

E.G.S. PILLAY ENGINEERING COLLEGE

(Autonomous)

Approved by AICTE, New Delhi | Affiliated to Anna University, Chennai

Accredited by NAAC with „A Grade| Accredited by NBA

NAGAPATTINAM – 611002



M.E. POWER ELECTRONICS AND DRIVES

REGULATION -2021

First Year – First Semester

Course Category	Course Code	Course Name	L	T	P	C	Maximum Marks		
							CA	ES	Total
Theory Course									
FC	2101PE101	Modeling and Analysis of Electrical Machines	3	2	0	4	40	60	100
PCC	2102PE102	Analysis and Design of Power Converters	3	0	0	3	40	60	100
PCC	2102PE103	Analysis and Design of Inverters	3	0	0	3	40	60	100
PEC	2103PE004	Program Elective – I (Solar And Energy Storage System)	3	0	0	3	40	60	100
PEC	2103PE006	Program Elective – II (Power Quality)	3	0	0	3	40	60	100
AU		Audit Course – I	2	0	0	0	100	00	100
Laboratory Course									
	2102PE104	Power Electronic Circuits Laboratory	0	0	4	2	50	50	100
	2102PE105	Power Electronics Simulation Laboratory	0	0	4	2	50	50	100
Total			17	2	8	20	400	400	800

2101PE101	MODELING AND ANALYSIS OF ELECTRICAL MACHINES	L	T	P	C
		3	2	0	4
MODULE I	BASIC CONCEPTS OF MODELING	12 Hours			
Basic two pole machine representation of commutator machines, three phase synchronous machine with and without damper bar and 3-phase induction machine; Kron's primitive machine - voltage, current and torque equations.					
MODULE II	DC MACHINE MODELING	12 Hours			
Mathematical model of separately excited DC motor - Steady state and transient state analysis, sudden application of inertia load, transfer function; Mathematical model of DC series motor and DC shunt motor; Linearization techniques for small perturbations.					
MODULE III	TRANSFORMER MODELING	12 Hours			
Single phase transformer model, three phase transformer connections, per phase analysis, normal systems, per unit normalization, per unit three phase quantities, change of base, per unit analysis of normal system, regulating transformers for voltage and phase angle control, auto transformers, transmission line and transformers.					
MODULE IV	INDUCTION MACHINE MODELING	12 Hours			
Static and rotating reference frames; Transformation relationships; Stationary circuit variables transformed to the arbitrary reference frame treating R, L, C elements separately; Application of reference frame theory to three phase symmetrical induction machine - Direct and quadrature axis model in arbitrarily rotating reference frame, voltage and torque equations					
MODULE V	SPECIAL MACHINES	12 Hours			
Permanent magnet synchronous machine, surface permanent magnet (square and sinusoidal back emf type) and interior permanent magnet machines - Construction and operating principle, dynamic modeling and self-controlled operation; Dynamic analysis of switched reluctance motors.					
					TOTAL: 60 Hours
REFERENCES:					
1	Charles Kingsley Jr., A.E. Fitzgerald and Stephen D. Umans, "Electric Machinery", McGraw-Hill Higher Education, New York, 2010.				
2	Paul C. Krause, Oleg Wasynczuk and Scott D. Sudhoff, "Analysis of Electric Machinery and Drive Systems", Wiley Student Edition, New Jersey, 2013.				
3	R. Krishnan, "Electric Motor & Drives: Modeling, Analysis and Control", Prentice Hall of India, New Delhi, 2001.				
4	T.J.E. Miller and J.R. Hendershot Jr., "Design of Brushless Permanent Magnet Motors", Oxford University Press, USA, 1994.				
5	T.J.E. Miller, "Reluctance Motor and their Controls", Oxford University Press, USA, 1993.				

