SCHOOL OF PHARMACY

Subject: Human Anatomy and Physiology-I (T) **Subject code: 22PS101**

Year/Sem : I-I **Regulation: R22**

Course Outcomes	Upon completion of the course the students will be able to
CO1	Understand the cellular and tissue levels. Their structure, locations and functions
CO2	Describe the integumentary system, skeletal system and joints with the diagram, classification and functions.
CO3	Analyse in depth the basics of nervous system and central nervous system in detail.
CO4	Evaluate the organs and mechanisms involved in the functioning of peripheral nervous system. Will have sound knowledge about the sense organs with diagrams
CO5	Explain in detail about all the endocrine glands, hormones secreted by them and their functions and disorders caused because the hormones.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	**2**	1	2								
CO 2	3	-	2								
CO 3	2	1	1								
CO 4	1	-	1								
CO 5	**1**	1	1								

Course Coordinator Program Coordinator HOD

Name of the Subject: Pharmaceutical Analysis-I (T) **Subject Code: 22PS102**

Year/Sem: I-I **Regulation: R22**

CO 1	Develop the ideas with the fundamentals of analytical Chemistry.
CO 2	Construct the fundamental methodology to prepare different strength of solutions and can Predict the sources of Errors.
CO 3	Develop Knowledge on Principe, Classification and applications of different types of titrimetric methods.
CO 4	Develop basic knowledge in the principles of electrochemical analytical techniques.
CO 5	Develop interpretation Skills in terms of choice of analytical techniques to perform the estimation of different category drugs.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	1	-	-	1	-	-	-	-	-
CO 2	1	3	3	3	-	2	-	-	-	-	-
CO 3	3	-	2	3	-	-	-	-	-	-	-
CO 4	1	3	3	2	-	-	-	-	-	-	-
CO 5	3	2	3	2	-	-	1	-	-	-	-
AVG											

Course Coordinator

Program Coordinator

HOD

Subject name: Pharmaceutics (T) **Subject code: 22PS103**

Year/ Sem: I-I **Regulation: R22**

Course Outcomes	Upon completion of the course, the students will be able to
CO1	OUTLINE various pharmaceutical dosage forms, their excipients, preparation methods and evaluation.
CO2	SUMMARIZE on prescription, child dose, dosage forms and their problems associated while dispensing and how to overcome.
CO3	DETERMINE the different incompatibilities. Associated with formulation while dispensing and preventive measures.
CO4	EXPLAIN about pharmacopeia, history of pharmacy education and industry.
CO5	ESTIMATE and solve problems related to allegation, tonicity, and proof spirit.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	3	2	-	-	-	-	-	-	2
CO 2	3	3	2	3	-	-	-	-	-	-	2
CO 3	2	3	2	2	-	-	-	-	-	-	2
CO 4	3	2	3	2	-	-	-	-	-	-	1
CO 5	2	3	2	3	-	-	-	-	-	-	1

Course Coordinator Program Coordinator HOD

Subject name: Pharmaceutical Inorganic Chemistry **Subject code: 22PS104**

Year/ Sem: I-I **Regulation: R22**

Course Outcomes	Upon completion of the course the students will be able to
CO 1	To Know the sources of impurities and the methods to determine the Impurities in Inorganic drugs and Pharmaceuticals.
CO 2	To understand the basics of Acids ,Bases and Electrolytes and Dental products
CO 3	To explain the medicinal and Pharmaceutical importance of Inorganic compounds.
CO 4	To describe the importance of Expectorants, Emetics, Antidotes and Astringents.
CO 5	To understand the handling and applications of Radiopharmaceuticals.

Mapping Matrix of CO's and PO's:

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	3	3								2
CO 2	3	2	2								2
CO 3	2	3	2								2
CO 4	3	3	2								2
CO 5	3	3	2								2

Course coordinator Program coordinator HOD

SCHOOL OF PHARMACY

Subject name: Communication skills **Subject code: 22HS105**

Year/ Sem: I-I **Regulation: R22**

Course Outcomes	Upon successful completion of this course, the student will be able to
CO-1	Demonstrates effective English communication skills through speaking, listening reading and writing .
CO-2	Develops confidence to use proper communication , using apt kinesics or body language in communication.
CO-3	Analyze the writing skills through letters, reports and resume writing from the text and use for all professional settings.
CO-4	Develops listening and reading techniques to communicate confidently and respond appropriately in all the skilled and social settings.
CO-5	Self assured to organize and deliver discussions, presentations and strategies to face the interviews effectively.

	Relationship of Course outcomes to Program Outcomes (PO AVG)																		
Course Outcomes (CO)	PO1	PO2		PO3			PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11		PO12			PS01	PS02
CO1	-	3	-				-	3	3		3	-	-	-	-	-			-	-
CO2	-	3	-				-	3	-		2	-	-	-	-	-			-	-
CO3	-	-	-				-	-	-		3	-	-	-	-	-			-	-
CO4	-	-	-				-	-	-		-	-	-	-	-	-			-	-
CO5	-	2	-				-	2	-		2	-	-	-	-	-			-	-

Course coordinator Program coordinator HOD

Subject name: Remedial Mathematics **Subject code: 22BS107**

Year/ Sem: I-I **Regulation: R22**

CO 1	Perform basic Matrix operations and solve linear equations. And apply this knowledge in Pharmaceutical Sciences
CO 2	Perform basic Logarithms and Functions operations and solve the related problems. And apply this knowledge in Pharmaceutical Sciences
CO 3	Solve basic Limits and Derivative problems. And apply this knowledge in Pharmaceutical Sciences
CO 4	Perform and solve basic Integration problems. And apply this knowledge in Pharmaceutical Sciences
CO 5	Solve basic Differential equations. And apply this knowledge in Pharmaceutical Sciences

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	1		1				-	-	-	-	1
CO 2	1		1				-	-	-	-	1
CO 3	1		1				-	-	-	-	1
CO 4	1		1				-	-	-	-	1
CO 5	1		1				-	-	-	-	1

Course Coordinator Program Coordinator HOD

Subject name: Human Anatomy and Physiology-I (L) **Subject code: 22PS108**

Year/Sem: I-I **Regulation: R22**

Course Outcomes	Upon completion of the course, the students will be able to
CO1	UNDERSTAND the construction, working, care and handling of instruments, glassware's and equipment's required for practical
CO2	IDENTIFY different types of tissues and their location
CO3	EXPLAIN human axial and appendicular skeleton system with the help of bones.
CO4	EXAMINE anatomy and physiology of human nervous system with the help of charts and models
CO5	INSPECT the anatomy and physiology of sense organs and their disorders using different models and charts

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	**2**	1									
CO 2	3										
CO 3	2		1								
CO 4	2	1	1								
CO 5	**2**	1	1	1							

Course Coordinator Program Coordinator HOD

Name of the Subject: Pharmaceutical Analysis-I(L) **Subject Code: 22PS109**

Year/Sem: I-I **Regulation: R22**

Course Outcomes	Upon completion of the course, the students will be able to
CO1	Develop the Calculations of various standardized solutions.
CO2	Construct the fundamental methodology to prepare different strength of solutions and can Predict the sources of Errors.
CO3	Develop Knowledge on Principe and assay procedure of various titrimetric methods.
CO4	Develop basic knowledge in the principles of electrochemical analytical techniques.
CO5	Develop interpretation Skills in terms of choice of analytical techniques to perform the Qualitative and Quantitative estimation of different category drugs.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	2	-	-	1	-	-	2	-	-
CO 2	3	3	2	-	-	-	-	-	1	-	-
CO 3	3	2	2	-	-	1	-	-	2	-	-
CO 4	3	3	2	-	-	-	-	-	1	-	-
CO 5	3	2	1	1	-	1	-	-	2	-	-

Course Coordinator Program Coordinator HOD

Subject name: Pharmaceutics (L) **Subject code: 22PS110**

Year/ Sem: I-I **Regulation: R22**

Course Outcomes	Upon completion of the course, the students will be able to
CO1	Demonstrate and practice preparation and dispensing of various liquid and semisolid dosage forms
CO2	Identify the incompatibilities in dispensing a pharmaceutical dosage form
CO3	Evaluate the prescription and estimate the accurate dose using various calculations.
CO4	Summarize on packaging, labelling and storage conditions of various dosage forms
CO5	Compare and contrast various dosage forms based on appearance.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	-	2	-	-	-	-	-	3	3
CO 2	3	3	2	3	-	-	-	-	-	3	3
CO 3	3	3	3	-	-	-	-	-	-	1	3
CO 4	3	-	3	2	-	-	-	-	-	-	3
CO 5	3	2	3	1	-	-	-	-	-	2	3
AVG	3	2	2.2	1.6	-	-	-	-	-	1.8	3

Course Coordinator Program Coordinator HOD

Subject name: Pharmaceutical Inorganic Chemistry(L) **Subject code: 22PS111**

Year/ Sem: I-I **Regulation: R22**

Course Outcomes	Upon completion of the course the students will be able to
CO 1	To Identify the sources of impurities by performing limit tests.
CO 2	To identify the compounds by performing their specific identification tests.
CO 3	To prepare the medicinal and Pharmaceutical important Inorganic compounds.
CO 4	To identify the Neutralizing capacity of inorganic compounds.
CO 5	To determine the swelling power of Bentonite.

Mapping Matrix of CO's and PO's:

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	3	3								2
CO 2	3	2	2								2
CO 3	2	3	2								2
CO 4	3	3	2								2
CO 5	3	3	2								2

Course coordinator Program coordinator HOD

Subject name: Communication skills(L) **Subject code: 22PS112**

Year/ Sem: I-I **Regulation: R22**

Course Outcomes	Upon completion of the course the students will be able to
CO 1	Adapts good pronunciation, identifying the correct speech sounds and excel to communicate well in the professional and personal contexts.
CO 2	Creates a consistent accent and builds confidence
CO 3	Identifies the errors in pronunciation and facilitates students in speaking Target language i.e. English without the influence of mother tongue.
CO 4	Demonstrates , public speaking skills with clarity and confidence through appropriate verbal and non verbal communication.
CO 5	Develop the comprehension skills and improves appropriate language for public speaking, group discussions and Interviews.

Mapping Matrix of CO's and PO's:

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	**3**	3	3								2
CO 2	3	2	2								2
CO 3	2	3	2								2
CO 4	3	3	2								2
CO 5	3	3	2								2

Course coordinator Program coordinator HOD

Subject name: Human Anatomy and Physiology-II(T) **Subject code: 22PS201**

Year/Sem: I-II **Regulation: R22**

Course Outcomes	**Upon completion of the course, the students will be able to**
CO1	Recall the composition and functions of blood components and the mechanism of blood coagulation.
CO2	Summarize the anatomy, physiology & disorders of the cardiovascular system.
CO3	Understand the anatomy, physiology & disorders of the digestive system.
CO4	Demonstrate the respiratory system and understand the essential organs of the urinary system and the process of urine formation.
CO5	Explain the male and reproductive systems and understand the concept of genetics.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO 1	**3**	2	3	2	-	-	-	-	-	-	2
CO 2	3	3	2	3	-	-	-	-	-	-	2
CO 3	2	3	2	2	-	-	-	-	-	-	2
CO 4	3	2	3	2	-	-	-	-	-	-	1
CO 5	**2**	3	2	3	-	-	-	-	-	-	1

Course Coordinator Program Coordinator HOD

Name of the Subject: Pharmaceutical Organic Chemistry-I **Subject Code: 22PS202**

Year/Sem: I-II **Regulation: R22**

Course outcomes	Upon completion of the course the students will be
CO1	Develop basic knowledge of organic compounds, IUPAC systems, types of isomerism and reactions and effects of substituents.
CO2	Able to understand the concept of saturated and unsaturated compounds, their preparation and reactions.
CO3	Able to understand the concept of functional groups their preparation, reactions, analysis and factors effecting the reactions.
CO4	Able to understand the concept of acidity and factors influencing their character.
CO5	Able to understand the concept of basicity and factors influencing their character.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

Course outcomes	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	1	2	1	-	-	-	-	-	-	-
CO2	3	3	2	2	-	-	-	-	-	1	-
CO3	3	3	3	2	-	-	-	-	-	1	-
CO4	3	1	2	1	-	-	-	-	-	-	-

Course Coordinator Program Coordinator HOD

Name of the Subject: Biochemistry (T) **Subject Code: 22BS203**

Year/Sem: I/II **Regulation: R22**

CO1	Define different definitions like enzymes, hemostasis, osmoregulation, carbohydrates, protein, vitamins, lipids, nucleic acids and compare the structure and functions of different organelles.
CO2	Explain electron transport chain and oxidative phosphorylation, its importance and mechanism of actions.
CO3	Determine the energetic of various metabolic pathways like glycolysis, ETC, Krebs cycle, β oxidation of fatty acids etc.
CO4	Classify and explain the different types of enzymes and enzyme inhibitions. Demonstrate the factors effecting enzyme action.
CO5	Outline the concepts and biological importance of biological macromolecules. Discuss and explain the various metabolisms of complex biochemical macromolecules like carbohydrates

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO 1	2	1	2							2	1
CO 2	2	2	2							1	1
CO 3	1	2	1							2	1
CO 4	2	1	2							2	1
CO 5	1	2	2							2	1
AVG	1.6	1.6	1.8							1.8	1

Course Coordinator Program Coordinator HOD

Name of the Subject: Pathophysiology (T) **Subject Code: 22BS204**

Year/Sem: I/II **Regulation: R22**

CO-1	DEFINE basic principles of Cell injury and able to explain basic mechanism involved in the process of inflammation
CO-2	OUTLINE the diseases related to cardiovascular, respiratory and renal system.
CO-3	UTILIZE the knowledge in diagnosing the diseases related to haematological diseases and endocrine, nervous and gastrointestinal systems
CO-4	EXPLAIN the etiology of diseases related to bone, joints and pathogenesis of cancer
CO-5	ILLUSTRATE the etiology and pathogenesis of infectious diseases.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	-	1	-	-	1	-	-	-	-	-
CO 2	3	-	3	3	-	2	-	-	-	2	2
CO 3	3	-	3	3	-	2	-	-	-	2	2
CO 4	3	-	3	2	-	2	-	-	-	2	2
CO 5	3	-	3	2	-	2	-	-	-	2	2
AVG	3		3	2		2				2	2

Course Coordinator Program Coordinator HOD

Name of the Subject: CAP (T) **Subject Code: 22CS205**

Year/Sem: I/II **Regulation: R22**

CO-1	Understand the concept of data collection and treatmen
CO-2	Apply the knowledge of data collection to find statistical information
CO-3	Understand the concept CRD, RBD and LSD and evaluate to the Design concept.
CO-4	Demonstrate the basic concepts of MS Excel and MS Power Point
CO-5	Analyze benefits of Data base Management systems and Structured Query Languages

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	-	1	-	-	1	-	-	-	-	-
CO 2	3	-	3	3	-	2	-	-	-	2	2
CO 3	3	-	3	3	-	2	-	-	-	2	2
CO 4	3	-	3	2	-	2	-	-	-	2	2
CO 5	3	-	3	2	-	2	-	-	-	2	2
AVG	3		3	2		2				2	2

Course Coordinator Program Coordinator HOD

Subject name: Human Anatomy and Physiology-II (L) **Subject code: 22PS206**

Year/Sem: I-II **Regulation: R22**

Course Outcomes	Upon completion of the course, the students will be able to
CO1	Demonstrate and classify the different types of blood groups and blood cells.
CO2	Recall the major steps in blood coagulation, clotting and bleeding time.
CO3	Describe sedimentation rate, hemoglobin contents.
CO4	List the major components of blood plasma and describe the functions of each.
CO5	Define pregnancy and describe the process of fertilization and various contraceptive methods.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	3	2	1	-	-	-	-	-	2
CO 2	3	3	2	3	-	-	-	-	-	-	2
CO 3	2	3	2	2	2	-	-	-	-	-	2
CO 4	3	2	3	2	-	-	-	-	-	-	1
CO 5	2	3	2	3	3	-	-	-	-	-	1

Course Coordinator Program Coordinator HOD

Name of the Subject: Pharmaceutical Organic Chemistry-I (L) **Subject Code: 22PS207**

Year/Sem: I-II **Regulation: R22**

Course outcomes	**Upon completion of the course, the students will be able to**
CO1	Develop basic knowledge on organic compounds and how to evaluate them.
CO2	Able to understand the concept of saturated and unsaturated, extra elements and how to evaluate them.
CO3	Able to understand the concept of functional groups their preparation, reactions, analysis and factors effecting the reactions.
CO4	Able to construct molecular models.

