SAGE UNIVERSITY, BHOPAL

(SANJEEV AGRAWAL GLOBAL EDUCATIONAL UNIVERSITY, BHOPAL)

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SYLLABUS

PhD COURSE WORK

SESSION-2023-2024

PhD PROGRAM

Program Educational Objectives (PEOs)

The Program PhD will develop ability to identify and solve the real-world problems related to various areas of Research. It will also develop an aptitude to apply the observations and in-depth knowledge of various research areas. The course will:

PEO I: Professionally utilize fundamental knowledge, analytical and problem-solving skills to articulate and make decisions critically and creatively based on research evidences and experiences in professional practice.

PEO II: Competently provide solutions for the advancement of knowledge through the application of appropriate tools and techniques

PEO III: Continue to acquire advanced knowledge in pursuing lifelong learning and display commitment to the community and profession through effective communication with peers by adhering to legal, ethical, and professional codes of practice.

PEO IV: Synthesize knowledge and contribute to original research that broad end the frontier of knowledge in the relevant field.

PEO V: Conduct research independently and adheres to legal, ethical and professional codes of practice.

PROGRAMME OUTCOMES (POs):

PO1.	Demonstrate an in-depth scholarship of their area of research
PO2.	Contribute to original research to broaden the boundary of knowledge through thesis or dissertation
PO3.	Make critical analysis, evaluation and synthesis of new ideas.
PO4.	Plan and perform independent research undertakings professionally, ethically and responsibly and to lead/supervise research projects
PO5.	Ethics: Convey and practice social, environmental and research ethics.
PO6.	Environment and Sustainability: Insist the significance of conserving a clean environment for perpetuation and sustainable development.
PO7.	Report research findings toppers at levels suitable for international publications
PO8.	Recognize the needs for continuing professional development & create different opportunities for others aiming at the growth of society.
PO9.	Facilitate students to take-up successful career in research& provide expert advice to society in the relevant field
PO10	Build entrepreneur life skills in different research areas & adapt practical skills leading to innovative ideas in the relevant field

ANNEXURE-2(i)

The Scheme of Examination for the PhD Course work

S. No.	Course Code	Course Name	Credit offered				MTE			ETE (Duration 3 hrs)	Total Marks
			L	T	P	Total	MST (30)	Ass/ Pr (10)	A (10)	(50)	
1	CC20P101	Research Methodology and Data Analysis Tools	4	-	-	4	30	10	10	50	100
2	XXYYP104	Discipline Specific Course	4	-	-	4	30	10	10	50	100
3	CC20P102	Research and Publication Ethics	4	-	-	4	30	10	10	50	100
4	CC20P103	Seminar / Presentation*	-	-	8	4	30	10	10	50	100
						16					-

MST- Mid Semester Test; Ass/Pre- Assignment/Presentation; A- Attendance; XX- first two digit of the specialization

**** Candidate needs to make continuous presentation every week as well as to the Panel of Experts on Literature Review on Topic of Research.***

** Candidate has to do self-study of 06 hrs. Per week and attend presentations of 2 hrs.

LIST OF COURSES

S. No	Course Code	Course Name	Discipline	Annexure No
1	CC20P101	RESEARCH METHODOLOGY AND DATA ANALYSIS TOOLS	CORE COURSE	2(ii)
2	CC20P102	RESEARCH AND PUBLICATION ETHICS	CORE COURSE	2(iii)
3	CC20P103	SEMINAR PRESENTATION	CORE COURSE	2(iv)
4	MG20P104	PRINCIPLES AND PRACTICES OF MANAGEMENT	MANAGEMENT	3
5	CS20P104	COMPUTER SCIENCE & ENGINEERING	ENGINEERING	4
6	ME22P104	MECHANICAL ENGINEERING	ENGINEERING	5
7	CE20P104	CIVIL ENGINEERING	ENGINEERING	6
8	EC20P104	ELECTRONICS & COMMUNICATION ENGINEERING	ENGINEERING	7
9	BO20P104	BOTANY	BIOLOGY	8
10	CH20P104	PHYSICAL CHEMISTRY	CHEMISTRY	9
11	MB20P104	MICROBIOLOGY	BIOLOGY	10
12	BT20P104	BIOTECHNOLOGY	BIOLOGY	11
13	HI20P104	HISTORY	ARTS	12
14	FS22P104	FORENSIC SCIENCE	SCIENCE	13
15	AQ22P104	AQUACULTURE	SCIENCE	14
16	PY22P104	PHYSICS	SCIENCE	15
17	PS21P104	PHARMACY	PHARMACY	16
17	SY22P104	PSYCHOLOGY	ARTS	17
18	ZL22P104	ZOOLOGY	SCIENCE	18
19	LC21P104	ENGLISH	LANGUAGE	19
20	LW22P104	LAW	LAW	20
21	PA22P104	POLITICAL SCIENCE	ARTS	21

22	**SC22P104**	**SOCIOLOGY**	**ARTS**	**22**
23	**AD22P104**	**DESIGN**	**DESIGN**	**23**
24	**JM20P104**	**JOURNALISM & MASS COMMUNICATIONS**		**24**
25	**PP22P104**	**PUBLIC ADMINISTRATION**		**25**
26	**PA21P104**	**PERFORMING ARTS**		**26**

ANNEXURE-2(ii)

SYLLABUS
CORE COURSE

Course Code: **CC20P101**	**Research Methodology and Data Analysis Tools**	Credits: 4
Course Objectives	1. To equip the students with the concept and methods of Research. 2. To plan and design research using scientific and statistical methods. 3. To analyze the data using statistical methods/Simulators	
Pre-requisites	None.	
UNIT	**CONTENT**	HOURS
I	**Introduction:** Concepts, Definition, Motivation in Research, Types of Research - Exploratory Research, Descriptive Research, Causal Research Analytical Research, Research process, Problem formulation, Approaches to Research, Review of Literature, Importance of reviewing the literature, Methods to write review of literature, Research gap, Research Design.	8
II	**Sampling Techniques**: Sampling and sampling distribution: Meaning, sampling Vs Census, Steps in Sampling process, Types of sampling - Probability and Non probability Sampling Techniques.	7
III	**Measurement, Scaling Techniques and Data Collection Methods:** Nominal Scale, Ordinal Scale, Interval Scale, Ratio Scale, Criteria for good measurement, Attitude measurement Scale – Likert's Scale, Semantic Differential Scale, Thrust one-equal appearing interval scale. **Data Collection:** Primary and Secondary data Sources - Advantages/Disadvantages, Data collection Methods: Observations, Survey, Interview and Questionnaire design, Qualitative Techniques of data collection.	15
IV	**Statistical Tools for Data Analysis:** Introduction to Probability Sample space and events, definitions of probability, properties of probability, Random variable Probability distribution Discrete and continuous random variable, conditional probability, Bayes' theorem and independence, Poisson, geometric, Binomial and Normal distribution. Mean, Median, Mode, Quartiles, Deciles and Percentiles, Measures of Dispersion: Standard Deviation -Variance - Coefficient of Variance, Skewness, Correlation and regression analysis Definition, Assumption of Correlation, Bivariate Correlation, Partial Correlation, Correlation Coefficients: Pearson, Kendall, Spearman, Objectives of Regression Analysis, Assumption of Regression Analysis, Simple Regression Model, Multiple Regressions Model,	15

	Coefficient of regression and their properties. Formulation of hypothesis-Testing of hypothesis, Type I and Type II Errors. Parametric tests: Z-test, t-test, F-test, Analysis of Variance; One-Way and Two-way classification. Non parametric tests - Chi-Square test.	
V	**Software's Support for Research:** Software for Data Analysis: Data representation, MS-Excel, AMOS, SPSS, MATLAB. MS-Word: Page setup, Margin, Alignments, working with font and paragraph, Various menu options/ribbon options (File, Edit, View, Insert, Format, Tools, Tables, Windows, Help). MS-PowerPoint: Creating a new PPT, working with templates, Menu options and Custom animation. *Appropriate software or software package can be added in the subject specific syllabus for data analysis, as per requirement of the researcher/ area like Introduction to R can be added to Engineering Stream and Engineering Management/ Operations Management.	11
VI	**Report Writing:** Importance of report writing, Types of reports, writing research proposal and synopsis, planning phase of report writing, chapter formation, referencing styles, plagiarism, ethics in research, characteristics of a good research report.	4
	Course Outcomes as per Bloom's Taxonomy	
CO1	Students will **understand**[2] basics of research methodology	
CO2	Students will be able to **explain**[3] the importance of research methodology for Nation, Society, education, and self.	
CO3	Students will be able to **identify**[3] the problem statements for research and solutions to it.	
CO4	Students will be able to **Analyze**[4]the data /situations by using statistical method and specific Simulator	
CO5	Students will also be able to **evaluate**[5] and **create**[6] a new device/ system/ process/ method and create new knowledge for decision making	
Text Books	1. Cooper Donald R and Schindler Pamela S. (2006). Business Research Methods. McGraw-Hill Education. India 2. Gupta, S.L., Gupta, H. (2011). SPSS 17.0 for Researchers. International Book House (Pvt.) Limited, (2), New Delhi. 3. Gupta S. P. (2014). Statistical Methods. Sultan Chand and Sons. India 4. Kothari C. R. (2014). Research Methodology: Methods and Techniques. New Age International (P) Publisher. New Delhi 5. Lambert, Joan, Frye, Curtis D. (2016). Microsoft Office 2016 Step by Step. PHI.	
Reference Books	1. Krishnaswami O. R., Ranganatham M. (2011). Methodology of Research in Social Sciences. Himalaya Publishing House. India 2. Sekaran Uma (2003). Research Methods for Business. Wiley India. 3. Levin and Rubin (2008). Statistics for Management. Dorling Kindersley Pvt Ltd. India 4. Milligan J. (2015). Learning Tableau. PACKET Publisher, India. 5. Zikmund, Babin,Carr,Griffin (2003). Business Research Methods. Cengage Learning, India.	

ANNEXURE-2(iii)

Core Course

Course Code: **CC20P102**	**Research Publication and Ethics (RPE)**	Credits: 4
Course Objectives	1. Provide students with the elemental knowledge of basics of philosophy of science and ethics, research integrity, publication ethics. 2. Prepare students to spot research misconduct and predatory publications. 3. Indexing and citation databases, open access publications, research Metrics (citations, h- index, Impact Factor etc).	
Pre-requisites		
UNIT	**CONTENT**	**HOURS**
I	**Philosophy and Ethics:** Introduction to philosophy: definition, nature and scope, concept, branches. Ethics: definition, moral philosophy, nature of moral judgments and reactions. Scientific Conduct: Ethics with respect to science and research; intellectual honesty and research integrity; scientific misconducts: falsification, fabrication, and plagiarism (FFP); redundant publications: duplicate and overlapping publications, salami slicing; selective reporting and misrepresentation of data.	8
II	**Publication Ethics:** Publication ethics: definition, introduction and importance; best practices / standards setting initiatives and guidelines: COPE, WAME, etc.; conflicts of interest; misconduct in publication: definition, concept, problems that lead to unethical behavior and vice versa, types; violation of publication ethics, authorship and contributor ship; identification of publication misconduct, complaints and appeals; predatory publishers and journals.	7
III	**Open Access Publishing:** Open access publications and initiatives; SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies; software tool to identify predatory publications developed by SPPU; journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal etc. **Publication Misconduct:** Group Discussions: subject specific ethical issues, FFP, authorship; conflicts of interest; complaints and appeals: examples and fraud from India and abroad; Databases and Research Metrics: Databases: indexing databases; citation databases: Web of Science, Scopus, etc.; Research Metrics: Impact Factor of journal as per Journal Citation Report, SNIP, SIR, IPP, Cite Score; metrics: h-index, g index, i10 index, altmetrics.	8
IV	**Ethics in writing:** What is ethical writing and why is it important? Literature review and proper use of e-resources for referencing, provide reasons why plagiarism awareness is important, identify and define different types of plagiarism, explain strategies for preventing plagiarism, using design thinking methods to avoid plagiarism. Writing quality academic publications: challenges to avoid plagiarism; scientific reading, cite and write, describe copyright and how to use others' work ethically;	10

Core Course

	Report writing using popular word processing packages such as MS Word, Open Office etc., how to determine the credibility of a source.	
V	**Introduction to Reference Management Tools (RMT):** Features and functionalities of anti-plagiarism software, detection of plagiarism by using different online tools agencies and organization dealing with plagiarism issues(eg. retract/deluze), use of plagiarism software like Tumit in, Urkund and other open source software tools plagiarism policies, penalties and consequences.	15
	Course Outcomes as per Bloom's Taxonomy	
CO1	Students will **understand**[2] the basics of philosophy of science.	
CO2	Students will be able to **explain**[3] the importance of being ethical in carrying out research and publication activities.	
CO3	Students will be able to identify3 the quality publication and how to be cognizant about dubious publishing practices/publishers.	
CO4	Students will be able to **utilize**[3] their knowledge to write avoiding plagiarism.	
CO5	Students will also **develop**[3] knowledge about the software/databases which are required for carrying out research work.	
Text Books	1. S. K. Yadav, Research and Publication Ethics, Ane Books Publication, 2020. 2. S. Gupta and S. Kamboj, Research and Publication Ethics, Alexis Press LLC, 2020. 3. K. Muralidhar, A. Ghosh and A. K. Singhvi, Ethics in Science Education, research and Governance, Indian National Science Academy (INSA) New Delhi, ISBN: 978-81-939482-1-7, 2019	
Reference Books	1. S. Hook, P. Kurtz, M. Todorovich, The Ethics of Teaching and Scientific Research, Prometheus Books, 1977. 2. B. Stanley, J.E. Sieber, G. B. Nelton, Research Ethics: A Psychological Approach, University of Nebraska Press, 1996.	