2102PE102	ANALYSIS AND DESIGN OF POWER CONVERTERS	L	T	P	C
		3	0	0	3
MODULE I	SINGLE PHASE AND THREE PHASE CONVERTERS	9 Hours			
Principle of phase control; Single phase full converter and semi converter (R, RL, RLE loads); Single phase dual converter; Three phase full converter and semi converter (R, RL, RLE load); Effect of freewheeling diodes and source inductances; Reactive power; Power factor improvement techniques; PWM rectifiers; Single phase and three-phase dual converters.					
MODULE II	DC-DC CONVERTERS	9 Hours			
Principles of step-down and step-up converters – Analysis of buck, boost, buck-boost and Cuk converters; Time ratio and current limit control; Resonant and quasi-resonant converters.					
MODULE III	DESIGN OF POWER CONVERTER COMPONENTS	9 Hours			
Introduction to magnetic materials - Hard and soft magnetic materials, types of cores, copper windings; Design of transformer; Inductor design equations; Inductor design for buck/flyback converters; Selection of input/output filters; Selection of device ratings; Design of heat sink.					
MODULE IV	AC VOLTAGE CONTROLLERS	9 Hours			
Single phase and three phase AC voltage controllers - Principle of operation, various configurations, analysis with R and RL loads, applications.					
MODULE V	CYCLOCONVERTERS	9 Hours			
Single phase and three phase cycloconverters - Principle of operation, various configurations, analysis with R and RL loads, applications; Power factor control; Introduction to matrix converters.					
				TOTAL:	45 Hours
REFERENCES:					
1. Rashid M.H., “Power Electronics Circuits, Devices and Applications”, Prentice Hall India, Third Edition, New Delhi, 2004.					
2. Jai P. Agrawal, “Power Electronics Systems”, Pearson Education, Second Edition, 2002.					
3. Bimal K. Bose “Modern Power Electronics and AC Drives”, Pearson Education, Second Edition, 2003.					
4. Ned Mohan, T.M Undeland and W.P Robbin, “Power Electronics: converters, Application and design”, John Wiley & Sons, Wiley India edition, 2006.					
5. Philip T. Krein, “Elements of Power Electronics”, Oxford University Press, 1998.					
6. P.C. Sen, “Modern Power Electronics”, Wheeler Publishing Co., First Edition, New Delhi, 1998.					
7. P.S.Bimbra, “Power Electronics”, Khanna Publishers, Eleventh Edition, 2003.					
8. Marian. K.Kazimierczuk and Dariusz Czarkowski, “Resonant Power Converters”, John Wiley & Sons, 2011.					
9. W. G. Hurley and W. H.Wofle, “Transformers and Inductors for Power Electronics Theory, Design and Applications”, John Wiley & Sons, 2013.					

2102PE103	ANALYSIS AND DESIGN OF INVERTERS	L	T	P	C
		3	0	0	3
MODULE I	BASIC INVERTERS	9 Hours			
Series inverter - Basic series inverter, modified series inverter, high frequency series inverter, design of L and C; Parallel inverter - Design of parallel inverter; Line commutated inverter; Concept of PWM techniques.					
MODULE II	VOLTAGE SOURCE INVERTERS	9 Hours			
Principle of operation of single phase half and full bridge inverters; Three phase inverters with 180 degree and 120 degree conduction mode with star and delta connected loads; Performance parameters; Voltage control of single phase and three phase inverters using various PWM techniques; Harmonic elimination techniques.					
MODULE III	CURRENT SOURCE AND IMPEDANCE SOURCE INVERTERS	9 Hours			
Load commutated current source inverter - Single phase and three phase auto sequential current source inverter (ASCI); Principle of operation of impedance source inverter; Comparison of CSI, VSI and ZSI.					
MODULE IV	MULTILEVEL INVERTERS	9 Hours			
Multilevel inverter - Concept, classification; Classical multilevel inverters - Diode clamped, flying capacitor and cascade type; Hybrid multilevel inverter; FFT analysis; Comparison of multilevel inverters; Applications of multilevel inverters.					
MODULE V	RESONANT INVERTERS	9 Hours			
Concept of zero voltage switching and zero current switching; Series and parallel resonant inverters; Voltage control of resonant inverters; Class E resonant inverter; Resonant DC Link inverters.					
				TOTAL:	45 Hours
REFERENCES:					
1. P.S. Bimbra, "Power Electronics", New Delhi, Khanna Publishers, 2006.					
2. M.H. Rashid, "Hand Book of Power Electronics: Circuits, Devices and Application", New Delhi, Prentice Hall of India, 2007.					
3. Ned Mohan, Tore M. Undeland and William P. Robbins, "Power Electronics: Converters, Applications and Design", 3 rd Edition, John Wiley and Sons, 2002.					
4. Jai P. Agrawal, "Power Electronics Systems", 2 nd Edition, Pearson Education, 2002.					
5. Bimal K. Bose, "Modern Power Electronics and Motor Drive - Advances and Trends", 2 nd Edition, Pearson Education, 2006.					