COPO MAPPING OF PHARMACEUTICAL ORGANIC CHEMISTRY-I LAB

Relationship of Course Outcomes (CO) to Program Outcomes (PO)											
Course outcomes	**PO 1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO1	3	2	3	1	-	-	-	-	-	-	-
CO2	3	2	3	2	-	-	-	-	-	-	-
CO3	3	3	3	2	-	-	-	-	-	-	-
CO4	3	1	-	3	-	-	-	-	-	-	-

Course Coordinator Program Coordinator HOD

Name of the Subject: Biochemistry (L) **Subject Code: 22BS208**

Year/Sem: I/II **Regulation: R22**

CO1	Identify the Carbohydrates by performing their individual identification tests.
CO2	Evaluate the Glucose content which is present in Urine.
CO3	Calculate the percentage of creatinine present in Blood.
CO4	Identify the proteins by performing their individual identification tests.
CO5	Identify the Amino acids by performing their individual identification tests

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1			2	2	2					2	1
CO 2			2	2	1					1	1
CO 3			1	2	1					2	1
CO 4			2	1	2					1	2
CO 5			2	2	1					2	1
AVG			1.80	1.80	1.40					1.6	1.2

Course Coordinator Program Coordinator HOD

Name of the Subject: CAP (L) **Subject Code: 22CS209**

Year/Sem: I/II **Regulation: R22**

CO1	Apply the concept of data collection and treatment
CO2	Apply the concept of data collection and treatment
CO3	Apply the concept CRD, RBD and LSD and evaluate to the Design concept.
CO4	Demonstrate the basic concepts of MS Excel and MS Power Point
CO5	Analyze benefits of Data base Management systems and Structured Query Languages

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1			2	2	2					2	1
CO 2			2	2	1					1	1
CO 3			1	2	1					2	1
CO 4			2	1	2					1	2
CO 5			2	2	1					2	1
AVG			1.80	1.80	1.40					1.6	1.2

Name of the Subject: POC-II (T) **Subject Code: 22PS301**

Year/Sem: II-I **Regulation: R22**

Course Outcomes	Upon completion of the course, the students will be able to
CO 1	Able to write and predict the structure, nomenclature, Aromaticity, reactivity and orientation of benzene and its derivatives, Nitro compounds, Polycyclic Aromatic Hydrocarbons and cycloalkanes.
CO 2	Able to analysis and predict the Acid –base properties of phenols and aromatic amines and its effect on substitution
CO 3	Able to write the synthesis and predict the mechanisms of Benzene derivatives and Polycyclic Aromatic Hydrocarbons.
CO 4	Able to write the reactions and predict the mechanisms and uses of benzene and its derivatives, Nitro compounds, Polycyclic Aromatic Hydrocarbons and cycloalkanes
CO 5	Able to demonstrate various theories and predict the stabilities of cycloalkanes and their reactivity

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3					2	3		
CO 2	3	3	3					2			
CO 3	3							2	2	2	
CO 4	3							2		2	
CO 5	3	2	2					2			

Course Coordinator Program Coordinator HOD

Name of the Subject: Physical Pharmaceutics-I (T) **Subject Code: 22PS302**

Year/Sem: II-I **Regulation: R22**

Course Outcomes	Upon completion of the course, the students will be able to
CO 1	DEFINE terminology related to properties of matter.
CO 2	UTILIZE the knowledge of solubility of drugs in formulation
CO 3	EVALUATE formulation based on its solid state properties
CO 4	OUTLINE physicochemical properties, complexation and protein binding of drug molecules.
CO 5	EXAMINE the tonicity of parenteral and ophthalmic preparations.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	2						2	1		
CO 2	2	2		2				3	2		
CO 3	1		2	2				2	1		
CO 4	2		3	2					1		
CO 5	2	2	1	1				2	2		

Course Coordinator Program Coordinator HOD

Name of the Subject: **Pharmaceutical Microbiology (T)** **Subject Code: 22BS303**

Year/Sem: II-I **Regulation: R22**

Course Outcomes	**Upon the completion of this course, the student will able to-**
CO1	Understand methods of identification, cultivation and preservation of variousmicroorganisms
CO2	Understand the importance and implementation of sterilization in pharmaceuticalprocessing and industry.
CO3	Learn sterility testing of pharmaceutical products.
CO4	Carry out microbiological standardization of Pharmaceuticals
CO5	Understand the cell culture technology and its applications in pharmaceuticalindustries.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO'S/P0'S	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO1	1	1	2	-	-	-	-	-	-	-	-
CO2	2	3	1	-	-	-	-	-	-	-	-
CO3	2	2	2	-	-	-	-	-	-	-	-
CO4	1	1	1	-	-	-	-	-	-	-	-

Course Coordinator Program Coordinator HOD

Subject name: Pharmaceutical Engineering (T) **Subject code: 22PC304**

Year/Sem: II-I **Regulation: R22**

Course Outcomes	**Upon completion of the course, the students will be able to**
CO1	Explain the concepts of fluid flow & describe the phenomenon of size reduction and size separation for effective practices sizing on pharmaceutical field.
CO2	Demonstrate the principles and applications of unit operations like mixing and crystallization.
CO3	Outline the concepts of heat transfer mechanisms and summarize the importance of various unit operations used in pharmaceutical industries like evaporation.
CO4	Demonstrate the principles and applications of unit operations like drying and distillation.
CO5	Demonstrate the principles and applications of unit operations like filtration and centrifugation.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO1	1	2						2	1		
CO 2	2			3				3	2		
CO 3	1		1						1		
CO 4	2			2			1		2		
CO 5	1			1							

Course Coordinator Program Coordinator HOD

Subject name: POC-II (L) **Subject code: 22PC305**

Year/Sem: II-I **Regulation: R22**

Course Outcomes	**Upon completion of the course, the students will be able to**
CO1	apply the basic knowledge of organic chemistry in identification of functional groups and synthesis of organic compounds
CO2	Analyse and predict the principles of chemical reactions
CO3	Analyse and interpret the mechanism of chemical reactions
CO4	apply the concept of moles in calculating theoretical yield
CO5	calculate and estimate the percentage purity of the compounds synthesized

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO1	1	2						2	1		
CO 2	2			3				3	2		
CO 3	1		1						1		
CO 4	2			2			1		2		
CO 5	1			1							

Course Coordinator Program Coordinator HOD

Name of the Subject: Physical Pharmaceutics-I (L) **Subject Code: 22PS306**

Year/Sem: II-I **Regulation: R22**

Course Outcomes	Upon completion of the course, the students will be able to
CO 1	Determine the physicochemical properties of pharmaceutical substances
CO 2	Estimate the pH of the fluids
CO 3	Estimate the solubility of drugs
CO 4	Construct phase diagrams
CO 5	Calculate phase diagrams

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	2							1		
CO 2	2	2		2					2		
CO 3	1	2		2					1		
CO 4	2	2		2					1		
CO 5	2	2		1					2		

Course Coordinator | Program Coordinator | HOD

Name of the Subject: Pharmaceutical Microbiology **Subject Code: 22BS307**

Year/Sem: II-II **Regulation: R22**

Course Outcomes	**Upon the completion of this course, the student will able to-**
CO1	Understand methods of identification, cultivation and preservation of variousmicroorganisms
CO2	Understand the importance and implementation of sterilization in pharmaceuticalprocessing and industry.
CO3	Learn sterility testing of pharmaceutical products.
CO4	Carry out microbiological standardization of Pharmaceuticals
CO5	Understand the cell culture technology and its applications in pharmaceuticalindustries.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO'S/P0'S	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO1	-	-	-	1	1	-	-	-	-	-	-
CO2	-	-	-	1	2	-	-	-	-	-	-
CO3	-	-	-	2	1	-	-	-	-	-	-
CO4	-	-	-	1	1	-	-	-	-	-	-
CO5	-	-	-	2	1	-	-	-	-	-	-

Course Coordinator Program Coordinator HOD

Subject name: Pharmaceutical Engineering (L) **Subject code: 22PC308**

Year/Sem: II-I **Regulation: R22**

Course Outcomes	**Upon completion of the course, the students will be able to**
CO1	Explain Size Analysis by Sieving, Size Reduction Using Ball Mill, Mixing, Distillation
CO2	Determine Construction Working and Application Of Pharmaceutical Machinery
CO3	Calculate The Efficiency of Steam Distillation And Uniformity Index For Given Sample
CO4	Evaluate Materials Used for Mixing, Drying, Filtration, Centrifugation
CO5	Demonstration Of Colloid Mill, Planetary Mixer, Fluidized Bed Dryer, Freeze Dryer And Such Other Major Equipment

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO1	1	2									
CO 2	2			3							
CO 3	1		1								
CO 4	2			2							
CO 5	1			1							

Course Coordinator Program Coordinator HOD

Subject name: POC-III (T) **Subject code: 22PS401**

Year/Sem: II-II **Regulation: R22**

Course Outcomes	**Upon completion of the course, the students will be able to**
CO1	Apply the concepts of stereochemistry in identifying the chiral and achiral molecules, Racemisation and Resolution of Racemic mixture.
CO2	Determine the nomenclature and configuration of stereoisomer and conformation of saturated compounds and atropisomerism
CO3	Interpret the nomenclature and classification of heterocyclic compounds and write the synthesis
CO4	Compare the reactivity and properties of heterocyclic compounds with uses
CO5	Outline and discuss the reaction with its mechanism and Applications of Named reactions and Reagents

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO1	1	2									
CO 2	2			3							
CO 3	1		1								
CO 4	2			2							
CO 5	1			1							

Course Coordinator Program Coordinator HOD

Name of the Subject: **Physical Pharmaceutics-II(Theory)** **Subject Code: 22PC402**

Year/Sem: II-II **Regulation: R22**

Course Outcomes	**Upon completion of the course, the students will be able to**
CO 1	Apply mathematical models to determine the rate and order of reaction, shelf life and explain various factors influencing reaction rates
CO 2	Determine the nature of flow of liquids and their measurement
CO 3	Formulate, evaluate and to understand rheological properties of suspensions and emulsions.
CO 4	Explain and determine surface & interfacial properties of liquids.
CO 5	Explain types and properties of colloidal systems.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO1	2		2			1			1		
CO 2	2			2		1			2		
CO 3	2			2		1			1		
CO 4	2			2		1			1		
CO 5	2			1		1			2		

Course Coordinator | Program Coordinator | HOD

Name of the Subject: Pharmacology-I **Subject Code: 22PS403**

Year/Sem: II-II **Regulation: R22**

Course outcome	Upon completion of course the student should be able to
CO 1	UNDERSTAND - Definition, historical landmarks and scope of pharmacology and detailed basics of pharmacology.
CO 2	EXPLAIN in detail about Pharmacokinetics, Pharmacodynamics and Receptor theories
CO3	SUMMARIZE and discuss in detail about the Pharmacology of peripheral nervous system.
CO 4	ANALYZE the pharmacology of drugs acting on central nervous system.
CO 5	INTERPRET in detail the pharmacology of psychological drugs that acts on central nervous system.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2										
CO 2	2		1								
CO 3	2		1								
CO 4	2	1									
CO 5	2	1	1								

Course coordinator Programme coordinator HOD

Name of the Subject: PGPY-I **Subject Code: 22PC404**

Year/Sem: II-II **Regulation: R21**

Course Outcomes	Upon completion of the course the students will be able to
CO-1	Describe and define in detail about the history, present status, future, scope, development of pharmacognosy and various systems of medicines.
CO-2	Explain the methods of cultivation, collection, processing, storage and crude drugs classification, marine drugs and plant fibres.
CO-3	Apply the suitable methods to detect different types of adulteration.
CO-4	Compare and contrast different types of plant tissue culture, primary & secondary metabolites.
CO-5	Assess the quality control of crude drugs by various methods of evaluation.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	1	-	2	2	-	-	-	-	-	-
CO2	1	1	1	2	1	2	-	-	-	-	-
CO3	2	1	1	2	-	-	-	-	-	-	-
CO4	1	2	-	1	-	-	-	-	-	-	-
CO5	2	1	2	1	1	-	0	-	-	-	-

Course coordinator Programme coordinator HOD

Subject name: Pharmaceutical Jurisprudence **Subject code: 22PS405**

Year/Sem: II-II **Regulation: R22**

Course Outcomes	**Upon completion of the course, the students will be able to**
CO1	Understand the Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals.
CO2	Students will gain the basic Knowledge and understanding of Various Indian pharmaceutical Acts and Laws
CO3	Knowledge and application of the legislation regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
CO4	Application of code of ethics during the pharmaceutical practice

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO1	2		2	1	1						2
CO 2	2		1	1			1			2	1
CO 3	2	2		1	1		1				2
CO 4	2		2	1	2					1	2

Course coordinator Programme coordinator HOD

Name of the Subject: Physical Pharmaceutics-II (L) **Subject Code: 22 PC406**

Year/Sem: II-II **Regulation: R22**

Course Outcomes	Upon completion of the course, the students will be able to
CO 1	Determine the order of a reaction
CO 2	Understand the effects of various suspending agent on formulation of suspensions and different factors influencing on them.
CO 3	Determine the viscosity, surface phenomena of liquids and surfactant properties
CO 4	Construct adsorption isotherms
CO 5	Calculation of Accelerated stability studies

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	2							1		
CO 2	2	2							2		
CO 3	2	2		2					1		
CO 4	1	2		2					1		
CO 5	2	2		1					2		

Course coordinator Programme coordinator HOD

Name of the Subject: Pharmacology-I (L) **Subject Code: 22PS407**

Year/Sem: II-II **Regulation: R22**

Course outcome	Upon completion of course the student should be able to
CO 1	Understand basics of experimental pharmacology, instruments and animals used in it.
CO 2	Discuss CPCSEA guidelines, lab techniques, blood withdrawal, serum and plasma separations, anesthesia and euthanasia techniques in lab animals.
CO3	Demonstrate routes of drug administration and hepatic microsomal enzyme effect on drugs
CO 4	Experiment on ciliary motility of frog, rabbit eye, rotarod and actophotometer equipments
CO 5	Evaluate anticonvulsant, anti-catatonic, anxiolytic and local anesthetic activity of different drugs on rats and mice

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2										
CO 2	2										
CO 3	2		1								
CO 4	2	1	1	2							
CO 5	2	1	1	2							

Course coordinator Programme coordinator HOD

Name of the Subject: PGPY-I (L) **Subject Code: 22PC408**

Year/Sem: II-II **Regulation: R22**

CO Code	Course Outcomes
CO1	Carryout the identification test for unorganised crude drugs
CO2	Demonstrate the various quantitative microscopically study of cure drugs.
CO3	Perform the linear measurements of starch grains, fibres and calcium oxalate crystals.
CO4	Integrate the physical evaluation of crude drugs for their quality assessment.
CO5	Follow the procedure of swelling and foaming index of crude drugs.

