Generation for MVDC Ship Power System with Improved Power Quality	Electric Power Components and Systems	47, 27-42	2019	SCIE	1.276

Key Developments for Electric Vehicles in Local Transport	Journal of Instrumentation And Innovation Science	4, 36-45	2019	Referred	3.917
Neutral Point Potential Control for Three Phase 3-Level Neutral Point Clamped Active Front End Converter.	International Journal on Electrical Engineering and Informatics	9, 342-363	2017	Referred	0.233
Carrier based Common Mode Voltage Reduction Techniques in Neutral Point Clamped Inverter based AC-DC-AC Drive System	Journal of Power Electronics	16, 142-152	2016	SCIE	0.913
Performance Analysis of BLDC Motor Drive Using PI and Fuzzy Logic Control Scheme	International Research Journal of Engineering and Technology	2, 916-922	2015	Referred	NA
Simulation of Brushless DC Motor for Performance Analysis Using MATLAB/SIMULINK Environment	International Journal on Recent and Innovation Trends in Computing and Communication	2, 1564-1567	2014	Referred	0.11
Sensorless Rotor Position Estimation for Switch Reluctance Motor: A Review	International Journal of Engineering Research and Technology	3, 1584-1588	2014	Referred	NA
Performance of 3-Phase Neutral Point Clamped Active Front End Multilevel Converter	International Journal of Scientific Engineering and Technology	2, 619-625	2013	Referred	NA
Review on High Gain DC/DC Converters for Renewable Energy Applications and their	International Journal of Emerging Trends in Engineering Research	3, 471-476	2013	Referred	NA

Comparison With Proposed Converter					
Back to Back Connected Multilevel Converters: A Review	IOSR Journal of Electrical and Electronics Engineering	5, 57-67	2013	Referred	3.26

Patents

Title	Year	Agency	Co-Investigator(if any)	Published/Granted
Novel Regenerative Braking for E-Rickshaw Application	2021	Australian Patent	Dr. Manoj Kumar	Granted
A Micro Multilevel Inverter	2021	Australian Patent	Dr. Arvind Mitta Dr. Kavali Janardan	Granted

Citations

	Link	h-index	i-10 index
Google Scholar	https://scholar.google.com/citations?user=zEwrgZUAAAAJ	11	14
Vidwan Profile	https://vidwan.inflibnet.ac.in/profile/61671	8	-

Dr. Rishi Kumar Singh

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U.G	Power System Stability & Control **(VII Sem)**	
	Power Controller **(V Sem)**	
	Power Electronics **(V Sem)**	
	Special Machines **(VIII Sem)**	
	Electrical Machines & Electronics **(V Sem)**	
P.G	Power System Stability & Control	
	Advance Control System	
	Multi Level Converter & Its Control	

Teaching Experience

Organization	Start Date	End Date	Designation
Maulana Azad National Institute of Technology, Bhopal.	**19 Aug 2005**	**19 Aug 2010**	**Assistant Professor**
Maulana Azad National Institute of Technology, Bhopal.	**15 Jul 2010**	**till date**	**Assistant Professor**

https://www.manit.ac.in/ Ph.D. Supervised/Ongoing

Name of the Student	Topic	Year of Award
Mr. Mohd.Navaid Ansari	Optimal Placement and Tuning of FACTS Devices for Modern Power Systems	Ongoing
Mr. Ankur Kumar Gupta	Short Term Day Ahead Photovoltaic Output Forecasting using Hybrid Models	Ongoing
Mirza Baig	A soft Computing Techniques	Ongoing

content/ Sponsored Research Projects (Completed/Ongoing)

Title	Sponsoring Agency	Duration	Amount	
Design of Controller for Robotics Manipulator Used in Medical Sciences	Commissioner, Medical Education, Govt. of MP	1	1.55	Dr.Amit Ojha Dr.Pankaj Swarnka

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Major Consultancy Projects

Title	Sponsoring Agency	Duration	Amount	Co-Investigator (if any)
Testing of Solar Dehydrator	Agro Products ,Bhopal	1	1	Dr.Amit Ojha

Publication

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus	IMPACT FACTOR
Sidhartha Panda,Narayana Prasad Patidar and Rishi Singh	Robust coordinated design of excitation and STATCOM-based controller using genetic algorithm	*Int. J. Innovative Computing and Applications*	1	2008	SCIE	0.653
S. Panda, N. P. Patidar and R. Singh	Simultaneous Tuning of Static Var Compensator and Power System Stabilizer Employing Real-Coded Genetic Algorithm	*World Academy of Science, Engineering and Technology, International Journal of Electrical and Computer Engineering*	2	2008	ESCI	0.782
Panda, Sidhartha & Patidar, Narayana & Singh, Rishi	A multi-objective genetic algorithm approach for adaptive PSS and TCSC-based controller design	Int. J. of Adaptive and Innovative Systems	1	2010	Scopus	0.235
Rishi Kumar Singh, Sidhartha Panda and	Coordinated Design of SVC Internal and External Controllers with Power	*International Journal of Electrical Engineering*	4	2011	SCIE	0.12

Narayana Prasad Patidar	System Stabilizer using Particle Swarm Optimization Technique					
Rishi Kumar Singh and N.P. Patidar	Swing, Voltage Stability and Power Transfer Capability in Transmission System with UPFC: The Art of Status	IJRET: International Journal of Research in Engineering and Technology	1	2014	Scopus	1.325
Rishi Kumar Singh and N.P. Patidar	Impact of UPFC on Swing, Voltage Stability And Power Transfer Capability In Transmission System	*International Journal of Scientific & Engineering Research*	5	2014	Scopus	4.2
M. N. Ansari and R. K. Singh	Application of D-STATCOM for Harmonic Reduction using Power Balance Theory	Turkish Journal of Computer and Mathematics Education (TURCOMAT)	12	2021	Scopus	0.148
Gupta A.K., Singh R., Umathe S	Testing Topologies to Overcome Fault in Micro-Grid Connected System	Smart Technologies for Energy, Environment and Sustainable Development, Vol 2. Springer Proceedings in Energy. Springer, Singapore	2	2022	Scopus	0.62
Anoop Arya, Shweta Mehroliya, Uliya Mitra, Sushma Gupta, Rishi Kumar Singh, P Mudra	Design and Performance Analysis of Grid Connected Hybrid Distributed Generation using DIGSILENT Power Factory	Distributed Energy System: Modelling and Control	1	2022	Scopus	0.53
A.K.Gupta, R.K.Singh	A Review on Implementation of Artificial Intelligence Techniques with Smart Grid	Recent Advances in Materials, Manufacturing and Machine Learning	1	2022	Scopus	0.54
Rishi Kumar Singh, Nikhil Kumar Singh	Power system transient stability improvement with FACTS controllers using SSSC-based controller	Sustainable Energy Technologies and Assessments	53	2022	SCI	8.0
Nikhil Kumar Singh, Rishi Kumar Singh, Deepak Kumar	Optimized resource allocation and trust management schemes for non-orthogonal multiple access on the internet of vehicles	Computers and Electrical Engineering	102	2022	SCI	4.152

Khare, Himashu yadav, Pranita Jain, Mohammed Wasim Bhatt						
Gupta AK and Singh RK	Short term day-ahead photovoltaic output forecasting using PCA-SFLAGRNN algorithm	Solar Energy (Front.)	10	2022	SCIE	3.858
Ansari, Mohd & Singh, Rishi	An optimal placement model of UPFC using Hybrid Taylor series-based spider monkey-teaching learning	ISA Transactions	1	2022	SCIE	5.911

Citations

	h-index	i-10 index	Total Citations
Google Scholar	4	1	63

DR. MUKESH KUMAR KIRAR

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Dr. Mukesh Kirar

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Subjects Taught

U.G	EMEC-III, EMEC-II, Power System
	Basic Electrical and Electronics Engineering
	Electrical Machine and Electronics, Industrial Electronics
P.G	Advanced Power System Protection
	Power System Stability and Control
	Power System Analysis
	Modern trends in power system operation, Smart grid technologies

Teaching Experience

Organization	Start Date	End Date	Designation
MANIT, Bhopal	26 May 2010	01 Nov 2014	Assistant Professor
MANIT, Bhopal	02 Nov 2014	28 Dec 2018	Assistant Professor-II
MANIT, Bhopal	29 Dec 2018	23 Dec 2024	Assistant Professor-I
MANIT, Bhopal	24 Dec 2024	Till Date	Associate Professor

Ph.D. Supervised/Ongoing

Name of the Student	Topic	Year of Award	Co-Supervisor (if any)
Shiwani Rai	Grid Integrated Solar Energy Conversion System to Improve Power Quality	2021	Dr. Y. Kumar
Sumeet Wankhede	Planning and Control of Distributed Energy Resources in Smart Grid Network	2023 (Submitted)	Dr. Priyanka Paliwal

Lokesh Chhadokar	Multi-Objective Optimal Charging Scheduling for EV Integration in Distribution Systems	On-going	----
Gautam Yadav	Design and Analysis of Protection Technique for Microgrid	On-going	Dr. S. C. Gupta

Sponsored Research Projects (Completed/Ongoing)

Title	Sponsoring Agency	Duration	Amount	Co-PI (if any)
Efficiency and Failure analysis of Distribution Transformer	MANIT-MHRD	12 Months	22.9 Lakhs	Dr. Ganga Agnihotr

