



**School of Allied Health Sciences**

**MSc (Clinical Research)**

**Program Code: SAH0101**

**Batch 2020-22**

*Rahul*

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### **Vision of the University**

To serve the society by being a global University of higher learning in pursuit of academic excellence, innovation and nurturing entrepreneurship.

### **Mission of the University**

1. Transformative educational experience
2. Enrichment by educational initiatives that encourage global outlook
3. Develop research, support disruptive innovations and accelerate entrepreneurship
4. Seeking beyond boundaries

### **Core Values**

- Integrity
- Leadership
- Diversity
- Community

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### **Vision of the School**

To steer the School of Allied Health Sciences towards excellence in academics, innovation and entrepreneurship by constant endeavors

### **Mission of the School**

1. To create the state of the art facility for quality teaching learning, research & innovation
2. To incorporate the contemporary standards in teaching & learning
3. To inculcate in the students values of integrity and compassion towards the care of patients and society.

### **Core Values**

- Skilled professional
- Multidimensional
- Compassion
- Management

### 1.3.1 Programme Educational Objectives (PEO)

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**PEO1:** To understand and analyze the impact of clinical research in a global, economic, environmental and societal context.

**PEO2:** To understand the regulatory perspectives and processes, standards and practices of ICH-GCP in conduct of ethical clinical trials.

**PEO3:** Forecast the resources necessary for developing and managing clinical research grants and trials as required and regulated by global regulatory agencies.

**PEO4:** Demonstrate advanced critical thinking skills necessary to enhance employment opportunities or advancement within the clinical research industry.

**PEO5:** Effectively communicate and collaborate with health care providers and regulatory agencies to develop culturally diverse domestic and global strategies for biopharmaceutical product approvals.

### 1.3.2 Map PEOs with Mission Statements:

PEO Statements	School Mission 1	School Mission 2
<b>PEO1:</b>	<b>3</b>	<b>3</b>
<b>PEO2:</b>	<b>3</b>	<b>3</b>
<b>PEO3:</b>	<b>3</b>	<b>3</b>
<b>PEO4:</b>	<b>3</b>	<b>3</b>
<b>PEO5:</b>	<b>3</b>	<b>3</b>

### 1.3.3 Program Outcomes (PO's)

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On successful completion of the program, post graduate attributes will be:

**PO1:** Clinical research and basic medical knowledge: Apply knowledge of basic medical sciences and clinical research to be a successful member of the research team or a individual.

**PO2:** Design/development of trials: design and implement a clinical (patient-oriented) research study including selection of study methods, measures of the intervention and outcomes, data collection, management and analysis.

**PO3:** Modern tool usage: Create, select and apply appropriate techniques, resources and modern tools in clinical data management with an understanding of the limitations.

**PO4:** Ethics: Understand professional and ethical responsibilities in clinical research practice by following standards, norms and practices of ethical and regulatory bodies.

**PO5:** Communication: Understand the regulatory perspectives, norms and processes and communicate effectively with them for seeking permissions/approvals; being able to comprehend, write and present effectively trial reports and documentation

**PO6:** Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO7:** Lifelong learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in broadest context of technological change.

### 1.3.4 Mapping of Program Outcome Vs Program Educational Objectives

	PEO1	PEO2	PEO3	PEO4	PEO5
PO1	2	3	3	2	2
PO2	3	2	3	3	2
PO3	1	1	2	3	3
PO4	1	3	1	1	3
PO5	2	3	3	2	3
PO6	1	2	3	2	3
PO7	3	2	1	2	3

**1. Slight (Low)**

**2. Moderate (Medium)**

**3. Substantial (High)**

### 1.3.5 Program Outcome Vs Courses Mapping Table<sup>1</sup>:

Program Outcome Courses	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7
<b>Sem-1</b>		3	2	1	1	1	2	2
MCR 103	Human Anatomy and Physiology	3	2	1	1	1	2	2
MCR 104	Microbiology and Pathology	3	2	1	1	1	2	2
MCR 105	General and Clinical Biochemistry	3	2	1	1	1	2	2
MCR 106	General Pharmacology	3	2	1	1	1	2	2
MCR 107	Introduction to Clinical Research	3	3	3	2	2	2	3
MCR 108	Human Anatomy and Physiology (Lab)	3	2	1	1	1	2	2
MCR 109	Microbiology and Pathology (Lab)	3	2	1	1	1	2	2
MCR 110	General and Clinical Biochemistry (Lab)	3	2	1	1	1	2	2
MCR 111	General Pharmacology (Lab)	3	2	1	1	1	2	2
<b>Sem-2</b>								
MCR 112	Systemic Pharmacology	3	2	1	1	2	2	2
MCR 113	Clinical trial process and good clinical practices	3	2	2	3	2	2	2
MCR 114	Introduction to Management	2	2	3	2	3	3	3
MCR 115	Medical terminologies and conditions	3	2	2	1	2	2	3
MCR 116	Epidemiology and biostatistics	3	3	3	2	3	2	3
MCR 117	Systemic Pharmacology (Lab)							
<b>Sem-3</b>								
MCR 118	Clinical Trials Management	3	3	3	3	3	3	3
MCR 119	Regulations in Clinical research	3	3	3	3	3	3	3
MCR 120	Documentation and Data Management in Clinical research	3	3	3	3	3	3	3
MCR 121	Pharmacovigilance and Pharmacoeconomics	3	3	2	2	3	2	2
MCR 122	Psychology and patient counselling	2	1	2	2	3	3	3
<b>Sem-4</b>								
MCR 123	Research Methodology	3	3	3	3	3	3	3
MCR 124	Recent Advances in Clinical Research	3	3	3	1	2	2	3

<sup>1</sup>Cel value will contain the correlation value of respective course with PO.



**Program Structure Template**  
**School of Allied Health Sciences**  
**M.Sc. Clinical Research**  
**Batch: 2020-2022**  
**TERM: I**

S. No.	Paper ID	Subject Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course <sup>2</sup> : 1. CC 2. AECC 3. SEC 4. DSE
				L	T	P			
THEORY SUBJECTS									
1.	35296	MCR 103	HUMAN ANATOMY AND PHYSIOLOGY	3	1	--	4	Core	CC
2.	35297	MCR 104	MICROBIOLOGY AND PATHOLOGY	3	1	--	4	Core	CC
3.	35298	MCR 105	GENERAL AND CLINICAL BIOCHEMISTRY	3	1	--	4	Core	CC
4.	35299	MCR 106	GENERAL PHARMACOLOGY	3	1	--	4	Core	CC
5.	35300	MCR 107	INTRODUCTION TO CLINICAL RESEARCH	3	1	--	4	Core	CC
Practical/Viva-Voce/Jury									
6.	35301	MCR 108	HUMAN ANATOMY AND PHYSIOLOGY(LAB)	--	--	4	2	Core	CC
7.	35302	MCR 109	MICROBIOLOGY AND PATHOLOGY(LAB)			4	2	Core	CC
8.	35303	MCR 110	GENERAL AND CLINICAL BIOCHEMISTRY(LAB)			2	1	Core	CC
9.	35304	MCR 111	GENERAL PHARMACOLOGY(LAB)			2	1	Core	CC
TOTAL CREDITS							26		