CO – PO Mapping:

CO Code	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
CO1	3	2	-	1	1	2	-	-	-	-	-
CO2	2	3	1	1	-	1	-	-	-	-	-
CO3	3	1	2	2	1	-	-	-	-	-	-
CO4	2	2	-	1	-	1	-	-	-	-	-
CO5	-	-	-	2	2	-	-	-	-	-	-
Average	**2.50**	**2.00**	**1.50**	**2.50**	**2.00**	**1.30**	**0.00**	**00**	**00**	**00**	**00**

Course coordinator **Programme coordinator** **HOD**

Name of the Subject: Medicinal Chemistry-II (T) **Subject Code: 21PS501**

Year/Sem: III-I **Regulation: R21**

Course Outcomes	Upon completion of the course the students will be
CO1	Able to understand the concept of receptors, distribution their interaction with drugs and their mechanism of action.
CO2	Able to analyse and interpret the nomenclature of compounds of synthetic origin
CO3	Able to explain the mechanism of action of various category of drugs
CO4	Able to apply the knowledge of medicinal chemistry in the study of Structural activity relationship of drug molecules.
CO5	Able to Apply the concepts of organic chemistry in the synthesis and development of lead molecules for new drug discovery

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	-	-	-	-	-	-	-	-	-
CO2	3	1	2	-	-	-	-	-	-	-	-	-
CO3	3	2	2	-	-	-	-	-	-	-	-	-
CO4	3	3	2	-	-	-	1	-	-	-	-	-
CO5	3	3	2	-	-	-	1	-	-	-	1	-

Course coordinator Programme coordinator HOD

Name of the Subject: Industrial Pharmacy-I (T) **Subject Code: 21PS502**

Year/Sem : III-I **Regulation : R21**

CO 1	To define various Pharmaceutical dosage forms
CO 2	To explain considerations involved in development of Pharmaceutical dosage forms
CO 3	To apply preformulation concepts in the development of solid, liquid and parenteral dosage forms
CO 4	To compare various dosage forms based on their formulation and usage
CO 5	To evaluate the dosage forms for their quality

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/PO's	PO1	P02	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	-	-	-	-	-	-	-	-	-	1
CO2	2	-	-	2	-	-	-	-	-	-	1
CO3	2	2	2	2	-	-	-	-	-	-	1
CO4	2	-	-	2	-	-	-	-	-	-	1
CO5	2	2	2	2	-	-	-	-	-	-	1

Course coordinator Programme coordinator HOD

Name of the Subject: Pharmacology-II (T) **Subject Code: 21PS503**

Year/Sem: III-I **Regulation: R21**

Course outcome	Upon completion of course the student should be able to
CO 1	UNDERSTAND mechanism of action of drugs and its relevance in the treatment of Cardio vascular diseases.
CO 2	EXPLAIN in detail about the pharmacology of drugs used for Blood related and Urinary system disorders.
CO3	SUMMARIZE and discuss in detail about the Autocoids, NSAIDS, Anti-gout and antirheumatic drugs.
CO 4	ANALYZE the pharmacology of drugs acting on endocrine system.
CO 5	EVALUATE the principles and types of bioassays and study bioassay of some drugs.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	1	2								
CO 2	2	_	1								
CO 3	1	2	1								
CO 4	1	1	_	2							
CO 5	2	_	1		1						

Course Coordinator Program Coordinator HOD

Name of the Subject: PGPY-II (T) **Subject Code: 21PS504**

Year/Sem: III-I **Regulation: R21**

Course Outcomes	Upon completion of the course the students will be able to
CO-1	Memorizing primary and secondary metabolic pathways
CO-2	Illustrate composition, chemistry & chemical classes, bio sources, therapeutic uses and commercial application of secondary metabolites.
CO-3	Apply the right method of production, estimation of some important phytoconstituents.
CO-4	Analyze the isolated various constituents viz. Terpenoids, Glycosides, Alkaloids and Resins from the crude drugs.
CO-5	Validating the isolated compounds by Spectroscopy, chromatography and electrophoresis techniques.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	1	1	2	-	-	-	-	-	-
CO2	2	3	1	1	-	1	-	-	-	-	-	-
CO3	3	1	2	2	-	-	-	-	-	-	-	-
CO4	2	2	-	1	-	1	-	-	-	-	-	-
CO5	2	1	1	1	1	-	0	-	-	-	-	-

Course Coordinator Program Coordinator HOD

Name of the Subject: Generic Product Development(T) **Subject Code: 21PS505**

Year/Sem: III-I **Regulation: R21**

Course Outcomes	Upon completion of the course the students will be able to
CO1	Describe the Generic Drug Product Development and its Amendments
CO2	Summarize the Dosage forms Design, product development steps, formulate optimization and process optimization
CO3	Outline various Analytical Techniques for verification and validation of active Ingredients.
CO4	Explain about the stability studies of active ingredient, finished dosage forms and scale up techniques.
CO5	Discuss the Bioequivalence studies, designs, electronic common technical documents and drug product approval process.

Relationship of Course Outcome (CO) - Program Outcome (PO) Mapping

CO's/PO's	PO1	P02	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2			2	2	2				2
CO2	3	2			2	2	2				2
CO3	3	3		2	3	2	2	2			2
CO4	2	2				2	2			2	
CO5	3	1	3			2	2	2			

Course Coordinator Program Coordinator HOD

Name of the Subject: Cosmetic Science (T) **Subject Code: 21PS508**

Year/Sem: III-I **Regulation: R21**

Course Outcomes	Upon completion of the course, the students will be able to
CO 1	Student will be able to RECALL regulations pertaining to cosmetics and cosmetic excipients
CO 2	Student will be able to OUTLINE classification of cosmetics and cosmeceuticals
CO3	Student will be able to UTILIZE the knowledge of creams, antiperspirants, deodorants, skin and hair care products etc.in further formulation.
CO 4	Student will be able to ANALYZE various oral, hair and skin related problems.
CO 5	Student will be able EVALUATE various cosmetic formulations based on skin functions, hair and oral care..

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	1	2						1	1	
CO 2	3	1				2		1			1
CO 3	3	3	2	1		1					1
CO 4	3	3	2			1				1	
CO 5	3	3	2			1			1		

Course Coordinator Program Coordinator HOD

Name of the Subject: Industrial Pharmacy-I (L) **Subject Code: 21PS509**

Year/Sem : III-I **Regulation : R21**

CO1	To explain how solubility, particle size, particle shape, crystallinity, amorphous structure of pure drug as preformulation parameters plays a major role in the manufacture of effective dosage forms.
CO.2	To determine the formulation and manufacturing procedures of different types of tablet dosage forms and capsule dosage forms.
CO3	To develop different coating procedures to tablets and evaluate prepared coated tablets.
CO4	To evaluate materials used for packaging such as glass, plastic and rubber containers.
CO5	To formulate various types of cosmetics and perform evaluation of cosmetic preparations

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	1	-	2	-	-	1	-	1	-	-
CO2	2	1	-	2	-	-	1	-	-	-	-
CO3	2	1	-	2	-	-	1	-	1	1	-
CO4	2	1	-	2	-	-	1	-	1	-	-
CO5	2	1	-	2	-	-	1	-	1	-	-

Course Coordinator Program Coordinator HOD

Name of the Subject: Pharmacology-II(L) **Subject Code: 21PS510**

Year/Sem : III-I **Regulation : R21**

CO 1	UNDERSTAND the in-vitro pharmacology and physiological salt solutions used in the lab
CO 2	EXPLAIN the effect of drugs on BP, heart rate, diuretic activity on different animal model and to study DRC of different drugs.
CO3	SUMMARIZE bioassay of different drugs using different methods
CO 4	UNDERSTAND the PD2 and PA2 value of drugs using isolated tissue preparations.
CO 5	EVALUATE the analgesic and anti-inflammatory, spasmogenic and spasmolytics effect of drugs using different methods.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	+	+	+	+							
CO 2		+		+							
CO 3	+		+	+	+						
CO 4	+	+									
CO 5	+		+	+							

Course Coordinator Program Coordinator HOD

Name of the Subject: PGPY-II(L) **Subject Code: 21PS511**

Year/Sem : III-I **Regulation : R21**

CO Code	Course Outcomes
PS511.1	Adhere the procedure for morphological, microscopical study of crude drugs.
PS511.2	Carryout the isolation and detection of Caffeine, Diosgenin, Atropine, Sennosides.
PS511.3	Perform the identification test for unorganized crude drugs.
PS511.4	Execute the extraction and chemical identification of some important crude drugs.
PS511.5	Demonstrate the paper chromatography, TLC and distillation.

CO – PO Mapping:

CO Code	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
PS511.1	2	2	1	-	-	-	-	-	-	-	-
PS511.2	2	-	1	-	2	1	-	-	-	-	-
PS511.3	2	2	1	-	-	-	-	-	-	-	-
PS511.4	2	-	1	-	1		-	-	-	-	-
PS511.5	-	-	-	2	2	-	-	-	-	-	-
Average	**2.00**	**2.00**	**1.00**	**2.00**	**2.00**	**1.00**	**0.00**	**00**	**00**	**00**	**00**

Course Coordinator Program Coordinator HOD

Name of the Subject: Medicinal Chemistry -III(T) **Subject Code: 21PS601**

Year/Sem: III-II **Regulation: R21**

CO1	Describe the chemistry of drugs with respect to their pharmacological activity.
CO2	Discuss the drug metabolic pathways, adverse effects and therapeutic value of drugs.
CO3	Explain the physicochemical properties and pharmacokinetic properties of the drugs.
CO4	Explain the structural activity relationship of different class of drugs.
CO5	Examine the chemical synthesis of various drugs.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3		2			2	2		2		2
CO 2	2		2			2	2		2		2
CO 3	2		2			2	2		2		2
CO 4	2		2			2	2		2		2
CO 5	2		2			2	2		2		2
AVG	2		2			2	2		2		2

Course Coordinator Program Coordinator HOD

Name of the Subject: PCOL-III (T) **Subject Code: 21PS602**

Year/Sem: III/II **Regulation: R21**

CO1	To describe and determine the concept of various categories and their mechanism of action involving Respiratory system, Gastrointestinal tract, Immune System, Chemotherapeutics and chronopharmacology.
CO2	To analyze and evaluate the pharmacokinetic, dosage and therapeutic implications of the drugs acting on Respiratory system, Gastrointestinal tract, Immune System and Chemotherapeutics
CO3	To predict the mechanism of resistance and tolerance, drug-drug and drug-food interactions interfering with chronotherapy, Respiratory system, Gastrointestinal tract, Immune System and Chemotherapeutics
CO4	To determine the side-effects and adverse effects of drugs interfering with chronotherapy, Respiratory system, Gastrointestinal tract, Immune System and Chemotherapeutics
CO5	To outline and design various preclinical toxicity studies.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	-	2	-	-	-	-	2	2	1	-	-
CO 2	2	-	-	3	-	-	-	3	2	1	-
CO 3	2	-	2	-	1	-	-	-	1	1	-
CO 4	2	-	-	2	-	-	2	-	-	-	1
CO 5	1	-	-	1	-	-	-	-	1	-	-
AVG	1.75	2	2	2	1	0	2	2	1.25	1	1

Course Coordinator Program Coordinator HOD

Name of the Subject: Herbal drug technology (T) **Subject Code: 21PS603**

Year/Sem: III-II **Regulation: R21**

Course Outcomes	Upon completion of the course the students will be able to
CO1	Understand raw material as source of herbal drugs from cultivation to herbal drug product.
CO2	Know the WHO and ICH guidelines for evaluation of herbal drugs
CO3	Know the herbal cosmetics, natural sweeteners, and nutraceuticals
CO4	Appreciate patenting of herbal drugs and different acts.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	-	-	-	-	-	-	-
CO2	3	3	2	2		-	-	-	-	-	-	-
CO3	2	2	2	2	1	-	-	-	-	-	-	-
CO4	3	3	1	3	1	-	-	-	-	-	-	-

Course Coordinator Program Coordinator HOD

Name of the Subject: Biopharmaceutics and Pharmacokinetics Subject Code: 21PS604

Year/Sem: III - II **Regulation: R21**

CO1	understand the basic concepts of biopharmaceutics, pharmacokinetics & pharmacokinetic models
CO2	Identify the physiological, physicochemical and dosage form-related factors that affects drug absorption from different dosage forms
CO3	Outline and recognize various drug disposition process that can cause pharmacokinetic and Pharmacodynamic variability
CO4	Identify and understand different study designs and various statistical tests applied in bioequivalence studies.
CO5	Evaluate the PK parameters and examine absolute, relative bioavailability of drugs from different dosage forms using either plasma or urine data along with *In-vitro-In vivo* correlation for different drug products.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO'S 1	3	2			2	2	2				2
CO'S 2	3						2				
CO'S 3	3						2	2			2
CO'S 4	3	3		3	3	2	2	2		2	2
CO'S 5	3	3	3	2	2	2	2	2			
AVG	3.0	2.7	3.0	2.5	2.3	2.0	2.0	2.0		2.0	2.0