- Self Study

ANNEXURE-2(iv)

Core Course

Course Code: **CC20P104**	**Seminar\Presentation**	Credits:4
Course Objectives	Preparestudentswiththeknowledgeofcurrentscenarioandtrendsofresearcharea of his/her interest. To enhance command over communication skill and presentations skills.	
Pre-requisites	Student need to develop observation, understanding and presentation skills	
Guidelines For Evaluation	There will be continuous evaluation and end semester evaluation- where 50% evaluation will be in continuous and 50% end semester **Continuous Evaluation** A] Every Saturday student has to make and deliver presentation, based on there view of five research papers. B] Student has to make minimum 10 presentation, five marks each presentation. C] Best ten presentations would be counted for the final internal assessment **End Semester Evaluation** **A]** Student has to prepare a review paper and it is to published or accepted inpeere view journal with good impact factor, which is listed in Scopus/SCI/WOS/UGC//any other journal of repute/conference proceedings. This paper should have identified research Gaps for future work. **It will be evaluate for 25marks.** **B]** A comprehensive presentation of work of complete semester to the panel of experts for 20 minutes for presentation and 10 minutes for questions/Viva-voce **will be evaluated for 25marks.** Note: There search paper should be signed in standard format of IEEE/APA.	**Totalpresentations-12 (Each Saturday for 2 hrs common presantation)**
	Course Outcomes as per Bloom's Taxonomy	
CO1	To develop basic **understanding**[2] of research area of specific subject	
CO2	To develop the comprehensive understanding review of paper sand be able to **analyze**[4] the findings	
CO3	To **find**[2]out there search gap in his/her research field and **formulate**[3] Objectives for his/her work	
CO4	To **analyze**[4]the exiting methods/practices and would be able to apply in the proposed research work	
CO5	To **publish**[5] review based research paper	
Reference Books:	• EmmaL edden, The Presentation Book: How to Createit, shape it and deliver it., PearsonBusiness;2ndedition,2017 • Ed Gregorich, How to write a review paper, csa news, Vol 64, No1,2019https://doi.org/10.2134/csa2019.64.0115	

ANNEXURE-3

Discipline Specific Course

Course Code: **MG20P104**	**Principles and Practices of Management**	Credits: 4
Course Objectives	1. To understand the core management principles which applies to individuals, medium and large organizations. 2. The students are expected to learn the basics of management functions and realize the ideal characteristics of a manager. 3. The impetus of this subject is to make the students familiarize with the professional skills required to be an effective manager.	
Pre-requisites	None.	
UNIT	**CONTENT**	**HOURS**
I	**Nature and Evolution of Management:** Meaning, Nature and Scope of Management, Levels and Types of Managers, Function, Role and Skills for Managers, Evolution of Management Thought, Early Classical Approaches – Scientific Management, Administrative Management, Bureaucracy, Neo-Classical Approaches – Human Relations Movement, Behavioral Approaches, Modern Approaches – Quantitative Approach; Systems Approach; Contingency Approach	8
II	**Functions of Management** **Planning:** Meaning, Need and Importance, Planning Process, Types of Planning and, Objectives, MBO **Organizing:** Concept, Process of Organizing, Forms of Organizational Structure, Formal and Informal Organizations **Staffing and Directing:** Concept, Manpower Planning, Directing **Controlling and Reviewing:** Concept of Controlling, Types of Controls, Controlling Process.	7
III	**Human Resource Management:** Human Resource: Meaning and importance, Human Resource Management: Definition, Meaning and Significance, Functions of HRM and Technology Implementation to foster Functions of HRM, Shift of Human Resource towards more full time remote work, Technology Adoption for Training and Development, Investment in Employees' Mental Health, Technology Based Leadership, Servant Leadership	8
IV	**Marketing Management:** Marketing Concepts: Nature and scope of marketing, Evolution, Various marketing orientations, Market Segmentation, Targeting, Positioning and Branding, Products and Pricing, Distribution Decisions, Integrated Marketing Communications, Digital Marketing, SEO, Direct and Online Marketing, Chat bots and AI go mainstream, Embrace the IoT	10
V	**Financial Management:** Introduction to Financial Management, Sources of Finance, Cost of Capital and Capital Structure Decision, Investment Decisions, Working Capital Management, Cloud based Accounting, Technology-driven tax and reporting compliance, Self-service finance-governed analytics and use of AI	15
	Course Outcome as per Bloom's Taxonomy	

CO1	The students will **understand**[2] the major functions of management viz. Planning, Organizing, Staffing, leading and controlling.	
CO2	They will be able to **explain**[3] and describe the interrelationship among the various functions of Management.	
CO3	They will be able to identify3 new vistas in management and their utilization for	
CO4	They will be able to utilize3 knowledge of management in social and professional life.	
CO5	They will also develop3 holistic understanding of management.	
Text Books	1. Koontz and Weihrich, H. (2008). Essentials of Management. Tata McGraw-Hill Education, India. 2. Robbins and Coulter (2007). Management. Prentice Hall of India. 3. Khan, M., Y. and Jain P., K. (2007). Financial Management. Tata McGraw Hill.	
Reference Books	1. Koontz and Weihrich, H. (2008). Essentials of Management. Tata McGraw-Hill Education, India. 2. Dessler, G. (2016). Human Resource Management. Pearsons Education Delhi, India. 3. Kotler, Keller, Koshy and Jha (2009). Marketing Management: A South Asian Perspective. Pearson Education, India. 4. Pandey, I., M. (2009). Financial Management. Vikas Publications, New Delhi, India.	

ANNEXURE-4

Discipline Specific Course

Course Code: **CS20P104**	**COMPUTER SCIENCE & ENGINEERING**	Credits: 4
Course Objectives	1. Students would learn the basic trends of research on the area of Computer Science and Engineering	
Pre-requisites		
UNIT	**CONTENTS**	**HOURS**
I	**Introduction to Cyber Crime & Threat**: Types of Cyber Crimes, Threat, Cyber security, recent threats to cyber domain, Internet, Privacy. Cyber Laws and Ethics. Cyber Security Threats Unauthorized Access, Viruses and Malicious Code, Internet Hacking and Cracking, Virus Attacks, Software Piracy.	8
II	**Optimization Techniques**: Engineering application of Optimization, Formulation of design problems as mathematical programming problems, General Structure of Optimization Algorithms, Constraints, The Feasible Region, Optimization Algorithms like Genetic Optimization, Particle Swarm Optimization, and Ant Colony Optimization etc. Real life Problems and their mathematical formulation as standard programming problems.	7
III	**Introduction to AI**: history of AI ,What is AI, Turing test, cognitive modelling approach, law of thoughts, the relational agent approach, the underlying assumptions about intelligence, techniques required to solve AI problems, level of details required to model human intelligence, successfully building an intelligent problem, Applications of AI by domain: Transportation, home/service robots, healthcare, education, low- resource communities, public safety and security, employment and workplace, entertainment, finance, banking and insurance.	8
IV	**Recent Research Trends:** Research trends in machine learning, deep learning, reinforcement learning, robotics, computer vision, natural language processing, ANN, collaborative systems, algorithmic game theory, internet of things (IoT), neuromorphic computing.	10
V	**Paper Writing tools and Software:** Microsoft word, Latex, Open Office, Libre Office, Google Docs, Referencing Tools and Reference Management Software: Mendeley, Zotero, Endnote, Refworks, Research Tools and Software: REF-N-WRITE, Online Statistical testing tools, Microsoft Excel, Google Scholar, Research Gate, Plagiarism Checker, Project Management Tools, Grammar Checkers and Sentence Correction Tools: MS Word Spelling & Grammar checker, Grammar, Pro Writing aid, StyleWriter, White Smoke, Ginger Software, Online Grammar checking sites	15
	Course Outcome as per Bloom's Taxonomy	
CO1	Students will **understand**[2] and **apply**[3] the concept of optimality criteria for various type of	
CO2	Students will **Apply**[3]the methods of optimization in real life situation.	
CO3	Students will be able to **analyze**[4] and **evaluate**[5] the existing algorithms for any application	
CO4	Students would be able to **Implement**[5] the uses of AI in various applications.	
CO5	Students will be able to **understand**[2] the security issues	

Text Books	1. Andreas Antoniou, Practical Optimization Algorithms and Engineering Applications. 2. Edwin K., P. Chong & Stanislaw h. Zak An Introduction to Optimization. 3. Peter Norvig and Stuart J. Russell (2003), "Artificial Intelligence: A Modern Approach", 4/E, Prentice Hall. 4. James S Tiller (2019), The ethical hack: A framework for business value penetration testing, CRC Press	
Reference Books	1. Patterson, Introduction To Artificial Intelligence & Expert Systems, , PHI 2. Russell and Norvig, Artificial Intelligence: A modern Approach, , PHI 3. Douglas W. Hubbard & Richard Seiersen (2016), How to Measure Anything in Cyber security Risk. (ISBN: 9781119085294)	

ANNEXURE-5

Discipline Specific Course

Course Code **ME22P104**	**MECHANICAL ENGINEERING**	**Credit-4**
Course Objectives:	1. Prepare students with the knowledge of different Courses in mechanical engineering. 2. To prepare students as a research scholar well equipped. 3. To develop a research aptitude and critical thinking in the research scholar.	
Prerequisite of course	• Postgraduate degree in a relevant discipline, competed from a recognized institute /University A minimum aggregate score of 55 %. • Basic Knowledge of mechanical engineering	
UNIT	**CONTENT**	**HOURS**
I	**Engineering Materials:** Structure and properties of engineering materials, phase diagrams, heat treatment, stress-strain diagrams for engineering materials.	12
II	**Machining and Machine Tool Operations:** Mechanics of machining; basic machine tools; single and multi-point cutting tools, tool geometry and materials, tool life and wear; economics of machining; principles of non-traditional machining processes; principles of work holding, jigs and fixtures; abrasive machining processes; NC/CNC machines and CNC programming.	12
III	**Casting, Forming and Joining Processes:** Different types of castings, design of patterns, molds and cores; solidification and cooling; riser and gating design. Plastic deformation and yield criteria; fundamentals of hot and cold working processes; load estimation for bulk (forging, rolling, extrusion, drawing) and sheet (shearing, deep drawing, bending) metal forming processes; principles of powder metallurgy. Principles of welding, brazing, soldering and adhesive bonding.	12
IV	**Mechanics of Materials:** Stress and strain, elastic constants, Poisson's ratio; Mohr's circle for plane stress and plane strain; thin cylinders; shear force and bending moment diagrams; bending and shear stresses; concept of shear center; deflection of beams; torsion of circular shafts; Euler's theory of columns; energy methods; thermal stresses; strain gauges and rosettes; testing of materials with universal testing machine; testing of hardness and impact strength.	12
V	**Vibrations:** Free and forced vibration of single degree of freedom systems, effect of damping; vibration isolation; resonance; critical speeds of shafts.	12
	Course Out come as per Bloom's Taxonomy	
CO1	Students will **Learn**[1] about **use**[3] of advanced Engineering Materials	
CO2	Students will **Apply**[3] laws of thermodynamics.	
CO3	Students would be able to **Use**[3] concepts of vibrations.	
CO4	Students will **Understand**[2] various manufacturing process.	
CO5	Students will **Understand**[2] about mechanics of machining.	

Text Book	1. Engineering Material & Metallurgy by R K Rajput (2006) charotar publishing house pvt. Ltd New Delhi 2. Manufacturing Process (2016) by H N Gupta ,R C Gupta New Age & International (p) Ltd Bangalore 3. Strength of Material (2003) by S Ramanurtham , R Narayanan Dhankat Rai Publication Meerut	
Reference Book:	1. Strength of Material (2012) Part 1. Elementary Theory and problems by Stephen Timoshenko. 2. Mechanical Vibration (2021) By S Graham Kelly Mc Graw Hill	

ANNEXURE-6

Discipline Specific Course

Course Code: **CE20P104**	**ADVANCE CIVIL ENGINEERING**	Credits: 4
Course Objectives	1. Students would learn the basic trends of research on the area of Advanced Civil Engineering. 2. Students would develop the understanding of Advanced Materials used in civil engineering, impact of construction on environment different smart materials and use of IoT 3. Student would learn the various software's used in Civil Engineering	
Pre-requisites		
UNIT	**CONTENTS**	**HOURS**
I	**Advanced Civil Engineering Materials** Plastics, Glass, plywood, Fly ash, Rubber, Heat insulating materials, Sound absorbent materials, Steel, Composite Materials Unidirectional composites, short fiber composites, rubber reinforced composites, laminated composites, Fiber reinforced plastics (FRP), Steel fibrous concrete	8
II	**Sustainability in construction** Sustainability, Construction impact on the environment, Sustainability assessment, Ensure Sustainable Construction, Biodiversity Enhancement, Support to the Community, Effective Use of Resources, Pollution Reduction, Creating Healthy Environment, Process Management.	7
III	**Structures and Smart Materials**: Introduction to Smart Materials and Structures, Measuring Techniques, Strain Measuring Techniques Using Electrical Strain Gauges. Sensors, Sensing Technology, Types of sensors, Actuators, Actuator Techniques, Actuator and Actuator Materials, Signal Processing and Control Systems, Data Acquisition And Processing	8
IV	**Internet of Things (IOT):** Introduction: Definition, Characteristics of IOT, IOT Conceptual framework, IOT Architectural view, Physical design of IOT, Logical design of IOT, Application of IOT.	10
V	**Civil Engineering Software's**, AUTOCAD for Drafting, STAAD PRO for Design and Analysis, PRIMAVERA for Construction Management, REVIT Structure for Building Information Modelling, ETABS for Design and Analysis, SAP 2000 , MS EXCEL , ARCGIS for Surveying , 3DS Max – Modelling , MX Road - Road design and Analysis	15
	Course Outcome as per Bloom's Taxonomy	
CO1	Students will **Learn**[1]about **use**[3] of advanced Civil Engineering Materials	
CO2	Students will **Apply**[3] Sustainability in construction	
CO3	Students would be able to **Use**[3] of Smart Structures and Smart Materials	
CO4	Students will **Understand**[2] in depth about Internet of things.	
CO5	Students will **Understand**[2] about software's used in civil engineering	

Text Books	1. Rangwala S C (1985), "Engineering Materials" Charotar Publishing House, Anand. 2. Raina K B (1999), "Civil Engineering Materials" Tata McGraw-Hill Publishing Company Ltd., New Delhi.	
Reference Books	1. Brain Culshaw (1996), "Smart Structure and Materials", Artech House – Borton. London. 2. L. S. Srinath (1998), "Experimental Stress Analysis", Tata McGraw-Hill.	