<sup>2</sup> CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses



**Program Structure Template**  
**School of Allied Health Sciences**  
**M.Sc. Clinical Research**  
**Batch: 2020-2022**  
**TERM: II**

S. No.	Paper ID	Subject Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course <sup>3</sup> : 5. CC 6. AECC 7. SEC 8. DSE
				L	T	P			
THEORY SUBJECTS									
10	35367	MCR 112	SYSTEMIC PHARMACOLOGY	3	1	--	4	Core	CC
11	35368	MCR 113	CLINICAL TRIAL PROCESS AND GOOD CLINICAL PRACTICES	3	1	--	4	Core	CC
12	35369	MCR 114	INTRODUCTION TO MANAGEMENT	3	1	--	4	Core	CC
13	35370	MCR 115	MEDICAL TERMINOLOGIES AND CONDITIONS	3	1	--	4	Core	CC
14	35371	MCR 116	EPIDEMIOLOGY AND BIOSTATISTICS	3	1	--	4	Core	CC
Practical/Viva-Voce/Jury									
15.	35372	MCR 117	SYSTEMIC PHARMACOLOGY (LAB)	--	--	2	1	Core	CC
16.	35373	MCR118	COMMUNITY POSTING AND APPLICATION OF BIOSTATISTICS (NON-EXAM)			4	2	Co Requisite	AECC
17.	35374	MCR119	CLINICAL TRIAL PROCESS AND GOOD CLINICAL PRACTICES (NON-EXAM)			4	2	Co Requisite	AECC
TOTAL CREDITS							25		

<sup>3</sup> CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

**Program Structure Template**  
**School of Allied Health Sciences**  
**M.Sc. Clinical Research**  
**Batch: 2020-2022**  
**TERM: III**

S. No.	Paper ID	Subject Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course <sup>4</sup> : 9. CC 10. AECC 11. SEC 12. DSE
				L	T	P			
THEORY SUBJECTS									
18	35451	MCR 203	CLINICAL TRIAL MANAGEMENT	2	2	--	4	Core	CC
19	35452	MCR 204	REGULATIONS IN CLINICAL RESEARCH	2	2	--	4	Core	CC
20	35453	MCR 205	DOCUMENTATION AND DATA MANAGEMENT IN CLINICAL RESEARCH	2	2	--	4	Core	CC
21	35455	MCR 206	PHARMACOVIGILANCE AND PHARMACOECONOMICS	2	2	--	4	Core	CC
22	35456	MCR 207	PSYCHOLOGY AND PATIENT COUNSELLING	3	1	--	4	Core	CC
Practical/Viva-Voce/Jury									
23.	35457	MCR208	ENGLISH AND COMMUNICATION SKILLS (NON-EXAM)	2	--	2	3	Co Requisite	SEC
24.	35458	MCR 209	DOCUMENTATION IN CLINICAL RESEARCH (NON-EXAM)			4	2	Co Requisite	AECC
25.	35459	MCR210	PSYCHOLOGY AND PATIENT COUNSELLING (NON-EXAM)			2	1	Co Requisite	AECC
TOTAL CREDITS							26		

<sup>4</sup> CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

**Program Structure Template**  
**School of Allied Health Sciences**  
**M.Sc. Clinical Research**  
**Batch: 2020-2022**  
**TERM: IV**

S. No.	Paper ID	Subject Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course <sup>5</sup> : 13. CC 14. AECC 15. SEC 16. DSE
				L	T	P			
THEORY SUBJECTS									
26.	35460	MCR 211	RESEARCH METHODOLOGY	1	1	--	2	Core	CC
27.	35461	MCR 212	RECENT ADVANCES IN CLINICAL RESEARCH	1	1	--	2	Core	CC
Practical/Viva-Voce/Jury									
28.	35462	MCR 213	PERSONALITY DEVELOPMENT AND LEADERSHIP (NON-EXAM)	1	1	--	2	Co Requisite	SEC
29.	35463	MCR214	TRAINING			24	12	Core	CC
30.	35464	MCR215	DISSERTATION			20	10	Core	CC
TOTAL CREDITS							28		

<sup>5</sup> CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

# Course Templates

## Syllabus for Theory and Practical Subjects

<b>School: SAHS</b>		<b>Batch : 2020-22</b>
<b>Program: M.SC</b>		<b>Current Academic Year: 2020-2021</b>
<b>Branch:</b>		<b>Semester: I</b>
1	Course Code	MCR 103
2	Course Title	Human Anatomy and Physiology
3	Credits	4
4	Contact Hours (L-T-P)	3-1-0
	Course Type	Compulsory
5	Course Objective	1.To understand the normal structure and functioning of various organ systems of the body and their interactions 2.to be able to comprehend the pathophysiology of commonly occurring diseases
6	Course Outcomes	By the end of the course, student will be able to: CO1: Understand the current state of knowledge about the functional organization of the human body. CO2: Describe insight of normal functioning of all the organ systems of the body and their interactions. CO3: State the pathophysiology of commonly occurring diseases. CO4: Identify physiology with various disorders and their pathogenesis. CO5: To understand the defence mechanism of human body
7	Course Description	The course is designed to give the students in-depth knowledge of fundamental functions of different systems of human body. The major topics to be covered include the following: the cell, muscle & nervous tissue; blood; lymphoid tissues; respiratory system; blood vessels; circulation; heart; gastro intestinal tract; endocrine & Reproductive system, excretory system, central nervous system and special senses
8	Outline syllabus	CO Mapping
	<b>Unit 1</b>	<b>GENERAL AND NERVE MUSCLE PHYSIOLOGY</b>
	A	Components of cell, functions of cell organelles, transport across cell membrane, homeostasis & membrane potential.
	B	Structure, functions of nerve tissues.
	C	neuromuscular junction, Difference between skeletal muscle, smooth muscle & cardiac muscle.
	<b>Unit 2</b>	<b>BLOOD AND CVS</b>
	A	composition; functions of blood, plasma proteins & haemoglobin, Erythrocytes,

		leucocytes & platelets, blood coagulation, blood groups & immunity	
	B	physiological anatomy of the heart & blood vessels, cardiac cycle.	CO1, CO3
	C	Heart sounds & ECG graph , Heart Rate, Cardiac Output, Blood Pressure & Pulse.	CO1, CO2, CO5
	<b>Unit 3</b>	<b>THE RESPIRATORY SYSTEM</b>	
	A	physiological anatomy & functions of respiratory system.	CO1, CO3
	B	Transport of Gases.	CO1, CO3
	C	Regulation of respiration & Hypoxia.	CO1, CO3
	<b>Unit 4</b>	<b>DIGESTIVE SYSTEM AND EXCRETORY SYSTEM</b>	
	A	physiological anatomy and functions of GIT, Composition and functions of different digestive juices , Digestion and Absorption in GIT.	CO1, CO2
	B	Physiological anatomy of kidney, structure and functions of excretory system, structure of nephron.	CO1, CO3
	C	Physiology of micturition and Regulation of Body Temperature in Humans.	CO1, CO3, CO4
	<b>Unit 5</b>	<b>ENDOCRINE AND REPRODUCTIVE SYSTEM</b>	
	A	General principles of endocrinology, Different endocrine glands and their functions	CO1, CO3, CO4
	B	Puberty, Spermatogenesis & semen.	CO1, CO3, CO4
	C	menstruation, ovulation and contraception.	CO1, CO3, CO4
	Mode of examination	Theory	
	Weightage Distribution	CA 30%	MTE 20%
			ETE 50%
	Text book/s*	Text book of physiology- A.K. Jain Essentials of medical physiology- K.Sembulingam	
	Other References		