Major Consultancy Projects

Title	Sponsoring Agency	Duration	Amount	Co-Investigator (if any)
Third Party Inspection of income tax building	CPWD Bhopal	18 Months	12 Lakhs	Dr. M. S. Chouhan, Dr. K. D
Vetting of Electrical Design and Drawing of Majholi, Siddhi	JIFT Water Infrastructure Ltd. Delhi	3 Months	2.5 Lakhs	Dr. S. K. Jain, Dr. Amit Ojha
Vetting of electrical Design and Drawing of Manpur Umaria	Water Infrastructure Ltd Delhi	3 Months	2.5 Lakhs	Dr. S. K. Jain, Dr. Amit Ojha
Vetting proof of mechanical design drawing of intermediate pumping station and sewage treatment plant of Hoshangabad	Consulting Engineering forum	3 Months	3.5 Lakhs	Dr. S. P. S. Rajput
Vetting/Approval of Electrical Load List For Bansagar	WPIL Ltd. Kolkata	3 Month	1.75 Lakhs	Dr. Tripta Thakur, Dr. Amit Ojha, Dr. Priyanka Paliwal

Vetting of Electrical Design and Drawing of Electrical substation Bineta Sehor	Water Infrastructure Ltd Delhi	2 Months	1.5 Lakhs	Dr. Amit Ojha, Dr. Priyanka Paliwal
Vetting of SLD and Switch yard layout for intake well & WTP area Detehra	IELM JV Pvt. Ltd Gurgaon	2 Months	1.0 Lakhs	Dr. Amit Ojha, Dr. Priyanka Paliwal
Vetting of drawing and design of PLC system architecture for chhatarpur water supply scheme	Concrete Udyog Ltd.	1 Month	0.5 Lakhs	Dr. Manisha Dubey
Vetting of Electrical Components of 65 MLD STP Gwalior	Sahaj/Jayantisuper Construction Pvt. Ltd.	8 Months	0.5 Lakhs	
Approval/verification of electrical design and drawing of 92.5 MLD STP	Eco Protection Engineers Pvt. Ltd	3 Months	0.5 Lakhs	Dr. Manisha Dubey
Vetting of grid connected ground mounted solar power project	Heliosvento Power Infra Pvt. Ltd	1 Month	0.6 Lakhs	Dr. Manisha Dubey, Dr. Amit Ojha, Dr. Priyanka Paliwal

Publication

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus	IMPACT FACTOR
Mukesh Kumar Kirar	RegPSO-ANN-Based Optimum Adaptive Load Shedding Technique	Arabian Journal for Science and Engineering	2191-4281	2023	SCI	2.7
Wankhede, Sumeet Kumar, Priyanka Paliwal, and Mukesh K. Kirar	Increasing penetration of DERs in smart grid framework: a state-of-theart review on challenges, mitigation techniques and role of smart inverters	Journal of circuits, systems and computers	29, 1793-6454	2020	SCI	1.5
Vishnoi, Shreya, Srete Nikolovski, More Raju, Mukesh Kumar Kirar, Ankur	Frequency Stabilization in an Interconnected Micro-Grid Using Smell Agent Optimization AlgorithmTuned Classical	Energies	16 no 6, 2913-2023	2023	SCI	3

Authors	Title	Journal	Volume/Pages	Year	Indexing	Impact Factor
Singh Rana, and Pawan Kumar	Controllers Considering Electric Vehicles and Wind Turbines					
Mukesh Kumar Kirar	IoT Based Remote Monitoring, Control, and Protection of Irrigation Water Pumping System	Journal of Operation and Automation in Power Engineering	11, 2423-4567	2023	Scopus	1.6
Laxman Solankee, Dr. Avinash Rai and Dr. Mukesh Kirar	High Impedance Fault Detection in Microgrid to Enhance Resiliency Against PMU Outage	International Journal of Computing and Digital Systems	1-9	2023	Scopus	0.23
Sumeet Kumar Wankhede; Priyanka Paliwal; Mukesh K. Kirar	Bi-Level Multi-Objective Planning Model of Solar PV-Battery Storage-Based DERs in Smart Grid Distribution System	IEEE Access	vol. 10, pp. 14897-14913	2022	SCI	3.47
M. Kumar, T. Maity and M. K. Kirar,	Energy Savings Through VOD (Ventilation-on-Demand) Analysis in Indian Underground Coal Mine	IEEE Access	vol. 10, pp. 93525-93533	2022	SCI	3.47

Patents

Title	Year	Agency	Co-Investigator(if any)	Published/Granted
Apparatus for Generating High Frequency Magnetic Field to test Magnetic Field Interference on Electric Devices	2023	Controller General of Patents and Trade Marks Government of India	Krishnav Bhatiya	Granted
Surge Protection Earthing Arrangement	2023	Controller General of Patents and Trade Marks Government of India	Krishnav Bhatiya	Granted

Citations

	h-index	i-10 index	Total Citations
Google Scholar	7	6	254
Vidwan Profile	3	7	66

DR GIRIBABU DYANAMINA

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Associate Professor

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Subjects Taught	
U.G	Renewable Energy Sources
	Utilization of Electrical Energy
	Electric Drives
P.G	Electric Vehicular Technology
	Advanced Electrical Drives
	Power Electronic Converters
	Non Conventional Energy Sources

Teaching Experience

Organization	Start Date	End Date	Designation
Maulana Azad National Institute of Technology, Bhopal.	21/12/2023	Continuing	Associate Professor
Maulana Azad National Institute of Technology, Bhopal.	27/03/2019	20/12/2023	Assistant Professor (Grade-I)
NIT Kurukshetra	23/09/2013	26/03/2019q	Assistant Professor (Grade-II)

Ph.D. Supervised/Ongoing

Name of the Student	Topic	Year of Award
Aftab Ahmed Ansari	DFIG Based Wind Energy System	2023
Sanjay Kumar Kakodia	Investigations on Speed Sensorless Control of Electric Vehicle	Ongoing
Navin Kumar	SEIG based Wind Energy System	Ongoing

Sponsored Research Projects (Completed/Ongoing)

Title	Sponsoring Agency	Duration	Amount
Design and Development of Intelligent Controller Based Dual Configured Wind Energy Conversion System for Enhanced LVRT Operation	SERB	3 Years (Ongoing)	46.80 Lakhs
Speed Sensorless Control of MLI Fed PMSM	MANIT, SEED	2 Years (Completed)	4.5 lakhs

Major Consultancy Projects

Title	Sponsoring Agency	Duration	Amount	Co-Investigator (if any)
Third Party Inspection of Center for Disability of Sports	CPWD Gwalior	2 Years	385 Lakhs	5

Publication:

1. Sanjay Kumar Kakodia, **Giribabu D**, "Improved Federal Test Procedure (FTP75) driving cycle performance for PMSM-fed hybrid electric vehicles using artificial neural network", *International Journal Circuit Theory and Applications*, Vol 51, Issue 9, PP. 1-17, 2023 **(IP-2.378).**

2. Aftab Ahmed Ansari, **Giribabu D,** "Neural network based direct torque control for doubly fed induction generator fed wind energy systems", *International Journal on Advances in Computational Design*, Vol 8, Issue 3, PP. 1-17, 2023.(Scopus)

3. Aftab Ahmed Ansari, **Giribabu D,** "Real-Time Implementation of The Fuzzy Logic Controlled Parallel Protection Technique to Enhance the DFIG System's FRT Capability", *Scientica Iranica*, **Vol 8, Issue 3**, PP. 1-26, 2023 **(IP 1.416)**

4. Sanjay Kumar Kakodia, **Giribabu D**, "Type-2 Fuzzy Logic controller-based stator current Model reference adaptive system speed observer for a hybrid electric vehicle to improve transient response during limp home mode", *International Journal Circuit Theory and Applications*, Vol 50, Issue 6, PP. 1-17, 2022. **(IP-2.378).**

5. Aftab Ahmed Ansari and **Giribabu.D**, "Fault Ride-Through Operation Analysis of Doubly Fed Induction Generator-Based Wind Energy Conversion Systems: A Comparative Review," in *Energies,* Vol. 15, No. 21, 2022, pp. 1-34. **(IP-3.252)**.

6. **Giribabu D, "**Experimental implementation of SEIG-based wind energy system using neural network controller" *International Journal of Power Electronics*, Vol 16, No. 2, PP 226-247, 2022. (Scopus)

7. **Giribabu D**, Sanjay Kumar Kakodia, "Adaptive Neuro Fuzzy Inference System Based Decoupled Control for Neutral Point Clamped Multi Level Inverter Fed Induction Motor Drive" *Chinese Journal of Electrical Engineering*, Vol 7, PP. 70-82, 2021. (Scopus)

8. Sanjay Dewangan, **Giribabu D,** Naveen Kumar, "Performance improvement of wind-driven self-excited induction generator using fuzzy logic controller, *International Transanction on Electrical Energy Systems,* Vol 15, PP. 1-20, 2019. **(IP-3.13)**

9. **Giribabu.D,** M.K.Pathak and S.P.Srivastava, "Modified Reference Model for Rotor Flux Based MRAS Speed Observer Using Neural Network Controller**"** in Taylor and Francis IETE *Journal of Research,* PP. 1-16, 2018.**(IP-0.89)**

10. **Giribabu.D**, M.K.Pathak and S.P.Srivastava, "Parallel Stator Resistance Estimator using Neural Networks for Rotor Flux Based MRAS Speed Observer" in Taylor and Francis Electrical Power Components and Systems, Vol. 44, No. 7, PP. 658-672, March, 2016. **(IP-1.144).**

11. **Giribabu D**, Maloy Das and Amit Kumar, "Comparative Study of Control Strategies for the Induction Generators in WECS" in *Journal of Wind and Structures*, Vol. 22, No. 6, PP. 635-662, 2016.