ANNEXURE-7

Discipline Specific Course

Course Code: **EC20P104**	**ELECTRONICS & COMMUNICATION ENGINEERING**	Credits: 4
Course Objectives	1. Students would learn the basic trends of research on the area of Electronics and Communication Engineering 2. Students would develop the understanding of Wireless Communication and Networks, Image and Speech processing, VLSI circuits and Bio Medical Signal Processing. 3. Student would learn the testing of VLSI circuits.	
Pre-requisites		
UNIT	**CONTENTS**	**HOURS**
I	**Wireless Communication and Networks**: Wireless Communication and Networks Computer simulation of radio channels, Overview of 4G-LTE networks, IP switching and MPLS- Overview of IP over ATM and its evolution to IP switching, State of art of OFDM and MIMO, Optical communication networks- DWDM based network, Optical network on chip, Introduction to near field communication, LoRa communication	8
II	**Image and Speech Processing**: Image and Speech Processing Image transforms, Image compression, Image segmentation, Color image processing, Motion picture analysis, Operations in speech such as enhancement, speech recognition, reorganization, Speech encoding, Frequency domain coders, Text to speech synthesis, Speaker identification	7
III	**Low Power VLSI Circuits:** Introduction: Need for low power VLSI chips, Sources of power dissipation on Digital Integrated circuits. Emerging Low power approaches. Device & Technology Impact on Low Power: Dynamic dissipation in CMOS, Transistor sizing& gate oxide thickness, Impact of technology Scaling, Technology & Device innovation. Simulation Power analysis: SPICE circuit simulators, gate level logic simulation, capacitive power estimation, static state power, gate level capacitance estimation, architecture level analysis, data correlation analysis in DSP systems, Monte Carlo simulation.	8
IV	**Bio Medical Signal Processing** Examples of Biomedical signals - ECG, EEG, EMG etc., tasks in Biomedical Signal Processing - Computer Aided Diagnosis. Origin of bio potentials. Illustration with case studies – Adaptive and optimal filtering - Modeling of Biomedical signals - Detection of biomedical signals in noise -removal of artifacts of one signal embedded in another -Maternal-Fetal ECG - Muscle contraction interference. Event detection - case studies with ECG & EEG - Independent component Analysis - Classification of biomedical signals.	10

V	Testing of VLSI Circuits Basics of Testing and Fault Modeling Introduction to Testing - Faults in digital circuits - Modeling of faults - Logical Fault Models - Fault detection - Fault location - Fault dominance - Logic Simulation - Types of simulation - Delay models - Gate level Event-driven simulation. Test Generation for Combinational and Sequential Circuits Test generation for combinational logic circuits - Testable combinational logic circuit design - Test generation for sequential circuits - design of testable sequential circuits.	15
	Course Outcome as per Bloom's Taxonomy	
CO1	Students will **understand**[2]the wireless communication networks.	
CO2	Students will **Apply**[3]the different techniques in image and speech processing.	
CO3	Students will be able to **analyze**[4] and **evaluate**[5] the methods used in VLSI circuit design.	
CO4	Students would be able to **analyze**[4] different signal processing in Bio Medical field.	
CO5	Students will be able to **understand**[2] the testing of VLSI circuits.	
Text Books	1. Theodore S. Rappaport (2002), Wireless Communications: Principles and Practice, 2nd Edition, Prentice Hall. 2. R.C. Gonzalez and P. Wintz (1987), Digital Image Processing, 2nd Ed, Addison Wesley. 3. Gary K. Yeap (2002), "Practical Low Power Digital VLSI Design", KAP. 4. D.C.Reddy(2005),"Biomedical Signal Processing: Principles and techniques", Tata McGraw Hill, New Delhi. 5. M. Abramovici, M.A. Breuer and A.D. Friedman, "Digital Systems	
Reference Books	1. Garg V, Joseph E. Wilkes, Wireless & Personal Communication Systems, Feher/Prentice Hall. 2. Rosenfeld and A. C. Kak (1982), Digital Image Processing Academic Press, Vol-1,. 3. R. Rangayan (2002), "Biomedical Signal Analysis", Wiley. 4. Rabaey, Pedram, "Low Power Design Methodologies" Kluwer Academi.	

ANNEXURE-8

Discipline Specific Course

Course Code: **BO20P104**	**BOTANY**	Credit: 04
Course Objectives	1. The Program Ph.D will develop ability to identify and solve the real world problems related to various areas of Plant Sciences. 2. It will also develop an aptitude to apply principle of plant Sciences. 3. It will provide in-depth knowledge of various fields of plants.	
Prerequisite	Postgraduate degree in a relevant discipline, competed from a recognized institute /university A minimum aggregate score of 55 %.	
UNIT	**CONTENTS**	**HOURS**
I	Angiosperms, Gymnosperms, Ethno botany and biodiversity; -Recent trends in Taxonomy, Botanical Nomenclature, Herbaria and Botanical gardens. Chemotaxonomy, Recent information on fossil history of angiosperms, Biosystematics and species concept, Ethno botany: Historical background and importance of the study, Conservation and preservation of the endangered species., Factors in the distribution of vegetation and floras. Gymnosperms: -Trend in phylogeny and classification of Gymnosperms	7
II	**Algae, Bryophytes, Pteridophytes, Mycology and plant Pathology**;-History with special reference to Indian work. Application of Algae, Bryophytes, Pteridophytes, Advances in plant pathology and economic important. New trends in the classification of Algae. Economic important. In Bryophytes,	6
III	**Molecular biology**: -Cell organelles and their functions, DNA and RNA molecular structure. Recombinant DNA technology, Agrobacterium mediated gene transfer, genome, genetic recombination ,Gene Library, Plant tissue culture, vectors, restriction enzymes.	7
IV	**Advancement of Environment science :** Soil waste management, rain water harvesting, Environment biotechnology sewage treatment, Field work, visit to a local area to document environmental assets river/forest/grassland/hill/mountain• Visit to a local pollutedsite-Urban/Rural/Industrial/Agricultural •	7
V	**Instrumentation and Techniques.** Microscope, Microtome, Laminar air flow, centrifuge, auto clave, Hot air oven, chromatography, electronic balance, BOD, COD, pH meter histological techniques, cytological techniques, PCR Southern and Northern techniques. Plant tissue culture techniques etc.	8
CO 1	A student completing the course is able to understand different banches of Botany such as systematics, evolution, ecology, developmental biology, physiology, biochemistry, plant interactions with microbes and insects, morphology, anatomy, reproduction, genetics and molecular biology of various life-forms.	

CO 2	They become competent enough in various analytical and technical skills related to plant sciences.	
CO 3	The course will increase the understanding of the students about the classification, structure, role and infectious cycle of microbes and Fungi.	
CO 4	Understand the various principals and methods related to botany.	
CO 5	The student completing the course is capable to perform research using various tools and techniques in plant sciences and develop scientific temperament and research attitude.	
Text Books	1. Schmidt-Nielsen K. Animal physiology, Adaptation and environment Cambridge university Press. 2. Bhatiya and Kohli, fundamental of Ecology. 3. Veer Bala Rastogi, fundamental of Genetics 4. Sharma Jaya, Botany, Kelash Pushtak Sadan. 5. Sharma Jaya, Plant Physiology, Kelash Pushtak Sadan. 6. Sharma Jaya, Applied and Environment Microbiology, Kelash Pushtak Sadan	
Reference Books	1. B Schierwater, R Desalle, G P Wagne, Molecular Ecology and Evolution. 2. J. Darnell, H. Lodish, & D. Baltimore, Molecular cell biology, , Scientific American books, inc., USA 3. Daniel L Hartl, Elizabeth & Jones W, Jones, Genetics: Principles and analysis, Bartlett publishers 4. De Robertis and E.M.F. De Robertis Jr., Cell and Molecular Biology, E.D.P . Lea & Febiger 5. R.W. Old & S.B. Primrose, Principles of gene manipulations, Blackwell Science, U.K 6. J. Palmer, Enzymes ,Harward publications. 7. B. Alberts,D. Bray, J. Lewis, M.Raff, K. Roberts & J.D Watson, Molecular biology of cells, Garlano publishing, Inc., New york .	

ANNEXURE-9

Discipline Specific Course

Course Code: **CH20P104**	**PHYSICAL METHODS IN CHEMISTRY**	Credits: 04
Course Objectives	1. Prepare students with the knowledge of molecular spectroscopy. 2. To produce students whose concepts are clear in physical methods in chemistry.	
Pre-requisite	Basic knowledge of spectroscopy.	
UNIT	**CONTENT**	**HOURS**
I	Introduction: Interaction of electromagnetic radiation with matter, transition probability and selection rules, line-widths and line shapes, Fourier Transforms in spectroscopy. Rotational and rotation-vibrational spectroscopy: Microwave and infrared spectroscopy of di- and polyatomic molecules, normal coordinates and their symmetry (CO2), skeletal vibration and group frequency, FT-IR instrumentation. Raman spectroscopy: Raman Effect, rotational and rotation- vibrational Raman transitions, nuclear spin effects, polarization of Raman lines. Lasers and laser spectroscopy: Principles of laser action, laser characteristics, pulsed lasers, laser cavity modes, Q-switching, mode locking, non-linear effects, harmonic generation, examples of lasers: He-Ne, Nd-YAG, titanium-sapphire., dye lasers. Lasers in spectroscopy: Raman, hyper-Raman, CARS, femtosecond spectroscopy.	15
II	Electronic spectroscopy: Vibronic spectroscopy of diatomic molecules, Franck-Condon factor, dissociation and pre-dissociation, rotational fine structure, solvent effects, photoelectron spectroscopy (PES): UV and X-ray PES of molecules. Single molecule spectroscopy: Single molecule detection, confocal detection optics and configuration, applications	10
III	Magnetic resonance: Are view of spinangular momentum, basic principles and relaxation times, intensity of NMR signals, electronics hielding, NMR in liquids: chemical shifts, spin couplings, NMR spectra of AX, A3X and AB systems. ESR of hydrogen, first order hyperfine energies, ESR of organic radicals in solution. FT-NMR: Rotating frame of reference, effect of RF pulses, FID, multi pulse operation, measurement of T1 by in versionre covery method, spinecho and measurement of T2, 2-D NMR, NMR	10
IV	Electron Paramagnetic Resonance Spectroscopy: Theory, analysis of EPR spectra of systems in liquid phase, radicals containing single and multiple set of protons, triplet ground states, transition metal ions, rare earth ions, ions in solid state, EPR spectra of various inorganic compounds. Mossbauer Spectroscopy: Physical concepts, spectral line shape, isomer shift, quadrupolesp letting, magnetic hyperfine interaction, Interpretation of Mossbauer parameters of ^{57}Fe and ^{119}Sn. Applications to Solid-state reactions, thermal decomposition, ligand exchange, electron transfer and isomerism. Mass Spectroscopy: Introduction and Applications to Isotopic systems.	15

V	Electrochemical Methods: Heterogeneous electron transfer and concept of capacitive and Faradic current. CV, DPV and coulometry. applications of CV in organic and inorganic chemistry.	10
Course Outcomes as per Bloom's Taxonomy		
CO1	The students will be able to **understand**[2]the concepts of spectroscopy.	
CO2	They will be able to **illustrate**[2]Raman and laser spectroscopy.	
CO3	Students will **understand**[2]the concepts of electronic spectroscopy.	
CO4	They will learn to **apply**[3]the concepts of magnetic resonance spectroscopy.	
CO5	They will **develop**[3]the knowledge of electrochemical method.	
Text Books	1. C. N. Banwell and E.M. Mc Cash, Fundamentals of Molecular Spectroscopy,1994, 4th edition, Tata McGraw Hill, New Delhi. 2. R. S. Drago, Physical Methods in Inorganic Chemistry, East-West Press Pvt. Ltd., 2012. 3. J. M. Hollas, Modern Spectroscopy, 2004, 4th edition, John Wiley & Sons, Ltd., Chichester. 4. G. M. Barrow, Introduction to Molecular Spectroscopy, McGraw-Hill,1962. 5. R. V. Parrish, NMR, NQR, EPR and Mossbauer spectroscopy in Inorganic Chemistry, Ellis Horwood Limited, 1990. 6. A. J. Baird and L. R. Faulkner, Electrochemical methods – Fundamentals and applications, Wiley, 1980.	
Reference Books:	1. A Carrington and A. D. Mc Lachlan, Introduction to Magnetic Resonance, Chapman and Hall, London, 1979. 2. R K Harris, Nuclear Magnetic Resonance Spectroscopy, Addison Wesley, Longman Ltd, London, 1986.	