Name of the Subject: Pharmaceutical Quality Assurance (T) **Subject Code: 21PS605**

Year/Sem: III-II **Regulation: R21**

Course Outcomes	Upon completion of the course the students will be able to
CO1	Understand the c GMP aspects in the pharmaceutical industry.
CO2	Appreciate the importance and construct the documentation.
CO3	Develop Knowledge and understand the scope of quality certifications applicable to pharmaceutical industry
CO4	Develop basic knowledge and understand the responsibilities of QA & QC departments.
CO5	Develop basic knowledge of Manufacturing operations and controls.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	3	1	-	-	-	-	-	-	-	-	-
CO2	-	2	-	3	-	-	-	-	-	-	-	-
CO3	-	3	-	-	-	-	2	-	-	-	-	-
CO4	2	3	-	3	-	-	-	-	1	-	-	-
CO5	3	3	-	-	3	-	-	-	-	-	-	-

Course Coordinator

Program Coordinator

HOD

Name of the Subject: Medicinal Chemistry -III(L) **Subject Code: 21PS609**

Year/Sem: III-II **Regulation: R21**

CO1	Experiment with chemicals to prepare drugs and Intermediates.
CO2	Estimate the percentage purity of the compounds by performing different types of assay techniques.
CO3	Utilize the microwave irradiation technique for the preparation of drugs and intermediates.
CO4	Design the structures and reactions using chem draw.
CO5	Determine the physiological properties of drugs.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO'S 1	2		2	2							2
CO'S 2	2		2	2							2
CO'S 3	2		2	2							2
CO'S 4	2		2	2							2
CO'S 5	2		2	2							2
AVG	2		2	2							2

Course Coordinator Program Coordinator HOD

Name of the Subject: PCOL-III (L) **Subject Code: 21PS610**

Year/Sem: III/II **Regulation: R21**

Course Outcomes	Upon completion of the course the students will be able to
CO1	Explain different animal models to determine effect of drugs on gastrointestinal tract and diabetes
CO2	Explain different toxicity test viz. LD50, skin irritation, eye irritation including pharmacokinetic insight and biochemical estimation
CO3	Demonstrate conduct of different bio-assays, conduct of bio statistical test and mydriatic and miotic effects of drugs on rabbit eye
CO4	Evaluate of products natural origin
CO5	Develop laboratory discipline organize the work in the laboratory Follow the instructions given in the laboratory

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	**2**	1	-	-	-	-	1	1	1	-	1
CO 2	3	-	-	3	-	-	-	2	1	1	-
CO 3	2	-	3	-	2	-	-	-	1	-	-
CO 4	3	-	-	2	-	-	2	-	-	-	1
CO 5	**3**	2	-	1	-	-	-	-	2	-	-
AVG	**2**	1	-	-	-	-	1	1	1	-	1

Course Coordinator Program Coordinator HOD

Name of the Subject: HERBAL DRUG TECHNOLOGY **Subject Code: PS 611**

Year/Sem: III-II **Regulation: R17**

Course Outcomes	Upon completion of the course the students will be able to
CO-1	Test for preliminary phytochemical screening
CO-2	Determination of phytochemical constituents.
CO-3	Evaluation of natural origins
CO-4	Application of herbal products in cosmetics

COPO MAPPING OF HERBAL DRUG TECHNOLOGY

Course Outcomes	**Relationship of Course Outcomes (CO) to Program Outcomes (PO)**											
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	1	2	-	-	-	-	-	-	-	-
CO3	-	2	-	2	-	-	-	-	-	-	-	-
CO4	-	-	-	2	-	-	-	-	-	-	-	-

Name of the Subject: Instrumental Methods of Analysis (T) **Subject Code: PS701**

Year/Sem: IV-I **Regulation: R17**

Course Outcomes	Upon completion of the course the students will be able to
CO1	Understand the interaction of matter with Electromagnetic radiation and its applications in drug analysis.
CO2	Understand the different types of analytical techniques and their applications.
CO3	Describe the principle of chromatographic separation and analysis of drugs
CO4	Understand the different types of Chromatographic separation techniques and Applications in drug analysis
CO5	Perform quantitative and qualitative analysis of Drugs using various analytical instruments

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	3	-	-	-	-	-	-	-	-	-	-
CO2	-	2	-	3	-	-	-	-	-	-	-	-
CO3	-	3	-	-	-	-	2	-	-	-	-	-
CO4	2	3	-	3	-	-	-	-	-	-	-	-
CO5	3	3	-	-	3	-	-	-	-	-	-	-

Course Coordinator Program Coordinator HOD

Name of the Subject: Industrial Pharmacy II **Subject Code: PS702**

Year/Sem: IV-I **Regulation: R17**

Course Outcomes	Upon completion of the course the students will be able to
CO-1	Describe the process of pilot plant scale-up of pharmaceutical dosage forms.
CO-2	Demonstrate the practice and the process of technology transfer from lab scale to commercial.
CO-3	Explain the different laws and acts that regulate the pharmaceutical industry.
CO-4	Describe the common measure used in quality.
CO-5	Describe the role and responsibility of regulatory agencies in the approval of drugs.

COPO MAPPING OF INDISTRIAL PHARMACY II

Course Outcomes	Relationship of Course Outcomes (CO) to Program Outcomes (PO)											
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3.00	2.00	3.00								
CO2	3	3.00	2.00	3.00								
CO3	3.00	2.00				2.00	3.00		3.00			
CO4	3.00	2.00	3.00	3.00	3.00							
CO5	3.00	2.00				2.00	3.00		3.00			

Course Coordinator Program Coordinator HOD

Name of the Subject: Pharmacy Practice (T) **Subject Code: PS703**

Year/Sem: IV-I **Regulation: R17**

Course Outcomes	Upon completion of the course the students will be able to
CO-1	Know various drug distribution methods in a hospital
CO-2	Appreciate the pharmacy stores management and inventory control
CO-3	Monitor drug therapy of patient through medication chart review and clinical review
CO-4	Obtain medication history interview and counsel the patients
CO-5	Identify drug related problems

COPO MAPPING OF PHARMACY PRACTICE

Course Outcomes	Relationship of Course Outcomes (CO) to Program Outcomes (PO)											
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	1	2	-	-	-	-	-	-	-	-
CO3	-	2	-	2	-	-	-	-	-	-	-	-
CO4	-	-	-	2	-	-	-	-	-	-	-	-
CO5	1	3	-	-	2	-	-	-	-	-	-	-

Course Coordinator Program Coordinator HOD

Name of the Subject: Novel Drug Delivery Systems (T) **Subject Code: PS704**

Year/Sem : IV-I **Regulation : R17**

CO1	To define various types of drug delivery systems
CO2	To compare the different types of delivery systems based on their formulation and usage
CO3	To evaluate drug delivery systems for their quality
CO4	To apply the mechanisms in developing various drug delivery systems
CO5	To develop various devices related to drug delivery systems

Mapping Matrix of CO's and PO's:

CO's/PO's	PO1	P02	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2										1
CO2	2			2							1
CO3	2	2	2	2							1
CO4	2	2	2	2							1
CO5	2			2							1

Course Coordinator Program Coordinator HOD

Name of the Subject: Pharmaceutical Marketing (T) **Subject Code: PS705**

Year/Sem : IV-I **Regulation : R17**

Course Outcomes	Upon completion of the course the students will be able to
CO1	Describe the concept of pharmaceutical marketing. Enumerate the concept of product management in pharmaceutical industry
CO2	Discuss the various components of promotion of pharmaceutical Products
CO3	Explain the different pharmaceutical marketing channels
CO4	Discuss the role and responsibility of professional sales representative and pricing authorities in India
CO5	Discuss the emerging concepts of marketing and the role market research

Relationship of Course Outcome (CO) - Program Outcome (PO) Mapping

CO's/PO's	PO1	P02	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	1				2	2	2	2		2
CO2	2	2				1	1	1	2		2
CO3	1	2				1	2	2	2		2
CO4	1	2				1	2	1	2		2
CO5	2	1				2	2	2	1		2

Course Coordinator Program Coordinator HOD

Name of the Subject: Pharmacovigilance **Subject Code: PS707**

Year/Sem: IV-I **Regulation: R17**

Course Outcomes	Upon completion of the course the students will be able to
CO-1	Know why drug safety monitoring is important? History and development of pharmacovigilance
CO-2	Appreciate National and international scenario of pharmacovigilance
CO-3	Appreciate International standards for classification of diseases and drugs.Adverse drug reaction reporting systems and communication in pharmacovigilance
CO-4	Understand ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning
CO-5	Understand the data during pre-clinical, clinical and post approval Pharmacovigilance Program of India (PvPI) .ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning

COPO MAPPING OF PHARMACOVIGILANCE

Course Outcomes	**Relationship of Course Outcomes (CO) to Program Outcomes (PO)**											
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	1	-	-	-	-
CO2	-	-	1	2	-	2	-	-	-	1	-	-
CO3	-	2	-	2	-	-	2	-	-	-	-	-
CO4	-	-	-	2	-	-	-	-	-	-	-	-
CO5	1	3	-	-	2	-	-	2	-	-	-	-

Course Coordinator Program Coordinator HOD

Name of the Subject: **Quality control and standardization of herbals(T)** **Subject Code: PS708**

Year/Sem: IV-I **Regulation: R17**

Course Outcomes	Upon completion of the course the students will be able to
CO1	Know the WHO and ICH guidelines for evaluation of herbal drugs
CO2	Understand raw material as source of herbal drugs from cultivation to herbal drug product.
CO3	Appreciate patenting of herbal drugs, GMP.
CO4	Know the herbal cosmetics, natural sweeteners, and nutraceuticals

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	-	-	-	-	-	-	-
CO2	3	3	2	2		-	-	-	-	-	-	-
CO3	2	2	2	2	1	-	-	-	-	-	-	-
CO4	3	3	1	3	1	-	-	-	-	-	-	-

Course Coordinator

Program Coordinator

HOD

Name of the Subject: Instrumental Methods of Analysis (L) **Subject Code: PS709**

Year/Sem: IV-I **Regulation: R17**

Course Outcomes	Upon completion of the course the students will be able to
CO1	Handling of Analytical Instruments for analyzing the compounds qualitatively and quantitatively
CO2	Apply separation techniques for the separation and analysis of the compounds
CO3	Prepare dilutions and estimate the amount of drug by UV methods
CO4	Demonstrate the HPLC instrument for analysis of some drugs.
CO5	Perform assay of different dosage forms for purity.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	2	-	-	1	-	-	-	-	-
CO 2	2	1	3	1	-	2	-	-	-	-	-
CO 3	2	-	3	2	-	-	-	-	-	-	-
CO 4	1	2	1	2	-	-	-	-	-	-	-
CO 5	3	1	3	1	-	-	2	-	-	-	-

Course Coordinator Program Coordinator HOD

Name of the Subject: Practice School (L) **Subject Code: PS710**

Year/Sem: IV-I **Regulation: R17**

Course outcome	Upon completion of course the student should be able to
CO 1	Understand industrial oriented and R&D departmental working by visiting and taking up a issue to report.
CO 2	Interpret the different disease case studies related to different systems of the body by visiting hospitals.
CO3	Develop medical audit report along with the study of prescription pattern, most prescribed medicines by visiting different pharmacy shops.
CO 4	Inspect the medicinal plants and relate their uses for different disorders by visiting the medicinal garden
CO 5	Analyze the regulatory affairs reports, important cases filed and to plan a equipment for formulation that is not used in usual practice

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	3	1								
CO 2	2	1	1								
CO 3	2	2	2								
CO 4	2	1	1								
CO 5	2	1	1	2							

Course Coordinator Program Coordinator HOD

Name of the Subject: Biostatistics & Research Methodology(T) **Subject Code: PS801**

Year/Sem: IV-II **Regulation: R17**

CO 1	Know the introduction of Statistics and Perform statistical parameters like measures of central tendency, dispersion and correlation.
CO 2	Know and perform regression analysis, basics of probability and parametric tests
CO 3	Perform non-parametric tests; understand research, designing research methodology and graphical representation.
CO 4	Understand blocking, confounding, regression modeling and introduction to practical components of industrial and clinical trials.
CO 5	Understand design and analysis of experiments.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	1	1	1	1	-	-	-	-	-	-	1
CO 2	1	1	1	1	-	-	-	-	-	-	1
CO 3	1	1	1	1	-	-	-	-	-	-	1
CO 4	1	1	1	1	-	-	-	-	-	-	1
CO 5	1	1	1	1	-	-	-	-	-	-	1

Course Coordinator | Program Coordinator | HOD

Name of the Subject: Social and Preventive Pharmacy **Subject Code: PS802**

Year/Sem: IV-II **Regulation: R17**

Course Outcomes	Upon completion of the course the students will be able to
CO-1	Acquire high realization of current issues related to health and pharmaceutical problems within the country
CO-2	Acquire high realization of current issues related to health and pharmaceutical problems within the worldwide
CO-3	Acquire high consciousness of current issues related to health and current healthcare development
CO-4	Have a critical way of thinking based on current healthcare development.
CO-5	Evaluate alternative ways of solving problems related to health and pharmaceutical issues

CO-PO MAPPING OF SOCIAL AND PREVENTIVE PHARMACY

Course Outcomes	**Relationship of Course Outcomes (CO) to Program Outcomes (PO)**											
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	1	-	-	1	-	-	-	-
CO2	-	1	1	2	-	2	-	-	-	1	-	-
CO3	-	2	-	2	-	-	2	1	-	-	-	-
CO4	-	-	-	2	-	-	-	-	-	1	-	-
CO5	1	3	-	-	2	-	-	2	1	-	-	-

Course Coordinator

Program Coordinator

HOD

Name of the Subject: Pharmaceutical Jurisprudence **Subject Code: PS803**

Year/Sem: IV-II **Regulation: R17**

Course Outcomes	Upon completion of the course the students will be able to
CO-1	Acquire knowledge on schedule rules, laws and regulations related to drugs and cosmetics.
CO-2	Explain pharmaceutical legislation, history, evolution and growth of pharmaceutical industry
CO-3	Describe the pharmaceutical education and its regulatory bodies; pharmacy profession in concern to code of ethics.
CO-4	Explain other acts and rules associated with food and factories
CO-5	Explain the intellectual property rights.