12. **Giribabu.D**, S.P.Srivastava and M.K.Pathak, "Rotor Flux Based MRAS for Three Level Inverter fed Induction Motor Drive Using Fuzzy Logic Controller," in *Int. J. Power Electronics,* Vol. 4, No. 5, 2012, pp. 463-478. **(IP-1.78)** (Scopus)

DR. MORE RAJU

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Dr. More Raju

Assistant Professor

 Research Area- Conventional and Deregulated Automatic Generation Control/Load Frequency Control, Optimization Techniques, Soft Computing Techniques, Mathematical modelling of Electrical Energy Systems etc.,

Email- rajunitt1[at]gmail[dot]com , mraju[at]manit[dot]ac[dot]in

Google Scholar link: https://scholar.google.com/citations?user=PHzOrfMAAAAJ&hl=en

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Subjects Taught

U.G	EE 353 Network Synthesis
	EE-221 Power System
	EE 214 Measurements and Instrumentation
	EE 3504 Measurements and Instrumentation
	EE 225 Instrumentation
	ARC 325 Electrical Services
P.G	PS103 Advanced Power System Protection
	PS101 Soft computing Techniques in Power System
	PS567 Energy Management Systems and SCADA
	PS 201 Modern Control System

Ph.D. Supervised/Ongoing

Name of the Student	Topic	Year of Award
Hiramani Shukla	Investigations on Combined Automatic Generation Control and Automatic Voltage Regulator for Interconnected Power Systems.	2023
Shubhansh Chaurasia	Applications of Blockchain Technology in Smart Grid (Tentative)	Ongoing
Rohit Kain	Machine learning for modern Smart Electric Grid (Tentative)	Ongoing

Major Consultancy Projects

Title	Sponsoring Agency	Duration	Amount	Co-Investigator (if any)
Third Party Quality Check for work Clo 395 Nos. Type-IIquarters including water supply, sanitary installation, drainage and internal electrical installation	GC, CRPF atArang, Raipur(C.G)	12-18 Months	22.34 L	Dr. D. Kishan (PI)
Third Party Quality Assurance for the works of construction of Ekalavya Model Residential School (EMRS) at various locations in state of	NPCC Ltd Central Zone Raipur	24 Months	30 L	Dr. D. Kishan (PI

Madhya Pradesh and Chattisgarh					

Publication

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus	IMPACT FACTOR
Hiramani Shukla and **More Raju**	Combined frequency and voltage regulation in an interconnected power system using fractional order cascade controller considering renewable energy sources, electric vehicles and ultra capacitor	Journal of Energy Storage	Vol. 84	2024	SCIE	9.4
Hiramani Shukla and **More Raju**	Application of COOT Algorithm Optimized PID plus D^2 Controller for Combined Control of Frequency and Voltage Considering Renewable Energy Sources	e-Prime - Advances in Electrical Engineering, Electronics and Energy	Vol. 6	2023	Scopus	Cite Score: 1.5
Hiramani Shukla and **More Raju**	Combined frequency and voltage regulation in multi-area system using an equilibrium optimiser based non-integer controller with penetration of electric vehicles	International Journal of Ambient Energy	Vol. 44 Page No. 1522-1548	2023	Scopus	Cite Score: 4.7
Prashant Khare, **More Raju**, S.C. Gupta and Hiramani Shukla	Liberalized Automatic Generation Control of Interconnected Thermal-Hydro-Gas System using Firefly Algorithm Optimized PID Controller	International Journal of Numerical Modelling: Electronic Networks, Devices and Fields	Vol. 37	2023	SCIE	1.6
ShreyaVishnoi, S. Nikolovski, **More Raju**, M. K. Kirar, A. S. Rana, and P. Kumar	Frequency Stabilization in an Interconnected Micro-Grid Using Smell Agent Optimization Algorithm-Tuned Classical Controllers	Energies	Vol No. 44 Page No. 1522-1548	2023	SCIE	3.2

	Considering Electric Vehicles and Wind Turbines					
Hiramani Shukla, S. Nikolovski, **More Raju**, A. S. Rana, and P. Kumar	SMES-GCSC Coordination for Frequency and Voltage Regulation in a Multi-Area and Multi-Source Power System with Penetration of Electric Vehicles and Renewable Energy Sources	Energies	vol. 16, no. 1, p. 251,	2022	SCIE	3.2
Hiramani Shukla, S. Nikolovski, **More Raju**, A. S. Rana, and P. Kumar	A Particle Swarm Optimization Technique Tuned TID Controller for Frequency and Voltage Regulation with Penetration of Electric Vehicles and Distributed Generations	Energies	vol. 15, no. 21, p. 8225	2022	SCIE	3.2
A. S. Rana, B. B. Bhagyasree, T. M. Harini, S. Sreekumar, and **More Raju**	Optimisation of Economic and Environmental Dispatch of Power System with and without Renewable Energy Sources	Distributed Generation & Alternative Energy Journal	vol. 38, no. 02, pp. 491–518,	2023	Scopus	-----
W. Tasnin, L. C. Saikia, and **More Raju**	Deregulated AGC of multi-area system incorporating dish-Stirling solar thermal and geothermal power plants using fractional order cascade controller	International Journal of Electrical Power & Energy Systems	Vol.101, pp. 60-74	2018	SCIE	5.2
More Raju, L. C. Saikia, and N. Sinha	Automatic generation control of a multi-area system using ant lion optimizer algorithm based PID plus second order derivative controller	International Journal of Electrical Power & Energy Systems	Vol. 80, pp. 52-63	2016	SCIE	5.2
More Raju, L. C. Saikia, and N. Sinha	Load frequency control of a multi-area system incorporating distributed generation resources, gate controlled series capacitor along with high-voltage direct current link using hybrid ALO-pattern	IET Renewable Power Generation	Vol. 13: pp. 330-341	2019	SCIE	2.6

	search optimised fractional order controller					
More Raju, L.C. Saikia, and N. Sinha	Maiden application of two degree of freedom cascade controller for multi-area automatic generation control	International transactions on Electrical Energy Systems	Vol. 28, No. 09	2018	SCIE	2.639
More Raju, L.C. Saikia, and N. Sinha	Load Frequency Control of Multi-area Hybrid Power System Using Symbiotic Organisms Search Optimized Two Degree of Freedom Controller	International Journal of Renewable Energy Research	Vol. 7, No 4, pp.1663-1674	2017	Scopus	

Patents

Title	Year	Agency	Co-Investigator(if any)	Published/Granted
A fuzzy framework for mechatronic system with design evaluation	2021	Australian Government	Bharat Bhushan Sharma, Bharti Panjwani, Ankur Singh Rana, Anuj Banshwar, Navven Kumar Sharma, Abhay Sharma, Mohit Pathak, Kashif Javed, Aman Joshi,	Granted
Automatic Motor Bike Side Stand	2023	Indian Patent	Dr. Mohd Majid, Dr. Abhinav Saxena, Omveer Singh, Santosh Kumar Maurya, Ramashankar Yadav, Arpit	Published

Citations

	h-index	i-10 index	Total Citations
Google Scholar	9	9	631 (As on 05/04/2024)

Dr. Punjan Dohare

Assistant Professor Grade-II

Qualification- Ph.D.

Research Area- Control applications to electrical system, Image Processing, Medical Imaging, Bio-instrumentation, Biomechanics, Electronic Nose, 3D Printing

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Phone- +918054017836

Subjects Taught	
U.G	Control System
	Basic Electrical Engineering
	Network Theory

Teaching Experience

Organization	Start Date	End Date	Designation
Maulana Azad National Institute of Technology Bhopal	22/12/2023	Till Date	Assistant Professor Grade-II
Madhav Institute of Technology & Science, Gwalior	18th Jan. 2018	30th Sep. 2021	Assistant Professor
CSIR-Central Scientific Instruments Organisation	13th Aug. 2012	31st Mar. 2017	Senior Project Fellow

Sponsored Research Projects (Completed/Ongoing)

Title	Sponsoring Agency	Duration	Amount
The three-dimensional approach in joint replacement technique to aid the orthopaedic surgeons Role: Principal Investigator	AICTE	21 Months	14.87 Lakhs

Publication

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus	IMPACT FACTOR
Punjan Dohare, Amol P. Bhondekar, Anupma Sharma, and C. Ghanshyam	"Influence of airflow dynamics on vortices in the human nasal cavity"	Engineering Computations	Vol. 36 No. 9, pp. 3164-3179	2019		1.67
Punjan Dohare, Sudeshna Bagchi and Amol P. Bhondekar	Performance optimization of sensing chamber using fluid dynamic simulation for electronic nose applications	Turkish Journal of Electrical Engineering & Computer Sciences	28(5), 3068-3078	2020		1.1
Punjan Dohare, and Sumit Jha	A Proposal for Reliable Routing in Communication Network." Advanced Materials Research,	Trans Tech Publications, Ltd	vol. 403–408	2011		
Punjan Dohare, Ritesh Kumar, S. R. Chowdhury, S. T. Sarkar, Anupma Sharma, C. Ghanshyam, and Amol Bhondekar	Importance of Aerodynamics in a Human Nasal Cavity	MICTDI-2016		2016		
Punjan Dohare, Sonam Bandil, and Somendra Mathur	Sensor and Measurement system for distributed temperature profiling in a test process reactor	13th National Seminar on Physics and Technology of Sensors (NSPTS-13).		2008		