ANNEXURE-10

Discipline Specific Course

Course Code **MB20P104**	**MICROBIOLOGY**	Credits: 04
Course Objectives	1. Prepare students with the knowledge of microbial world. 2. To produce students whose concepts are clear in microbiology and related techniques.	
Pre-requisite	Basic knowledge of Biology.	
UNIT	**CONTENT**	**HOURS**
I	Animal cell culture and tissue engineering. Cell lines, cell culture growth kinetics, Basic Techniques of mammalian cell culture (Open and closed cell-cultures, Primary Cell culture), Cell surgery and Cell Fusion Methods (Preparation of anucleated cells and polykaryon cells, preparation of ghost RBCs, Preparation of mini cells, micro cells, Surgical manipulation of in vitro fertilization, Hybridoma cell preparations, Use of Hybridoma technology: e.g. M AB and other related techniques, Mini cells, micro cells and anucleated cells in fusion and their application.) Tissue Engineering: Capillary culture Units, feeder layers. Use of Animal Cells in Culture: Mutant cell preparation, Evaluation of Chemical carcinogenicity, Cell malignancy Testing, Toxicity Testing, Karyotyping and cytogenetic characterization, Production of metabolic products, ESC applications, Pluripotent stem cell applications.	15
II	Tissue culture Techniques: Animal Culture: Media requirements and sterilization techniques, primary and established cell lines. Culture methods: hanging drop, monolayer and suspension. Advantages and disadvantages. Scale up methods. Roux tubes roller bottles. Stem cells: adult and embryonic, applications to tissue engineering. Applications of animal cells. b) Plant tissue culture: Cell and callus culture, another culture. Micropropagation, somatic cell hybridization, protoplast fusion, cybrids, artificial seeds, Agrobacterium mediated gene transfer and use of Ti plasmid. Applications of plant tissue culture engineering, pathogen resistance (BT gene), herbicide tolerance, salt tolerance, production of secondary metabolites and transgenic plants.	10
III	Molecular modeling: Introduction, force field, quantum chemistry, Schrödinger equation, potential energy functions, energy minimization, local and global minima, saddle point, grid search, , various approximations; LCAO, HF, semi-empirical calculations; single point calculations, full-geometry optimization methods, ZDO, MNDO, CNDO, NDDO, AM1, PM3, RM1, conformational search, Z-matrix, docking, molecular modeling packages. Protein structure prediction Protein Structure Prediction; Homology modeling, prediction of protein structure from sequences, functional sites, Protein folding problem, protein folding classes, protein identification and characterization; structure determination by X-ray and NMR.	10

IV	**Microbial and Cellular Techniques**: Microscopic techniques; Microbial growth and kinetics (synchronous culture, continuous and batch and fed-batch cultures, chemo stat and turbid stat); Methods for identifying microbes (Polyphasic approach); Cell disruption and fractionation of organelles; Isolation and purification of membrane proteins; Various methods to study cell-cell and cell-virus fusion; Flow cytometry techniques; Confocal and Atomic Force Microscopy; Types of Biosafety cabinets.	15
V	**Molecular genetics/Microbiology:** Studies of the mechanism for plasmid replication, construction of cloning vectors and analysis of recombinant protein expression. Genetic analysis of the production of antibiotics in bacteria. Studies of molecular mechanisms for cellular osmoregulation. The genetics of alginate biosynthesis and function studies of the enzyme structures, Oil microbiology, Development of new plasmid tools for use in bio prospecting, Microbial producers of bioactive agents from the marine environment.	10
	Course Outcomes as per Bloom's Taxonomy	
CO1	The students will be able to **understand**[2]the concepts of microbiology.	
CO2	They will be able to **illustrate**[2]methods in microbiology.	
CO3	Students will **understand**[2]the microbiology and biotechnology.	
CO4	They will learn to **apply**[3]the concepts of microbiology.	
CO5	They will **develop**[3]the knowledge of microbiology and various aspects of it.	
Text Books:	1. Razdan, M. K. Introduction to Plant Tissue Culture. 2nd Edition. Oxford & IBH. 2008. 2. Ausubel FW. Current Protocols in Molecular Biology. Wiley-Blackwell. 2011. 3. Burgess R. and Deutcher MP. Guide to Protein Purification. Academic Press, SanDiego, USA. 2009. 4. Butler, M. Animal Cell Culture & Technology. 1st edition. Tailor & Francis Publishers (UK) 2004. 5. Singh Vinod. Textbook of Bacteriology, IBDC publishers, 2010.	
Reference Book	1. Joanne W., Kathleen S. and Dorothy W. Prescott's Microbiology, 11th Edition, 2020. 2. Ronald M. A. and Bartha R. Microbial Ecology: Fundamentals and Applications, 4th edition 2009.	

ANNEXURE-11

Discipline Specific Course

Course Code **BT20P104**	**BIOTECHNOLOGY**	**Total Lec.: 60**
Course Objectives	1. Prepare students with the knowledge of different trends in biotechnology. 2. To prepare students as a research scholar well equipped and practiced in bio techniques. 3. To develop a research aptitude and critical thinking in the research scholar.	
Pre-requisite	Basic knowledge of Molecular Biology and Basic Cellular Techniques.	
UNIT	**CONTENT**	**HOURS**
I	**Microbial, Cellular Techniques and Proteomics** Microscopic techniques; Microbial growth and kinetics (synchronous culture, continuous and batch and fed-batch cultures, chemo stat and turbid stat); Methods for identifying microbes (polyphasic approach); Cell disruption and fractionation of organelles; Isolation and purification of membrane proteins; Various methods to study cell-cell and cell-virus fusion; Flow cytometry techniques; Confocal and Atomic Force Microscopy; Types of Biosafety cabinets. UV and fluorescence spectroscopy; Circular Dichroism; Mass spectrometry - Principles and their applications; Protein separation techniques and instrumentation (Gel filtration, Ion exchange and Affinity chromatography, 1D and 2D Polyacrylamide gel electrophoresis).	15
II	**Recombinant DNA techniques and Genomics** Use of Restriction and modification enzymes in cloning; Plasmid vector; Transformation and Plasmid isolation; PCR; DNA sequencing methods (Sanger's chain termination method, and automated DNA sequencing); Next generation sequencing (NGS); Global expression profiling; Whole genome analysis of mRNA and protein expression; Real time PCR and Microarrays and their applications.	10
III	**Gene expression, Genetic Manipulation and transcriptomics:** Use of reporter genes-enzymatic and bioluminescent reporters. S1 nuclease mapping, primer extension / 5' RACE. Transcriptome analysis by differential Display-PCR, Q-PCR, EST analysis, DNA microarrays, Serial Analysis of Gene Expression (SAGE), RNA-Seq, in-situ hybridization. Use of inducible bacterial promoters for expression of various proteins including toxic and membrane proteins. Expression systems in S. cerevisiae, plant systems. CRISPR/Cas9 and Targeted Genome Editing, Transient Gene silencing and knockout approaches (siRNA, shRNA, microRNA). New biomedical and pharmaceutical applications of alginates, chitosans, gelatin and proteoglycans, Capsule- and gel technology applied in food.	10

IV	Analysis of protein and Protein engineering DNA and protein-protein interactions: Electrophoretic mobility shift assays, DNA foot printing by D Nase I and dimethyl sulphate, ChIP- chips. Yeast two hybrid systems. Co-immuno precipitations and pull-downs. Use of fluorescent tags for protein localization study, Phage display. Surface Plasmon Resonance (SPR), Isothermal, Calorimetric. Concept of protein structure, conserved residues, catalytic site. Site directed mutagenesis by conventional and PCR-based methods. Cysteine and Linker scanning mutagenesis. Genome shuffling.	15
V	Environmental biotechnology and basics of bio techniques in laboratory Biofilm formation and bio fouling, Gel-immobilized microbial ecosystems, Anaerobic fermentation of organic material, Directing microbial environment in marine aquaculture, Mechanisms for bacterial colonization and directing microbial environment in marine aquaculture, Structure and stability in natural pelagic ecosystems. Preparation of solutions; Concepts of solution strength (concentration); Sterilization of solutions; Preparation of Buffers - Concept of pKa and Henderson-Hassel bach equation; Concept of conjugate acid and base.	10
Course Outcomes as per Bloom's Taxonomy		
CO1	The students will be able to **understand**[2]basic concept of Recombinant DNA techniques and Genomics.	
CO2	They will be able to **illustrate**[2]Analysis of protein.	
CO3	Students will **understand**[2]the concepts of Gene expression.	
CO4	They will learn to **apply**[3]the concepts of bio techniques in laboratory.	
CO5	They will **develop**[3]the knowledge of Protein engineering.	
Text Books:	• Razdan, M. K. Introduction to Plant Tissue Culture. 2nd Edition. Oxford & IBH. 2008. • Ausubel FW. Current Protocols in Molecular Biology. Wiley-Blackwell. 2011. • Burgess R. and Deutcher MP. Guide to Protein Purification. Academic Press, SanDiego, USA. 2009. • Butler, M. Animal Cell Culture & Technology. 1st edition. Tailor & Francis Publishers (UK)2004. • Freshney, R.I. Culture of Animal cells: A Manual of Basic Technique and specialized applications. 7th edition. Wiley-Blackwell. 2016. • Green M.R. and Sambrook J. Molecular Cloning: A Laboratory Manual. Vol. I, II, III. 4th edition. Cold spring harbor laboratory press. 2013.	
Reference Books:	• Plummer D.T. An Introduction to Practical Biochemistry. 3rd edition. McGraw Hill Higher Education. 2001. • Sheehan, David. Physical Biochemistry: Principles and Applications. 2nd edition. Wiley.2009. • Wilson K. and Walker J. Principles and Techniques of Biochemistry and Molecular Biology. 7th edition. Cambridge University Press India Pvt. Ltd. 2010.	

ANNEXURE-12

Discipline Specific Course

Course Code **HI20P104**	**HISTORY**	**Total Lecture: 60 4-0-0= 4**
Course Objectives:	• Prepare students with the knowledge of different trends in History. • To develop a research aptitude and critical thinking in the research scholar. • To make them Energetic and self-motivated associates of society with a strong acumen, and hopeful attitude to obtain the best from the world • To give a broader horizon to the career of the students as an Administrator, Politician, thinker, Leader, Writer, team manager and a Demographer by seeking admittance to the research area. • To provide the students the necessary knowledge of economic History of ancient, medieval, and modern times.	
Pre-requisite	Basic knowledge of History.	
UNIT	**CONTENT**	**HOURS**
I	**Literature** Vedic Literature, Brahmanical Literature, Buddhist Literature Jain Literature	15
II	**Histories and Biographies** Itihasa-Purana Tradition and Charitas with special reference to the Buddha charita, Rajatarangini and Harshacharita. Account of foreign travelers with special reference to Meghasthenes, Hiuen-tsang, and Al-beruni. Romantic and folk literature with special reference to the Malavikagnimitram of Kali dasa and the Kathasaritsagara of Somadeva	10
III	**Archival Management** Introduction to course: Books, Museums, Archaeological-Forts, Temples, Wadas Literary-Bakhars, Peshwa Daptar, Diaries etc. scripts Basic concepts and theories in archives and records management. Scripts. Records: History of records, record keeping and archives Integration of records into Organizations	15
IV	**Colonialism, Nationalism and Communalism:** Colonialism in South Asia: Nature; Textualization of knowledge: Translation of Classical Indian manuscripts, Genesis of Gazetteers, Census, and social engineering. Colonial economy: Nature and development-Industrial, financial, and agricultural;critique. Nationalism in South Asia: Origin, Indian National Movement. British rule, Nationalist politics, and Growth of communalism in colonial India;Communal violence and Partition.	10

V	**Trade Routes**– Internal & external trade, industry, guilds, Ownership of land in ancient India, principles In Ancient India. Main features of Mauryan, Satvahana, & Gupta economy. Rise and growth of Feudalism. Temple economy in south India	10
	Course Outcomes as per Bloom's Taxonomy	
CO1	The students will be able to **understand**[2]basic concept of Recombinant DNA techniques and Genomics.	
CO2	They will be able to **illustrate**[2]Analysis of protein.	
CO3	Students will **understand**[2]the concepts of Gene expression.	
CO4	They will learn to **apply**[3]the concepts of bio techniques in laboratory.	
CO5	They will **develop**[3]the knowledge of Protein engineering.	
Textbooks:	• Randall Jimerson, (2000). ***Understanding Archives and Manuscripts*** Chicago: Society of American Archivists. • James O'Toole, (1990) ***Understanding Archives and Manuscripts***, (Chicago: Society of American Archivists • Luniya, B.N. (2005) **Evolution of Indian Culture**, Agra, Lakshmi Narayan Publications • Basham, A.L., (1999). **Cultural History of India** Delhi Rupa Publications. • Metcalf D and Thomas, Metcalf, (2002) **A Concise History of India**, Cambridge University Press	
Reference Books:	• Pandey; S.N., (2008), ***Economic History of Modern India,*** Roadworthy Publications Pvt. Ltd. • Sharma; Sharan; Ram, *Perspectives* ***in Social and Economic History of Early India,*** Munshram Manoharlal Publisher Pvt. Ltd. • L.J. Bellardo and L. Carlin, (1992) ***Glossary for Archivists, Manuscript*** *Curators and Records Managers* Chicago: Society of American Archivists • Giddens, Anthony (1974) Positivism **and Sociology** London, Heinemann.	-

ANNEXURE-13

Discipline Specific Course

Course Code: **FS22P104**	**FORENSIC SCIENCE**	Credits 4
Course Objective	1. Prepare students with the knowledge of forensic science 2. To produce students whose concepts are clear in forensic analysis of samples.	
Prerequisite	Basic knowledge of forensic science	
UNIT	**CONTENTS**	**HOURS**
I	• Forensic Science: Definition, History & Development, Scope, Ethics in Forensic Science • Physical Evidence: Nature, Types, Search methods, Collection, Preservation, Packing & Forwarding of Physical & Trace evidence for forensic analyses, Chain of Custody • Crime Scene: Nature, Types, Preservation of Scene of Crime Criminal Investigations: Unnatural deaths, Criminal assaults, Sexual offenses, Poisoning, Vehicular accidents • Courts: Types, powers and jurisdiction, Admissibility of evidence in Courts, Definition of Experts, Provisions in Cr.P.C.,1973 & Indian Evidence Act relating to experts & their reports; Court Procedures pertaining to Expert Testimony & Witness • Organization of Forensic Science Laboratories of Centre and State, NCRB and NICFS • Fundamental Rights: Right of Equality (Articles 14 to 18) and Right of Freedom (Articles 19 to 22) as per Constitution of India • Criminal Profiling: Profile of victim and culprit, its role in crime investigation, Lie detection (Polygraphy), Narco analysis, Brain mapping, scope and limitations • Identification through Skull superimposition and facial reconstruction	6
II	• Analysis of Ethyl alcohol in beverages , liquors, biological fluids and breath Analysis of Methanol and Denaturants Illicit liquors	10