COPO MAPPING OF PHARMACEUTICAL JURISPRUDENCE

Course Outcomes	**Relationship of Course Outcomes (CO) to Program Outcomes (PO)**											
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3.00	2.00				2.00	3.00		3.00			
CO2	3.00	2.00				2.00	3.00		3.00			
CO3	3.00	2.00				2.00	3.00		3.00			
CO4	3.00	2.00				2.00	3.00		3.00			
CO5	3.00	2.00				2.00	3.00		3.00			

Course Coordinator Program Coordinator HOD

Name of the Subject: Computer Aided Drug Design(T) **Subject Code: PS804**

Year/Sem: IV-II **Regulation: R17**

CO 1	Understand the design and discovery of lead molecules
CO 2	Understand the role of drug design in drug discovery process
CO 3	Understand the concept of QSAR and docking
CO 4	Understand the various strategies to develop new drug like molecules
CO 5	Understand the design of new drug molecules using molecular modeling software

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	2		2							
CO 2	1	2		2							
CO 3	1	2		2							
CO 4	1	2		2							
CO 5	1	2		2							

Course Coordinator | Program Coordinator | HOD

Name of the Subject: Nanotechnology (T) **Subject Code: PS805**

Year/Sem: IV/II **Regulation: R17**

Course Outcomes	Upon completion of the course the students will be able to
CO1	Discuss the approaches for the development of novel drug delivery systems
CO2	Perform the formulation and evaluation of novel drug delivery systems.
CO3	Apply the criteria for selection of drugs and polymers for the development of Nano technology delivery systems
CO4	Develop Nano formulations with appropriate technologies
CO5	Evaluate the product-related test and for identified diseases

Relationship of Course Outcome (CO) - Program Outcome (PO) Mapping

CO's/PO's	PO1	P02	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2			3	2			1		
CO2	3	3			3	1			1		
CO3	3	3			3	2			2		
CO4	3	3			3	1			1		
CO5	3	2			3	2			1		

Course Coordinator Program Coordinator HOD

Name of the Subject: Experimental pharmacology (T) **Subject Code: PS806**

Year/Sem: IV/II **Regulation: R17**

Course Outcomes	Upon completion of the course the students will be able to
CO1	Describe about different types of laboratory Animals used in experimental pharmacology with details on drug administration & blood collection.
CO2	Explain about different methods used in preclinical screening of lab animals
CO3	Describe preclinical screening models for drugs acting on ANS.
CO4	Describe preclinical screening models for diuretics, anticoagulants & anticancer drugs.
CO5	Summarize research methodology & biostatistics in experimental pharmacology.

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO's/ PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	-	2	-	-	-	-	2	1	1	-	-
CO 2	2	-	-	3	-	-	-	3	2	1	-
CO 3	1	-	2	-	1	-	-	-	1	-	-
CO 4	2	-	-	2	-	-	1	-	-	-	1
CO 5	1	-	-	1	-	-	-	-	2	-	-
AVG	1.5	2	2	2	1	0	1.5	2	1.5	1	1

Course Coordinator Program Coordinator HOD

Name of the Subject: Advanced Instrumentation Techniques (T) **Subject Code: PS807**

Year/Sem: IV-II **Regulation: R17**

Course Outcomes	Upon completion of the course the students will be able to
CO1	Understand the advanced Instruments used and their applications in drug analysis
CO2	Understand the chromatographic separation and analysis of drugs
CO3	Perform qualitative and quantitative analysis of drugs using various analytical instruments
CO4	Understand the calibration of various analytical instruments.
CO5	Know analysis of drugs using various analytical instrument

Relationship of Course Outcomes (CO) to Program Outcomes (PO)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	3	1	-	-	-	-	-	-	-	-	1
CO2	-	2	-	3	-	-	-	-	-	-	-	-
CO3	-	3	-	-	-	-	2	-	-	-	-	1
CO4	2	3	-	3	-	-	-	-	1	-	-	-
CO5	3	3	-	-	3	-	-	-	-	-	-	-

Course Coordinator

Program Coordinator

HOD

NALLA NARASIMHA REDDY

Education Society's Group of Institutions - Integrated Campus

(UGC AUTONOMOUS INSTITUTION)

EAMCET/ ICET/ PGECET Code NNRG

CSE ECE

ENGLISH COURSE OUTCOMES (R22)

CO-1	**Demonstrate** effective English communication skills through listening, speaking, reading and writing
CO-2	**Interpret** the subject by using technical vocabulary/terms and engineering jargon on all practical and professional occasions
CO-3	**Plan** and **organize** contents/ideas in writing paragraphs, technical reports, letters and business correspondence suitable for all specialized situations
CO-4	**Develops** listening and reading comprehension techniques to communicate confidently and respond appropriately in all the skilled and social settings.
CO-5	**Strengthen** the basic proficiency in English by using correct grammar

MAPPING

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1							2	2	3	3		2
CO-2							2	2	3	3		2
CO-3							2	2	3	3		2
CO-4							2	2	3	3		2
CO-5							2	2	3	3		2

Course Coordinator

HOD, H&S

ENGINEERING CHEMISTRY COURSE OUTCOMES(R22)

CO 1	Acquire the knowledge of crystal field and molecular orbital theory and can explain the stability and magnetic properties of complexes.
CO 2	Interpret various parameters of water and explain the problems caused by hard water in the industry.
CO 3	Apply the knowledge of electrochemical processes in the working of a battery, process of corrosion and its control methods.
CO 4	Impart the knowledge on various types of fuels and their applications.
CO 5	Anticipate the applications of engineering materials and their utility in order to become good engineers and entrepreneurs.

Relationship of Course Outcomes to Programme Outcomes:

Course Outcomes (CO)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	1	-	-	-	1	1	-	-	-	1
CO2	3	-	1	-	-	-	2	1	-	-	-	1
CO3	3	-	2	-	-	-	1	1	-	-	-	1
CO4	3	-	1	-	-	-	1	1	-	-	-	1
CO5	2	-	1	-	-	-	2	1	-	-	-	1

Course Coordinator

HOD, H&S

NALLA NARASIMHA REDDY

Education Society's Group of Institutions - Integrated Campus

(UGC AUTONOMOUS INSTITUTION)

EAMCET/ ICET/ PGECET Code NNRG

CSE ECE

Matrices & Calculus (R22)

	Course Outcomes
C01	**Determine** the Rank, Echelon form and analyze the solution of system of equations for consistency and inconsistency.
CO2	**Find** the Eigen values and vectors of a matrix and reduce the quadratic form to canonical form by orthogonal transformation.
CO3	**Interpret** the applicability of mean value theorems. **Apply** the definite integrals to **evaluate** the areas and volumes of revolution of the curves.
CO4	**Analyze** the problems related to partial differentials and relate its applications to engineering subjects.
CO5	**Evaluate** the multiple integrals and apply the concepts to find areas and volumes.

CO-PO Mapping

Program outcomes/course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2										1
CO2	3	2										1
CO3	3	2										1
CO4	3	2										1
CO5	3	2										1

Course Coordinator

HOD, H&S

NALLA NARASIMHA REDDY

Education Society's Group of Institutions - Integrated Campus

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Ordinary Differential Equations and Vector Calculus (R22)

	Course Outcomes
C01	**Evaluate** the first order and first degree differential equations and **apply** this concept to solve the problems on Trajectories, Newton's law of cooling and etc.
CO2	**Solve** higher order differential equations by using various methods.
CO3	**Find** Laplace Transforms of various functions and **Apply** the concepts of Laplace transforms to solve the differential equations.
CO4	**Find** the physical quantities involved in engineering field related to the vector valued functions.
CO5	**Evaluate** the line, surface and volume integrals and converting them from one to another

CO-PO Mapping

Program outcomes/course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2										1
CO2	3	2										1
CO3	3	2										1
CO4	3	2										1
CO5	3	2										1

Course Coordinator

HOD, H&S

NALLA NARASIMHA REDDY

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APPLIED PHYSICS COURSE OUTCOMES(R22)

CO1	Understand physical world from fundamental point of view by the concepts of Quantum mechanics
CO2	Identify the role of semiconductor devices in science and engineering Applications.
CO3	Explore the fundamental properties of dielectric, magnetic materials and Superconductors for their applications
CO4	Applying the knowledge of Nanomaterials in various fields.
CO5	Understand various aspects of Lasers and Optical fiber and their applications in diverse fields.

Course Outcomes	Relationship of Course outcomes(CO) to Program Outcomes (PO)													
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1					1				1		
CO2	3	2	1					1				1		
CO3	3	2	1					1				1		
CO4	3	2	1					1				1		
CO5	3	2	1					1				1		

Course Coordinator

HOD, H&S

Department of Electronics & Communication Engineering
Academic Year: 2023-24

YEAR: I **SEMESTER: I** **REGULATION: R22**

Course Name: Elements of Electronics and Communication Engineering **Course Code: 22EC101PC**

CO1	**Understand** about the Parameters of Various Electronic Components
CO2	**Analyze** various Instruments and Equipment (DMM,CRO,Power Supply and Function Generator)
CO3	**Distinguish** Various Signals used for Analog and Dital Communications
CO4	**Understand** various Logic Gates and verify their Truth Tables
CO5	**Identify** Various Analog and digital IC's

Department of Electronics & Communication Engineering
Academic Year: 2023-24

YEAR: II **SEMESTER: I** **REGULATION: R22**

Course Name: Analog Circuits **Course Code: 22EC301PC**

CO1	**Analyze** the biasing techniques of transistors
CO2	**Extract** the equivalent models of transistors
CO3	**Design** multistage amplifiers and understand the concepts of Frequency Analysis of transistors
CO4	**Differentiate** between the positive and negative feedback concepts as applied to various electronic circuits
CO5	**Design, construct & analyze** oscillator circuits to generate audio and radio frequency sinusoidal signals

Course Name: Network analysis and Synthesis **Course Code: 22EC302PC**

CO1	**Understand** behavior of Electric & Magnetic Networks
CO2	**Analyze** the transient and steady-state responses of the RL, RC and RLC circuits
CO3	**Examine** various two port network parameters and its characteristics
CO4	**Construct** various filter networks and attenuators
C05	**Inspect** functions of RC, LC and RL networks using Foster and Causer methods

Course Name: Digital Logic Design **Course Code: 22EC303PC**

CO1	**Realize** different number systems and Boolean functions using universal gates
CO2	**Realize** the logic gates and Boolean functions using different logic families and verify the functionality
CO3	**Utilize** the postulates of the Boolean Algebra to minimize the combinational and sequential circuits
CO4	**Analyze** sequential circuits and machines with the functionality
CO5	**Illustrate** different types of Finite State Machines

Course Name: Signals and Systems **Course Code: 22EC304PC**

CO1	**Interpret** any signal in terms of complete set of orthogonal functions and the types of signals
CO2	**Analyze** the Fourier spectrum using Fourier series and Fourier transforms
CO3	**Apply** the Examine an LTI system and its filter characteristics of a system
CO4	**Analyze** Laplace Transforms and Z-Transforms
CO5	**Explain** the Sampling theorem and Correlation functions

Course Name: Probability Theory and Stochastic Processes **Course Code: 22EC305PC**

CO1	**Define** events & different theorems of probability
CO2	**Explain** single & multiple Random Variables and operations performed on them
CO3	**Define** the concepts of Random Process and its Characteristics
CO4	**Analyze** Spectral and temporal characteristics of Random Signals
CO5	**Apply** the concepts of Noise in Communication systems

Course Name: Analog Circuits Laboratory **Course Code: 22EC306PC**

CO1	**Determine** the Q point on the DC load line and stability factor for various biasing techniques of BJT
CO2	**Analyze** the Characteristics and Frequency response of various amplifiers
CO3	**Analyze** and Design negative Feedback amplifiers and Oscillators

Course Name: Digital logic Design Laboratory **Course Code: 22EC307PC**

CO1	**Realize** and implementation of Boolean functions using digital logic IC's
CO2	**Implementation** of different combinational logic circuits using IC's
CO3	**Realize** and **implementation** of Asynchronous and Synchronous counters using Flip-Flop IC's

Course Name: Basic Simulation Laboratory **Course Code: 22EC308PC**

CO1	**Simulate** operations on various types of signals and sequences
CO2	**Analyze** signal characteristics in frequency domain and frequency response of an LTI system using Fourier transform
CO3	**Inspect** the stability of an LTI system using Laplace, Z-transforms and Determine convolution and correlation between signals and sequences

Course Name: Constitution of India **Course Code: 22MC309CI**

CO1	**Understand** the concept of Indian Constitution
CO2	**Outline** the fundamental rights and Fundamental Duties
CO3	**Analyze** the Directive Principles of State Policy
CO4	**Analyze** the distribution of powers between of Union and States
CO5	**Know** the Emergency Provision of Indian Constitution

Department of Electronics & Communication Engineering
Academic Year: 2023-24

YEAR: III **SEMESTER: I** **REGULATION: R21**

Course Name: Microprocessors and Microcontrollers **Course Code: 21EC501PC**

CO1	**Understand** the internal architecture, organization and program the assembly language for 8086 microprocessor unit using instruction set & macros.
CO2	**Understand** the internal architecture, organization and program the assembly language for 8051 microcontroller unit using instruction set & macros.
CO3	**Learn** how to implement the I/O and memory interfaces to 8051 for various applications.
CO4	**Know** the fundamentals of ARM processor with architecture and instruction set.
CO5	**Expand** the knowledge of ARM processor to study CORTEX & OMAP processors

Course Name: Data Communications & Networks **Course Code: 21EC502PC**

CO1	**Discuss** the basics of Internet and compare ISO-OSI &TCP/IP reference models
CO2	**Solve** problems in Error Control and Access control mechanisms
CO3	**Analyze** different Routing Techniques
CO4	**Explain** different UDP and TCP protocols
CO5	**Compare** the functioning of various Application layer Protocols

Course Name: Control Systems **Course Code: 21EC503PC**

CO1	**Develop** the mathematical model of physical systems
CO2	**Estimate** the system response & stability in Time domain
CO3	**Analyze** the system response & stability in Frequency domain
CO4	**Design** different types of controllers and compensators
CO5	**Analyze** linear time systems using state space representation

Course Name: Business Economics & Financial Analysis **Course Code: 21SM504MS**

CO1	**Understand** the various Forms of Business and the impact of economic variables on the Business
CO2	**Analyze** Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt
CO3	**Study** the firm 's financial position by analyzing the Financial Statements of a Company
CO4	**Learn** the basic business types, impact of the economy on Business and Firms specifically
CO5	**Analyze** the Business from the Financial Perspective

Course Name: Computer Organization & Operating Systems Course Code: 21EC511PE

CO1	**Describe** organization of digital computers and their basic principles and operations
CO2	**Illustrate** the hierarchical memory system and the design of the Control unit
CO3	**Demonstrate** Different ways of Communicating with I/O Devices and standard I/O interfaces
CO4	**Understand** the objective and functions of modern operating systems
C05	**Analyze** issues related to file system interface and implementation, disk management