Prerna Soni, **Punjan Dohare**, and Sonam Bandil	Induction motor Tests Using MATLAB/Simulink	National Conference on Advances in Electrical Engineering (AEE- 06).		2006		
Punjan Dohare and A.K. Wadhwani	Three-Dimensional Printing of Joint Replacement for Clinical Applications	2nd International Conference on Multidisciplinary Innovation in Academic Research (ICMIAR- 2021)		2021		
Punjan Dohare and Amol P. Bhondekar	Computational fluid dynamic approach to design the bio-inspired sensor chamber for volatile detection of electronic nose applications	Indo-German Conference on Computational Mathematics (IGCM), IISc, Bangalore		2019		
Punjan Dohare and Amol P. Bhondekar	Laminar airflow computational modelling in the human nasal cavity	International Conference on Sustainable and Innovative Solutions for Current Challenges in Engineering & Technology (ICSISCET 2019)		2019		
Punjan Dohare and Sumit Jha	A proposal for reliable routing in communication network	International Conference on Control, Robotics and Cybernetics (ICCRC 2011)		2011		
Punjan Dohare and Sumit Jha	Energy Management and Electrifying Domestic Areas	5th International Multi Conference on Intelligent Systems, Sustainable, New and Renewable Energy technology and Nanotechnology, (IISN- 2011)		2011		

Book Chapter

- **Punjan Dohare** and Amol P. Bhondekar (2020) Laminar Airflow Computational Modelling in the Human Nasal Cavity. In: Pandit M., Srivastava L., Venkata Rao R., Bansal J. (eds) Intelligent Computing Applications for Sustainable Real-World Systems. ICSISCET 2019. Proceedings in Adaptation, Learning and Optimization, vol 13. Springer, Cham. https://doi.org/10.1007/978-3-030-44758-8_41

Dr. Punjan Dohare Curriculum vitae Personal Details Present Status : Assistant Professor Grade-II Address : EE321, Electrical Engineering Department, MANIT Bhopal Email : punjan.nitk@gmail.com Contact No : +918054017836 Academic Qualification DOCTOR OF PHILOSOPHY (Engineering Sciences) with 9.29 CGPA Academy Of Scientific & Innovative Research 2020 MASTER OF TECHNOLOGY (Control System) with 8.449 CGPA National Institute of Technology, Kurukshetra 2011 BACHELOR OF ENGINEERING (Electrical Engineering) with 77.00% (Dist.) Madhav Institute of Technology & Science, Gwalior 2008 Research Interest • Control applications to electrical system, Image Processing, Medical Imaging, Bio-instrumentation, Biomechanics, Electronic Nose, 3D Printing Ph.D. Thesis Title • Understanding Olfaction: A CFD based approach for the development of bio-inspired sensor chamber for electronic nose Ph.D. Thesis Adviser's Name • Dr. Amol P Bhondekar, Senior Principal Scientist, CSIR-Central Scientific Instruments Organisation, Chandigarh India Teaching and Research Experience S. No. Position held Institute From To 1 Assistant Professor Madhav Institute of Technology & Science, Gwalior 18th Jan. 2018 30th Sep. 2021 2 Senior Project Fellow CSIR-Central Scientific Instruments Organisation 13th Aug. 2012 31stMar. 2017 Courses Taught • I have taught various courses falling under the domain of Electrical Engineering at Undergraduate as well as Postgraduate level. Some of them are listed as bellow: ♣ Control System (B.Tech & M.E.) ♣ Basic Electrical Engineering (B.Tech) ♣ Network Theory (B.Tech) Sponsored Projects • Project Title: The three-dimensional approach in joint replacement technique to aid the orthopaedic surgeons Role: Principal Investigator Funding Agency: AICTE Amount: 14.87 Lakhs Duration: 21 Months Status: Completed Publications •

Punjan Dohare, Amol P. Bhondekar, Anupma Sharma, and C. Ghanshyam, "Influence of airflow dynamics on vortices in the human nasal cavity", Engineering Computations, Vol. 36 No. 9, pp. 3164-3179, 2019. https://doi.org/10.1108/EC-08-2018-0335 (Impact Factor-1.67) • Punjan Dohare, Sudeshna Bagchi and Amol P. Bhondekar, "Performance optimization of sensing chamber using fluid dynamic simulation for electronic nose applications", Turkish Journal of Electrical Engineering & Computer Sciences, 2020, 28(5), 3068-3078. https://doi.org/10.3906/elk-1903-103 (Impact Factor- 1.1) • Punjan Dohare, and Sumit Jha. "A Proposal for Reliable Routing in Communication Network." Advanced Materials Research, vol. 403–408, Trans Tech Publications, Ltd., Nov. 2011, pp. 1057–1061. https://doi.org/10.4028/www.scientific.net/amr.403-408.105 International Conferences • Punjan Dohare and A.K. Wadhwani, "Three-Dimensional Printing of Joint Replacement for Clinical Applications", 2nd International Conference on Multidisciplinary Innovation in Academic Research (ICMIAR2021), Chennai, March 18, 2021. • Punjan Dohare and Amol P. Bhondekar, "Computational fluid dynamic approach to design the bio-inspired sensor chamber for volatile detection of electronic nose applications", Indo-German Conference on Computational Mathematics (IGCM), IISc, Bangalore, December 02-04, 2019. • Punjan Dohare and Amol P. Bhondekar, "Laminar airflow computational modelling in the human nasal cavity", International Conference on Sustainable and Innovative Solutions for Current Challenges in Engineering & Technology (ICSISCET 2019), November 02-03, 2019. • Punjan Dohare and Sumit Jha, "A proposal for reliable routing in communication network", In Proceedings of the 2011 International Conference on Control, Robotics and Cybernetics (ICCRC 2011), New Delhi, India, March 19-20, 2011. • Punjan Dohare and Sumit Jha, "Energy Management and Electrifying Domestic Areas" in 5th International Multi Conference on Intelligent Systems, Sustainable, New and Renewable Energy technology and Nanotechnology, (IISN-2011), Klawad, India, 2011. National Conferences • Punjan Dohare, Ritesh Kumar, S. R. Chowdhury, S. T. Sarkar, Anupma Sharma, C. Ghanshyam, and Amol Bhondekar (2016, April). Importance of Aerodynamics in a Human Nasal Cavity. In Proceedings of the

Modern Information and Communication Technologies for Digital India (MICTDI-2016). ● Punjan Dohare, Sonam Bandil, and Somendra Mathur (2008, March). Sensor and Measurement system for distributed temperature profiling in a test process reactor. In Proceedings of the 13th National Seminar on Physics and Technology of Sensors (NSPTS-13). ● Prerna Soni, Punjan Dohare, and Sonam Bandil (2006, November). Induction motor Tests Using MATLAB/Simulink. In Proceedings of the National Conference on Advances in Electrical Engineering (AEE06). Book Chapter ● Punjan Dohare and Amol P. Bhondekar (2020) Laminar Airflow Computational Modelling in the Human Nasal Cavity. In: Pandit M., Srivastava L., Venkata Rao R., Bansal J. (eds) Intelligent Computing Applications for Sustainable Real-World Systems. ICSISCET 2019. Proceedings in Adaptation, Learning and Optimization, vol 13. Springer, Cham. https://doi.org/10.1007/978-3-030-44758-8_41 Awards and Recognitions ● Best paper award in 47th Mid Term Symposium on Modern Information and Communication Technologies for Digital India conducted (April 09-10, 2016). ● Received a fellowship from the M.P. Council of Science and Technology in 36th M.P. Young Scientist Congress. Membership of learned societies S. No. Name of Body Date of Award Status of Membership 1. IEEE 09-03-2021 Annual 2. IETE 24-03-2021 Life Technical Skills Software ● MATLAB, SIMULINK, OCTAVE, Fluent, CFD-CFX Post, MIMICS, ICEM CFD Hardware ● 3D Printing Machine REFERENCES Dr. Amol P Bhondekar Senior Principal Scientist, CSIR-Central Scientific Instruments Organisation, Sector - 30 C Chandigarh 160030. Mobile: +918146585825 E-mail id: amol.bhondekar@gmail.com Dr. Akhilesh Swarup Professor (Retired), Electrical Engineering Department, NIT Kurukshetra, Haryana – 136119. Mobile: +919416266610 E-mail id: akhilesh.swarup@gmail.com Dr C Ghanshyam Ex-Chief Scientist, CSIR- Central Scientific Instruments Organisation, Sector - 30 C Chandigarh 160030

.

Dr. Siddhartha Deb Roy

Designation- Assistant Professor

Qualification- B.E., M.Tech., Ph.D

Research Area- Cyber-Security in AGC Systems, Protection Systems, Networked Microgrids, IOT Systems; Machine Learning/ Artificial Intelligence Applications in Power Systems; Power System Stability and Control; Smart Grid.