2102PE104	POWER ELECTRONIC CIRCUITS LABORATORY	L	T	P	C
		0	0	4	2
LIST OF EXPERIMENTS:					
1. Single phase half controlled converter with RL load.					
2. Single phase full controlled converter with RL load.					
3. Single phase series inverter.					
4. Single phase parallel inverter.					
5. Single phase cycloconverter.					
6. Three phase fully controlled converter with RL and RLE loads.					
7. MOSFET based step up and step down choppers.					
8. Single phase PWM inverter.					
9. AC voltage controller.					
10. Resonant converter.					
					TOTAL: 60 HOURS
REFERENCES:					
1. Ned Mohan, T.M. Undeland and W.P Robbin, "Power Electronics: Converters, Application and Design" John Wiley & Sons. Wiley India edition, 2006.					
2. Rashid M.H., "Power Electronics Circuits, Devices and Applications", Prentice Hall India, New Delhi, 1995.					

2102PE105	POWER ELECTRONICS SIMULATION LABORATORY	L	T	P	C
		0	0	4	2
LIST OF EXPERIMENTS:					
1. Simulation of single phase half controlled converter with RLEload.					
2. Simulation of single phase fully controlled converter with RLEload.					
3. Simulation of three phase half controlled converter with RLload.					
4. Simulation of three phase fully controlled converter with RLload.					
5. Simulation of step up and step down DC choppers.					
6. Simulation of single phase and three phase AC voltage controllers.					
7. Simulation of single phase voltage source inverter with RL/RC load.					
8. Simulation of i) Basic / modified series inverter, ii) Series resonant inverter.					
9. Simulation of single phase current source inverter with induction heating load.					
10. Simulation of multi-level inverter topologies.					
					Total: 60 Hours
REFERENCES:					
1. Ned Mohan, T.M. Undeland and W.P Robbin, "Power Electronics: Converters, Application and Design" John Wiley & Sons. Wiley India edition, 2006.					
2. Rashid M.H., "Power Electronics Circuits, Devices and Applications", Prentice Hall India, New Delhi, 1995.					

PROGRAM ELECTIVE – I

2103PE004	SOLAR AND ENERGY STORAGE SYSTEM	L	T	P	C
		3	0	0	3
UNIT I	INTRODUCTION				9 Hours
Characteristics of sunlight; Semiconductors and P-N junctions; Behavior of solar cells – Cell properties, PV cell interconnection.					
UNIT II	STAND ALONE PV SYSTEM				9 Hours
Solar modules; Storage systems; Power conditioning and regulation; Protection; Stand-alone PV systems design; Sizing of solar panels.					
UNIT III	GRID CONNECTED PV SYSTEMS				9 Hours
PV systems in buildings; Design issues for central power stations- Safety, economic aspect, efficiency and performance; International PV programs.					
UNIT IV	ENERGY STORAGE SYSTEMS				9 Hours
Impact of intermittent generation; Battery energy storage; Solar thermal energy storage; Pumped hydroelectric energy storage.					
UNIT V	SOLAR ENERGY APPLICATIONS				9 Hours
Solar energy applications - Water pumping, battery chargers, solar car, direct-drive applications, space and telecommunications.					
				Total:	45 Hours
REFERENCES:					
<ol style="list-style-type: none"> 1. Eduardo Lorenzo G. Araujo, “ Solar electricity engineering of photovoltaic systems”, Progensa, 1994. 2. Stuart R.Wenham, Martin A.Green, Muriel E. Watt and Richard Corkish, “ Applied Photovoltaics”, 2007, Earth scan, UK. 3. Frank S. Barnes & Jonah G. Levine, “ Large Energy storage Systems Handbook”, CRC Press, 2011. 4. McNeils, Frenkel and Desai, “Solar & Wind energy Technologies”, Wiley Eastern, 1990. 5. S.P. Sukhatme, “Solar Energy”, Tata McGraw Hill, 1987. 					