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 103.1	3	2	2	1	1	2	3
MCR 103.2	3	2	2	1	1	2	3
MCR 103.3	3	3	1	1	2	2	3
MCR 103.4	3	3	1	1	2	2	3
MCR 103.5	3	3	1	1	2	2	3

<b>School: SAHS</b>		<b>Batch : 2020-22</b>	
<b>Program: M.SC</b>		<b>Current Academic Year: 2020-2021</b>	
<b>Branch:</b>		<b>Semester: I</b>	
1	Course Code	MCR 104	
2	Course Title	Microbiology and Pathology	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	<p>1.To equip with the basic knowledge and concepts about microbiology that would develop a better understanding and management of the microbes causing infections and various other ailments.</p> <p>2. To equip with the basic knowledge and concepts about microbiology that would develop a better understanding of the pathology of various diseased conditions.</p>	
6	Course Outcomes	<p>By the end of the course, student will be able to:</p> <p>CO1:define, list and recognise the extremely small forms of life.</p> <p>CO2: perform, demonstrate, implement and apply the concept of microbiology in better understanding of the human infections</p> <p>CO3: define, list and recognise the essential nature of disease.</p> <p>CO4: perform, demonstrate, implement and apply the concept of pathological changes in human body in various diseased conditions</p>	
7	Course Description	<p>The course is designed to give the students basic knowledge and concepts of microbes, pathogens, their relation and impact on various body functions and management by developing the basic understanding of the pathophysiology of various ailments.</p>	
8	Outline syllabus		CO Mapping
	<b>Unit 1</b>	<b>Introduction</b>	
	A	Introduction, classification of microorganisms	CO1
	B	basic concepts- normal flora, probiotics, colonization	CO1
	C	Infection and sterilization	CO1
	<b>Unit 2</b>	<b>Bacteriology and Virology</b>	
	A	Introduction, classification, general features	CO1, CO2
	B	pathogenicity, diagnosis	CO1, CO2, CO3
	C	treatment and prevention of common infections	CO1, CO2, CO3
	<b>Unit 3</b>	<b>Mycology and parasitology</b>	
	A	Introduction, classification, general features	CO1, CO2

	B	pathogenicity, diagnosis	CO1, CO2, CO3
	C	treatment and prevention of common infections	CO1, CO2, CO3
	<b>Unit 4</b>	<b>Inflammation and Healing</b>	
	A	Cell and Tissue response to injury, hypertrophy, hyperplasia, necrosis, apoptosis	CO3, CO4
	B	Inflammation and Healing	CO3, CO4
	C	Immunity	CO3, CO4
	<b>Unit 5</b>	<b>Clinical pathology</b>	
	A	Hypersensitivity reactions	CO3, CO4
	B	Introduction to histopathology and Clinical pathology	CO3, CO4
	C	Examination of body fluids and secretions	CO3, CO4
	Mode of examination	Theory	
	Weightage Distribution	CA 30%	MTE 20%
			ETE 50%
	Text book/s*	BURTON G.R.W: Microbiology for the Health Sciences CORTON KUMAR AND ROBINS: Pathological Basis of the Disease	
	Other References		

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 104.1	3	2	2	1	1	2	3
MCR 104.2	3	2	2	1	1	2	3
MCR 104.3	3	3	1	1	2	2	3
MCR 104.4	3	3	1	1	2	2	3
MCR 104.5	3	3	1	1	2	2	3

<b>School: SAHS</b>	<b>Batch : 2020-22</b>	
<b>Program: M.SC</b>	<b>Current Academic Year: 2020-21</b>	
<b>Branch: Clinical research</b>	<b>Semester: 1</b>	
1 Course Code	<b>MCR 105</b>	
2 Course Title	<b>GENERAL AND CLINICAL BIOCHEMISTRY</b>	
3 Credits	<b>4</b>	
4 Contact Hours (L-T-P)	<b>3-1-0</b>	
Course Status	Compulsory	



5	Course Objective	<ol style="list-style-type: none"> <li>1. To train the students in the management of medical laboratory along with handling a variety of laboratory chemicals and instruments including electronic and advanced equipment used in modern medical laboratories.</li> <li>2. To make the students able to do routine laboratory testing under stipulated conditions.</li> <li>3. To prepare specimens and operate machines that automatically analyse samples.</li> <li>4. To provide the conceptual basis for understanding biochemical and particularly address the fundamental mechanisms of the biomolecules to facilitate the life.</li> <li>5. To develop diagnostic skills in clinical biochemistry and to provide an advanced understanding of the core principles and topics of Biochemistry and their experimental basis.</li> </ol>	
6	Course Outcomes	<p>CO1: To understand the importance of acid, base, Buffers and nutrition</p> <p>CO2: To understand the importance of chemistry of carbohydrates and proteins</p> <p>CO3: To understand the importance of chemistry of lipids and fatty acid</p> <p>CO4: To understand the clinical importance of enzymes and energy metabolism</p> <p>CO5: To understand the importance of organ function test and DNA based diagnostics</p>	
7	Course Description	<ul style="list-style-type: none"> <li>• Acid, Base and Indicators</li> <li>• Nutrition</li> <li>• Carbohydrate and Protein Chemistry</li> <li>• Lipid Chemistry and Fatty acids</li> <li>• Enzyme and Energy metabolism</li> <li>• Clinical Chemistry</li> </ul>	
8	Outline syllabus <b>Theory</b>		
	<b>Unit 1</b>	<b>Acid, Base, Indicators and Nutrition</b>	
		A. Acid- base indicators: Definition, concept, mechanism of action.	CO1
		B. Importance of nutrition: Calorific values, Respiratory quotient, Energy requirement of a person - Basal metabolic rate, Balanced diet, Recommended dietary allowances	CO1
		C. Role of carbohydrates, lipids and proteins in diet.	CO1

	<b>Unit 2</b>	<b>Carbohydrate and Protein Chemistry</b>	
		A. Definition, general classification with examples of Carbohydrate and Lipid.	CO2
		B. Glycosidic bond, Structures, composition, sources, properties and functions of Monosaccharides, Disaccharides, Oligosaccharides and Polysaccharides.	CO2
		C. Peptide bond, Biologically important peptides, isoelectric pH, properties of amino acid and structural organisation of protein.	CO2
	<b>Unit 3</b>	<b>Lipid Chemistry and Fatty acids</b>	
		A. Definition, classification, properties and functions of lipids.	CO3
		B. Triacylglycerol and Phospholipids.	CO3
		C. Cholesterol and Essential fatty acids and their importance, Lipoproteins	CO3
	<b>Unit 4</b>	<b>Enzymes and Energy metabolism</b>	
		A. Enzyme kinetics	CO4
		B. Electron transport chain	CO4
		C. Oxidative phosphorylation and Uncouplers.	CO4
	<b>Unit 5</b>	<b>Clinical Biochemistry</b>	
		D. Kidney function tests	CO5
		E. Liver function tests	CO5
		F. Cardiac markers, ELISA, PCR, DNA based diagnostics	CO5