	● Analysis of Chemicals in Trap Cases ● Metabolism and Chemical examination of : Insecticides & Pesticides, Tranquillizers & Sedatives, Hypnotics Stimulants, Narcotics, Opiates, Drugs of abuse; Analyses of above and their Toxicity ● Plant poisons Metallic Poisons Extraction, Isolation & Clean-up procedures, Identification of common poisons from viscera, tissues and body fluids ● Fire and Arson: Analyses of Petroleum Products and other incendiary materials ● Explosives: Definition, Types and Analyzes Bombs: Country made bombs, Improvised Explosive Devices (IEDs) and their examination Investigation in Explosion and Arson related cases ● Post – mortem examination and Post – mortem changes, Estimation of time since death ● Forensic Entomology: Introduction, Insects of forensic importance, Insects on Carrion, Forensic applications ● Spectrophotometry: UV, Visible, IR, Raman, Atomic absorption, Emission ● X – rays and x-ray based techniques such as XRD, XRF Mass Spectroscopy Chromatographic Techniques: TLC, GLC, HPLC,HPTLC ● Hyphenated Techniques: GC-MS, LC-MS, IR-MS and ICP-MS	
III	● Detection and Identification of Blood stains Determination of Species of Origin Blood Group Systems Techniques of Determination of Blood groups of Blood Stains ● Detection of Seminal and other body fluids and their Blood Grouping, Red cells Enzymes, Serum Proteins of forensic significance ● Disputed Paternity & Maternity DNA: Structure, DNA as genetic marker, DNA Extraction and Profiling Techniques DNA Pheno typing and RNA Profiling & their applications ● Determination of Species of Origin, Sex , Age, Stature, and individual identification through skeletal remains. Human dentition, Type of teeth, determination of Age, Bite marks ● Modes & Manner of deaths, Sexual offenses and its medico legal importance, Amendments in law related to sexual offenses ● Hair & Fibers: Nature, Types, Structure and Examination Pollens and Diatoms: Their application in Forensic investigation Dust & Soil: Nature, Types, Forensic Examination ● Injuries & Wounds: Types, Medico legal importance, Gunshot wounds	10

	• Wildlife Forensics: Wild life (Protection) Act,1972, Scope, Evidences and Identification • Electrophoresis: High and Low voltage electrophoresis, Immune electrophoresis • Immunoassays: Principle, Types ,Techniques and applications	
IV	• Fire arms: Types, Classification, Ammunition and their Compositions • Forensic examination of Firearms, Ammunition, Firearms' projectiles (Bullets, Shots, Slug etc.), Shell case • Gunshot residues analysis • Concept of Velocity, Penetration, Dispersion, Ricochet, Accidental Discharge, Determination of Range in firearm cases • Examination of Country made firearms • Basics of Internal, External and Terminal Ballistics • Tool marks: Meaning, Types and Examination Restoration of Erased Markings on Metal Surfaces • Paint, Lacquer & Varnishes: Nature, composition and forensic examination • Glass: Composition, Types, Fractures, • Examination Cement, Mortar and Concrete: General Composition, Forensic Analysis • Track Marks: Foot Prints, Shoe Prints, Tire Marks, Their Preservation & Casting, Comparison, Skid marks. Gait pattern • Microscopy: Polarizing, Comparison, Stereoscopic, Fluorescent and Electron Microscopes	9
V	• Documents: Definition, Types, Preliminary examination of documents • Reproduction of documents through photographic and mechanical means and their examination • Examination of Alterations such as Erasures, Obliterations & Additions Indentations, Secret writings and Charred documents Inks, Papers and their scientific examinations with modern methods Age of documents • Examination of Typescripts, Printed matter including currency notes and lottery tickets. Mechanical impressions, ESDA, VSC • Hand writings: Class and Individual characteristics of Handwritings, Factors affecting handwritings, Standard samples for comparison, Comparison of hand-written texts Anonymous and disguised writings Identification of hand writings, signatures, detection of forged signature and forgeries • Examination of Credit Cards and Similar materials	10

	• Fingerprints: History, Characteristics, Types, Classification, Preservation, Development, Lifting and Comparison, Examination of Chance Prints, Computerization of Fingerprints, AFIS • Biometric Systems of Identification and its relevance • Voice Analysis: Introduction, Significance, Structure of Human Voice apparatus, Voice spectrography, Voice analysis, Legal aspects and limitations • Computer Forensics: Introduction, Types of Computer crimes, Digital evidence- Seizure, Acquisition and Forensic examination Mobile Phone Forensics • Photography: Types, application in criminal investigation & Forensic evidence examination	
	Course Outcome as per Bloom's Taxonomy	
CO1	The students will be able to understand the concepts of forensic science	
CO2	They will be able to illustrate methods in forensic science	
CO3	Students will understand the concepts of instrumental techniques	
CO4	They will learn to apply the concepts of forensic science	
CO5	They will develop the knowledge of forensic science and its techniques	
Text books	1. Nanda, B.B and Tewari, R.K. (2001): Forensic Science in India: A vision for the twenty first century Select Publisher, New Delhi 2. Saferstein. Forensic Science, Handbook, Vol I, II & III, Prentice Hall Inc. USA 3. Saferstein. Forensic Science, Handbook (Vol I- III), 1976 Prentice Hall Inc. USA. 4. Sharma, B.R : Forensic Science in Criminal Investigation and Trials, Central Law Agency, Allahabad, 1974	
Reference Books	1. Saferstein. Criminalistic- An Introduction to Forensic Science. Prentice Hall Inc, USA (1995) 2. Albert S Osborn; Questioned Documents, Second Ed, Universal Law Publishing, Delhi; (1982)	

ANNEXURE-14

Discipline Specific Course

Course Code: **AQ22P104**	**AQUACULTURE**	Credits: 4
Course Objectives	**1.** To learn the advanced aquaculture production system research for different species globally. **2.** To gain knowledge in the latest research in seed production methods for finfishes and shellfishes along with hatchery management technology. **3.** . To learn the impact of aquaculture on ecosystem management and climate change effects **4.** To learn the latest research in the lines of understanding the influence of environment on nutrient utilization. **5.** To learn about applied biotechnology aspects in aquaculture	
UNIT	**CONTENT**	**HOURS**
I	**Aquatic biology** 1. Physico-chemical analysis of water and soil. 2. Estimation of Primary and Secondary productivity. 3. Estimation of Biomass and Gross Production. 4. Quantitative and Qualitative analysis of planktons 5. Methods of collection, preservation and identification of Benthos and Macro invertebrates.	8
II	**Microscopy** 6. Structure, principles and applications of compound microscope. 7. Structure, principles and applications of dark –field and phase –contrast microscope. 8. Structure, principles and application of fluorescent microscope. 9. Structure, principles and application of electron microscope. 10. Preparation of specimen for microscopy, autoradiography.	7
III	**Centrifugation and Spectroscopy** 1. Structure, principles and application of centrifuges. 2. Spectrophotometer-structure, principles and application, determination of optical density of various samples. 3. UV-VIS, spectrophotometer and fluorescence spectroscopy. 4. Structure, Principle and application of Atomic absorption Spectrophotometer. 5. Structure, principles and application of Electron Spin Resonance. (ESR) and mass spectrometer.	8

IV	Aquaculture Ecosystem Management and Climate **Change** 1. **Aquaculture and ecosystem relationship:** Ecosystems and productivity, Biotic interaction within ecosystems and ecological homeostasis, Climate; Weather elementsof concern in aquaculture, Greenhouse gases, Global warming and their impact 2. **Impact of environment on aquaculture:** Raw water source, Physical and chemical characteristics, Contaminants and pollutants (algae, pathogens, heavy metals, pesticides) and their effect on productivity **3.Impact of aquaculture on environment:** Waste water discharge, Its quality and quantity, Impacts of effluents on ecosystems, Chemical degradation of soil and water. 4. **Environment monitoring:** Problems and preventive measures of antibiotic and drug residues, Stalinization of soil and water, Eutrophication, Environment impact assessment and environmental audit. 5. **Environment threats:** Introduction of exotics and escape of farmed fish, Pathogens in aquatic environment, Safety of aquaculture products, Role of microbes in aquatic environment, Assessment of probiotic impact in aquaculture	10
V	**Feed Management in Aquaculture** 1.Nutrient dynamics: Influence of nutrient cycles on web/chain, Influence of detrital food web on nutrient distribution, Nutrient loading through feed and fertilizer, Natural feed augmentation for increasing fish production, Different food chains in aquatic ecosystem, Feeding behavior and feeding niche, Effect of environmental parameters on appetite of fish. 2. Eco-friendly feed: Use of exogenous phytase and acidifiers, high energy diets, methods of enhancing feed digestibility, biofloc and probiotics influences. 3. Nutritional pathology: Deficiency and imbalance diseases: essential amino acids, essential n-3 and n-6 fatty acids deficiencies, Micronutrients: fat-soluble vitamins,water-soluble vitamins; Macro-elements, trace-elements and mineral toxicity,Influence of stress on feed intake, Digestion and absorption, Stress indicator and nutritional strategies for mitigate stress. 4.Feed Management:Impact of feed and nutrition on environment. Nutrients effecting the water quality. Nutritional strategies to reduce the nutrient flow in aquaculture system. Contribution of feed waste to organic load of aquaculture production system. Role of additives in reducing environmental pollution. 5.Study of influence of thermal stress, Hypoxia, Salinity and pH, Stress enzyme. (LDH, catalase, SOD, glutathione peroxidase), Stress hormone (Cortisols) and sex steroid hormone.	15

	Course Outcome as per Bloom's Taxonomy	
CO1	The students will **understand**[2] the Aquaculture and its management.	
CO2	They will be able to **explain**[3] and describe the interrelationship among the various functions of Aquaculture system and influence of climate	
CO3	They will be able to **identify**[3] new vistas in Aquaculture and their utilization for effective management.	
CO4	They will be able to **utilize**[3] knowledge of Aquaculture in social and professional life.	
CO5	They will also **develop**[3] holistic understanding of Aquaculture.	
Text Books	• Black KD. 2001. *Environmental Impacts of Aquaculture*. CRC Press. • Holmer M, Black K, Duarte CM, Marba N and Karakassis I. (Eds.). 2008. *Aquaculture in the Ecosystem*. Daya Publ. House. • Midlen, A. and Redding, T., 1998. *Environmental Management for Aquaculture*. Chapman and Hall. • Mischke, C.C., 2014. *Aquaculture Pond Fertilization - Impacts of Nutrients Input on Production*.	
Reference Books	• ADCP (Aquaculture Development and Co-ordination Programme). 1980. Fish Feed Technology. ADCP/REP/80/11. F.A.O., Rome. • De Silva, S. S. and Anderson, T. A. 1995. *Fish Nutrition in Aquaculture*. Chapman andHall Aquaculture Series, London. • Guillame, J., Kaushik, S., Berqot, P. and Metallier, R. 2001. *Nutrition and Feeding of Fish and Crustaceans*. Springer Praxis Publishing, Chichester, U. K. • Halver, J. E. 1989. *Fish Nutrition*, Academic Press, San Diego, California. • Halver, J. E and Tiews, K. T. 1979. *Finfish Nutrition and Fishfeed Technology* Vol. I and II. Heenemann, Berlin. • Halver, J. E. and Hardy, R. W. 2002. *Fish Nutrition*. Academic Press, London. • Hepher, B. 1988. *Nutrition of Pond Fishes*. Cambridge University Press, Cambridge. • Lovell, R. T. 1998. *Nutrition and Feeding of Fishes*. KluwerAcademic Publishers.	

ANNEXURE-15

Discipline Specific Course

Course Code **PY22P104**	**PHYSIC**	**Total Lec.:**
		4-0-0
Learning Objectives	• To convey the scholars some of the concepts of higher levels of physics; • To prepare them for research in advanced physical fields. • To make the scholars familiar with the basics & types of lasers and their uses indifferent areas of science and technology. • To familiarize the research students about the physical principles functioningbehind semiconductors and the devices made out ofit; • To enable the scholars about the fundamentals of MATLAB programming; • To understand the concepts of various numerical methods and simulation techniques.	
Pre-requisite:	Fundamental of Physics	
UNIT	**CONTENT**	**HOURS**
I	**Physics of Nano materials: -** Introduction: Origin of Nanotechnology, Nanomaterials, classification of nanostructures –1D, 2D and 3D confinement, Surface area to volume ration,Quantum confinement effect, band theory of nano materials, Physical and chemical properties of nano materials, applications of nano-structured materials.	10
II	***Quantum Mechanics:*** Schrödinger Picture, **Time independent perturbation theory**: Theory and an example; S**cattering theory**: Quantum theory, Partial wave analysis (one example), Born Approximation and its validity (One example); P**ath integral formulation**: propagator, Schrödinger wave equation from path integral, eg: free particles; Introduction to second quantization; Q**uantum field theory**: quantization of scalar field and Dirac field.	9
III	**Basic principle of Laser**: Spontaneous and stimulated Emission and Absorption; Laser and its characteristics; Population inversion, Properties of Laser Beams: Mono chromaticity, Coherence: first order& higher order, Directionality, Brightness, Laser speckles.	9
IV	**P-N junction Diodes**: Zener diodes, Avalanche diodes, Junction field effect ransistors (JFETs), FETs, Schottky barrier diodes, MOSFET. **Microwave Devices**: Tunnel Diode, MISTunnel Diode, MISS witch Diode, Transferred Electron Devices (TEDs). **Microwave Devices**: Tunnel Diode, MIS Tunnel Diode, MIS Switch Diode, Transferred Electron Devices (TEDs).	9
V	**Modeling Using MATLAB/ Any Programming Language:** Introduction to Modeling; Modeling Concepts and Definitions; Review of computational science examples; Accuracy and precision in modeling; Modeling terminology; Introduction to MATLAB; MATLAB Scripts; MATLAB Arrays; Linear models; Graphing data in MATLAB; MATLAB Array Math; Advanced graphing in MATLAB; Nonlinear Functions; Nonlinear modeling examples; MATLAB I/O; MATLAB conditional statements; MATLAB loops; MATLAB functions; Curve fitting;	8
Course Outcomes as per Bloom's Taxonomy		
CO1	Student will **learn**[1]about the background on Nano materials	
CO2	Student will able to **understand**[2]the fundamental of Quantum Mechanics	