PROGRAM ELECTIVE – II

2103PE006	POWER QUALITY	L	T	P	C
		3	0	0	3
MODULE I	INTRODUCTION				9 Hours
Definition of power quality ; Power quality, Voltage quality - Power quality issues; Short duration voltage variations; Long duration voltage variations; Transients; Waveform distortion; Voltage imbalance; Voltage fluctuation, Power frequency variations; Sources and Effects of power quality problems; Power quality terms, Power quality and Electro Magnetic Compatibility (EMC) Standards. CBEMA & ITI curves.					
MODULE II	LONG & SHORT INTERRUPTIONS				9 Hours
Short Interruptions - Introduction - Origin of short interruptions: Voltage magnitude events due to reclosing, Voltage during the interruption- Monitoring of short interruptions - End user issues: Influence on Induction motors, Synchronous motors, Adjustable speed drives. Long Interruptions Definition - Terminology: Failure, Outage, Interruption - Origin of interruptions - Causes of long interruptions , Multiple events, single phase tripping					
MODULE III	VOLTAGE SAG – CHARACTERIZATION				9Hours
Definition, causes of voltage sag, voltage sag magnitude- monitoring, Overview of mitigation methods. Transients Definition - Principles of over voltage protection - Types and causes of transients - Devices for over voltage protection - Utility capacitor switching transients - Utility lightning protection – Waveform Distortion					
MODULE IV	HARMONICS				9 Hours
Harmonics: Harmonics indices, Inter harmonics; Notching; Voltage Vs Current Harmonics Vs Transients; Sources and effects of harmonic distortion; System response characteristics; Principles of controlling harmonics; Standards and limitation; Mitigation and control techniques.					
MODULE V	POWER DEVICES & MITIGATION				9 Hours
Overview of mitigation methods ;from fault to trip, reducing the number of faults, reducing the fault clearing time, changing the power system, installing mitigation equipment, improving equipment immunity, different events and mitigation methods; Evolution of power quality monitoring; Deregulation effect on power quality monitoring; Brief introduction to power quality - measurement equipments and power conditioning equipments					
				Total:	45 Hours
REFERENCES:					
1. Barry W. Kennedy, “Power Quality Primer”, New York, McGraw-Hill, 2000.					
2. J. Arriliaga, N.R. Watson and S. Chen, “Power System Quality Assessment”, John Wiley, & Sons, 2000.					
3. Math H J Bollen, “Understanding Power Quality Problems”, 1 st Edition, IEEE Press, Standard Publishers Distributors, 2001.					
4. Arindham Ghosh, Gerard Ledwich, “Power Quality Enhancement Using Custom Power Devices”, 1 st Edition, Kluwer Academic Publishers, 2002.					

AUDIT COURSES

2101AU001	ENGLISH FOR RESEARCH PAPER WRITING	L	T	P	C
		2	0	0	0
Course Objectives:					
	1. Teach how to improve writing skills and level of readability				
	2. Tell about what to write in each section				
	3. Summarize the skills needed when writing a Title				
	4. Infer the skills needed when writing the Conclusion				
	5. Ensure the quality of paper at very first-time submission				
MODULE I	INTRODUCTION TO RESEARCH PAPER WRITING	6 Hours			
Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness					
MODULE II	PRESENTATION SKILLS	6 Hours			
Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticizing, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts, Introduction					
MODULE III	TITLE WRITING SKILLS	6 Hours			
Key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check					
MODULE IV	RESULT WRITING SKILLS	6 Hours			
Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions					
MODULE V	VERIFICATION SKILLS	6 Hours			
Useful phrases, checking Plagiarism, how to ensure paper is as good as it could possibly be the first- time submission					
				Total:	30 Hours
FURTHER READING: -					
COURSE OUTCOMES:					
CO1	Understand that how to improve your writing skills and level of readability				
CO2	Learn about what to write in each section				
CO3	Understand the skills needed when writing a Title				
CO4	Understand the skills needed when writing the Conclusion				
CO5	Ensure the good quality of paper at very first-time submission				
REFERENCES:					
1. R. Nishith, Singh AK, “Disaster Management in India: Perspectives, issues and strategies ““New Royal book Company.					
2. Sahni, Pardeep Et. Al. (Eds.),” Disaster Mitigation Experiences And Reflections”, Prentice Hall Of India, New Delhi.					
3. Goel S. L. , Disaster Administration And Management Text And Case Studies” ,Deep &Deep Publication Pvt. Ltd., New Delhi.					