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 105.1	3	2	2	1	1	2	3
MCR 105.2	3	2	2	1	1	2	3
MCR 105.3	3	3	1	1	2	2	3
MCR 105.4	3	3	1	1	2	2	3
MCR 105.5	3	3	1	1	2	2	3

<b>School: SAHS</b>		<b>Batch : 2020-2022</b>	
<b>Program: M.Sc</b>		<b>Current Academic Year: 2020-2021</b>	
<b>Branch: Clinical Research</b>		<b>Semester: I</b>	
1	Course Code	MCR 106	
2	Course Title	Basic Pharmacology	
3	Credits	4	
4	Contact Hours (L)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To equip with the basics knowledge about drugs, their types, mode of action, effect etc which would lay the foundation for their courses in the next semester.	
6	Course Outcomes	<b>CO1: Knowledge:</b> defining, listing and recognising the drugs. <b>CO:2 Comprehension:</b> understanding, characterising, explaining, identifying and locating the various drugs that are useful in treatment and management of diseases. <b>CO3: Application:</b> performing, demonstrating, implementing and applying the concept of basic pharmacology which help in appropriate diagnosis and treatment of systematic diseases. <b>CO4: Analysis:</b> analysing, categorising, comparing and differentiating type of drugs.	
7	Course Description	This course is designed to develop an understanding of the theoretical concepts surrounding pharmacology, such as the pharmacokinetics and pharmacodynamics of drugs, and the concepts surrounding pharmacotherapy.	
8	Outline syllabus		CO Mapping
	<b>Unit 1</b>	<b>General Pharmacology</b>	
	A	Drugs- nature, Sources.	CO1, CO2
	B	Doses Forms	CO3, CO4
	C	Routes of drug Administration.	CO1, CO2
	<b>Unit 2</b>	<b>Action of Specific Agents</b>	
	A	Mechanisms or drug action	CO2, CO4
	B	Dose–response relationship	CO1, CO3
	C	Pharmacokinetics of drug absorption, distribution, biotransformation, excretion and toxicity, Factors influencing drug metabolism of drug action	CO1, CO3
	<b>Unit 3</b>	<b>Pharmacology</b>	
	A	Drug action and effectiveness	CO2, CO4
	B	Drug safety; Factors influencing the objectively demonstrated response.	CO1, CO3
	C	Pharmacodynamic	CO1, CO2
	<b>Unit 4</b>	<b>Drug Discovery Process</b>	
	A	Bioavailability and Bioequivalence	CO2
	B	Drug Development	CO4

	C	<b>Discovery of New Drugs</b>			CO1, CO3
	<b>Unit 5</b>	<b>Pre-clinical Evolution and toxicity studies</b>			
	A	Introduction to clinical trial			CO1, CO3
	B	Phase 1			CO2
	C	Phase 2 clinical Trials			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Textbook/s*	K D TRIPATHI: Essentials of Medical Pharmacology. 5 <sup>th</sup> edition, Jaypee, New Delhi, 2004 Ashok Garg: Manual of Ocular Therapeutics, Jaypee, New Delhi, 1996 Essentials of Medical Pharmacology by Tripathi			

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 106.1	3	2	2	1	1	2	3
MCR 106.2	3	2	2	1	1	2	3
MCR 106.3	3	3	1	1	2	2	3
MCR 106.4	3	3	1	1	2	2	3
MCR 106.5	3	3	1	1	2	2	3

<b>School: SAHS</b>		<b>Batch : 2020-2022</b>	
<b>Program: M.Sc</b>		<b>Current Academic Year: 2020-2021</b>	
<b>Branch:</b>		<b>Semester: I</b>	
1	Course Code	MCR 107	
2	Course Title	Introduction to clinical research	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	1.To have an overview of the various processes involved in the clinical development of a new drug 2.To understand some frequently used terms in clinical research 3. To understand and appreciate the roles and responsibilities of various stakeholders in clinical research 4. To understand the key concepts in evolution and responsible conduct of clinical research	

6	Course Outcomes	<p>On successful completion of this course, student will be able to:</p> <p>CO1:Develop an understanding of basic structure, prospects and evolution of the clinical research industry</p> <p>CO2:Demonstrate knowledge about basic terminologies, standard definitions, terms and vocabulary used in clinical research field.</p> <p>CO3:Develop an understanding of basic infrastructure, working, effectiveness, requirements and importance of CROs and SMOs.</p> <p>CO4:Demonstrate concepts and knowledge about clinical evolution of drug through various phases and role of various stakeholders.</p> <p>CO5:Understand, identify fraud and misconduct in clinical research and adopt ethical practices.</p>		
7	Course Description	The course provides an introductory overview about clinical research, its evolution, history, phases, key role players and focuses on the main areas of why and how ethical and responsible clinical research is carried out.		
8	Outline syllabus			CO Mapping
	<b>Unit 1</b>	<b>Introduction, history, definitions and terminologies in Clinical research</b>		
	A	Introduction		CO1
	B	History		CO1
	C	Definitions and terminologies		CO2
	<b>Unit 2</b>	<b>CROs and SMOs</b>		
	A	Introduction and working		CO3
	B	Types		CO3
	C	Responsibilities and limitations		CO3
	<b>Unit 3</b>	<b>Phases of Clinical trials</b>		
	A	Phase 0 and 1		CO4
	B	Phase 2		CO4
	C	Phase 3 and 4		CO4
	<b>Unit 4</b>	<b>Stakeholders in Clinical research</b>		
	A	Sponsor and Investigator		CO3, CO4
	B	Ethics review bodies		CO4
	C	CRC and CRA		CO4
	<b>Unit 5</b>	<b>Fraud and Misconduct</b>		
	A	Introduction and definitions, identification		CO5
	B	Importance of ethical and responsible trials		CO5
	C	Legal implications and management		CO5
	Mode of examination	Theory		
	Weightage	CA	MTE	ETE

	Distribution	30%	20%	50%	
	Text book/s*	Basic Principles of Clinical Research			
	Other References				

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 107.1	3	2	3	2	3	2	2
MCR 107.2	3	2	3	2	2	2	2
MCR 107.3	3	2	3	2	3	3	2
MCR 107.4	3	2	2	2	3	3	2
MCR 107.5	3	2	2	3	2	2	3

## Syllabus for Practical Subjects

<b>School: SAHS</b>		<b>Batch: 2020-22</b>
<b>Program: M.Sc</b>		<b>Current Academic Year: 2020-2021</b>
<b>Branch: Clinical research</b>		<b>Semester: I</b>
1	Course Code	MCR 108
2	Course Title	Human Anatomy and Physiology
3	Credits	2
4	Contact Hours (L-T-P)	0-0-4
	Course Status	Compulsory
5	Course Objective	To understand the normal structure and functioning of various organ systems of the body and their interactions and to be able to comprehend the pathophysiology of commonly occurring diseases
6	Course Outcomes	On successful completion of this course, student will be able to: CO1: Demonstrate knowledge about the microscope and its use, and estimation of haemoglobin. CO2: Perform TLC and RBC count. CO3: Perform DLC count. CO4: Perform BT, CT and BG tests. CO5: Use device and record BP
7	Course Description	The course in Physiology and Anatomy cover the first year is designed to give the students a depth knowledge of fundamental functions of different systems of human body. The major topics to