CO3	They will be able to **characterise**[4]LASERmaterials on the basis of their optical properties.
CO4	They will be able to **Learn**[1]the advanced concepts in various semiconductor diodes
CO5	They will be able to **Apply**[3]their learned knowledge to develop Mathematical Modeling
Text Books:	• C. Poole & F. Owners, Introduction to Nanotechnology, Wiley,2007. • Introduction of Quantum Mechanics; David J. Griffiths; Pearson Education;2010. • Introduction to Semiconductors, Smith, John Wiley,1962. • Laser Fundamentals, by William T. Silfvast, Cambridge University Press,2008. • Numerical Methods for Engineers and Scientists: An Introduction with Applications UsingMATLAB; Amos Gilat and VishSubramiam
Referenc e Book	• R. Booker & E. Boysen, Nanotechnology, John Wiley &Sons2015. • G. Thomas, Transmission Electron Microscopy of Metals, John Wiley & Sons Inc,1962. • Quantum Mechanics 2nd Ed; Bransden and Joachain; Pearson; 2000. • Quantum Mechanics and Path Integral; Feynmann and Hibbs, McGraw-Hill College; 1965. • Semiconductor Devices Basic Principles; Singh; JohnWiley; • Laser Spectroscopy: Basic Concepts and Instrumentation, by Demtroder; Springer,2004. • Physics and Technology of Semiconductor Devices; Grove; Wiley;1967 • Modeling and Simulation of Systems Using Matlab and Simulink; D. K. Chaturvedi, 2010

ANNEXURE-16

SAGE UNIVERSIRTY, BHOPAL

Ph. D Course Work Syllabus (Faculty of Pharmacy)

Discipline Specific Course

Course	Name	Pharmaceutical Sciences
	Code	PS21P104
Unit	**Course Content**	
I	**Central Drug Standard Control Organization (CDSCO):** Functions and responsibilities Investigational New Drug: Need of an IND, Content and Format of an IND application, Submission of an IND, FDA review of IND. The New Drug Application: Overview, Law regulations and Guidance, new drug development and approval, NDA development preclinical investigation, new drug application (phase I, phase II, phase IV and post marketing surveillance, Common technical document (CTD) for NDA etc.	
II	**Controlled drug delivery systems:** Design and fabrication of diffusion controlled, dissolution controlled, osmotic, gastro-retentive delivery systems, biodegrable polymeric delivery systems. Controlled drug delivery polymers, roles of polymers in drug delivery, pharmacokinetic/ pharmacodynamic basis of oral controlled drug delivery. The concepts of bioavailability and bioequivalence, In vitro and in vivo methods in establishment of bioequivalence.	
III	**Drug Design:** Approaches to drug design, method of variation, biochemical and physiological approaches. Lead compound - Search & Optimization: Search of lead compound from natural products and other sources, selection of test compounds. Methods of lead optimization – synthesis of analogs, variation of substituents, extension of structure, ring versus chain structures, bioisosterism, ring contraction and expansion. Hansch analysis, Free-Wilson analysis, Craig plot, Topliss scheme, CoMFA analysis.	
IV	**Extraction:** Different techniques adopted for the extraction of phytoconstituents like Maceration, percolation, sonication, soxhlet assisted extraction, and ultrasound assisted extraction, super critical carbon dioxide extraction and Microwave assisted extraction. Standardization of herbal drugs/formulations : Conventional methods, Modern techniques (Role of genetic markers, RAPD, DNA fingerprinting technique etc)	
V	**Common animal models for selected categories of drugs**: anti-hypertensive, anti-inflammatory, anti-diabetic, anti-ulcer, anti-oxidants. Detailed study of guidelines for maintenance, breeding techniques and experimentation using laboratory animals: a) CPCSEA b) OECD c) ICH d) GLP e) ICMR f) Guidelines according to official compendia Organization of screening: Pharmacological activity of new substances and safety assessment tests.	

ANNEXURE-17

Discipline Specific Course

Course Code **SY22P104**	**PSYCHOLOGY**	**Total Lecture :60**
		4–0–0=4
Course Objectives:	This course aims: • To understand the meaning and scope of psychology. • To recognize the foundation and approaches to social psychology. • To analyze the basic theories of Personality. • To explore the different methods of psychological assessment. • To examine the classification of abnormality through DSM and ICD.	
UNIT	**CONTENT**	**HOURS**
I	**Introduction:** Meaning, Goals and History of psychology. Foundation – four waves of psychology. Schools of thought – Structuralism, Functionalism, Behaviorism, Psychoanalysis, Humanistic and Cognitive.	10
II	**Psychological Assessment**: Definition, nature and use of psychological tests. Rating Scales. Types of Psychological tests. Reliability and Validity: Concepts and Types. Test Construction:Steps of Test construction. Nature of Intelligence: Individual andGroup testing. Personality Assessment: Self Report personality inventories. Measuring Interest and Aptitude. Projective Tests.	14
III	**Personality:** Definition and Approaches to Personality--- Psychoanalytic theories: Freud, Adler, Jung and Erickson. Trait approach: All port and Cat tell and Behavioral Approach. Humanistic Approach: Maslow and Rogers.	12
IV	**Social Psychology:** Theoretical Approaches: Genetic, Learning, Cognitive, Psychoanalytic and Role Theory Conformity, Complianceand Pro Social Behavior. Group: Characteristics and its Types. Social Facilitation and Social Loafing, Concept and Theories of Aggression and Interpersonal attention. Prejudice and Discrimination, Attribution Theories: Kelly and Weiner. Environmental Stress: Natural and Technological Disaster. Crowding and Urban Stress. Human response to protect the environment	12
V	**Psychopathology:** Models of Abnormality, Classification of Disease: DSM and ICD. Psychotherapies: Psychoanalytical Behavioral, Cognitive and Humanistic	12

Course Outcomes (As per Blooms' taxonomy)	
After successful completion of course students will able to:	
CO1	**Outline**[1] the foundation and scope of Psychology.
CO2	**Extend**[2]the various concepts and approaches to social psychology.
CO3	**Interpret**[2] the methods of assessment in the field of psychology.
CO4	**Compare**[4] the classification of DSM and ICD.
CO5	**Examine**[1]the different types of psychotherapies.
Text Books:	• Morgan, King & Weiss. An Introduction to Psychology. New Delhi. McGrawHill. • Adams H.E.& Sutkar, F.G. (E.D.). **Comprehensive Handbook of Psychopathology.** New Delhi. Springer. • Sarason & Sarason. **Abnormal Psychology**. New Delhi. Pearson. (10th Edition). • Taylor & Shelley. **Social Psychology**. New Delhi. Pearson. • Baron & Byrne. **Social Psychology**. New Delhi. Pearson. • Hussain & Akbar**. Social Psychology**. New Delhi. Pearson. • Aiken, L.R. &Groth- Marnat, G. (2009). Psychological Testing and Assessment (12th ed) Delhi: Pearson. • Anastasi, A & Urbina, S. (1997). **Psychological Testing** (7th ed) NY: Prentice-Hall. • Gregory, R.J. (2004). **Psychological Testing: History, Principles, & ApplHalland Lindzay, Theories of personality. New Delhi: Wiley India Pvt. Ltd.** • Friedman H. S. and Schustack, M. W. (2004**) Personality,** 2nd edition. NewDelhi: Pearson education. India.
Reference Books:	• Comer & Gould. (2011). **Psychology around Us.** New Delhi. Wiley India. • Chada, N.K. & Seth, S. (2014). **The Psychology Realm: An Introduction**. Pinnacle Learning. New Delhi. • Korchin S.J. (1986). **Modern Clinical Psychology**. New Delhi. Pearson. • Lamm, A. (1997). **Introduction to Psychopathology.**New Delhi. Pearson. • Coolican, H. (2006). Introduction to **Research Methodology in Psychology**. London. Hodder Arnold. • Misra, G. (1989).**Applied Social Psychology**. New Delhi. Sage publication. • Secord K. Beckman.**Social Psychology.** New York. McGraw Hill. • Kassin, S., Fein, S., & Markus, H.R. (2008), **Social Psychology**. New York

	• Miller, L.A., Lover, R.L. & McIntire, S.A. (2013). **Psychological Testing**. New Delhi: Sage. • Singh, A.K. (2008). **Tests, Measurements and Research Methods in Behavioral Sciences**. Patna: Bharati Bhawan. • Pervin L.A. **Personality: Theory and Research.** New Delhi: Wiley Eastern. • Biscoff, L J. (1970) **Interpreting personality theories.** New York. Harper and Roe.

ANNEXURE-18

Discipline Specific Course

CourseCode: ZL22P104	**ZOOLOGY**	Credits: 4
Course Objectives	1. Prepare students with the knowledge of different trends in biotechnology. 2. To prepare students as a research scholar well equipped and practiced inbio techniques. 3. To develop a research aptitude and critical thinking in the research scholar.	
Pre- requisite	Basic knowledge of Molecular Biology and Basic Cellular Techniques.	
Unit	**Contents**	
I	**TAXONOMY AND DEVELOPMENTAL BIOLOGY:** Molecular basis of evolution. Affinities in Invertebrates. Evolution of vertebrates – Amphioxus as model – Various hypothesis on evolution of vertebrates. Early development of vertebrates. Early development of Invertebrates. Gametogenesis and early development-Physiological, chemical and molecular events.	
II	**ENDOCRINOLOGY**: His to-physiology of Hypothalamus-Hypo-physical axis, Endocrineregulation of calcium Phosphate homeostasis in the vertebrates. Pineal gland structure and its functions, Pineal- thyroid-gonadal axis and its role in various vertebrates. Endocrine function of kidney(aldosterone reninangiotensin system)	
III	**ANIMAL BIOCHEMISTRY:** Hormonal control of carbohydrate, protein, and lipidmetabolism, Metabolism of Na, K, Biological significance of trace elements Fe, Cu, Mg, Zn, Se. Evolution of hormones and Mechanism of action of hormones at cellular level and at genetic level, Membrane receptors, CAMP, IP3, DAG and ZN-fingers. Enzymes – Mechanism of enzyme action and kinetics, coenzymes, respiratory enzymes.	
IV	**Molecular Biology: Cell Organelles and their functions, DNA** and RNA structure, DNA techniques, Immunology, Vertebrate immune response, The B cell response, the T cell response, Carcinogen-Biology of cancer. The AIDS virus and its life cycle. Gene Library, genome, genetic recombination.	
V	**INSTRUMENTATION-** Microscope, Microtome, Laminar air flow, centrifuge, auto clave, Hot air oven, chromatography, electronic balance, BOD, COD ,Ph meter histological techniques, cytologicaltechniques, PCR Southern and Northern techniques. etc.	
CO1	The students will be able to **understand**[2]basic concept of Recombinant DNA techniques and Genomics	
CO2	They will be able to **illustrate**[2]Analysis of protein	
CO3	Students will **understand**[2]the concepts of Gene expression.	
CO4	They will learn to **apply**[3]the concepts of bio techniques in laboratory.	
CO5	They will **develop**[3]the knowledge of Protein engineering.	

Textbooks /References	1. Schmidt-Nielsen K.(1995) Animal physiology, Adaptation and environment Cambridge university Press. 2. Bhatiya and Kohli fundamental of Ecology. 3. Veerbala Rastogi fundamental of Genetics 4. Celis J.E.(1994):Cell biology – a laboratory hand book ,Vol.I,II,and III Acadimic press	

ANNEXURE-19

Discipline Specific Course

Course Code: **LC21P104**	**ENGLISH**	Credits: 4
		4-0-0-4
Course Objectives	The purpose of this course will be to ground the students' understanding of English Literature and Language in the study of specific texts. The growth of English language and literature over the centuries from a totally different state- more in the condition of a dialect in the earliest periods- to what it is in the present century should form the background knowledge of every student of English literature. The luaint systems and structures of the medieval English developed rather luickly during the 16th and 17th centuries. The objective of this course is to introduce the music and luaintness of the English sounds and vocabulary of the earliest period in English literary history to the students to enable them to have a historical perspective of the developments over the centuries. The course also introduces the great masters of the English Literature.	
Pre-requisite		
UNIT	**CONTENT**	**HOURS**
I	Drama	10
II	Poetry, Fiction, Short Story, Non-Fictional Prose,	10
III	Language: Basic concepts, theories and pedagogy. English inUse.	15
IV	English in India: history, evolution and futures, Cultural Studies	10
V	Literary Criticism, Literary Theory post World War II	15

Course Outcomes as per Bloom's Taxonomy

At the end of the course the students should be able to:	
CO1	To develop a clear understanding of English Literature that provides the basis forthe texts suggested
CO2	To analyze the various elements of poetry, such as diction, tone, form, genre,imagery, figures of speech, symbolism, theme, etc.
CO3	To trace the evolution of sonnets, understand the sonnet form, analyze particularsonnets, and appreciate Shakespeare's contribution to the form.
CO4	To gain insight into the age of Shakespeare and the unilueness of Shakespeareancreative output with regard to both his sonnets and plays
CO5	To have a nuanced understanding of the dramatic literature of the Elizabethanperiod, with regard to the classical and romantic strains embedded in the plays
Text Books	Bruce Mitchell, *A Guide tu Old English*. Sixth Edition. Massachusetts. BlackwellPublishers, 2001. Carter, Ronald & MacRae,John. *The Ruutledge Histury uf English Literature inEnglish: Britain and Ireland*, New York.Routledge 1997. Gardner, Helen *The Metaphysical Puets* Penguin Books,1957. Gassner, John; Quinn, Edward (1969). "England: middle ages". *The Reader'sEncyclupedia uf Wurld*