2101AU002	DISASTER MANAGEMENT				L	T	P	C
					2	0	0	0
COURSE OBJECTIVES:								
	1. Summarize basics of disaster							
	2. Explain a critical understanding of key concepts in disaster risk reduction and humanitarian response.							
	3. Illustrate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.							
	4. Describe an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.							
	5. Develop the strengths and weaknesses of disaster management approaches							
MODULE I	INTRODUCTION						6 Hours	
Disaster: Definition, Factors and Significance; Difference between Hazard And Disaster; Natural and Manmade Disasters: Difference, Nature, Types and Magnitude								
MODULE II	REPERCUSSIONS OF DISASTERS AND HAZARDS						6 Hours	
Economic Damage, Loss of Human and Animal Life, Destruction Of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts And Famines, Landslides And Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks And Spills, Outbreaks Of Disease And Epidemics, War And Conflicts.								
MODULE III	DISASTER PRONE AREAS IN INDIA						6 Hours	
Study of Seismic Zones; Areas Prone To Floods and Droughts, Landslides And Avalanches; Areas Prone To Cyclonic and Coastal Hazards with Special Reference To Tsunami; Post-Disaster Diseases and Epidemics								
MODULE IV	DISASTER PREPAREDNESS AND MANAGEMENT						6 Hours	
Preparedness: Monitoring Of Phenomena Triggering a Disaster or Hazard; Evaluation of Risk: Application of Remote Sensing, Data from Meteorological And Other Agencies, Media Reports: Governmental and CommMODULEY Preparedness.								
MODULE V	RISK ASSESSMENT						6 Hours	
Disaster Risk: Concept and Elements, Disaster Risk Reduction, Global and National Disaster Risk Situation. Techniques of Risk Assessment, Global Co-Operation in Risk Assessment and Warning, People's Participation in Risk Assessment. Strategies for Survival								
						Total:	30 Hours	
FURTHER READING: -								
COURSE OUTCOMES:								
CO1	Ability to summarize basics of disaster							
CO2	Ability to explain a critical understanding of key concepts in disaster risk reduction and humanitarian response.							
CO3	Ability to illustrate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.							
CO4	Ability to describe an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.							
CO5	Ability to develop the strengths and weaknesses of disaster management approaches							
References:								
1. Goel S. L., Disaster Administration And Management Text And Case Studies”, Deep & Deep Publication Pvt. Ltd., New Delhi, 2009.								
2. Nishitha Rai, Singh AK, “Disaster Management in India: Perspectives, issues and strategies “NewRoyal book Company, 2007.								
3. Sahni, Pardeep Et. Al. ,” Disaster Mitigation Experiences And Reflections”, Prentice Hall Of India, New Delhi, 2001.								

2101AU003	SANSKRIT FOR TECHNICAL KNOWLEDGE			L	T	P	C	
				2	0	0	0	
COURSE OBJECTIVES:								
	1. Illustrate the basic sanskrit language							
	2. Recognize sanskrit, the scientific language in the world.							
	3. Appraise learning of sanskrit to improve brain functioning.							
	4. Relate sanskrit to develop the logic in mathematics, science & other subjects enhancing the memory power.							
	5. Extract huge knowledge from ancient literature.							
MODULE I	ALPHABETS						6 Hours	
Alphabets in Sanskrit								
MODULE II	TENSES AND SENTENCES						6 Hours	
Past/Present/Future Tense - Simple Sentences								
MODULE III	ORDER AND ROOTS						6 Hours	
Order - Introduction of roots								
MODULE IV	SANSKRIT LITERATURE						6 Hours	
Technical information about Sanskrit Literature								
MODULE V	TECHNICAL CONCEPTS OF ENGINEERING						6 Hours	
Technical concepts of Engineering-Electrical, Mechanical, Architecture, Mathematics								
						Total:	30 Hours	
FURTHER READING:	-							
COURSE OUTCOMES:								
CO1	Understanding basic Sanskrit language							
CO2	Write sentences							
CO3	Know the order and roots of Sanskrit.							
CO4	Know about technical information about Sanskrit literature							
CO5	Understand the technical concepts of Engineering							
References:								
1. "Abhyastakam" – Dr. Vishwas, Samskrita-Bharti Publication, New Delhi								
1. "Teach Yourself Sanskrit" Prathama Deeksha-Vempati Kutumbshastri, Rashtriya Sanskrit Sansthanam, New Delhi Publication								
2. "India's Glorious Scientific Tradition" Suresh Soni, Ocean books (P) Ltd., New Delhi, 2017.								