Course Name: Microprocessors and Microcontrollers Lab Course Code: 21EC505PC

CO1	**Apply** the basics of 8086 microprocessor and build Assembly Language Programs (ALP) for various CPU operations of 8086 using Microsoft's MASM software
CO2	**Apply** the basics of 8051 microcontroller and build Assembly Language Programs (ALP) for various CPU operations of 8051 using Keil-µVision 4.0 software
CO3	**Establish** and Develop programs for 8051 Serial Port Programming, Interrupt Programming & Interfacing Applications using Keil-µVision 4.0 software

Course Name: Data Communications & Networks Lab Course Code: 21EC506PC

CO1	**Evaluate** data communication link considering different topologies with queuing, noise and congestion under TCP and UDP transmission
CO2	**Analyze** packet flow on basis of routing protocols in different wireless standards
CO3	**Understand** and observe data format for different network layer, transport layer and application layer protocols in Internet

Course Name: Advanced Communication Skills Lab Course Code: 21EN508HS

CO1	**Develops** confidence to use relevant vocabulary, using apt kinesics or body language in communication
CO2	**Infer** the meaning of the text easily through comprehension techniques like, skimming, scanning and effective reading through proper vocabulary
CO3	**Exhibit** the writing skills through letters, reports and resume writing from the text and use for all professional settings

Department of Electronics & Communication Engineering
Academic Year: 2023-24

YEAR: IV **SEMESTER: I** **REGULATION: R18**

Course Name: Microwave and Optical Communications **Course Code: EC701PC**

CO1	**Explain** O and M microwave tubes, their structures and principles of microwave power generation
CO2	**Understand** the principles of solid-state devices
CO3	**Analyze** the waveguide components
CO4	**Calculate** the scattering parameters for junctions and verify it by measurements
CO5	**Explain** optical fiber transmission link with optical transmitter and receiver

Course Name: Digital Image Processing **Course Code: EC713PE**

CO1	**Understand** digital image processing fundamentals and Analyze images using various transform techniques
CO2	**Evaluate** various image enhancement techniques in the spatial and frequency domain
CO3	**Categorize** various techniques for image restoration
CO4	**Apply** different operators for image segmentation and Morphological operations
CO5	**Categorize** the performance and characteristics of various image compression models

Course Name: Biomedical Instrumentation **Course Code: EC721PE**

CO1	**Make** use of bio-systems and medical systems for an engineering perspective
CO2	**Identify** various techniques/Instruments for measuring physiological parameters
CO3	**Apply** the Categorize different EEG electrodes and their applications
CO4	**Explain** about various critical care equipment
CO5	**Elaborate** principles of medical imaging such as MRI,SPECT,PET,CT

Course Name: Python Program **Course Code: CS702OE**

CO1	**Examine** syntax and semantics in the use of Python flow control and functions
CO2	**Demonstrate** manipulations of File systems and exception handling
CO3	**Inspect** Python Programs using REGEX and multi-threading
CO4	**Contrast** GUI and web programming applications using Python
CO5	**Construct** applications related to Network Programming, Web Services and Databases in Python

Course Name: Professional Practice, Law & Ethics **Course Code: SM702MS**

CO1	**Understand** Professional Ethics & Personal Ethics, code of Ethics, Conflict of Interest. Will able to learn the concept of professionalism, Whistle blowing and the brief introduction of GST
CO2	**Identify** various techniques/Instruments for measuring physiological parameters. Recognize the element of contract, unlawful and illegal agreement. Will analyze the remedies for breach of contract, sale of goods act 1930 and performance of contract of sales
CO3	**Illustrate** Arbitration, Conciliation and ADR different forms of laws and the dispute resolution board.; Distinction between conciliation, negotiation, mediation and arbitration, confidentiality
CO4	**Enumerate** the concept of labor laws and other construction related laws and other different types of ACT (1946, 1947, 1923) and also); RERA Act 2017, NBC 2017
CO5	**Understand** IPR Copyright, Trademarks, Patents and Designs, Secrets, Piracy in Internet Remedies and procedures in India

Course Name: Microwave and Optical Communications Lab **Course Code: EC703PC**

CO1	**Identify** and demonstrate the working of various microwave and optical components
CO2	**Analyze** Microwave Passive Devices by conducting experiments and measuring various parameters
CO3	**Analyze** the characteristics of Optical semiconductor Sources like LED, LASER Diode, by conducting experiments and measuring various parameters

Course Name: Industrial Oriented Mini Project/ Summer Internship **Course Code: EC704PC**

CO1	**Demonstrate** sound technical knowledge & Domain knowledge of the selected topic
CO2	**Plan, communicate, analyze & identify** the Problem for the proposed work and collect
CO3	**Design** the Solution and execute by using engineering approach to overcome the complex problems
CO4	**Learn** to work as a team and to focus on getting a working project done on time with each student
CO5	**Implement** and test solutions to trace against the user requirements

Course Name: Seminar **Course Code: EC705PC**

CO1	**Enhance** Technical Communication Skills
CO2	**Collaborate** and Engage in Peer Feedback
CO3	**Develop** for Future Academic or Professional Endeavors

Course Name: Project Stage - I **Course Code: EC706PC**

CO1	**Formulate** and apply mathematical, science, and engineering principles to solve real-time engineering problems
CO2	**Implement** the existing technique in domains of VLSI, Image & Signal Processing, Communication, and Embedded system using modern tools and technology
CO3	**Validate** the obtained results on contemporary issues related to society and the environment

Department of Electronics & Communication Engineering
Academic Year: 2023-24

YEAR: I **SEMESTER: II** **REGULATION: R22**

Course Name: Electronic Devices and Circuits **Course Code: 22EC201PC**

CO1	**Analyze** the characteristics of PN Junction Diode
CO2	**Examine** various applications of Diode
CO3	**Analyze** the characteristics of CE, CB & CC configurations
CO4	**Explain** the operations of FET, MOSFET & compare their performances
CO5	**Understand** the various special purpose diodes

Course Name: Electronic Devices and Circuits Laboratory **Course Code: 22EC202PC**

CO1	**Construct** and analyze the characteristics of PN junction diode, Zener diode and Silicon Controlled Rectifier, Implement the rectifier circuits with and without filter and voltage regulator
CO2	**Analyze** the characteristics and calculate the parameters of transistors like BJT, FET, and UJT
CO3	**Design** the various Amplifiers like Common Emitter, Common Base, Common Source and Implement them using hardware and also observe their frequency response

Department of Electronics & Communication Engineering
Academic Year: 2023-24

YEAR: II **SEMESTER: II** **REGULATION: R22**

Course Name: Numerical Methods and Complex Variables **Course Code: 22MA401BS**

CO1	**Apply** the Laplace transforms techniques for solving
CO2	**Evaluate** the real roots of algebraic and transcendental equations by different numerical methods and estimate the value for the given data using interpolation methods
CO3	**Find** the numerical solutions for a given ODE's and use suitable method to find the numerical integration
CO4	**Analyze** complex functions with reference to their analyticity using Cauchy's Riemann equations
CO5	**Find** the Taylors and Laurent's series expansion of complex functions, integrating using Cauchy's integral and residue theorems

Course Name: Electromagnetic Fields and Transmission Lines **Course Code: 22EC401PC**

CO1	**Understand** the basic laws and equations related to electrostatic fields
CO2	**Demonstrate** the concepts and laws related to magnetostatic fields
CO3	**Apply** the Maxwell's equations in different conditions
CO4	**Identify** the characteristics of EM waves in different medium
CO5	**Analyze** transmission lines and its characteristics

Course Name: Analog and Digital Communications **Course Code: 22EC402PC**

CO1	**Understand** the concepts of analog modulation and demodulation techniques
CO2	**Compare** AM, FM, PM and Pre-Emphasis, De-Emphasis circuits
CO3	**Classify** the different types Transmitter and Receivers
CO4	**Analyze** digital pulse modulation techniques
CO5	**Estimate** the Probability error for Digital modulation and demodulation techniques

Course Name: Linear and Digital IC Applications **Course Code: 22EC403PC**

CO1	**Understand** the concepts of operational amplifiers and Examine linear integrated circuit applications
CO2	**Apply** the knowledge of functional diagrams of IC555, IC565 and its applications
CO3	**Evaluate** the various data converters
CO4	**Analyze** CMOS and TTL Logic family ICs of combinational circuits
CO5	**Analyze** CMOS and TTL Logic family ICs of sequential circuits

Course Name: Electronic Circuit Analysis **Course Code: 22EC404PC**

CO1	**Understand** the concepts of Power Amplifiers
CO2	**Construct** the tuned amplifier for Frequency Response with Q Factor
CO3	**Design** Multivibrators for various Applications using transistors
CO4	**Design** Multivibrators for various Applications using transistors
C05	**Analyze** the concepts of Synchronization, Frequency Division for Sweep Circuits and Sampling Gates

Course Name: Analog and Digital Communications Laboratory **Course Code: 22EC405PC**

CO1	**Design** and implement various Analog and Pulse modulation and demodulation Techniques and observe the time and frequency domain characteristics
CO2	**Attain** the knowledge about AM, FM Transmitters and Receivers
CO3	**Design** and implement various Digital modulation and demodulation Techniques and observe the waveforms of these modulated Signals practically

Course Name: Linear and Digital IC Applications Laboratory **Course Code: 22EC406PC**

CO1	**Understand** the pin configuration of each linear/ digital IC and its functional diagram
CO2	**Design** the circuits for the given specifications using linear and digital ICs
CO3	**Design** and analyze the various application of 555 timer

Course Name: Electronic Circuit Analysis Laboratory **Course Code: 22EC407PC**

CO1	**Comprehend** the fundamentals of multistage amplifiers, feedback, power amplifiers and oscillator circuits
CO2	**Analyze** the circuit design process and simulate the common emitter common collector and common source amplifier circuits. Discriminate the design and simulate various oscillator circuits
CO3	**Create** the design and simulate the cascade, class A power amplifier circuits, and single tuned voltage amplifier circuits. To know the working of transistorized multivibrator circuits

Course Name: Real Time Project/ Field Based Project **Course Code: 22EC408PC**

CO1	**Analyze, formulate, and implement** the proposed method in domains of VLSI, Image & Signal Processing, Communication, and Embedded systems that find a solution to the society and environment
CO2	**Demonstrate** effectively the engineering principles used in their project individually and as a team
CO3	**Structure** future work to promote life-long learning in the context of technological adaptation

Department of Electronics & Communication Engineering
Academic Year: 2023-24

YEAR: III **SEMESTER: II** **REGULATION: R21**

Course Name: Antenna and Wave Propagation **Course Code: 21EC601PC**

CO1	**Describe** the antenna radiation pattern, characteristic parameters with their mathematical relations
CO2	**Compare** various types of antenna arrays
CO3	**Explain** the different methods to measure antenna far zone pattern and gain measurements
CO4	**Characterize** various antennas based on geometry, frequency of operation pattern with radiation pattern
CO5	**Distinguish** various methods of wave propagation in free space and related parameters

Course Name: Digital Signal Processing **Course Code: 21EC602PC**

CO1	**Understand** the LTI system characteristics
CO2	**Make** use of Algorithms to fast compute DFT of given discrete sequence
CO3	**Construct** digital IIR filter for the given specifications
CO4	**Calculate** the filter coefficients for FIR structure
CO5	**Demonstrate** the impacts of finite word length effect in filter design

Course Name: VLSI Design **Course Code: 21EC603PC**

CO1	**Demonstrate** about the fabrication steps and electrical properties of MOS circuits
CO2	**Design** various gates, adders, Multipliers and Memories using stick diagrams, layouts
CO3	**Develop** the Subsystems with CMOS Technology for Logic Circuits
CO4	**Design** various forms of memories
CO5	**Design** PLA's, FPGA, CPLDs and apply concept of fault models and testing

Course Name: Embedded System Design **Course Code: 21EC613PE**

CO1	**Choose** embedded systems for specific application
CO2	**Analyze** the types of core, memory and interfacing to external hardware
CO3	**Design** procedure embedded firmware design
CO4	**Identify** the significance of Real Time Operating Systems
CO5	**Evaluate** the issues for development of task communication techniques and device drivers

Course Name: Data Base Management Systems **Course Code:**

CO1	**Understand** the basic concepts of database management systems
CO2	**Draw** Entity-Relationship diagrams to represent simple database application scenarios
CO3	**Write** SQL queries for a given context in relational database
CO4	**Discuss** normalization techniques with simple examples
C05	**Describe** transaction processing and concurrency control concepts

Course Name: Digital Signal Processing Lab **Course Code: 21EC604PC**

CO1	**Apply** and analyze different discrete time systems using DFT/FFT
CO2	**Design** and implement IIR and FIR filter
CO3	**Design** sampling rate converter

Course Name: e – CAD Lab **Course Code: 21EC605PC**

CO1	**Illustrate** HDL programs for combinational and sequential logics with simulations and synthesis
CO2	**Design** and analyze NMOS and CMOS logic circuits
CO3	**Design** layouts for logic circuits and perform physical verification

Course Name: Scripting Languages Lab **Course Code: 21EC606PC**

CO1	**Study** the basics of scripting language like Java script, Perl ,PHP and Ruby
CO2	**Understand** the requirements of Scripting Languages and identify the uses of Scripting Languages
CO3	**Introduce** in-depth knowledge of programming features of Perl and PHP and to state the implementation and applications of Scripting

Department of Electronics & Communication Engineering
Academic Year: 2023-24

YEAR: IV **SEMESTER: II** **REGULATION: R18**

Course Name: Wireless & Sensor Networks **Course Code: EC813PE**

CO1	**Analyze** various architectures of wireless sensor networks
CO2	**Understand** design issues and challenges in wireless sensor networks
CO3	**Compare** the performance of various routing and MAC protocols
CO4	**Classify** various data gathering and data dissemination methods
CO5	**Explain** gateway concepts and communication between wireless sensor networks and internet

Course Name: Low Power VLSI Design **Course Code: EC823PE**

CO1	**Understand** knowledge about the need of low power circuit design methods
CO2	**Acquire** the knowledge of different architectural approaches to achieve low power designs
CO3	**Analyze** and design low voltage low power sub system blocks like adders which are required to build the data path systems
CO4	**Interpret the** methods for design of low voltage low power multipliers
CO5	**Design** of low voltage low power memories in different methods

Course Name: Database Management System **Course Code:**

CO1	**Understand** the basic concepts of database management systems
CO2	**Draw** Entity-Relationship diagrams to represent simple database application scenarios
CO3	**Write** SQL queries for a given context in relational database
CO4	**Discuss** normalization techniques with simple examples
CO5	**Describe** transaction processing and concurrency control concepts

Course Name: Project Stage-II **Course Code: EC801PC**

CO1	**Analyze, formulate, and implement** the proposed method in domains of VLSI, Image & Signal Processing, Communication, and Embedded systems that find a solution to the society and environment
CO2	**Demonstrate** effectively the engineering principles used in their project individually and as a team
CO3	**Structure** future work to promote life-long learning in the context of technological adaptation