		be covered include the following: the cell, muscle& nervous tissue; blood; lymphoid tissues; respiratory system; blood vessels; circulation; heart; gastro intestinal tract; endocrine & Reproductive system, excretory system, central nervous system and special senses.			
8	Outline syllabus		CO Mapping		
	<b>Unit 1</b>	<b>Microscope and Haemoglobin Estimation</b>			
	A	Demonstration and Focussing of Microscope		CO1	
	B	Briefing and Demonstration of Hb Estimation		CO1	
	C	Practical of Hb Estimation		CO1	
	<b>Unit 2</b>	<b>TLC and RBC Count</b>			
	A	Briefing		CO1, CO2	
	B	Demonstration		CO1, CO2	
	C	Practical		CO1, CO2	
	<b>Unit 3</b>	<b>DLC</b>			
	A	Briefing		CO1, CO3	
	B	Demonstration		CO1, CO3	
	C	Practical		CO1, CO3	
	<b>Unit 4</b>	<b>BT, CT and BG</b>			
	A	Briefing		CO4	
	B	Demonstration		CO4	
	C	Practical		CO4	
	<b>Unit 5</b>	<b>Blood Pressure recording</b>			
	A	Briefing		CO5	
	B	Demonstration		CO5	
	C	Practical		CO5	
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 108.1	3	2	2	1	1	2	3
MCR 108.2	3	2	2	1	1	2	3
MCR 108.3	3	3	1	1	2	2	3
MCR 108.4	3	3	1	1	2	2	3
MCR 108.5	3	3	1	1	2	2	3

<b>School: SAHS</b>		<b>Batch: 2020-22</b>	
<b>Program: M.Sc</b>		<b>Current Academic Year: 2020-2021</b>	
<b>Branch: Clinical research</b>		<b>Semester: I</b>	
1	Course Code	MCR 110	
2	Course Title	General and Clinical Biochemistry	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective	<ol style="list-style-type: none"> <li>1. To train the students in the management of medical laboratory along with handling a variety of laboratory chemicals and instruments including electronic and advanced equipment used in modern medical laboratories.</li> <li>2. To make the students able to do routine laboratory testing under stipulated conditions.</li> <li>3. To prepare specimens and operate machines that automatically analyse samples.</li> <li>4. To provide the conceptual basis for understanding biochemical and particularly address the fundamental mechanisms of the biomolecules to facilitate the life.</li> <li>5. To develop diagnostic skills in clinical biochemistry and to provide an advanced understanding of the core principles and topics of Biochemistry and their experimental basis.</li> </ol>	
6	Course Outcomes	<p>CO1: To understand the importance and use of different types of glasswares</p> <p>CO2: To understand the importance of safety measures and use of different types of equipments</p> <p>CO3: To understand the importance of acid, base and pH</p> <p>CO4: To understand the importance of qualitative analysis of carbohydrate, lipid and protein</p> <p>CO5: To understand the importance of colorimetry</p>	
7	Course Description	<ul style="list-style-type: none"> <li>• Introduction of Glasswares</li> <li>• Introduction of Laboratory Equipments</li> <li>• Safety of measurements in Laboratory,</li> <li>• Preparation of Solutions</li> <li>• Determination of strength of acids and bases</li> </ul>	
8	Outline syllabus		CO Mapping
	<b>Unit 1</b>	<b>Introduction of Glasswares</b>	
		a. Introduction to Laboratory apparatus	CO1
		b. Introduction to Laboratory glasswares	CO1
		c. Maintenance of Laboratory apparatus	CO1



		and glasswares	
	<b>Unit 2</b>	<b>Introduction of Laboratory Equipments and safety measures</b>	
		a. Safety measurements in Biochemistry lab b. General laboratory protocols c. Awareness in a lab	CO2 CO2 CO2
	<b>Unit 3</b>	<b>Acid, Base and pH and Preparation of Solutions</b>	
		a. Preparation of acids of different concentration b. Preparation of bases of different concentration c. Demonstration of pH meter	CO3 CO3 CO3
	<b>Unit 4</b>	<b>Qualitative analysis</b>	
		a. Qualitative analysis of Carbohydrates b. Qualitative analysis of Proteins c. Hydrolysis of Sucrose	CO4 CO4 CO4
	<b>Unit 5</b>	<b>Determination of strength of acids and bases, Calorimetry</b>	
		a. Determination of the strength of NaOH solution b. Demonstration of Colorimeter c. Lambert Beer law	CO5 CO5 CO5
	Mode of examination	Jury/Practical/Viva	
	Weightage Distribution	CA      MTE      ETE 60%      0%      40%	
	Text book/s*	A text book of Medical Biochemistry by Chatterjee & Shinde Text book of biochemistry for Medical students by Vasudevan and Sreekumari Harpers Illustrated Biochemistry by Robert K.M.	
	Other References		

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 110.1	3	2	2	1	1	2	3
MCR 110.2	3	2	2	1	1	2	3
MCR 110.3	3	3	1	1	2	2	3
MCR 110.4	3	3	1	1	2	2	3
MCR 110.5	3	3	1	1	2	2	3

<b>School: SAHS</b>		<b>Batch : 2020-22</b>	
<b>Program: M.SC</b>		<b>Current Academic Year: 2020-2021</b>	
<b>Branch:</b>		<b>Semester: I</b>	
1	Course Code	MCR 109	
2	Course Title	Microbiology and Pathology	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Type	Compulsory	
5	Course Objective	1.To equip with the basic knowledge and concepts about microbiology that would develop a better understanding and management of the microbes causing infections and various other ailments. 2. To equip with the basic knowledge and concepts about microbiology that would develop a better understanding of the pathology of various diseased conditions.	
6	Course Outcomes	By the end of the course, student will be able to: CO1:define, list and recognise the extremely small forms of life using microscope. CO2: Identify microorganisms on already prepared slides and prepare new slides. CO3: Identify and prepare culture media through various methods. CO4:Perform physical, chemical and microscopic examination of various samples CO5: Perform section cutting and staining and efficiently do specimen handling	
7	Course Description	The course is designed to give the students basic knowledge and concepts of microbes, pathogens, their relation and impact on various body functions and management by developing the basic understanding of the pathophysiology of various ailments.	
8	Outline syllabus		CO Mapping
	<b>Unit 1</b>	<b>Basics and Equipments</b>	
	A	Compound Microscope	CO1
	B	Sterilization of equipments	CO1
	C	Examination of body fluids and secretions	CO1
	<b>Unit 2</b>	<b>Slides</b>	
	A	Permanent slides I	CO1, CO2
	B	Permanent slides II	CO1, CO2
	C	Gram positive and negative staining	CO1, CO2
	<b>Unit 3</b>	<b>culture media</b>	
	A	culture media	CO3
	B	culture methods	CO3
	C	culture conformation	CO3
	<b>Unit 4</b>	<b>examination</b>	

	A	Physical and Chemical examination of urine			CO4
	B	Microscopic examination of urine			CO1, CO4
	C	Examination of body fluids and secretions			CO1, CO4
	<b>Unit 5</b>	<b>Sections and staining</b>			
	A	Types of section cutting			CO1, CO5
	B	Specimen handling			CO5
	C	Staining of tissues-H & E staining			CO1, CO5
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	BURTON G.R.W: Microbiology for the Health Sciences CORTON KUMAR AND ROBINS: Pathological Basis of the Disease			
	Other References				