2101AU004	VALUE EDUCATION			L	T	P	C
				2	0	0	0
COURSE OBJECTIVES:							
	1. Understand value of education and self-development						
	2. Imbibe good values in students						
	3. Let the should know about the importance of character						
MODULE I							6 Hours
Values and self-development–Social values and individual attitudes. Work ethics, Indian vision of humanism. Moral and non-moral valuation. Standards and principles. Value judgments							
MODULE II							8 Hours
Importance of cultivation of values. Sense of duty. Devotion, Self-reliance. Confidence, Concentration. Truthfulness, Cleanliness. Honesty, Humanity. Power of faith, Nationally Patriotism. Love for nature, Discipline							
MODULE III							8 Hours
Personality and Behavior Development-Soul and Scientific attitude. Positive Thinking. Integrity and discipline. Punctuality, Love and Kindness. Avoid fault Thinking. Free from anger, Dignity of labor. Universal brother hood and religious tolerance. True friendship. Happiness Vs suffering, love for truth. Aware of self-destructive habits. Association and Cooperation. Doing best for saving nature							
MODULE IV							8 Hours
Character and Competence–Holy books vs Blind faith. Self-management and Good health. Science of reincarnation. Equality, Nonviolence, Humility, Role of Women. All religions and same message. Mind your Mind, Self-control. Honesty, Studying effectively.							
						Total:	30 Hours
FURTHER READING:	-						
COURSE OUTCOMES:							
CO1	Knowledge of self-development						
CO2	Learn the importance of Human values						
CO3	Developing the overall personality.						
References:							
1. Chakroborty, S.K.“Values and Ethics for organizations Theory and practice”, Oxford University Press, New Delhi							

2101AU005	CONSTITUTION OF INDIA			L	T	P	C
				2	0	0	0
Course Objectives:							
	1. Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective						
	2. To address the growth of Indian opinion regarding modern Indian intellectuals' constitutional						
	3. Role and entitlement to civil and economic rights as well as the emergence nation hood in the early years of Indian nationalism.						
	4. To address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.						
MODULE I	HISTORY OF MAKING OF THE INDIAN CONSTITUTION:					5 Hours	
History, Drafting Committee, (Composition & Working)							
MODULE II	PHILOSOPHY OF THE INDIAN CONSTITUTION:					5 Hours	
Preamble, Salient Features							
MODULE III	CONTOURS OF CONSTITUTIONAL RIGHTS AND DUTIES:					5 Hours	
Fundamental Rights, Right to Equality, Right to Freedom, Right against Exploitation, Right to Freedom of Religion, Cultural and Educational Rights, Right to Constitutional Remedies, Directive Principles of State Policy, Fundamental Duties.							
MODULE IV	ORGANS OF GOVERNANCE:					5 Hours	
Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers, Judiciary, Appointment and Transfer of Judges, Qualifications, Powers and Functions.							
MODULE V	LOCAL ADMINISTRATION:					5 Hours	
District's Administration head: Role and Importance Municipalities: Introduction, Mayor and role of Elected Representative, CEO, Municipal Corporation. Pachayati raj: Introduction, PRI: Zila Pachayat. Elected officials and their roles, CEO Zila Pachayat: Position and role. Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy.							
MODULE VI	ELECTION COMMISSION:					5 Hours	
Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners - Institute and Bodies for the welfare of SC/ST/OBC and women.							
					Total:	30 Hours	
FURTHER READING:		-					
COURSE OUTCOMES:							
CO1	Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.						
CO2	Discuss the intellectual origins of the framework of argument that informed the conceptualization						
CO3	of social reforms leading to revolution in India.						
CO4	Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.						
CO5	Discuss the passage of the Hindu Code Bill of 1956.						
REFERENCES:							
1. The Constitution of India, 1950 (Bare Act), Government Publication.							
2. Dr.S.N.Busi, Dr.B. R.Ambedkar framing of Indian Constitution, 1 st Edition, 2015.							
3. M.P. Jain, Indian Constitution Law, 7 th Edn., Lexis Nexis, 2014.							
4. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.							