	Drama. London: Methuen 2000. Graham Law, *Serializing Fictiun in the Victurian Press*. New York: Palgrave, 2000.
Reference Books	Henry Mayr-Harting, *The Cuming uf Christianity tu Anglu-Saxun England*.Pennsylvania: University Press Pennsylvania, 1992. ----*The English Alliteratiye Traditiun.* University of Pennsylvania Press. 1991Hieatt, A. Kent (1983). *Beuwulf and Other Old English Puems*. New York: Bantam Books 1999. Mikics, David . *A New Handbuuk uf Literary Terms*. New Haven, CT: YaleUniversity Press, 2007. Rupert Christiansen. *Rumantic Affinities: Purtraits Frum an Age*, 1780–1830.London: Bodley Head, 1988. Sanders ,Andrew. *The Shurt Oxfurd Histury uf English Literature*, Oxford:Clarendon Press,1994. Stanley Brian Greenfield, *A New Critical Histury uf Old English Literature.* NewYork: New York University Press, 1986. William ,Harmon and C. Hugh Holman, *A Handbuuk tu Literature*. (Upper SaddleRiver, New Jersey: Prentice Hall, 1986

ANNEXURE-20

Discipline Specific Course

Course Code **LW22P104**	**LAW**	**Credit-4**
Course Objectives:	1. Prepare students with the knowledge of different Courses in Law. 2. To prepare students as a research scholar well equipped and practiced in Law. 3. To develop a research aptitude and critical thinking in the research scholar.	
Prerequisite of course	• Postgraduate degree in a relevant discipline, competed from a recognized institute / University A minimum aggregate score of 55 %. Basic Knowledge of Law.	
UNIT	**CONTENT**	**HOURS**
I	**Constitutional Law of India:** Preamble, Fundamental Rights and Duties, DirectivePrinciples of State Policy, Writ Jurisdiction.	12
II	**Legal Theory:** Nature and Sources of Law, Custom; Importance of custom, Theories of customary law; Precedent: kinds, ratio decided; obiter dicta, Legislation,	12
III	**International Law and Institutions:** Nature of International Law and its relationship with Municipal Law**,** Sources of International Law**.**	12
IV	**Law of Crimes:** Nature and Definition of Offence**,** Meaning, nature essentials andstages of offence**,** Common Intention and Common Object, General Exceptions, Sexual Offences, Offences against Human Body, Offences against Property.	12
V	**Family Law:** Sources and Schools of Hindu Law in India**,** Marriage**,** Divorce**,** Adoption and Guardianship**,** Maintenance**,** Matrimonial-Remedies**.**	12
Course Outcome (As per Bloom's Taxonomy)		
At the end of the course the students will be able to:		
CO1	To **evaluate4** the relationship between Fundamental Rights and Directive Principles of State Policy in respect to social equality.	
CO2	Critically **analyze4** and research complex problems relating to law and legal theory.	
CO3	**Tell**[1] the concept of public law and its various branches.	
CO4	To illustrate**3** how society views crime against women, human body and property.	
CO5	The students will be able to understand**2** the working of Family Courts.	
Text Books	• Jai Narayan Pandey (2020) Constitutional Law of India, Allahabad, Central Law Agency. • B.N. Mani Tripathi(2018) Jurisprudence(Legal Theory), Allahabad, Allahabad law Agency. • V.K. Ahuja, (2016) The Public International Law, New Delhi, Lexis Nexis, Butterworths. • Ratan Lal and Dhiraj Lal (2017) The Indian Penal Code,New Delhi, LexisNexis, Butterworth. • Paras Diwan (2019) Modern Hindu Law, Allahabad, Allahabad law Agency.	
Reference Book	• S.R. Myneni (2020) Constitutional Law I,Hyderabad, Asia Law House. • N.V. Paranjape (2016) Jurisprudence And Legal Theory, Allahabad, Central law Agency. • Dr S.K. Kapoor's (2021) International Law and Human Rights,Central law agency • Prof S.N.Mishra(2017) Indian Penal Code, Allahabad, Central Law Publication. • Dr. S.R. Myneni (2014) Hindu Law (Family Law - I), Hyderabad, Asia Law House	

ANNEXURE-21

Discipline Specific Course

Course Code **PA22P104**	**POLITICAL SCIENCE**	**Credit-4**
UNIT	**CONTENT**	**HOURS**
I	**Political Theory:** Concepts- Liberty, Equality, Justice, Rights, Democracy, Power, Citizenship, Political Traditions, Liberalism, Conservatism, Socialism, Marxism, Feminism, Ecologism	
II	**Political Thought**: Confucius, Plato, Aristotle, Machiavelli, Hobbes, Locke, Rousseau, Hegel, Mary Wollstonecraft, John Stuart Mill, Karl Marx,	
III	**Indian Political Thought**: Dharamshastra, Kautilya, Aggannasutta, Barani, Kabir, Pandita Ramabai, Bal Gangadhar Tilak, Swami Vivekanand, Rabindranath Tagore, M.K Gandhi, Sri Aurobindo, Periyar E. V. Ramasamy, Muhammad Iqbal, M.N.Roy, V D Savarkar, Dr. B.R.Ambedkar, J L Nehru, Ram Manohar Lohia, Jaya Prakash Narayan, Deendayal Upadhyaya.	
IV	**Comparative Political Analysis:** Approaches: Institutional, Political Culture, Political Economy and New Institutionalism; Comparative Methods Colonialism and decolonization: forms of colonialism, anti-colonial struggles and decolonization State theory: debate over the nature of state in capitalist and socialist societies; post-colonial state; welfare state; globalization and nations-states Political regimes: democratic and non-democratic regimes Constitutions and Constitutionalism: forms of constitutions, rule of law, judicial independence and liberal constitutionalism; emergency powers and crisis of constitutionalism. Democratisation: democratic transition and consolidation. Development: Underdevelopment, Dependency, Modernization, World Systems Theory, development and democracy. Structures of Power: ruling class, power elites, democratic elitism	
V	Concepts: State, state system and non-state actors, Power, Sovereignty, Security: traditional and non- traditional. Conflict and Peace: Changing Nature of Warfare; Weapons of mass destruction; deterrence; conflict resolution, conflict transformation. Contemporary Challenges: International terrorism, Climate change and Environmental Concerns, Human Rights, Migration and Refugees; Poverty and Development; Role of Religion, Culture and Identity Politics.	

VI	India's Foreign Policy: Perspectives on India's Foreign Policy: India's Identity as postcolonial, development, rising power and as emerging political economy Continuity and change in India's Foreign Policy: Principles and determinants; Non-alignment movement: historical background and relevance of Non Aligned Movement; India's Nuclear Policy India's relations with major powers: USA, USSR/Russia, People's Republic of China India's Engagement with multipolar world: India's relations with European Union, BRICS, ASEAN, Shanghai Cooperation Organization, African Union, Southern African Development Community, Gulf Cooperation Council India's relations with neighborhood: SAARC, Gujral doctrine, Look East/ Act East, Look West. India's Negotiation Strategies in International Regimes: The United Nations, World Trade Organization, International Monetary Fund, Intergovernmental Panel on Climate Change	
VII	Political Institutions in India: Making of the Indian Constitution: Colonialism heritage and the contribution Indian National Movement to the making of the Indian Constitution Philosophy of the Constitution: Preamble, Fundamental Rights, Directive Principles Union Executive: President, Prime Minister and Council of Ministers Union Parliament: Structure, Role and Functioning, Parliamentary Committees Judiciary: Supreme Court, High Court, Judicial Review, Judicial Activism, Judicial Reform. Executive and Legislature in the States: Governor, Chief Minister, State Legislature Electoral Process and Election Commission of India: Conduct of Elections, Rules, Electoral Reforms. Local Government Institutions: Functioning and reforms. Constitutional and Statutory Bodies: Comptroller and Auditor General, National Commission for Scheduled Castes, National Commission for Scheduled Tribes, National Commission for Human Rights, National Commission for Women, National Commission for Minorities.	

VIII	Political Processes in India: State, Economy and Development: Nature of Indian State, Development Planning model, New Economic Policy, Growth and Human Development. Process of globalization: social and economic implications. Identity Politics: Religion, Tribe, Caste, Region, Language. Social Movements: Dalit, Tribal, Women, Farmers, labor Civil Society Groups: Non-Party Social Formations, Non-Governmental organizations, Social Action Groups.	

ANNEXURE-22

Discipline Specific Course

Course Code **SC22P104**	**SOCIOLOGY**	**Total Lecture:60**
		4–0–0=4
Course Objectives:	This course aims: • To understand the meaning and scope of sociology. • To recognize the foundation and approaches to social institutions. • To analyze the basic aspects of culture. • To explore the different methods of societal assessment. • To examine the social events and protests.	
UNIT	**CONTENT**	**HOURS**
I	**Introduction:** Sociological Concepts - Social Structure, Culture, Network, Status and Role, Identity, Community, Diaspora, Values, Norms and Rules, Personhood, Habitus and Agency, Bureaucracy, Power and Authority	10
II	**Family, Marriage and Kinship** - Theoretical Approaches: Structure-Functionalist, Alliance and Cultural, Gender Relations and Power Dynamics, Inheritance, Succession and Authority, Gender, Sexuality and Reproduction, Emotions and Family, Emergent Forms of Family, Changing Marriage Practices, Changing Care and Support Systems, Family Laws, Domestic Violence and Crime against Women, Honor Killing	14
III	**Rural Transformations** - Rural and Peasant Society, Caste-Tribe Settlements, Agrarian Social Structure and Emergent Class Relations, Land Ownership and Agrarian Relations, Decline of Agrarian Economy, De-Peasantization and Migration, Agrarian Unrest and Peasant Movements, Changing Inter-Community Relations and Violence	12
IV	**State, Politics and Development** - 1.**Political Processes in India**-Tribe, Nation State and Border, Bureaucracy, Governance and Development , Public Policy: Health, Education and Livelihoods , Political Culture , Grass-root Democracy , Law and Society , Gender and Development, Corruption, Role of International Development Organizations 2. **Social Movements and Protests** - Political Factions, Pressure Movements based on Caste, Ethnicity, Ideology, Gender, Disability, Religion and Region, Civil Society and Citizenship, NGOs, Activism and Leadership, Reservations and Politic Groups,	12

V	**Culture and Symbolic Transformations**- Signs and Symbols, Rituals, Beliefs and Practices, Changing Material Culture, Moral Economy, Education: Formal and Informal, Religious Organizations, Piety and Spirituality, Commodification of Rituals, Communalism and Secularism, Cultural Identity and Mobilization, Culture and Politics, Gender, Body and Culture, Art and Aesthetics, Ethics and Morality, Sports and Culture, Pilgrimage and Religious Tourism, Religion and Economy, Culture and Environment, New Religious Movements.	12

Course Outcomes (As per Blooms' taxonomy)	
After successful completion of course students will able to:	
CO1	**Outline**[1] the foundation and scope of sociology.
CO2	**Extend**[2]the various concepts and approaches to.
CO3	**Interpret**[2] the methods of assessment in the field of sociology.
CO4	**Compare**[4] the classification of DSM and ICD.
CO5	**Examine**[1]the different types of.
Text Books:	• Morgan, King & Weiss. An Introduction to Psychology. New Delhi. McGraw Hill. • Adams H.E. & Sutkar, F.G. (E.D.). **Comprehensive Handbook ofPsychopathology.** New Delhi. Springer. • Sarason & Sarason. **Abnormal Psychology**. New Delhi. Pearson. (10th Edition). • Taylor & Shelley. **Social Psychology**. New Delhi. Pearson. • Baron & Byrne. **Social Psychology**. New Delhi. Pearson. • Hussain & Akbar**. Social Psychology**. New Delhi. Pearson. • Aiken, L.R. &Groth- Marnat, G. (2009). Psychological Testing and Assessment (12th ed) Delhi: Pearson. • Anastasi, A.& Urbina, S. (1997). **Psychological Testing** (7th ed) NY: Prentice-Hall. • Gregory, R.J. (2004). **Psychological Testing: History, Principles, & ApplHall and Lindzay, Theories of personality. New Delhi: Wiley India Pvt. Ltd.** • Friedman H. S. and Schustack, M. W. (2004**) Personality,**2nd edition. New Delhi: Pearson education. India.
Reference Books:	**The Blackwell Encyclopedia of Sociology** by George Ritzer (Editor)ISBN: 9781405124331 Publication Date: 2007 **The Cambridge Dictionary of Sociology** by Bryan S. Turner ISBN: 9780511371455 Publication Date: 2006

	A Dictionary of Sociology by John Scott ISBN: 9780199683581 Publication Date: 2014 **Encyclopedia of Social Theory** by George Ritzer (Editor)ISBN: 0761926119 Publication Date: 2004 **Handbook of Social Movements Across Disciplines** by Bert Klandermans (Editor); Conny Roggeband (Editor) ISBN: 9780387709604 Publication Date: 2007 **Handbook of the Sociology of Aging** by Jacqueline L. Angel (Editor); Richard A. Settersten (Editor) ISBN: 9781441973740 Publication Date: 2011 **Handbook of the Sociology of Health, Illness, and Healing** by Bernice A. Pescosolido (Editor); Jack K. Martin (Editor); Jane D. McLeod (Editor); Anne Rogers (Editor) ISBN: 9781441972613 Publication Date: 2010 **Handbook of the Sociology of Mental Health** by Carol S. Aneshensel (Editor); Alex Bierman (Editor); Jo C. Phelan (Editor) ISBN: 9789400742765 Publication Date: 2012 **Handbook of the Sociology of Morality** by Steven Hitlin (Editor); Stephen Vaisey (Editor) ISBN: 9781441968968 Publication Date: 2010 **International Encyclopedia of Marriage and Family** ISBN: 0028656725 Publication Date: 2002 **The Wiley-Blackwell Companion to Major Social Theorists** by George Ritzer (Editor); Jeffrey Stepnisky (Editor) ISBN: 9781444396607 Publication Date: 2011