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 109.1	3	2	2	1	1	2	3
MCR 109.2	3	2	2	1	1	2	3
MCR 109.3	3	3	1	1	2	2	3
MCR 109.4	3	3	1	1	2	2	3
MCR 109.5	3	3	1	1	2	2	3

<b>School: SAHS</b>		<b>Batch : 2020-2022</b>	
<b>Program: M.sc</b>		<b>Current Academic Year: 2020-2021</b>	
<b>Branch: Clinical Research</b>		<b>Semester: I</b>	
1	Course Code	MCR 111	
2	Course Title	Basic Pharmacology LAB	
3	Credits	1	
4	Contact Hours (P)	2	
	Course Type	Compulsory	
5	Course Objective	To equip with the basics knowledge about drugs, their types, mode of action, effect etc which would lay the foundation for their courses in the next semester.	
6	Course Outcomes	CO1: Knowledge: defining, listing and recognising the drugs. CO:2 Comprehension: understanding, characterising, explaining, identifying and locating the various drugs that are useful in treatment	

		<p>and management of diseases.</p> <p>CO3: Application: performing, demonstrating, implementing and applying the concept of basic pharmacology which help in appropriate diagnosis and treatment of systematic diseases.</p> <p>CO4: Analysis: analysing, categorising, comparing and differentiating type of drugs.</p>		
7	Course Description	This course is designed to develop an understanding of the theoretical concepts surrounding pharmacology, such as the pharmacokinetics and pharmacodynamics of drugs, and the concepts surrounding pharmacotherapy		
8	Outline syllabus			CO Mapping
	<b>Unit 1</b>	<b>Practical based on General Pharmacology</b>		
	A	Mechanisms or drug action		
	B	Dose–response relationship		
	C	Pharmacokinetics of drug absorption, distribution, biotransformation, excretion and toxicity, Factors influencing drug metabolism of drug action		
	<b>Unit 2</b>	<b>Study of different doses forms.</b>		
	A	Introduction to Drug Doses		
	B	Introduction to Routes		
	C	Calculation of Drug Dose		
	<b>Unit 3</b>	<b>Drug Labelling and Package insert</b>		
	A	Demonstrate to Labelling the bottle		
	B	Demonstrate Insert drug in the bottle		
	C	Demonstrate Package of the bottle		
	<b>Unit 4</b>	<b>Experimental and Clinical Pharmacology Practical</b>		
	A	Animal Care, and Sex Determination		
	B	Animal Handling		
	C	<b>Dose Calculation for Experimental animal</b>		
	<b>Unit 5</b>	<b>Practical based on Preperation of drugs</b>		
	A	Anti-glaucoma; Sulphonamides		
	B	Antibiotics; Corticosteroids		
	C	Anaesthetics; Proteolytic enzymes		
	Mode of examination	Practical		
	Weightage Distribution	CA	MTE	ETE
		30%	20%	50%
	Text book/s*	<p>K D TRIPATHI: Essentials of Medical Pharmacology. 5<sup>th</sup> edition, Jaypee, New Delhi, 2004</p> <p>Ashok Garg: Manual of Ocular Therapeutics, Jaypee, NewDelhi, 1996 Essentials of Medical Pharmacology by Tripathi</p> <p>Pharmacology &amp;Pharmacotherapeutics by R. S. Satoskar□</p>		

	Essentials of Pharmacotherapeutics by F. S. K. Barar	
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POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 111.1	3	2	2	1	1	2	3
MCR 111.2	3	2	2	1	1	2	3
MCR 111.3	3	3	1	1	2	2	3
MCR 111.4	3	3	1	1	2	2	3
MCR 111.5	3	3	1	1	2	2	3

## SEMESTER II

<b>School: SAHS</b>		<b>Batch: 2020-2022</b>
<b>Program: M.Sc</b>		<b>Current Academic Year: 2020-2021</b>
<b>Branch: Clinical Research</b>		<b>Semester: II</b>
1	Course Code	MCR 112
2	Course Title	Systemic Pharmacology
3	Credits	4
4	Contact Hours (L)	2-2-0
	Course Type	Compulsory
5	Course Objective	At the end of the course the students will be equipped with the basics knowledge about, Medicine which would lay the foundation for their courses in the next semester.
6	Course Outcomes	<b>CO1: Knowledge:</b> defining, listing and recognising the drugs. <b>CO:2 Comprehension:</b> understanding, characterising, explaining, identifying and locating the various drugs that are useful in treatment and management of diseases. <b>CO3: Application:</b> performing, demonstrating, implementing and applying the concept of basic pharmacology which help in appropriate diagnosis and treatment of systematic diseases. <b>CO4: Analysis:</b> analysing, categorising, comparing and differentiating type of drugs.
7	Course Description	At the end of the course the students will be equipped with the basics knowledge about certain concepts, which would lay the foundation for their courses in the next semester.
8	Outline syllabus	CO Mapping

	<b>Unit 1</b>	<b>Drugs affecting blood and cardiovascular system</b>			
	A	Drugs used in Hypertension			CO1, CO2
	B	Drugs affecting Coagulation			CO3,CO4
	C	Drugs used in Heart Failure			CO1,CO2
	<b>Unit 2</b>	<b>Drugs Affecting nervous system</b>			
	A	Introduction to Autonomic Nervous system			CO2,CO4
	B	Cholinergics system and Agent or Adrenergic System and Agents			CO1, CO3
	C	Anti Depressant Drugs			CO1,CO3
	<b>Unit 3</b>	<b>Drugs affecting Respiratory system and GIT</b>			
	A	Drugs used in Asthma and COPD			CO2,CO4
	B	Drugs for Peptic Ulcer			CO1,CO3
	C	Drugs for Diarrhoea and Constipations			CO1,CO2
	<b>Unit 4</b>	<b>Hormones and hormone Antagonist</b>			
	A	Anti diabetic Agents			CO2
	B	Thyroid and Anti Thyroid Drugs			CO4
	C	<b>Corticosteroids</b>			CO1,CO3
	<b>Unit 5</b>	<b>Antimicrobial and Anti- inflammatory Drugs</b>			
	A	Introductions to Anti-microbial drugs			CO1,CO3
	B	Anti-Fungal Drugs			CO2
	C	NSAID			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	K D TRIPATHI: Essentials of Medical Pharmacology. 5 <sup>th</sup> edition, Jaypee, New Delhi, 2004 Ashok Garg: Manual of Ocular Therapeutics, Jaypee, NewDelhi, 1996 Essentials of Medical Pharmacology by Tripathi Pharmacology &Pharmacotherapeutics by R. S. Satoskar □ Essentials of Pharmacotherapeutics by F. S. K. Barar			

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 112.1	3	2	2	1	1	2	3
MCR 112.2	3	2	2	1	1	2	3
MCR 112.3	3	3	1	1	2	2	3
MCR 112.4	3	3	1	1	2	2	3