2101AU006	PEDAGOGY STUDIES	L	T	P	C
		2	0	0	0
Course Objectives:					
	1. Review existing evidence on their view topic to inform programmed design and policy				
	2. Making under taken by the DFID, other agencies and researchers.				
	3. Identify critical evidence gaps to guide the development.				
MODULE I	INTRODUCTION AND METHODOLOGY:	6 Hours			
Aims and rationale, Policy background, Conceptual framework and terminology - Theories of learning, Curriculum, Teacher education - Conceptual framework, Research questions - Overview of methodology and Searching.					
MODULE II	THEMATIC OVERVIEW	6 Hours			
Pedagogical practices are being used by teachers in formal and informal classrooms in developing countries - Curriculum, Teacher education.					
MODULE III	EVIDENCE ON THE EFFECTIVENESS OF PEDAGOGICAL PRACTICES	6 Hours			
Methodology for the in depth stage: quality assessment of included studies - How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy - Theory of change - Strength and nature of the body of evidence for effective pedagogical practices - Pedagogic theory and pedagogical approaches - Teachers' attitudes and beliefs and Pedagogic strategies.					
MODULE IV	PROFESSIONAL DEVELOPMENT	6 Hours			
Professional development: alignment with classroom practices and follow up support - Peer support - Support from the head teacher and the commMODULEy - Curriculum and assessment - Barriers to learning: limited resources and large class sizes					
MODULE V	RESEARCH GAPS AND FUTURE DIRECTIONS	6 Hours			
Research design – Contexts – Pedagogy - Teacher education - Curriculum and assessment - Dissemination and research impact.					
				Total:	30 Hours
FURTHER READING:	-				
COURSE OUTCOMES:					
CO1	What pedagogical practices are being used by teachers informal and informal classrooms in developing countries?				
CO2	What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?				
CO3	How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?				
REFERENCES:					
1. Ackers J, HardmanF (2001) Classroom interaction in Kenyan primary schools, Compare, 31(2): 245-261.					
2. Agrawal M (2004)Curricular reform in schools: The importance of evaluation, Journal of Curriculum Studies, 36(3):361-379.					
3. Akyeamong K (2003) Teacher training in Ghana-does it count? Multi-site teacher education research project (MUSTER) country report 1.London:DFID.					
4. Akyeamong K, Lussier K, Pryor J, Westbrook J (2013) Improving teaching and learning of basic maths and reading in Africa: Does teacher preparation count? International Journal Educational Development, 33(3): 272–282.					
5. Alexander RJ(2001) Culture and pedagogy: International comparisons in primary education. Oxford and Boston: Blackwell.					
6. Chavan M(2003) Read India: A mass scale, rapid, 'learning to read' campaign.					
7. www.pratham.org/images/resource%20working%20paper%202.pdf					

2101AU007	STRESS MANAGEMENT BY YOGA			L	T	P	C
				2	0	0	0
COURSE OBJECTIVES:							
1. To achieve overall health of body and mind							
2. To overcome stress							
MODULE I							10 Hours
Eight parts of yoga.(Ashtanga)							
MODULE II							10 Hours
Yam and Niyam - Do`s and Don`t`s in life - i) Ahinsa, satya, astheya, bramhacharya and aparigraha,							
MODULE III							10 Hours
Asan and Pranayam - Various yog poses and their benefits for mind & body - Regularization of breathing techniques and its effects-Types of pranayam							
						Total:	30 Hours
FURTHER READING:	-						
COURSE OUTCOMES:							
CO1	Develop healthy mind in a healthy body thus improving social health also						
CO2	Improve efficiency						
References:							
1. Yogic Asanas for Group Training-Part-I”:Janardan Swami Yoga bhyasi Mandal, Nagpur							
2. Rajayoga or conquering the Internal Nature” by Swami Vivekananda, Advaita Ashrama (Publication Department), Kolkata							