Email- sid.debroy.26[at]gmail[dot]com

Phone-+91-970772859	Subjects Taught
UG	Power System Stability and Control
	Extra High Voltage AC and DC Transmission
	Fundamentals of Electrical and Electronics Engineering
PG/PhD	Research Methodology

Teaching Experience

Organization	Start Date	End Date	Designation	Nature of Work
MANIT Bhopal	16/01/2024	Present	Assistant Professor	Teaching and Research
IIT Kanpur	13/02/2023	29/12/2023	Research Associate - III	Research
NIT Meghalaya	27/06/2022	03/02/2023	Research Associate	. Research

Ph.D. Supervised/Ongoing

Name of the Student	Topic	Year of Award	Co-Supervisor (if any)
Shiv Kumar Tripathi	Cybersecurity of Power System Protection and Networked Microgrids	Pursuing	NA
Praveen Kumar	Peer to Peer Energy Trading in Power Systems	Pursuing	Supervisor: Dr Gumpu Srinivasulu Co-supervisor: Dr. Siddhartha Deb Roy

Publication

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus	IMPACT FACTOR
1. L.Debbarma, S.Debbarma, K.Roy, **Siddhartha Deb Roy**, P.P. Singh	Enhancing Grid Frequency Support by Integrating RTEM and P2P Energy Trading Models in Coordination with AGC System	*IEEE Transactions on Industry Applications*	Accepted	2025	SCI	4.2
2. **Siddhartha Deb Roy**, Ankush Sharma, Saikat Chakrabarti, Sanjoy Debbarma	Securing Power System Data in Motion by Timestamped Digital Text Watermarking	*IEEE Transactions on Smart Grid*	(In Press, Accepted)	2024	SCI	9.6
3. **Siddhartha Deb Roy**, Sanjoy Debbarma	Enhancing Cyber-Resilience of Power Systems' AGC Sensor Data by Time Series to Image Domain Encoding	*IEEE Transactions on Smart Grid*	doi: 10.1109/TSG.2024.3361014	2024	SCI	9.6

4. **Siddhartha Deb Roy**, Sanjoy Debbarma	Imposter Attacks in Energy Market Operation	*IEEE Transactions on Smart Grid*	vol. 13, no. 5, pp. 3836-3839	2022	SCI	9.6
5. L.Debbarma, S.Debbarma, K.Roy, **Siddhartha Deb Roy**, P.P. Singh	Joint contribution of RTEM and AGC system for frequency stabilisation in renewable energy integrated power system	*IET Energy System Integration*	https://doi.org/10.1049/esi2.12145.	2024	SCI	1.6
6. K. Roy, S. Debbarma, **Siddhartha Deb Roy**, L. Debbarma	A Bi-level stacked LSTM-DNN-based decoder network for AGC dispatch under regulation market framework in presence of VPP and EV aggregators	*IET Energy System Integration*	https://doi.org/10.1049/esi2.12169.	2024	SCI	1.6
7. **Siddhartha Deb Roy**, Sanjoy Debbarma, Adnan Iqbal	A Decentralized Intrusion Detection System for Security of Generation Control	*IEEE Internet of Things Journal*	vol. 9, no. 19, pp. 18924- 18933	2022	SCI	10.238
8. **Siddhartha Deb Roy**, Sanjoy Debbarma, Josep. M. Guerrero	Machine Learning based Multi-Agent	*IEEE Journal of Emerging*	Vol. 12, No. 1, pp. 182 – 193	2022	SCI	4.6

	Title	Journal	Details	Year	Index	IF
	System for Detecting and Neutralizing Unseen Cyber-Attacks in AGC and HVDC Systems	*and Selected Topics in Circuits and Systems*				
9. **Siddhartha Deb Roy**, Sanjoy Debbarma	Detection and mitigation of cyber-attacks on AGC systems of low inertia power grid	*IEEE Systems Journal*	14 (2), pp. 2023–2031	2020	SCI	4.4
10. **Siddhartha Deb Roy**, Sanjoy Debbarma	A novel OC-SVM based ensemble learning framework for attack detection in AGC loop of power systems	*Electric Power Systems Research (EPSR), Elsevier*	vol. 202, p. 107625.	2022	SCI	3.9
11. **Siddhartha Deb Roy**, Sanjoy Debbarma, Josep. M. Guerrero	A Data-driven Algorithm to Detect False Data Injections Targeting both Frequency Regulation and Market Operation in Power Systems	*International Journal of Electrical Power & Energy Systems (IJEPES), Elsevier*	vol. 143, pp. 108409	2022	SCI	5.2

Conference Publications

1. **Siddhartha Deb Roy,** Sanjoy Debbarma, Kingshuk Roy, Liza Debbarma, "Protecting Sensor Data Confidentiality in WAN Enabled Power Systems: A Framework Utilising Image Encoding and Machine Learning Regression", *2024 IEEE IAS Industrial and Commercial Power System Asia (IEEE I&CPS Asia 2024)*, Thailand.

2. **Siddhartha Deb Roy,** S. Debbarma, K. Roy, L. Debbarma, Asim Datta, " A Non-Iterative Model-Based Intrusion Detection System for AGC System", *IEEE Guwahati Sub-section Conference, GCON*, 2023.

3. Kingshuk Roy, Sanjoy Debbarma, **Siddhartha Deb Roy**, Liza Debbarma, "An Encoder-Decoder-Based Generation Command Dispatch for AGC of a Multi-Area Grid", *2024 IEEE IAS Industrial and Commercial Power System Asia (IEEE I&CPS Asia 2024)*, Thailand.

4. L. Debbarma, S. Debbarma, K. Roy, **Siddhartha Deb Roy**, P.P. Singh, "A Multi-Agent Reinforcement Learning Based Approach for Frequency Regulation of Power System Penetrated with Dynamic RTEM and Microgrids", *2024 IEEE IAS Industrial and Commercial Power System Asia (IEEE I&CPS Asia 2024)*, Thailand.

5. S. Debbarma, K. Roy, **Siddhartha Deb Roy**, L. Debbarma, "A Probabilistic Multi-Stage UFLS Framework Considering Distributed Generation With RoCoF Relays*", 2024 IEEE 3rd International Conference on Electrical Power and Energy Systems (ICEPES)*, Bhopal, India, 2024, pp. 1-6.

6. **Siddhartha Deb Roy**, Sanjoy Debbarma, "Deep Learning for Classification of FDIs on Time-Series Sensor Data in Cyber-Physical Power Systems", *2022 IEEE 21st Mediterranean Electrotechnical Conference (MELECON),* Italy, 2022, pp. 665-670, doi: 10.1109/MELECON53508.2022.9843077.

7. **Siddhartha Deb Roy** and S. Debbarma, "Mitigation of Intrusions to ACE Signals in Power System Networks," *2020 IEEE International Conference on Power Electronics, Smart Grid and Renewable Energy (PESGRE2020)*, 2020, pp. 1-6, doi: 10.1109/PESGRE45664.2020.9070588.

8. **Siddhartha Deb Roy**, Sanjoy Debbarma, "A Survey on the Security Vulnerabilities in the Cyber-Physical Power Systems", *2022 4th International Conference on Energy, Power and Environment (ICEPE), 2022,* pp. 1-6, doi: 10.1109/ICEPE55035.2022.9798028.

9. **Siddhartha Deb Roy**, S. Debbarma and S. Deb, "A Comparative Analysis of Supervised Classifiers Employing NCA for Feature Selection to Secure Generation Control," *2021 1st International Conference on Power Electronics and Energy (ICPEE)*, 2021, pp. 1-6, doi: 10.1109/ICPEE50452.2021.9358601.

10. **Siddhartha Deb Roy** and S. Debbarma, "Inertia Emulation Using Battery Management System in a Low Inertia Grid with HVDC Links," *2018 2nd International Conference on Power, Energy and Environment: Towards Smart Technology (ICEPE)*, 2018, pp. 1-9, doi: 10.1109/EPETSG.2018.8659053.

11. **Siddhartha Deb Roy** and S. Debbarma, "Imposter Attacks Against Data Integrity to Disrupt Power Balancing in Power Systems," *4th International Conference on Energy, Power and Environment (ICEPE)*, 2022, pp. 1-6, doi: 10.1109/ICEPE55035.2022.9797987.

12. S. Debbarma, C. Hazarika and **Siddhartha Deb Roy**, "SPC based approach for Frequency Control of Power Systems Penetrated with Fast Acting Reserve," *2019 8th International Conference on Power Systems (ICPS)*, 2019, pp. 1-6, doi: 10.1109/ICPS48983.2019.9067625.

13. I. Bhand, S. Debbarma and **Siddhartha Deb Roy**, "Loss Allocation in Distribution Network involving Peer-to-Peer Energy Transactions," *2022 4th International Conference on Energy, Power and Environment (ICEPE),* 2022, pp. 1-6, doi: 10.1109/ICEPE55035.2022.9798075.

14. K. Roy, S. Debbarma, **Siddhartha Deb Roy**, Liza Debbarma, " Regulation Mileage-based Generation Command Dispatch", *2023 5th International Conference on Energy, Power and Environment (ICEPE)*, 2022.

15. L. Debbarma, S. Debbarma, K. Roy **Siddhartha Deb Roy**, Piyush Pratap Singh, "Integration of AGC and Real Time Energy Market Model in Power Systems for Dynamic Performance Analysis", *2023 5th International Conference on Energy, Power and Environment (ICEPE)*, 2022.

Citations

	h-index	i-10 index	Total Citations
Google Scholar	7	7	238 (as on 07/01/2025)

Dr. GUMPU SRINIVASULU

Designation- Assistant Professor

Qualification- B.E., M.Tech., Ph.D

Research Area- Electricity Markets, Power System Economics, Planning and Operation of Power Systems, Machine Learning Applications in Power Systems and Peer to Peer Trading.