MCR 112.5	3	3	1	1	2	2	3
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<b>School: SAHS</b>		<b>Batch : 2020-2022</b>	
<b>Program: M.sc</b>		<b>Current Academic Year: 2020-2021</b>	
<b>Branch: Clinical Research</b>		<b>Semester: I</b>	
1	Course Code	MCR 117	
2	Course Title	Systemic Pharmacology LAB	
3	Credits	1	
4	Contact Hours (P)	2	
	Course Type	Compulsory	
5	Course Objective	To equip with the basics knowledge about drugs, their types, mode of action, effect etc which would lay the foundation for their courses in the next semester.	
6	Course Outcomes	CO1: Knowledge: defining, listing and recognising the drugs. CO:2 Comprehension: understanding, characterising, explaining, identifying and locating the various drugs that are useful in treatment and management of diseases. CO3: Application: performing, demonstrating, implementing and applying the concept of basic pharmacology which help in appropriate diagnosis and treatment of systematic diseases. CO4: Analysis: analysing, categorising, comparing and differentiating type of drugs.	
7	Course Description	This course is designed to develop an understanding of the theoretical concepts surrounding pharmacology, such as the pharmacokinetics and pharmacodynamics of drugs, and the concepts surrounding pharmacotherapy	
8	Outline syllabus		CO Mapping
	<b>Unit 1</b>	<b>Practical based on General Pharmacology</b>	
	A	Mechanisms or drug action	CO1, CO2
	B	Dose-response relationship	CO3, CO4
	C	Pharmacokinetics of drug absorption, distribution, biotransformation, excretion and toxicity, Factors influencing drug metabolism of drug action	CO1, CO2
	<b>Unit 2</b>	<b>Study of different doses forms.</b>	
	A	Introduction to Drug Doses	CO2, CO4
	B	Introduction to Routes	CO1, CO3
	C	Calculation of Drug Dose	CO1, CO3
	<b>Unit 3</b>	<b>Drug Labelling and Package insert</b>	
	A	Demonstrate to Labelling the bottle	CO2, CO4
	B	Demonstrate Insert drug in the bottle	CO1, CO3
	C	Demonstrate Package of the bottle	CO1, CO2

	<b>Unit 4</b>	<b>Experimental and Clinical Pharmacology Practical</b>			
	A	Animal Care, and Sex Determination			CO2
	B	Animal Handling			CO4
	C	<b>Dose Calculation for Experimental animal</b>			CO1, CO3
	<b>Unit 5</b>	<b>Practical based on Preparation of drugs</b>			
	A	Anti-glaucoma; Sulphonamides			CO1, CO3
	B	Antibiotics; Corticosteroids			CO2
	C	Anesthetics; Proteolytic enzymes			CO4
	Mode of examination	Practical			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	K D TRIPATHI: Essentials of Medical Pharmacology. 5 <sup>th</sup> edition, Jaypee, New Delhi, 2004 Ashok Garg: Manual of Ocular Therapeutics, Jaypee, New Delhi, 1996 Essentials of Medical Pharmacology by Tripathi Pharmacology & Pharmacotherapeutics by R. S. Satoskar Essentials of Pharmacotherapeutics by F. S. K. Barar			

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 117.1	3	2	2	1	1	2	3
MCR 117.2	3	2	2	1	1	2	3
MCR 117.3	3	3	1	1	2	2	3
MCR 117.4	3	3	1	1	2	2	3
MCR 117.5	3	3	1	1	2	2	3

<b>School: SAHS</b>		<b>Batch : 2020-2022</b>	
<b>Program: M.Sc</b>		<b>Current Academic Year: 2020-2021</b>	
<b>Branch:</b>		<b>Semester: II</b>	
1	Course Code	MCR 113	
2	Course Title	Clinical trial process and good clinical practices	
3	Credits	4	
4	Contact Hours (L-T-P)	2-2-0	
	Course Type	Compulsory	



5	Course Objective	1.To provide a comprehensive introduction to the clinical research process, conduct &management of clinical trials. 2.To make student more familiar with roles/jobs as part of the study team. 3.To provide extensive Knowledge & application in different aspects of Clinical research process. 4.To understand the historical development, the principles and content of internationalguidelines for clinical research (Declaration of Helsinki, ICH-GCP) and their influence	
6	Course Outcomes	On successful completion of this course, student will be able to:  CO1:Adopt latest technological advancement in clinical practices with professional and ethical uprightness and socio-economic concerns.  CO2:Follow and implement GCP and regulatory guidelines during clinical research process.  CO3:Construct timelines/guidelines and standard operating procedures for day to day clinical trial activities.  CO4:To describe the different phases and working process of clinical drug development  CO5:To define the investigator’s role and responsibilities in a clinical study, particularly regarding informed consent and safety reporting	
7	Course Description	This course gives insight of the clinical trial process,its conduct and management as per GCP guidelines. Good clinical practice provides a framework of principles which aim to ensure the safety of research participants and the integrity and validity of data. This course aims to provide with the basic principles of GCP and how these principles can be applied practically in the research setting.	
8	Outline syllabus		CO Mapping
	<b>Unit 1</b>	<b>Regulatory filing applications</b>	
	A	IND	CO4
	B	NDA	CO4
	C	ANDA, BA/BE	CO4
	<b>Unit 2</b>	<b>Trial process</b>	
	A	Site selection and initiation	CO3, CO5
	B	Patient recruitment and retention, informed consent	CO1, CO3
	C	Study close out	CO3
	<b>Unit 3</b>	<b>Site monitoring</b>	
	A	Introduction and importance- audit, inspection and monitoring, analysis of reports, improvements and corrections etc.	CO1, CO5

	B	Audit and inspection-process, responsibilities,concerned bodies and people, reports, submissions etc			CO1, CO5
	C	Monitoring- process, responsibilities, concerned bodies and people, reports, submissions, analysisetc			CO1, CO5
	<b>Unit 4</b>	<b>Historical evolution of GCP</b>			
	A	Nuremberg code			CO2
	B	Declaration of Helsinki			CO2
	C	Belmont report, ICH			CO2
	<b>Unit 5</b>	<b>Ethics in clinical research</b>			
	A	Principles of ethics, ICH-GCP			CO1, CO2
	B	GCP guidelines			CO2
	C	Challenges in implementation of GCP guidelines			CO2
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*				
	Other References				

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 113.1	2	2	2	2	3	2	3
MCR 113.2	3	2	2	3	2	3	3
MCR 113.3	3	3	3	2	3	3	2
MCR 113.4	3	2	2	2	3	3	3
MCR 113.5	2	2	2	3	2	2	2

<b>School: SAHS</b>		<b>Batch : 2020-2022</b>
<b>Program: M.Sc</b>		<b>Current Academic Year: 2020-2021</b>
<b>Branch:</b>		<b>Semester: II</b>
1	Course Code	MCR 114
2	Course Title	Introduction to management
3	Credits	4
4	Contact Hours (L-T-P)	2-2-0
	Course Type	Compulsory
5	Course Objective	1. To enable students to define and describe the evolution of management and variousbehavioural science contributions; nature and scope of management.