2101AU008	PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS	0	2	1	C
		2	0	0	0
COURSE OBJECTIVES:					
1. To learn to achieve the highest goal happily					
2. To become a person with stable mind, pleasing personality and determination					
3. To awaken wisdom in students					
MODULE I		10 Hours			
Neetisatakam-holistic development of personality - Verses- 19,20,21,22 (wisdom) - Verses- 29,31,32 (pride & heroism) – Verses- 26,28,63,65 (virtue) - Verses- 52,53,59 (dont's) - Verses- 71,73,75,78 (do's)					
MODULE II		10 Hours			
Approach to day to day work and duties - Shrimad Bhagwad Geeta: Chapter 2-Verses 41, 47,48 - Chapter 3- Verses 13, 21, 27, 35 Chapter 6-Verses 5,13,17,23, 35 - Chapter 18-Verses 45, 46, 48.					
MODULE III		10 Hours			
Statements of basic knowledge - Shrimad Bhagwad Geeta: Chapter2-Verses 56, 62, 68 Chapter 12 -Verses 13, 14, 15, 16,17, 18 - Personality of role model - shrimad bhagwad geeta - Chapter2- Verses 17, Chapter 3-Verses 36,37,42 - Chapter 4- Verses 18, 38,39 Chapter18 – Verses 37,38,63					
				Total:	30 Hours
FURTHER READING: -					
COURSE OUTCOMES:					
CO1	Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life				
CO2	The person who has studied Geeta will lead the nation and mankind to peace and prosperity				
CO3	Study of Neet is hatakam will help in developing versatile personality of students.				
REFERENCES:					
1. Gopinath, Rashtriya Sanskrit Sansthanam P, Bhartrihari's Three Satakam, Niti- sringar-vairagya, New Delhi,2010					
2. Swami Swarupananda , Srimad Bhagavad Gita, Advaita Ashram, Publication Department,Kolkata, 2016.					

2101AU009	UNNAT BHARAT ABHIYAN	L	T	P	C
		2	0	0	0
COURSE OBJECTIVES:					
	<ol style="list-style-type: none"> 1. Unnat Bharat Abhiyan is inspired by the vision of transformational change in rural development processes by leveraging knowledge institutions to help build the architecture of an Inclusive India. 2. The Mission of Unnat Bharat Abhiyan is to enable higher educational institutions to work with the people of rural India in identifying development challenges and evolving appropriate solutions for accelerating sustainable growth. 3. It also aims to create a virtuous cycle between society and an inclusive academic system by providing knowledge and practices for emerging professions and to upgrade the capabilities of both the public and the private sectors in responding to the development needs of rural India 				
MODULE 1					10 Hours
Introduction. Holistic development of a village – Economic, Social, Human, Governance, Basic Amenities, Environmental aspects. Vision and mission of UBA. Activities of Unnat Bharat Abhiyan. Expediting the process of indigenous, sustainable rural development with effective support from professional institutes of higher education. Building capacity in institutes of Higher Education for research, training and development of technologies relevant to national needs, especially those of rural India. Creating the Requisite Structure to Cope with the Challenge.					
MODULE 2					10 Hours
National Steering Committee for UBA (NSC - UBA). The Coordinating Institution for UBA (CI-UBA) and its Responsibilities. Identification and Role of Mentoring Institutions (MI - UBA). Identification and Role of Subject Expert Groups (SEG - UBA). UBA Participating Institutions in General (PIs - UBA).					
MODULE 3					10 Hours
Methodology of Intervention and Monitoring. Expected outcomes from UBA. Mechanism for Providing the Base-level funding from MHRD. Various Sources of Funding for the Actual Cluster Development Work. Status of Steps Already Completed towards Setting up the Structural Network of UBA. Major activities so far. Action Plans.					
				Total:	30 Hours
References:					
1. https://www.rcisgbau.in/pdf/UBA_concept_note.pdf					
2. https://unnatbharatabhiyan.gov.in/documents					
3. https://unnatbharatabhiyan.gov.in:8443/introduction					
4. https://unnatbharatabhiyan.gov.in:8443/newwebsite/https://unnatbharatabhiyan.gov.in:8443/app/webroot/files/general- documents/Unnat%20Bharat%20Abhiyan-%20Brochure%202016.pdf					