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Subjects Taught	
U.G	Basic Electrical and Electronics Engineering
	Network Theory

Teaching Experience			
Organization	**Start Date**	**End Date**	**Designation**
Madanapalle Institute of Technology and Science, Madanapalle, Andhrapradesh	30-08-2022	26-12-2023	Assistant Professor

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus	IMPACT FACTOR
Gumpu Sreenivasulu NC Sahoo, and Pamulaparthy Balakrishna	A coordinated stochastic dispatch model for hybrid energy markets with renewable energy uncertainties using moth flame optimization	Energy Systems	14	2023	Scopus	2.3
Gumpu Sreenivasulu and Pamulaparthy Balakrishna	Feasibility Assessment of Multilateral Transactions in Optimal Dispatch Market with Distributed Generations	Electrical Engineering	104, 2417-2435	2022	SCI	1.8
Gumpu Sreenivasulu NC Sahoo, and Pamulaparthy Balakrishna	Low Economic Risk Operation of Transactive Energy Markets with Renewable Sources and Virtual Power Plants using Self-Adaptive Particle Swarm Optimization	Electrical Engineering	104, 2729-2755	2022	SCI	1.8
Gumpu Sreenivasulu, NC Sahoo, and Pamulaparthy Balakrishna	Dynamic Economic Dispatch of Transactive Energy Markets using Dynamic Programming incorporated with Adaptive Step Size and Restructuring of States	Electric Power Systems Research	210	2022	SCI	3.9
Gumpu Sreenivasulu and Pamulaparthy Balakrishna	Optimal Dispatch of Renewable and Virtual Power Plants in Smart Grid Environment through Bilateral Transactions	Electrical Power Components and systems	49(4-5), 488-503	2021	SCI	1.5
Gumpu Sreenivasulu and Pamulaparthy Balakrishna	Review of Congestion Management Methods from Conventional to Smart Grid Scenario	International Journal of Emerging Electric Power Systems	20(3), 1-24	2019	Scopus	1.0
Gumpu Sreenivasulu, NC Sahoo,	An Optimal Transport Theory based Approach for Efficient	IET Energy Conversion and Economics	4(3), 213-231	2023		

and Pamulaparthy Balakrishna	Dispatch of Transactions in Energy Markets					

Citations

	h-index	i-10 index	Total Citations
Google Scholar	5	1	68

Dr. Chaduvula Hemanth

Assistant Professor

Qualification-   Ph.D
Research Area-planning and operation of microgrid, modeling of renewables, cogeneration units, battery storage system, demand response, optimization.
Email- hemanthped[at]gmail[dot]com
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Subjects Taught

UG	Measurements, Smart Grid Technology, Introduction to Electric Vehicles
PG	Energy Management and Audit

DR. CHADUVULA HEMANTH

Subjects Taught
Teaching Experience

Organization	Start Date	End Date	Designation

Vignan's Institute of Information Technology, Duvvada	01.07.2015	23.12.2015	Assistant Professor
National Institute of Technology Andhra Pradesh	30-08-2022	22-12-2023	Ad-hoc faculty

Publication

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus	IMPACT FACTOR
Hemanth Chaduvula, Debapriya das	Analysis of microgrid configuration with optimal power injection from grid using point estimate method embedded fuzzy-particle swarm optimization	Energy	282, 128909	2023	SCI	8.857
Hemanth Chaduvula, Debapriya das	Investigating effect of various time varying load models in grid connected microgrid system integrated with renewables and cogeneration units	International Journal of Ambient Energy	44, 2558-2570	2023	Scopus	0.421
Hemanth Chaduvula, Debapriya das	Optimal energy management in a microgrid with known power from the grid based on a particle swarm optimization embedded Fuzzy multi-objective approach	International Journal of Ambient Energy	43, 7885-7898	2022	Scopus	0.421
J. Sanam, S. Ganguly, A. K. Panda, and C. Hemanth	Optimization of Energy Loss Cost of Distribution Networks with the Optimal Placement and Sizing of DSTATCOM Using Differential Evolution Algorithm	Arabian Journal for Science and Engineering	42, 2851-2865	2017	SCI	2.9

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Indian Institute of Technology Kanpur	28/07/2023	31/12/2023	Project Scientist	Research

Publication

Authors	Title	Journal	VOL. NO., PAGE NO	YEAR	SCI/ Scopus	IMPACT FACTOR
M. K. Behera and L. C. Saikia	A seamless control of grid-connected PV system for alleviating PV penetration in rural grid using supercapacitor accompanying with DSTATCOM and improved CTF control	IEEE Transactions on Industry Applications	Vol. 60 No. 2 PP. 3588–3602	2024	SCI	4.2
M. K. Behera and L. C. Saikia	An unprecedented control of 3-phase grid tied solar photovoltaic-hydrogen/bromine-supercapacitor composite storage microgrid for pulse power load regulation under nonideal grid conditions	International Journal of Numerical Modelling: Electronic Networks, Devices and Fields	Vol. 36, PP. e3118 No. 6	2023	SCI	1.6
M. K. Behera and L. C. Saikia	A novel spontaneous control for Autonomous Microgrid VSC system using BPF Droop and improved hysteresis band Control Scheme	Electric Power Systems Research	Vol. 220 PP. 109262	2023	SCI	3.3
M. K. Behera and L. C. Saikia	A novel resilient control of grid-integrated solar PV-hybrid energy storage microgrid for power smoothing and pulse power load accommodation	IEEE Transactions on Power Electronics	Vol. 38 No. 3 PP. 3965-3980	2023	SCI	6.6
A. Ranjan, **M. K. Behera**, and L. C. Saikia	An advance control of grid integrated wind turbine driven DFIG-battery system with grid power shaping under Gust Wind Variation	IETE Journal of Research	Vol. 70 No. 3 PP. 3030-3051	2023	SCI	1.3
M. K. Behera and L. C. Saikia	Anti-windup filtered second-order generalized integrator-based spontaneous control for single-phase grid-tied solar PV-H_2/Br_2 redox flow battery storage microgrid system	Journal of Energy Storage	Vol. 55 PP. 105551	2022	SCI	8.9

M. K. Behera and L. C. Saikia	An improved voltage and frequency control for islanded microgrid using BPF based droop control and optimal third harmonic injection PWM scheme	IEEE Transactions on Industry Applications	Vol. 58 No. 2 PP. 2483–2496	2022	SCI	4.2
M. K. Behera and L. C. Saikia	Combined voltage and frequency control for diverse standalone microgrid networks using flexible IDC with novel FOC: A real-time validation	IETE Journal of Research	Vol. 69 No. 9 PP. 6431–6456	2021	SCI	1.3
M. K. Behera and L. C. Saikia	An intelligent hybrid GMPPT integrating with accurate PSC detection scheme for PV system using ESSA optimized AWFOPI controller	Sustainable Energy Technologies and Assessments	Vol. 46 PP. 101233	2021	SCI	7.1
M. K. Behera and L. C. Saikia	A new combined extreme learning machine variable steepest gradient ascent MPPT for PV system based on optimized PI-FOI cascade controller under uniform and partial shading conditions	Sustainable Energy Technologies and Assessments	Vol. 42 PP. 100859	2020	SCI	7.1
M. K. Behera and N. Nayak	A comparative study on short-term PV power forecasting using decomposition based optimized extreme learning machine algorithm	Engineering Science and Technology, an International Journal	Vol. 23 No. 1 PP. 156–167	2020	SCI	5.1
M. K. Behera, I. Majumder, and N. Nayak	Solar photovoltaic power forecasting using optimized modified extreme learning machine technique	Engineering Science and Technology, an International Journal	Vol. 21 No. 3 PP. 428–438	2018	SCI	5.1

Conference Papers

1. **M. K. Behera**, L. C. Saikia, S. K. Ramoji, S. K. Bhagat, and B. Dekaraja, "Design and analysis of combined control strategy for grid integrated PV-hybrid system with sparrow search optimized seamless control," *2023 IEEE International Conference on Energy Technologies for Future Grids* (*ETFG*), Dec. 2023.
2. **M. K. Behera**, L. C. Saikia, S. K. Ramoji, S. K. Bhagat, B. Dekaraja, and G. M. Meseret, "Implementation of sparrow search algorithm tuned AWFOPI controller for three phase grid-

tied SPV-DSTATCOM under dynamic loading conditions," *2022 IEEE Silchar Subsection Conference* (*SILCON*), Nov. 2022.

3. **M. K. Behera**, L. C. Saikia, S. K. Ramoji, B. Dekaraja, and S. K. Bhagat, "An improved control of grid integrated solar PV system using fractional order PI controller combined with active current detection scheme," *2022 4th International Conference on Energy, Power and Environment* (*ICEPE*), Apr. 2022.

4. **M. K. Behera**, L. C. Saikia, S. K. Ramoji, B. Dekaraja, and S. K. Bhagat, "A novel decentralized FO voltage and current control scheme for voltage and frequency regulation in inverter dominated islanded microgrids using improved droop control," *IFAC-PapersOnLine*, vol. 55, no. 1, pp. 679–684, Jan. 2022.

5. **M. K. Behera**, L. C. Saikia, S. K. Ramoji, B. Dekaraja, S. K. Bhagat, and N. R. Babu, "A modified droop control for AC microgrids to improve dynamic performance with linear and unbalanced loads," *2021 International Conference on Computational Performance Evaluation* (*ComPE*), Dec. 2021.

6. **M. K. Behera**, L. C. Saikia, S. K. Ramoji, B. Dekaraja, S. K. Bhagat, and N. R. Babu, "Voltage and frequency control for DG inverter in low voltage islanded microgrid with improved virtual impedance droop control scheme," *2020 IEEE 17th India Council International Conference* (*INDICON*), Dec. 2020.

7. **M. K. Behera**, R. Raj, and L. C. Saikia, "A novel decentralized virtual impedance droop integrating phase-locked loop (PLL) control scheme for parallel DG inverter in an islanded microgrid," *2020 IEEE 17th India Council International Conference (INDICON)*, Dec. 2020.

8. **M. K. Behera**, I. Majumder, and N. Nayak, "Extreme learning forecast model for grid connected MPPT based photovoltaic station," *International Journal of Pure and Applied Mathematics*, *114*(10), pp. 373-81. 2017.