ANNEXURE-23

Discipline Specific Course

Course Code **AD20P102**	**APPERAL DESIGN**	**Total Lecture:**
I	**Textile Design function:** Geometrical Principles of apparel Construction, Use of basic design elements in motif, pattern, fabric and garment design generation. Geometry of patterns, Placement of patterns by various combining techniques via translation, rotationto create fabric design.	**10**
II	**Techniques of design generation:** Weaving, dyeing and Printing e.g. brocades, Ikat,batik, kalamkari, Home fashion textiles, Quilt Designing-Types of fabrics, weddings, geometrical and resist dyed quilts patterns, Bed sheet designing-cut and spread techniques,Towels and Carpets.	**12**
III	**Computer assisted technologies in garment industry:** Introduction to CAD/ CAM and CIM, Fashion illustration and portfolio presentation via Patterns insertions and modifications, special effects brushes, color modifications etc., Fashion marketing concept, Fashion Promotion Mix.	**14**
IV	**Introduction to nonwovens:** Fabre preparation processes. Web formation processes. Web bonding processes. Finishing processes. Knitting and knitwear:Manufacturing of single jersey, rib, purl and interlock weft knit fabrics. Properties of these fabrics, Manufacturing of Tricot and Rashal fabrics and properties of these fabrics, Knitwearmanufacturing, their design, properties and application	**14**
V	Modern Apparel production: Modern marker planning, spreading, cutting, sewing, pressing and delivery techniques. Different types of Software's used for modern apparel production techniques	**10**

ANNEXURE-24

Discipline Specific Course

Course Code **JM20P104**	**JOURNALISM & MASS COMMUNICATIONS**	**Total Lecture:**
Course Objectives	The Program Ph.D will develop ability to identify and solve the real world problems related to various areas of Journalism and Mass Communication. It will also develop an aptitude to apply Theories and Models of Mass Communication, Journalism and in- depth knowledge of various aspects of Media related to the society.	
Prerequisite of course-	Postgraduate degree in a relevant discipline, competed from recognized institute /university A minimum aggregate score of 55%.	
UNIT	**CONTENT**	**HOURS**
I	**Journalism and Mass Communication**; -History of journalism, Four theories of Press, The Role of Press, News and News values, Freedom of Press: The Right to Expression, Right to Privacy, Press Codes and Ethics, The MacBride Report, NWICO, First Press Commission, Second Press Commission, Press Council of India, Media Laws, Censorship And Control of Press. Media Roles and Responsibilities, Freedom of Press. Mass communication Concept and functions, Theories of communication(Modernization, Agenda Setting, Dependency, Cognitive Dissonance, Cultivation)Models of Mass Communication (SMCR, Aristotle, Lasswell, Osgood, Shennon Weawer, Schramm)	**12**
II	**Public Relations and Advertising:-** Concept and Scope of PR, Tools and Techniques of PR, Lobbing, Propaganda and publicity, PR process and practice, Professional bodies (PRSI, IPRA, PRSA), Digital PR, Corporate communication, Corporate social responsibility, Crisis Management. Advertising concept and scope, Evolution of advertising, Advertising, Advertising agencies and classifications. Advertising - creativity and ethics. Media Planning, Media Buying, Media Scheduling, Client Servicing, Copy writing for different media, Brand Management,IMC.	**12**
III	**Electronic Media: -** Development of Broadcasting in India, Commission and Committees on Broadcasting (Chanda Committee, Vergheese Committee, Prasar Bharti Act, Vardan Committee)**,**	**12**

	Terrestrial and Satellite Television, Cable Television, Radio and TV Programme formats, Types of Shots and their use, Types of Microphones and application, Video Production Process (Pre production, Single and Multi-Camera Setup, Production and Post Production), Lighting for Television, Audio Production Process, Cinematography Act, IT Act, Copyright, Intellectual Property Rights.	
IV	**Media, Culture and Society**: - The Cultural context of development, Development Communication, Modernisation model of development communication, Alternative approaches to development, The need for National and International regulations, Use of ICT for development. Development models of Daniel Lerner, EM Rogers, Wilbur Schramm, and Participatory Rural Appraisal. SITE, JDCP, KCP, Philosophy and policy of Community Radio, Contemporary issues of Development Communication.	**12**
V	**New Media: -** New Media Technology, New Media Access and Control, Digital Divide, Information and knowledge Society, Information Society Theories – (Daniel Bell, Machlup, Webster, Schiller), Evolution of New Media Audiances (Elite , Mass, Specialised and Interactive), New Media Uses and Gratification, Social and Cultural Effects of New media, New Media theory and Perspective, Social-technical paradigm , Media in DigitalAge**,** New Media issues – (Invasion of Privacy, Piracy, Cyber Crimes, Pornography, IT Policy, Information Bill and Regulations).	12
COURSE OUTCOMES		
At the end of the course the students should be able to:		
CO1	Research Scholar would be able to acquaint with the in-depth knowledge of Journalism and Mass Communication.	
CO2	Research Scholar would be able to understand the different dimensions of Media Studies.	
CO3	Research Scholar can develop the sense of importance of the communication Research as per the need of the hour.	
CO4	Research Scholar would be able to understand the various phenomena of the Mediato meet international standard for Communication Research.	
CO5	Research scholar would be able to develop the critical thinking, research aptitude, ethics and social responsibility related to media for society.	
Text Books	1.Kumar. Kewal. J.(1994).Mass Communication in India, Jaico Publications .Mumbai.Forth Edition 2.Hasan .Seema.(2016).Mass Communication: Principles and Concepts.CBS Publishers. SecoEdition 3.Mehta .D.S.(2014). Mass Communication and Journalism In India.Allied Publishers.401 Pa4.Greer .Graham. .(1998). A New Introduction to Journalism. Juta and Company Ltd.240 Pag	

	5.Rudin. Richard & Ibbotson. Trevor. (October 10, 2002).Focal Press.1st edition 6.Chatterjee, P.C.(2010). Broadcasting In India.Sage Publications 7.Singh.Devvrat.(2012).Indian Television: Content, Issues and Challenges, Haranand Publications .Delhi 8.Narayan .Sunetra Sen.(2014). Globlization and Television. Oxford University Press Delhi 9. Prof. Uma Shankar Pandey, Perspectives of Mass Communication Theory, First Edition S.I pvt.ltd., Kolkata
Reference Books	1. Barnas. Frank.(2017).Broadcast News writing, Reporting and Producing . Routledge. ,Seventh Edition 2. Mcluhan . Marshall .(1964).Understanding Media, McGraw - Hill, Education.Canada Schramm, W. & Roberts, D.F., The Process and Effects of Mass Communication, Urbana,IL: University of Illinois Press.

ANNEXURE-25

Discipline Specific Course

Course Code PP22P104	**PUBLIC AMINISTRATION**	**Total Lecture:**
UNIT	**CONTENT**	**HOURS**
I	**Public Administration as a Discipline**: Meaning, Nature, Scope, Dimensions and Significance of the discipline and its relations with Political Science, Management, Law and Economics.	
II	**Salient features of Indian Constitution**: Democracy, Federal System, Parliamentary Government, Fundamental Rights and Duties, Directive Principles of State Policy. Union Executive: President, Prime Minister, Council of Ministers Judiciary – Supreme Court – Composition, Jurisdiction and Functions, Administrative Adjudication	
III	**Constitutional Bodies** – Election Commission, UPSC, Finance Commission, State Public Service Commission State Government – Governor, Chief Minister, Council of Ministers	
IV	**Public Personnel Administration–** Concept, Meaning, Nature and Scope. Types of Personnel Systems – Aristocratic, Bureaucratic and Democratic; Principles of Personnel System – Merit, Spoils, Career Recruitment Meaning and Importance, Main Features of the System of Recruitment in India, Central and State Services. Types of Recruitment; Union Public Service Commission and State Public Service Commission – Composition, Functions and Role Retirement Meaning and Significance, Features and Forms. Retirement Benefits – Pension, Provident Fund and Gratuity. New Pension Scheme	
V	**Salient Features of Administration in Developed & Developing Countries- Social, Economic, Political and Administrative Structural Functional Approach, Behavioral Approach and Ecological Approach Accountability**: Control Machinery of UK, USA, Japan Relevance of Comparative Public Administration in the era of Liberalization, Privatization and Globalization (LPG)	

VI	**Development Administration Definition**, Distinction between Development Administration and General Administration - Nature, Concept, Theories and Assumptions of Development Administration	
VII	**Evolution of local Self Government** Pre-independence Period: British Period, Post-independence Period: Community Development Programme, Balwantarai Mehta Committee and Ashok Mehta Committee.	
VIII	**Rural Government**: Evolution of Rural Government in India: Panchayati Raj, Zilla Parishad, Panchayat Samiti and Grama Panchyat Composition, Functions, Finance, State Finance Commission.	

ANNEXURE-26

Discipline Specific Course

Course Code **PA21P104**	**PERFORMING ARTS**	**Total Lecture: 60**
Course Objectives	The purpose of this course will be to ground the students' understanding of Performing Arts in the study of specific texts. The DSE focuses on the trainingof the Performing Arts Practitioners both from the Theory and the Practical Perspectives involving intense Research sessions. This is typically designed forPractitioners who had intensive training in their specific art form for at least 5 years. This Full-Time dedicated course offers teaching under Full Time Facultyboth for Theory and Practical with well-equipped Teaching aids and intricately framed Syllabus	
UNIT	**CONTENT**	**HOURS**
I	**Cultural History of India** • Cultures of India from pre-historic to CE 1200 • Evolution of Art in pre-historic and historic periods, as evidenced in cave paintings, sculptures and other visual representations • Evolution of dance and drama (Natya), (a) the divine origin theory according to Natya sastra, and, (b) art as a product of society, its rituals and belief systems • The Vedas, major epics and puranas (Ramayana, Mahabharata, Cilappadika ram and Bhagavata purana) in terms of their content, character and relevance to dance and theatre • Bhakti and various religious movements and their influence on different representative aspects of culture with focus on dance and theatre	**10**
II	**Folk and Traditional Theatre Forms of India** • Understanding and defining the terms Tribal, Folk, Traditional and Classical in the context of Indian dance and drama and their interrelation • Introduction to the different tribal, folk and traditional dance and theatre forms spread over various regions of India • Introduction to regional theatrical practices of Kudiattam,	**10**

	Yakshagana, Bhagavatamela, Tamasha, Ramalila, Rasalila, Bhavai, Nautanki, Jatra, Chhau, Laiharaoba, Therukoothu, Theyyam, Ankia-nat, Pandvani, Chindu Bhagavata, Bhand Jashan and others • Awareness of various musical instruments, costumes and make-up used in these forms	
III	**The Natya sastra** • Knowledge of Natya sastra and the concept of Natya and Nritta • Study of chapters relating to the eleven aspects (ekadash sangraha) such as, Abhinayas, Dharmis, Vrittis, Pravrittis and Aatodyas. Samanya and Chitrabhinayas and their classification • Dasarupakas • Natyagruha (Playhouse) and Ranga – Construction, types and different elements • Poorvarangavidhi and Stage conventions viz. Kakshya vibhag etc.	15
IV	**Art and Aesthetics** • 'Rasasutra' of Bharata • Elaboration of the theory of Rasa by commentators like Bhattalollata, Sri Sankuka, Bhattanayaka andAbhinavagupta. • Rasa and its constituent elements, viz., Sthayi, Sanchari and Sattvika bhavas and their corresponding Vibhavas and Anubhavas • Definition, purpose and elements of Art • A brief introduction to Performance studies and significant western theories on Art : 'Art as Imitation/Catharsis' , 'as Imagination', 'as Beauty', 'as Communication' and 'as Utility' put forth by various Philosophers	10
V	**Dance and Theatre forms of East and South Asian Countries** • An overview of dance and theatre forms of East Asian (China, Japan and Korea), South Asian (Bangladesh, Pakistan and Sri Lanka) and South- East Asian (Indonesia, Thailand, Vietnam, Cambodia, Myanmar, Philippines and Laos) countries • History and presentation techniques of various popular theatre and dance forms of the above countries	15
Course Outcomes as per Bloom's Taxonomy		
At the end of the course the students should be able to:		
CO1	**Prospective Employment and Career Prospects-** To empower graduates for employment in the performing arts field, content writing, teaching and exploring careers in Performing Arts and orient them for research and higher studies.	
CO2	**Proficiency-** Graduates will demonstrate comprehensive knowledge of literature in their chosen domain or research focus. They will describe a range of techniques related to performing arts and rhetorical strategies used in texts, including their relationship to audience, purpose and cultural contexts.	
CO3	**Entrepreneurship-** Establish dance institutes/studios and to work as entrepreneurs with an ability to develop new projects and choreographicworks.	

CO4	**Research Methods-** Graduates will learn how to design and carry out original and persuasive research in Performing arts, English literature and Psychology with particular attention to literary theory and criticism.
CO5	**Continuous Learning-** The course will enable them to be a continuous learnerby expanding the skill-set in response to a changing environment and new developments.
Text Books	Bruce Mitchell, *A Guide to Old English*. Sixth Edition. Massachusetts. Blackwell Publishers, 2001. Carter, Ronald & MacRae,John. *The Routledge History of English Literaturein English: Britain and Ireland*, New York.Routledge 1997**.** Gardner, Helen *the Metaphysical Poets* Penguin Books, 1957. Gassner, John; Quinn, Edward (1969). "England: Middle Ages". *The Reader's Encyclopedia of World Drama*. London: Methuen 2000. Graham Law, *Serializing Fiction in the Victorian Press*. New York: Palgrave,2000.
Reference Books	Henry Mayr-Harting, *The Coming of Christianity to Anglo-Saxon England*. Pennsylvania: University Press Pennsylvania, 1992. ----*The English Alliterative Tradition*. University of Pennsylvania Press. 1991 Hieatt, A. Kent (1983). *Beowulf and Other Old English Poems*. New York: Bantam Books 1999. Mikics, David. *A New Handbook of Literary Terms*. New Haven, CT: YaleUniversity Press, 2007. Rupert Christiansen. *Romantic Affinities: Portraits from an Age*, 1780–1830. London: Bodley Head, 1988. Sanders, Andrew. *The Short Oxford History of English Literature*, Oxford: Clarendon Press,1994. Stanley Brian Greenfield, *A New Critical History of Old English Literature*.New York: New York University Press, 1986. William, Harmon and C. Hugh Holman, *A Handbook to Literature*. (UpperSaddle River, New Jersey: Prentice Hall, 1986