UGC AUTONOMOUS INSTITUTION

School of Management Sciences

Name of the Subject: Management and Organizational Behavior **Subject Code: 22MBA01**

Year/Sem : I Year/I Sem **Regulation : R22**

CO1	Gain understanding of the Concepts of Management, its Evolution, Functions and the Theories contributed by various Management Thinkers
CO2	Learn the process of planning, goal setting and the process of decision making with the help of various models.
CO3	Learn the processes of Organizing and Controlling with the help of various Organizational Structures
CO4	Appreciate the relevance of Individual and group behavior in an organization and the role of Culture and dynamics
CO5	Identify different Leadership Styles, Skills and the Theories of Motivation

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	2		2		1	1	2	3	3		
CO2	2	1	1			1	1	1	1	3	
CO3	1	2		1		1	1				1
CO4	2	2	1	3	2	1		2		1	1
CO5	2			2	1	1	1	1		1	1

UGC AUTONOMOUS INSTITUTION

School of Management Sciences

Name of the Subject: Business Economics **Subject Code: 22MBA02A**

Year/Sem :I Year/I Sem **Regulation: R22**

Course Objectives

1. To provide an understanding of the basic concepts associated with Business Economics.
2. To impart the knowledge of various aspects of Demand and Supply
3. To highlight the importance of Production and Cost concepts in a Firm.
4. To elaborate on the nature of various Market Structures
5. To enable the understanding of various Pricing Strategies

Course Outcomes

1. Understand the Concepts and Principles of Business Economics.
2. Learn various concepts and practical applications of Demand and Supply viz. Laws, Types, Elasticity, Forecasting and Equilibrium
3. Learn concepts and applications related to Production and Cost of a firm.
4. Learn the features of various Market Structures along with the Decision-making with regards to Price and Output in Short and Long Terms
5. Understand the concepts of Pricing Practices, Theory of Firm and Managerial & Behavioral Theories of a Firm

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	1	3	2			1			2		
CO2	2	1		2			1	1			
CO3	1	1					2		1	1	2
CO4	1	1				1			1		
CO5	2		1	1	1	1					

School of Management Sciences

Name of the Subject: Financial Reporting & Analysis **Subject Code: 22MBA03**

Year/Sem : MBA I YR I SEM **A.Y:2022-23** **Regulation : R22**

CO1	Understand the Concepts and Principles of Accounting.
CO2	Understand the Accounting Process in detail.
CO3	Learn various aspects in depreciation, Inventory and Goodwill.
CO4	Analyze the Working Capital and Flow of Funds and Cash into the Business
CO5	Prepare, analyze and Interpret Financial Statements.

Mapping Matrix of CO's and PO's

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO 1	1	1	1					1					1
CO 2	3	3	2	2		2					1	2	
CO 3	2	3	3			2		1	1			2	
CO 4	3	2	2			2		1	2	2			
CO 5	2	3	1	1	1	2	1		1		2		1

(Autonomous Institution)

SCHOOL OF MANAGEMENT SCIENCES

Course Name: Research Methodology and Statistical Analysis

Year/ Semester: I/I **Regulation: R22**

Course Outcomes (After the completion of the course, the student is able to):

CO.1	Gain a conceptual overview of Research and the relevant concepts to Research.
CO.2	Learn the different types of Research Designs, Data Collection Tools and Procedures.
CO.3	Use different methods of representing data through Graphs and Tables; gain an overview of Statistics and relevant concepts and conduct Small Sample Tests.
CO.4	Learn to solve mathematical problems related to ANOVA (One-way and Two-way), Correlation and Regression.
CO.5	Learn the application of Time Series and Index Numbers; appreciate the need for preparing and presenting a structured Research Report.

CO-PO Mapping:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO1	PSO2	PSO3
CO.1	3	3	3	-	3	-	-	2	2	2	1
CO.2	1	2	2	-	1	-	-	2	2	2	2
CO.3	3	3	3	-	-	1	1	-	1	-	1
CO.4	2	3	3	1	1	2	-	-	2	-	2
CO.5	2	3	3	1	2	1	1	-	1	-	-

UGC AUTONOMOUS INSTITUTION

School of Management Sciences

Name of the Subject: LEGAL AND BUSINESS ENVIRONMENT **Subject Code: 22MBA05**

Year/Sem :I Year/I Sem **Regulation: R22**

Objectives

To educate on the Legal and Regulatory Framework for doing business in India

To educate various aspects in Law of Contract

To explain about Negotiable Instruments and Rbi guidelines on Digital Transactions

To enlighten students the significance of Monetary, Fiscal Policy, Union Budget

To impart knowledge of different Business Regulations and Environment Laws

Course Outcome

Understand the Business Laws related to incorporation of a company

Learn the Law of Contract & Sale of Goods

Learn the salient fetures of Negotiable instruments Act 1881

Learn the Reforms Undertaken by the Government with respect to th challenging business environments

Gain insights of the Regulatory framework in India.

Mapping Matrix of CO's-PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3				2	3			2	3	
CO2	3					3			2	3	
CO3	2					3			2	3	
CO4			2			3	2		3		
CO5	3					3	2		1	3	2

UGC AUTONOMOUS INSTITUTION

School of Management Sciences

Name of the Subject: Business Ethics and Corporate Governance **Subject Code: 22MBA06A**

Year/Sem : I Year/I Sem **Regulation : R22**

CO1	Understand the Need for Business Ethics and Corporate Governance in India
CO2	Apply Knowledge of Established Methodologies of Solving Professional Ethical Issues
CO3	Learn Codes and Committees in Corporate Governance
CO4	Understand the Role of Board in Corporate Governance
CO5	Assess the Stakeholder Perspective of Corporate Governance

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	2	3	1		3	2	2		2	2	3
CO2	2			2	3	1	2		2	2	3
CO3	3		2	1	2	3		2	1	1	3
CO4	2	2	2	1	3	2		2	3	1	2
CO5		1	2		2		2		2	1	1

UGC-AUTONOMUS

School of Management Sciences

SUBJECT CODE: 22MBA07

SUBJECT: BUSINESS COMMUNICATION LAB **SEMESTER: I-I**

Course Objectives:

- To demonstrate the importance various modes of communication and their applications inbusiness.
- To develop Business Writing skills with practice of writing letters and improving the readabilityof written communication.
- To highlight the importance of writing business reports and proposals.
- To impart knowledge and skills necessary for development of verbal (speech & presentation)and non-verbal (body language) skills.
- To orient on the contemporary aspects in communication.

Course Outcomes: Students will be able to

- Appreciate the importance and influence of Business Communication and learn its applicationsfor the purpose of self-development.
- Learn by practice of writing a variety of formal and informal letters & e-mails and reports andimprove the readability of written documents
- Identify the intricacies of writing Business Reports and Proposals
- Develop verbal (oral) skills by giving presentations and participating in group discussions;appreciate the impact of body language in the process of communication
- Polish their etiquette, improve telephonic skills and appreciate the need for culture in maintenance of public relations.

Mapping matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	2	-`	-	2	2	3	3	3	2	1
CO2	3	-	-	-	2	2	2	3	2	3	1
CO3	3	-	-	-	2	2	2	3	3	2	1
CO4	3	-	-	-	2	2	2	3	3	2	1
CO5	1	3	-	-	2	2	2	2	2	2	2

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SCHOOL OF MANAGEMENT SCIENCES

Course Name: Statistical Data Analysis Lab

Year/ Semester: I/II **Course Code: 22MBA08** **A.Y: 2022-23**

Course Outcomes (After the completion of the course, the student is able to):

CO.1	Understand the importance of the main functions of MS- Excel /SPSS
CO.2	Practice advance Excel Tools for conduction of Data Analysis
CO.3	Evaluate Data Analysis using Pivot Tables and Pivot Charts
CO.4	Analyze the Data using Descriptive Statistics
CO.5	Conduct various Parametric and Non-parametric Tests using MS Excel / SPSS□

CO-PO Mapping:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO1	PSO2	PSO3
CO.1	3	3	3	-	-	1	1	1	3	1	2
CO.2	2	2	2	-	-	1	1	1	3	1	2
CO.3	3	3	3	-	-	1	1	1	3	1	2
CO.4	2	1	-	-	2	2	-	2	3	-	1
CO.5	-	-	1	2	-	-	-	-	-	1	-

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School of Management Sciences

Name of the Subject: Human Resource Management **Subject Code: 22MBA09**

Year/Sem : I Year/II Sem **Regulation : R22**

CO1	Understand the concepts, role and functions of HRM and appreciate the need of HR to act as a Strategic Business Partner of the Organization.
CO2	Learn the methods of conducting Job Analysis, process of writing Job Descriptions & Specifications and the processes of recruitment and selection.
CO3	Gain an understanding of various concepts and practices of Employee Training & Development and Performance Management & Appraisals.
CO4	Learn the principles and practices of Employee Compensation and Rewards, with the help of Job Evaluation & Broad-banding etc. and the salient features of Workmen Compensation Act and Minimum Wages Act.
CO5	Appreciate the need for effective Employee Relations and learn the salient features of Industrial Disputes Act and Factories Act

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	2		1	1	2		1	1	1		1
CO2	2			1	1			1			2
CO3	1		2	2	2			1		3	1
CO4	2				1		1		1		1
CO5	1	3	2	0					2		

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School of Management Sciences

Name of the Subject: Marketing Management **Subject Code: 22MBA10**

Year/Sem : I Year/II Sem **Regulation : R22**

CO1	Understand the important concepts and principles of Marketing Management and Marketing Research.
CO2	Learn about the analysis of Market Opportunities and Customer Value with the help of Marketing Mix Elements
CO3	Learn the significance of designing a customer driven strategy through Market Segmentation, Targeting and Positioning
CO4	Assess Global marketing, green marketing strategies for sustainable development
CO5	Gain insights of the key aspects of pricing decisions and the role of communication

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1		1	2	1			2				
CO2	3	1			3	2					
CO3	1	3					1		1	3	
CO4	2	2	2	3			2			2	
CO5	2	1			1	1	1	2			1

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SCHOOL OF MANAGEMENT SCIENCES

Course Name: FINANCIAL MANAGEMENT

Year/ Semester: I/II **A.Y: 2022-23**

Course Outcomes (After the completion of the course, the student is able to):

CO.1	Understand the concept of time value of money.
CO.2	Learn about the capital budgeting techniques and cost of capital.
CO.3	Learn the significance of Capital structure vs. financial structure.
CO.4	Assess dividend policies of Indian companies, determinants of working capital, analysis of investment in inventory.
CO.5	Understand the Concepts and Applications of Working Capital Management and Management of Current Assets.

CO-PSO Mapping:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO1	PSO2	PSO3
CO.1	3	3	3	-	-	-	-	1	2	2	1
CO.2	3	3	3	2	-	1	1	1	2	2	2
CO.3	3	3	3	1	-	1	1	1	2	-	-
CO.4	2	2	2	2	-	1	1	1	2	-	-

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SCHOOL OF MANAGEMENT SCIENCES

Course Name: Quantitative Analysis for Business Decisions

Year/ Semester: I/II **Regulation: R22**

Course Outcomes (After the completion of the course, the student is able to):

CO.1	Understand the origin and application of operations research.
CO.2	Learn about the Formulation of Linear Programming Problem for different areas.
CO.3	Appreciate the significance of variations of assignment problem, transportation problem, methods for finding Initial feasible solution.
CO.4	Learn the aspects of Decision Theory and Network Analysis
CO.5	Gain insights of the theoretical principles and practical applications of different queuing models.

CO-PSO Mapping:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO1	PSO2	PSO3
CO.1	3	3	3	-	-	-	-	-	3	1	1
CO.2	2	3	3	-	1	-	-	1	3	1	2
CO.3	1	3	3	-	-	1	-	-	2	-	1
CO.4	2	3	3	1	-	-	-	1	2	-	1
CO.5	1	3	3	1	-	1	1	-	2	-	-

School of Management Sciences

Name of the Subject: Entrepreneurship & Design Thinking Subject Code: 22MBA13

Year/Sem : MBA I YR II SEM A.Y:2022-23 Regulation : R22

CO1	To understand the Entrepreneurial process and also inspire them to be Entrepreneurs.
CO2	To highlight importance of entrepreneurial motivational behavior, entrepreneurial competencies,entrepreneurial Stress.
CO3	To elucidate on the opportunities and challenges of entrepreneurship
CO4	To clarify students the significance of Principles, process of Design Thinking
CO5	To educate on Development of Prototypes, Testing Ideas and Implementing Design Thinking

Mapping Matrix of CO's and PO's

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO 1	1	1	1					1				1	
CO 2	3	3	2	1		2					1	2	
CO 3	2	3	3			2		1	2			2	
CO 4	3	2	2			1		1	2	2			
CO 5	2	3	1	1	1	2	1		1		2		1

School of Management Sciences

Name of the Subject: LOGISTICS AND SUPPLY CHAIN MANAGEMNET Subject Code: 22MBA14

Year/Sem : I YEAR/II SEM **Regulation : 22**

Course Objective:

To provide understanding of the components and processes of supply chain and logistics management as well as the performance driers of supply chain

To impart knowledge on the various functions of logistics management

To educate on designing of the supply chain network

To clarify the significance of establishing global supply chain

To highlight the role of information technology in supply chain

Course Outcome

Understand the cyclical perspective of logistics and supply chain process

Learn about the distribution, transportation, warehousing related issues and challenges in supply chain

Appreciate the significance of network design in the supply chain

Gain knowledge of various models/tools of measuring the Supply Chain Performance

Appreciate the role of coordination and technology in Supply Chain Management.

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	1	1	3			3		1	2		
CO2	2	2				1	3	1		2	
CO3	3	1	3					1	1	1	
CO4	1	3	3			2			3		
CO5	2		3			3	3	3	1	2	

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School of Management Sciences

Name of the Subject: Rural Marketing **Subject Code: 22MBA015D**

Year/Sem :I Year/II Sem **Regulation: R22**

Course Objectives

1. To enable understanding of the importance of Rural Marketing, Rural Environment, Problems in Rural Marketing in India
2. To describe the different rural marketing Strategies to be adopted by the corporate.
3. To elaborate on the rural market brand and channel management aspects.
4. To help understand the factors that influence rural consumers during purchase of products
5. To impart knowledge on various applications and innovation strategies in rural marketing.

Course Outcomes

1. Understand the importance of Indian Rural Economy.
2. Learn various rural marketing strategies
3. Learn challenges of Retail Channel Management
4. Understand the aspects of rural business research.
5. Learn e- rural marketing, CSR, IT for rural development, e- Governance for Rural India.