9. S. K. Bhagat, L. C. Saikia, **M. K. Behera**, S. K. Ramoji, B. Dekaraja and G. M. Meseret, "Effect of several mayfly optimized tilt controllers in AGC of RES integrated system," *2023 IEEE International Conference on Energy Technologies for Future Grids (ETFG)*, Dec, 2023.

10. S. R. Singh, **M. K. Behera**, and L. C. Saikia, "Improved variable step size P&O MPPT for Wind Energy Conversion Systems," *2023 IEEE Silchar Subsection Conference (SILCON)*, Nov. 2023.

11. S. R. Singh, **M. K. Behera**, L. C. Saikia, R. Borthakur, T. Mallik and J. Gogoi, "Implementation of solar PV-battery based Electric Vehicle Charging Station," *2023 IEEE Silchar Subsection Conference (SILCON)*, Nov. 2023.

12. S. R. Singh, S. Kumar Bhagat, L. C. Saikia, **M. K. Behera**, A. Kalita and S. Gogoi, "Application of a artificial hummingbird algorithm optimized tilted integral double derivative controller for a multi-area Thermal Power System," *2023 IEEE Silchar Subsection Conference (SILCON)*, Nov. 2023.

13. B. Dekaraja, L. C. Saikia, S. K. Ramoji, S. K. Bhagat, **M. K. Behera**, and G. Mesfin, "AGC of hybrid multiarea power systems using AC-AHVDC links," *2023 IEEE Guwahati Subsection Conference (GCON)*. Jun. 2023.

14. S. K. Ramoji, L. C. Saikia, B. Dekaraja, **M. K. Behera**, G. M. Meseret, and S. K. Bhagat, "Modified TID controller for concerted voltage and frequency control of Two-area power system," *2023 IEEE Guwahati Subsection Conference (GCON)*. Jun. 2023.

15. B. Dekaraja, L. C. Saikia, S. K. Ramoji, **M. K. Behera**, S. K. Bhagat, and G. M. Meseret, "Electric vehicle to grid support on combined frequency and voltage control of multiarea power system considering renewable energy," *2022 IEEE International Power and Renewable Energy Conference (IPRECON)*. Dec. 2022.

16. G. M. Meseret, L. C. Saikia, **M. K. Behera**, S. K. Ramoji, B. Dekaraja, and S. K. Bhagat, "Optimized intelligent based controller for LFC of multi-area hydrothermal system incorporating wind firm and HVDC links," *2022 IEEE Silchar Subsection Conference (SILCON)*, Nov. 2022.

17. S. K. Ramoji, L. C. Saikia, B. Dekaraja, **M. K. Behera**, G. M. Meseret, and S. K. Bhagat, "Impact of TCSC and ESS on unified ALFC-AVR study of multi-area interconnected power system using 2DOF-TIDD controller," *2022 IEEE Silchar Subsection Conference (SILCON)*, Nov. 2022.

18. S. K. Bhagat, L. C. Saikia, G. M. Meseret, **M. K. Behera**, S. K. Ramoji, N. R. Babu, and B. Dekaraja, "Effect of PWTS and AHVDC link on multi-area AGC system considering TIDD controller," *2022 IEEE Silchar Subsection Conference (SILCON)*, Nov. 2022.

19. S. K. Ramoji, L. C. Saikia, B. Dekaraja, **M. K. Behera**, and S. K. Bhagat, "Repercussions of SMES and HVDC link in amalgamated voltage and frequency regulation of multi-area multi-unit interconnected power system," *2022 4th International Conference on Energy, Power and Environment (ICEPE)*, Apr. 2022.

20. S. K. Bhagat, L. C. Saikia, N. R. Babu, B. Dekaraja, S. K. Ramoji, **M. K. Behera**, and S. Das, "Effect of various FACTS devices and HVDC link on multi-area power system utilizing 2DOF TIDN controller," *2022 4th International Conference on Energy, Power and Environment (ICEPE)*, Apr. 2022.

21. S. K. Ramoji, L. C. Saikia, B. Dekaraja, **M. K. Behera**, and S. K. Bhagat, "Performance comparison of various tilt controllers in coalesced voltage and frequency regulation of multi-area multi-unit power system," *2022 IEEE Delhi Section Conference (DELCON)*, Feb. 2022.

22. B. Dekaraja, S. K. Bhagat, L. C. Saikia, **M. K. Behera**, and S. K. Ramoji, "Combined frequency and voltage regulation of a renewable and energy storage integrated multi area systems using cascade controller," *2022 IEEE Delhi Section Conference (DELCON)*, Feb. 2022.

23. B. Dekaraja, L. C. Saikia, S. K. Ramoji, **M. K. Behera**, and S. K. Bhagat, "Performance analysis of diverse energy storage on combined ALFC and AVR control of multiarea multiunit system with AC/HVDC interconnection," *IFAC-PapersOnLine*, vol. 55, no. 1, pp. 479–485, Jan. 2022.

24. S. K. Bhagat, L. C. Saikia, N. R. Babu, S. K. Ramoji, D. Raja, and **M. K. Behera**, "The application of various PID controllers and the effect of AHVDC and DSTS on dynamics responses in a multi-area AGC," *IFAC-PapersOnLine*, vol. 55, no. 1, pp. 473–478, Jan. 2022.

25. S. K. Bhagat, L. C. Saikia, N. R. Babu, B. Dekaraja, **M. K. Behera**, and S. K. Ramoji, "Effect of DSTS and HVDC on multi-area AGC system considering BSA optimized 2DOF-TID controller," *2021 IEEE 18th India Council International Conference (INDICON)*, Dec. 2021.

26. S. K. Ramoji, L. C. Saikia, B. Dekaraja, **M. K. Behera**, N. R. Babu, and S. K. Bhagat, "Combined voltage and frequency control of a multi-area multi-source power system using CFOPI-TIDN controller," *2021 International Conference on Computational Performance Evaluation (ComPE)*, Dec. 2021.

27. N. R. Babu, L. C. Saikia, S. K. Bhagat, S. K. Ramoji, D. Raja, and **M. K. Behera**, "Impact of wind system and redox flow batteries on LFC studies under deregulated scenario," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, Mar. 2021.

28. S. K. Bhagat, L. C. Saikia, N. R. Babu, S. K. Ramoji, B. Dekaraja, and **M. K. Behera**, "Integration of STP and WTS in multi-area AGC studies considering GHA optimized TIDF

controller," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, Mar. 2021.

29. S. K. Ramoji, L. C. Saikia, B. Dekaraja, **M. K. Behera**, S. K. Bhagat, and N. R. Babu, "Optimal unified frequency and voltage control of multi-area multi-source power system using the cascaded PIDN-TIDF controller," *2020 IEEE 17th India Council International Conference (INDICON)*, Dec. 2020.

30. B. Dekaraja, L. C. Saikia, S. K. Ramoji, N. R. Babu, S. K. Bhagat, and **M. K. Behera**, "Coordinated control of voltage and frequency in a three-area multisource system integrated with SMES using FOI-FOPDF controller," *2020 IEEE 17th India Council International Conference (INDICON)*, Dec. 2020.

31. N. R. Babu, L. C. Saikia, S. K. Bhagat, S. K. Ramoji, B. Dekaraja, and **M. K. Behera**, "Optimal location of AC-HVDC tie-line in a multi-area LFC system incorporated with renewable and ESD considering CA optimized PI-TID cascade controller," *2020 IEEE 17th India Council International Conference (INDICON)*, Dec. 2020.

32. T. K. Behera, **M. K. Behera**, and N. Nayak, "Spider monkey based improve P&O MPPT controller for photovoltaic generation system," *2018 Technologies for Smart-City Energy Security and Power (ICSESP)*, Mar. 2018.

33. M. Parida, **M. K. Behera**, and N. Nayak, "Combined EMD-ELM and OS-ELM techniques based on feed-forward networks for PV power forecasting," *2018 Technologies for Smart-City Energy Security and Power (ICSESP)*, Mar. 2018.

34. I. Majumder, **M. K. Behera**, and N. Nayak, "Solar power forecasting using a hybrid EMD-ELM method," *2017 International Conference on Circuit, Power and Computing Technologies (ICCPCT)*, Apr. 2017.

Book Chapters

1. **M. K. Behera**, L. C. Saikia, S. K. Ramoji, B. Dekaraja, A. Saha, S. K. Bhagat, and N. R. Babu, "A QSSA optimized fractional-order controller for improving transient response in AC autonomous microgrid VSC system," *Advances in Smart Energy Systems*, pp. 255–275, Sep. 2022.

2. **M. K. Behera**, L. C. Saikia, S. K. Ramoji, B. Dekaraja, S. K. Bhagat, and N. R. Babu, "A novel effective single sensor MPPT technique for a uniform and partially shaded solar PV system via MSCA approach," *Modeling, Simulation and Optimization Smart Innovation, Systems and Technologies*, pp. 247–260, Mar. 2021.

3. S. K. Ramoji, L. C. Saikia, B. Dekaraja, **M. K. Behera**, S. K. Bhagat, N. R. Babu, and A. Saha, "Conflated voltage–frequency control of multi-area multi-source system using fuzzy TID controller and its real-time validation," *Advances in Smart Energy Systems*, pp. 277–294, Sep. 2022.

4. B. Dekaraja, L. C. Saikia, S. K. Ramoji, **M. K. Behera**, S. K. Bhagat, A. Saha, and N. R. Babu, "Impact of electric vehicles and wind turbine in combined ALFC and AVR studies using AFA-optimized CFPD-PIDN controller," *Advances in Smart Energy Systems*, pp. 233–253, Sep. 2022.

5. A. Saha, L. C. Saikia, N. R. Babu, S. K. Bhagat, **M. K. Behera**, S. K. Ramoji, and B. Dekaraja, "Presentation of real-time lab analysis for multiple-area renewable sources-thermal-hydro system by implementation of cat swarm optimization," *Advances in Smart Energy Systems*, pp. 221–231, Sep. 2022.

6. S. K. Ramoji, L. C. Saikia, B. Dekaraja, N. R. Babu, S. K. Bhagat, and **M. K. Behera**, "Modeling and simulation of an isolated CCGT and DSTS plant using BWO optimized piλdμ controller for amalgamated control of voltage and frequency," *Modeling, Simulation and Optimization Smart Innovation, Systems and Technologies*, pp. 297–309, Mar. 2021.

7. B. Dekaraja, L. C. Saikia, S. K. Ramoji, N. R. Babu, S. K. Bhagat, and **M. K. Behera**, "Modeling and simulation of a multi-area hydro-thermal interconnected system using fopiµ controller for integrated voltage and frequency control," *Modeling, Simulation and Optimization Smart Innovation, Systems and Technologies*, pp. 275–285, Mar. 2021.

8. S. K. Bhagat, L. C. Saikia, D. K. Raju, N. R. Babu, S. K. Ramoji, B. Dekaraja, and **M. K. Behera**, "Maiden application of hybrid particle swarm optimization with genetic algorithm in AGC studies considering optimized TIDN controller," *Modeling, Simulation and Optimization Smart Innovation, Systems and Technologies*, pp. 335–346, Mar. 2021.

9. N. R. Babu, L. C. Saikia, S. K. Bhagat, S. K. Ramoji, B. Dekaraja, and **M. K. Behera**, "LFC of a solar thermal integrated thermal system considering CSO optimized TI-DN controller," *Modeling, Simulation and Optimization Smart Innovation, Systems and Technologies*, pp. 323–334, Mar. 2021.

Patents

Title	Year	Agency	Co-Investigator(if any)	Published/Granted
Isolated power system and method consisting CCGT and DSTS plant for frequency and voltage control	2022	IP Australia	S. K. Ramoji, L. C. Saikia, B. Dekaraja, N. R. Babu, S. K. Bhagat, and **M. K. Behera**	Granted

Citations

	h-index	i-10 index	Total Citations
Google Scholar	12	14	752 (As on 11/12/2024)

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T. S. Bheemraj, V. Karthikeyan, Kumaravel S.	A Quintuple Phase Shift Modulation Scheme in Multilevel Dual Active Bridge Converter for Battery Energy Storage System	International Journal of Circuit Theory and Applications, Wiley	51 1665-1684	2023	SCI	2.45
T. S. Bheemraj, V.Karthikeyan, Kumaravel S.	PSO based Universal Phase Shift Modulation Scheme for DAB Converter to Eliminate Backflow Power in Energy Storage Applications	International Journal of Circuit Theory and Applications, Wiley	51 3792-3805	2023	SCI	2.45
T. S. Bheemraj, Y. A. Kumar,V. Karthikeyan, Pragaspathy S	A Hybrid Structured High Step-Up DC-DC Converter for Integration of Energy Storage Systems in Military Applications	IEEE Transactions on Circuits and Systems II: Express Briefs	70 1545-1549	2023	SCI	4.73
T. S. Bheemraj, Dandu Prajapathi, V. Karthikeyan, Kumaravel S	A Novel High Gain Non-Isolated Three Port DC-DC Converter for DC Microgrid Applications	Journal of Circuits, Systems and Computers, World Scientific	32 2350226	2023	SCI	1.5
B. Krishna, **T. S. Bheemraj,** V. Karthikeyan	Optimized Active Power Management in Solar PV-Fed Transformerless Grid-Connected System for Rural Electrified Microgrid.	Journal of Circuits, Systems and Computers, World Scientific	30 2150039	2021	SCI	1.5

PUBLICATIONS in CONFERENCE

- **T. S. Bheemraj**, B. Krishna, V. Karthikeyan and S. Kumaravel, "High Accurate Dual Loop Controller for Power Regulation in DAB DC-DC Converter for Solar PV Applications," 2019 International Conference on Computing, Power and Communication Technologies (GUCON), New Delhi, India, 2019, pp. 355-359.
- **T S Bheemraj**; Kiran Babu; Muhammad Rafi; Anjana K G; Subhash Joshi T G, "Influence of Magnetizing Inductance and Dead Time in the Performance of Half-Bridge LLC Resonant Converter," 2023 IEEE International Conference on Power Electronics, Smart Grid, and Renewable Energy (PESGRE), Trivandrum, India, 2023, pp. 1-6, doi: 10.1109/PESGRE58662.2023.10404569.
- M. Rafi, T. G. Subhash Joshi, K. Babu and **T. S. Bheemraj**, "Efficient Core Utilization Methods in Planar Magnetic Components," 2023 11th National Power Electronics

Conference (NPEC), Guwahati, India, 2023, pp. 1-5, doi: 10.1109/NPEC57805.2023.10384927.

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Research Groups

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- Power System
- Renewal Energy

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2	Dr. S.K. Bharadwaj	Power system, Advance control system
3	Dr. R.K. Nema	Power electronics and Electrical drives , Renewable energy systems, Solar Photovoltaics
4	Dr. Y. Kumar	Power System
5	Dr. Manisha Dubey	Power System

Sr. No.	Name of Faculty	Research Area
6	Dr. Shailendra Jain	Power electronics and Electrical drives, Power quality improvement.
7	Dr. Savita Nema	Control Systems, Renewable energy system, Solar Photovoltaics, Electrical Drives
8	Dr. Tripta Thakur	Power System economics and Power System management
9	Dr. N.P. Patidar	Power system
10	Dr. Sushma Gupta	Electrical drives
11	Dr. S.C. Gupta	Power system
12	Dr. Anoop Arya	Power system, power markets, AI applications to power system
13	Dr. Suresh Kumar Gawre	Renewable energy, Power electronics and Electrical drives
14	Dr.Priyanka Paliwal	Power system, Optimization techniques
15	Dr.Pankaj Swarnkar	Advanced control system
16	Dr. Amit Ojha	Electrical drives
17	Dr. Rishi Kumar Singh	Power System
18	Dr. Mukesh Kumar Kirar	Power System

Sr. No.	Name of Faculty	International Journal	National Journal	Conferences International	Conference National
1	Dr. A.M. Shandilya	07	02	10	44
2	Dr. S.K. Bharadwaj	25	--	20	60
3	Dr. R.K. Nema	63	--	36	52
4	Dr. Yogendra. Kumar	16	01	16	10
5	Dr. Manisha Dubey	34	02	40	23

Sr. No.	Name of Faculty	Research Area			
6	Dr. Shailendra Jain	70	10	46	48
7	Dr. Savita Nema	20	--	21	24
8	Dr. Tripta Thakur	31	--	50	20
9	Dr. N.P. Patidar	28	01	13	08
10	Dr. Sushma Gupta	11	01	21	--
11	Dr. S.C. Gupta	08	--	20	03
12	Dr. Anoop Arya	05	--	09	06
13	Dr. Suresh Kumar Gaware	08	--	05	--
14	Dr.Priyanka Paliwal	06	--	04	--
15	Dr.Pankaj Swarnkar	08	--	--	--
16	Dr. Amit Ojha	09	--	05	05
17	Dr. Rishi Kumar Singh	04	--	02	--
18	Dr.Mukesh Kumar Kirar	10	--	14	--

Labs

Bilingual lab manual

S. No.	Laboratory	Lab Incharge (s)	Lab Mentor	Technical Staff
UG Lab				
1.	Senior Machine Lab	Dr. Amit Ojha Dr. Chaduvula Hemanth	Dr. Sanjeev Singh	Mr. Sanjay Arya
2.	Junior Machine Lab	Dr. More Raju Dr. Chaduvula Hemanth	Dr. N.P.Patidar	Mr. Suraj Yadav

3.	Control Lab	Dr. Pankaj Swarnkar Dr. Punjan Dohare	Dr. Savita Nema	Mr. Bharat Bhusan Khare
4.	Instrumentation & Measurement Lab	Dr. Rishi Singh Dr. Punjan Dohare	Dr. Sushma Gupta	Mr. Rupesh Patankar
5.	Power Electronics Lab	Dr. Giribabu D.	Dr. Sanjeev Singh	Mr. Rohit Bamaniya
6.	Electronics Lab	Dr. Suresh Kumar Gawre	Dr. Sushma Gupta	Mr. Rupesh Patankar
7.	Network Lab	Dr. Srinivasulu Gumpu	Dr. Y.Kumar	Mr. Rupesh Patankar
8.	Power System Lab	Dr. S.C. Gupta Dr. Mukesh K. Kirar	Dr. Manisha Dubey	Mr. Bharat Bhusan Khare
PG Lab				
9.	Advanced Power System Lab	Dr. Mukesh K. Kirar Dr. Raju More	Dr. Y.Kumar	Mr. Bharat Bhusan Khare
10.	Advanced Power Electronics & Drives Lab	Dr. Amit Ojha Dr. T.S.Bheemraj	Dr. Shailendra Kumar Jain	Mr. Rohit Bamaniya
11.	Digital Controller Lab	Dr. Pankaj Swarnkar	Dr. Savita Nema	Mr. Bharat Bhusan Khare