Mapping Matrix of CO's and PO's

S.No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	2	1		2			2			1	
CO2	2	1			3	2		1			
CO3	1	3					1		2	3	2
CO4	2	2	2	3			1	1		2	
CO5	1	1			2	1	1	2			3

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School of Management Sciences

Name of the Subject: POM **Subject Code: 22MBA16**

Year/Sem : II Year/I Sem **Regulation: R22**

CO1	Understand the importance concepts of operations management.
CO2	Learn various strategies in product and process design, analysis.
CO3	Learn examine the various aspects of plant location and product layout.
CO4	Understand the aspects of scheduling.
CO5	Gain insights of integrated materials management, e-procurement, materials planning.

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	1			1		1		2		2	2
CO2	2		1		1		1		1		
CO3	2	3		1			1		1		
CO4	1				1			1		1	1
CO5	3	3	3		2		1			1	

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School of Management Sciences

Academic Year 2022-23

Name of the Subject: Management Information Systems **Subject Code: 22MBA17**

Year/Sem : II Year/I Sem **Regulation : R22**

CO1	Understand the importance of MIS for strategic advantages.
CO2	Learn various business applications of information systems like e-business, BPR, DSS.
CO3	Learn examine the information system planning.
CO4	Understand alternative methods for building information system.
CO5	Learn cyber security with inter networks security defenses.

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	2	2		2			1			1	
CO2					3	2			2		
CO3		3		1					2	3	
CO4	2	2	2	3	2		1	1		2	
CO5	2				2			2	1		

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School of Management Sciences

Name of the Subject: Business Analytics **Subject Code: 22MBA18**

Year/Sem : II Year/I Sem **Regulation: R22**

CO1	Understand the importance of business analytics in practice.
CO2	Learn challenges of data modelling, concept of probability distribution.
CO3	Able to compute and interpret the results of Regression and Correlation Analysis.
CO4	Understand the aspects data mining.
CO5	Learn Monte Carlo simulation, risk analysis and decision tree analysis.

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3		2	1				2			
CO2	2	1								2	
CO3	1	2		1		1					
CO4	2	3	3							2	
CO5	2	3	2		1	1	2	1			

School of Management Sciences

Name of the Subject: SECURITY ANALYSIS PORTFOLIO MANAGEMENT **Subject Code: 22MBA19F1**

Year/Sem :II YEAR/I SEM **Regulation: 22**

Course Outcome

Students will be able to understand

CO 1: Understand the Indian financial system and also about investment

CO 2: Learn the relevance of risk and return

CO 3; Learn various influences bond valuation and management

CO 4; Understand the relevance of equity valuation of cash market and derivatives

CO 5; Identify the need for mutual funds in India

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3				2	3			2	3	
CO2	3	2				3			2	3	
CO3	2	2			2	3			2	3	
CO4			2		3	3	2		3		
CO5	3					3	2		1	3	2

School of Management Sciences

Name of the Subject: RISK MANAGEMENT AND FINANCIAL DERIVATIVES **Subject Code: 22MBA20F2**

Year/Sem :II YEAR/I SEM **Regulation: 22**

CO1	**Understand risk management and derivatives**
CO2	**Learn the relevance of Basel norms, types of risks**
CO3	**Learn various aspects about Derivatives Market in India**
CO4	**Understand the uses of options strategies**
CO5	**Examine the importance of SWAP Market**

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	2	3	2			2	2	1	3	3	
CO2	1		2			2	1	2	2	2	
CO3	**2**	2	1			1			2	1	
CO4	1	1				2	3	2	2		
CO5	2	3	3			1	1	1	1	2	

School of Management Sciences

Name of the Subject: Strategic Cost and Management Accounting **Subject Code: 22MBA21F3**

Year/Sem : II Year/I Sem **Regulation: R22**

CO1	Understand the cost analysis and control.
CO2	Learn the relevance of unit, job, process costing for strategic decisions.
CO3	Learn various aspects of activity-based management.
CO4	Understand the role of types of budgets and the budgeting process in non-profit organizations.
CO5	Identify the need for establishing cost standards.

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	1		2				1	1				2
CO2	2	3	2			1	1	1	2		2	2	
CO3	3	2	3	1	1	2			1	2		2	
CO4	2	2	2	2	1	2	1			2			1
CO5	2	3	3	1		2		1	2		1		

School of Management Sciences

Name of the Subject: Strategic Management Accounting **Subject Code: 21MBA21F3**

Year/Sem : II Year/ISem **A.Y: 2022-23** **Regulation: R21**

CO1	Brief description about Accounting and cost Concepts.
CO2	Describe the different techniques of cost accounting and solving for minimization of cost.
CO3	How marginal Costing techniques will be used for various decision making in the company.
CO4	Management accounting techniques utilization in the reduction of the cost.
CO5	How to prepare different types of Budgets and budgeting reports for various departments.

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	X	X		X				X	X		
CO2	X	X	X			X	X	X	X		X
CO3	X	X	X	X	X	X			X	X	
CO4	X	X	X	X	X	X	X			X	
CO5	X	X	X	X		X		X	X		X

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School of Management Sciences

Name of the Subject: Talent and Performance Management Systems **Subject Code: 22MBA19H1**

Year/Sem : II Year/ I Sem **Regulation: R22**

CO1	Understand Talent Management Process along with its key components.
CO2	Learn the significance of performance management and employee development in organizations
CO3	Learn different approaches to Performance Management System.
CO4	Understand KRA's and KPI's and performance metrics.
CO5	Identify the importance of reward systems in organizations.

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	1			1	1	1		1	1		
CO2		3	1	2	2		1	1		1	
CO3	2	1				2	2	1		3	
CO4			1	2		1					1
CO5	1	1	1		1			2		1	

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School of Management Sciences

HUMAN RESOURCES ELECTIVE **SEM: II-I**

SUBJECT CODE: 22MBA21H3 **SUBJECT: EMPLOYEE RELATIONS**

Course Outcomes: The students will be able to

- Understand the changing nature of Labor/Workforce in India and appreciate the need for knowingand maintaining good relations with Industry and Trade Unions.
- Learn the legal framework/process of Collective Bargaining and the aspects of Negotiation, SocialSecurity and Drafting of Agreements.
- Learn various aspects of Tripartism, Social Dialogue and the role of Government in IndustrialRelations
- Understand the salient features of various Acts such as Factories Act, Minimum Wages Act, ESIAct etc. and the need for maintenance of good Employee Relations
- Understand the salient features of Acts such as Industrial Disputes Act, Occupational Safety,Health and Working Conditions Code etc.

Mapping of CO's, PO's & PSO, S

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	2	1	2	2	-	3	2	2	3	2
CO2	3	3	2	1	3	1	1	1	3	3	2
CO3	3	2	2	2	3	1	3	-	2	3	2
CO4	3	2	1	-	3	-	2	1	3	3	-
CO5	3	2	1	2	3	-	2	2	3	3	1

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School of Management Sciences

Name of the Subject: Learning and Development **Subject Code: 22MBA20H2**

Year/Sem : II Year/ I Sem **Regulation: R22**

CO1	Understand Learning theories with the emphasis on learning outcomes
CO2	Learn the significance of Training in organization.
CO3	Learn different training methods
CO4	Understand essentials of management development
CO5	Identify the Training needs, Training methods for different sectors

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3							1			
CO2	2	1	1							1	2
CO3	3							1	1		
CO4	1		1	3	1	1	1			1	
CO5	2			3			1			1	

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School of Management Sciences

Name of the Subject: Strategic management **Subject Code: 22MBA23**

Year/Sem : II Year/II Sem **Regulation: R22**

CO1	Understand the importance of strategic management process.
CO2	Learn various market life cycle models for strategic analysis.
CO3	Learn Strategies for competing in global markets and internet economy
CO4	Appreciate the need for having appropriate Turnaround and Diversification Strategies.
CO5	Understand the aspects of strategy evaluation and control.

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	1			2		1	2	1			2
CO2	1	1	2			2	1		1		1
CO3	1	2			2					2	1
CO4	1	1			1	1		2	1	1	
CO5	1		1	1		1	1		1		

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SCHOOL OF MANAGEMENT SCIENCES

Course Name: INTERNATIONAL FINANCIAL MANAGEMENT

Year/ Semester: II-II **Regulation: R22**

Course Outcomes (After the completion of the course, the student is able to):

CO1	Understand recent changes and challenges in International Financial Management.
CO2	Learn Factors affecting International Trade flows
CO3	Learn various aspects about International Stock market.
CO4	Understand the uses of exchange rates.
CO5	Examine the importance of International Financing

CO-PO & CO-PSO Mapping:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO1	PSO2	PSO3
CO.1	3	2	3	-	-	2	3	2	3	-	2
CO.2	2	3	2	-	-	2	3	2	2	-	2
CO.3	3	2	3	2	1	2	3	2	3	-	3
CO.4	3	2	2	-	2	-	2	1	3	2	2
CO.5	3	3	3	2	2	2	3	2	3	2	3

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SCHOOL OF MANAGEMENT SCIENCES

Course Name: STRATEGIC FINANCIAL MANAGEMENT

Year/ Semester: II/II **Course Code: 22MBA25F5** **A.Y: 2023-24**

Course Outcomes (After the completion of the course, the student is able to):

CO.1	Understand financial strategy and control of a company.
CO.2	Learn the relevance of risk and uncertainty in making strategic decisions.
CO.3	Learn various aspects of capital budgeting.
CO.4	Understand the capital structure, dividend policy, financial distress, restructuring.
CO.5	Identify the different diversification strategies and mergers and acquisitions.

CO-PO & CO-PSO Mapping:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO1	PSO2	PSO3
CO.1	1	1	1	1	1	1	3	1	1	-	1
CO.2	1	1	1	-	-	1	3	1	2	1	2
CO.3	1	1	1	1	1	1	3	1	2	-	1
CO.4	1	1	1	-	-	1	3	1	2	-	1

School of Management Sciences

Name of the Subject: Financial Analytics **Subject Code: 22MBA26F6**

Year/Sem :II YEAR/II SEM **Regulation: 22**

CO1	**Understand techniques of financial statements**
CO2	**Learn the relevance of time value money.**
CO3	**Learn various aspects of capital budgeting**
CO4	**Understand industry, technical and economic analysis**
CO5	**Learn duration of bond and immunization strategies.**

Mapping Matrix of CO's and PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	2		3	2			2			2	
CO2	1	2				2	2		2		2
CO3	2		3	3			2			2	
CO4	3	2				2			2	2	3
CO5		3	3				2				

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SCHOOL OF MANAGEMENT SCIENCES

Course Name: INTERNATIONAL HUMAN RESOURCE MANAGEMENT

Year/ Semester: II-II **Regulation: R22**

Course Outcomes (After the completion of the course, the student is able to):

CO1	Gain an overview of the nature, scope and importance of International Human Resource Management
CO2	Understand and appreciate the role of International Human Resource Management in development and execution of strategies for success of multinational corporations.
CO3	Learn the role of International Human Resource Management in long-term planning and staffing of manpower globally
CO4	Gain insights of the strategic role of Training and Development of Expatriates in management of international assignments.
CO5	Acquaint themselves with the process of global performance management and understand the complexities of global compensation

PO'S & PSO'S:

S. No	Program Outcomes
PO1	**Management Knowledge:** Acquire knowledge and skills in management and ability to apply its principles and practices to arrive at optimal solution for any corporate problems.
PO2	**Problem analysis:** Demonstrate critical thinking skills in understanding managerial issues and problems by collecting and analyzing data.
PO3	**Development of solutions:** Design solutions for management problems by applying the contemporary methods in management sciences to enhance organizational efficiency and to find innovative business solutions.
PO4	**Behavioral skills:** Improve the verbal and non-verbal communication skills and acquire leadership skill and team work capabilities through participation. Demonstrate hands-on experience in administration and research.
PO5	**Ethics:** Apply ethical principles and understand the impact of the professional management solutions in societal and environmental contexts.
PO6	**Entrepreneurial Perspective:** To identify business opportunities and acquire entrepreneurial traits to evaluate and manage their own business successfully.
PO7	**Global Perspective:** Students should be able to demonstrate their ability to analyze and evaluate the political, economical, social, legal and technological global environment.

PO8	**Life-long learning:** Ability to engage in independent and life-long learning in the context of managing unpredictable societal and global issues.
PSO1	To apply the fundamental knowledge of management sciences to optimally solve the complex business problems.
PSO2	To demonstrate the practice of professional ethics and standards for societal and environmental well-being.
PSO3	To inculcate in students the ability to gain multidisciplinary knowledge through simulated problems, case analysis, projects and industrial training.

CO-PO & CO-PSO Mapping:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	3	2	3	2	2
CO2	3	3	3	2	2	2	3	2	3	2	3
CO3	3	2	3	-	2	1	3	-	3	2	3
CO4	2	3	2	3	1	1	2	2	2	2	3
CO5	3	3	3	2	2	-	3	2	3	2	2

Signature of Dean

Signature of Faculty

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SCHOOL OF MANAGEMENT SCIENCES

Course Name: Leadership and Change Management

Year/ Semester: II-II **Regulation: R22**

Course Outcomes (After the completion of the course, the student is able to):

CO1	Gain an understanding of the concepts and principles of leadership by studying the contributions made by various philosophers and Universities.
CO2	Learn from the various theories and styles of leadership and their contribution the subject matter of leadership from time to time.
CO3	Appreciate the role of leader in the ever-changing business scenario and gain knowledge of various models of change.
CO4	Understand the role of power, politics and conflicts in times of change, management of resistance to change in the process of implementing organizational change.
CO5	Gain insights of the process organizational development from a consultative perspective.

CO-PO & CO-PSO Mapping:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO1	PSO2	PSO3
CO1	2			2							
CO2	2	2		2	1		1			1	1
CO3	1			1					2		
CO4	1		1		1			2			
CO5	1							1			

(Autonomous Institution)

SCHOOL OF MANAGEMENT SCIENCES

Course Name: HR Analytics **Subject Code: 22MBA26H6**
Year/ Semester: II-II **Regulation: R22**

Course Outcomes (After the completion of the course, the student is able to):

CO1	Gain an understanding of the relevance of HR Analytics in the current business scenario.
CO2	Have an understanding of the models of conducting HR Analytics and understanding of the methods of capturing, examining & purifying data for conduction of HR Analytics.
CO3	Use MS Excel for conduction of HR Analytics for key HR Processes
CO4	Have an overview of various tools and software technologies used for conduction of Descriptive HR Analytics and Visualization of HR Data.
CO5	Appreciate the significance of Predictive and Prescriptive Analytics.

CO-PO & CO-PSO Mapping:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO1	PSO2	PSO3
CO1	3	3	2	2	2	1	3	3	3	2	2
CO2	3	3	3	2	2	1	2	3	3	3	2
CO3	3	3	3	3	1	1	1	2	3	3	1
CO4	3	3	3	3	2	1	3	3	3	3	2
CO5	3	3	3	2	2	2	2	3	3	3	2