		<p>2. Discuss and communicate the difference between management and administration</p> <p>3. To understand various levels and functions of management</p> <p>4. To describe the various skills, abilities and tools that are necessary for successful managers.</p>
6	Course Outcomes	<p>On successful completion of this course, student will be able to:</p> <p>CO1: Develop an understanding and evaluate the influence of historical forces on the current practice of management.</p> <p>CO2: Explain how organizations adapt to an uncertain environment and identify techniques managers use to influence and control the internal environment.</p> <p>CO3: Practice the process of management's four functions: planning, organizing, leading, staffing and controlling.</p> <p>CO4: Identify and properly use vocabularies within the field of management to articulate one's own position on a specific management issue and communicate effectively with varied audiences.</p> <p>CO5: Evaluate leadership styles to anticipate the consequences of each leadership style.</p>
7	Course Description	This course provides the basic concept about management and its functions of planning, organizing, staffing, directing, and controlling resources to accomplish organizational goals. The role of the manager at each level of the organization along with the abilities, skills and tools required to be an effective manager/leader are also emphasized. An insight of organizational behaviour is also covered.
8	Outline syllabus	
	<b>Unit 1</b>	<b>Basics of management</b>
	A	Definition, concept and principles
	B	Historical perspectives and various theories
	C	Various models of management
	<b>Unit 2</b>	<b>Functions of Management</b>
	A	Planning and organizing
	B	Leading and staffing
	C	Controlling and evaluating
	<b>Unit 3</b>	<b>Management vs administration</b>
	A	Administration
	B	Comparison with management
	C	Similarity with management
	<b>Unit 4</b>	<b>Leadership</b>

	A	Definition, concept, managers vs leaders			CO5
	B	Leadership qualities			CO5
	C	Leadership styles			CO5
	<b>Unit 5</b>	<b>Organizational behaviour</b>			
	A	Definition, concept, importance			CO4
	B	Personality development, leadership, motivation			CO4
	C	Groups, cooperation and conflicts			CO4
	Mode of examination	Theory/Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Dr P. N. Reddy, Prof H R Appannaiah, P C Tripathi, Essentials of Management., P. C. Tripathi and P. N. Reddy, Principles of Management			
	Other References	L. M. Prasad, Principles and Practice of Management			

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 114.1	2	2	2	2	2	2	2
MCR 114.2	2	3	2	2	2	3	3
MCR 114.3	2	3	3	3	3	3	2
MCR 114.4	2	3	3	2	3	3	3
MCR 114.5	2	2	2	2	3	3	3

<b>School: SAHS</b>		<b>Batch : 2020-2022</b>
<b>Program: M.Sc</b>		<b>Current Academic Year: 2020-2021</b>
<b>Branch:</b>		<b>Semester: II</b>
1	Course Code	MCR 115
2	Course Title	Medical terminologies and conditions
3	Credits	4
4	Contact Hours (L-T-P)	2-2-0
	Course Type	Compulsory
5	Course Objective	1. To identify and define the roles of the basic word parts including prefixes, suffixes, root words and combining forms. 2. To interpret abbreviations for common signs, symptoms, medical conditions and diagnostic testing and therapeutic procedures. 3. To interpret major symptoms and signs in clinical

		evaluation. 4. To have a understanding of a basic differential diagnosis for problems affecting each organ system.		
6	Course Outcomes	CO1: Define prefixes, roots and suffixes associated with each body system and make use of correct medical terms CO2: Define several pathological conditions affecting each body systems. CO3: Apply symptomatic and diagnostic terms in medical communication, documentation and dealings. CO4: Recall the meanings of abbreviations associated with different body systems CO5: Discuss surgical, clinical and laboratory procedures related to health care.		
7	Course Description	Covers prefixes, suffixes, root words, abbreviations, conditions, symptoms and procedure terms. Course taught by body systems. This course also discusses some of the most common medical conditions and gives an insight into how a human body works and how professionals diagnose ailments.		
8	Outline syllabus			CO Mapping
	<b>Unit 1</b>	<b>Introduction</b>		
	A	Components of medical terms		
	B	Prefixes and suffixes		
	C	Terms related to body as a whole		
	<b>Unit 2</b>	<b>Integumentary, musculo-skeletal system</b>		
	A	general pathologic conditions		
	B	symptomatic terms, diagnostic terms		
	C	general abbreviations oncology terms		
	<b>Unit 3</b>	<b>Cardio-vascular and respiratory system</b>		
	A	general pathologic conditions		
	B	symptomatic terms, diagnostic terms		
	C	general abbreviations oncology terms		
	<b>Unit 4</b>	<b>Urinary, Nervous and sensory system</b>		
	A	general pathologic conditions		
	B	symptomatic terms, diagnostic terms		
	C	general abbreviations oncology terms		
	<b>Unit 5</b>	<b>Endocrine and reproductive system</b>		
	A	general pathologic conditions		
	B	symptomatic terms, diagnostic terms		
	C	general abbreviations oncology terms		
	Mode of examination	Theory		
	Weightage Distribution	CA	MTE	ETE
		30%	20%	50%
	Text book/s*			

	Other References		
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POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 115.1	2	2	2	2	2	2	2
MCR 115.2	2	3	2	2	2	3	3
MCR 115.3	2	3	3	3	3	3	2
MCR 115.4	2	3	3	2	3	3	3
MCR 115.5	2	2	2	2	3	3	3

<b>School: SAHS</b>		<b>Batch : 2020-2022</b>
<b>Program: M.Sc</b>		<b>Current Academic Year:2020-2021</b>
<b>Branch:</b>		<b>Semester:II</b>
1	Course Code	MCR 116
2	Course Title	Epidemiology and biostatistics
3	Credits	4
4	Contact Hours (L-T-P)	2-2-0
	Course Type	Compulsory
5	Course Objective	<p>1.To introduce the basic principles and methods of epidemiology and demonstrate their broad applicability.</p> <p>2.To provide fundamental skills needed to interpret and critically evaluate literature relevant to public health professionals.</p> <p>3.To provide a structured method for organizing and analysing raw data and to interpret and communicate the results.</p> <p>4. To describe preferred methodological alternatives to commonly used statistical methods when assumptions are not met.</p>
6	Course Outcomes	<p>CO1: Describe the contribution of epidemiology and biostatistics to the scientific study of health and disease.</p> <p>CO2: Define and distinguish the concepts of health, disease, determinants and indicators of health</p> <p>CO3: Apply knowledge, concepts and understanding of levels of prevention, patterns of epidemic, epidemic forecasting etc. for successful</p>

		management of epidemic CO4: Select from, use, and interpret results of, the principal methods of statistical inference and design. CO5: Communicate the results of statistical analyses accurately and effectively.			
7	Course Description	The course is designed to help the students develop essential knowledge and skills in quantitative public health research by integrating the core disciplines of epidemiology and biostatistics in one course. This course will enable the students to apply an epidemiological approach to the study of disease and illness. This study will help in interpreting and assessing the evidence quality of a range of study designs and to apply appropriate statistical techniques in the analysis.			
8	Outline syllabus			CO Mapping	
	<b>Unit 1</b>	<b>Health and disease</b>			
	A	Concept and definition		CO1, CO2	
	B	Natural history of disease		CO1, CO2	
	C	Determinants and indicators of health		CO1, CO2	
	<b>Unit 2</b>	<b>Levels of prevention</b>			
	A	Primary		CO3	
	B	Secondary		CO3	
	C	Tertiary		CO3	
	<b>Unit 3</b>	<b>Epidemiology</b>			
	A	Concept, principle and definition		CO1, CO3	
	B	Types of Epidemiological studies I		CO1, CO3	
	C	Types of Epidemiological studies-II		CO1, CO3	
	<b>Unit 4</b>	<b>Epidemic management</b>			
	A	patterns of epidemic		CO1, CO3	
	B	epidemic forecasting		CO1, CO3	
	C	Epidemic management		CO1, CO3	
	<b>Unit 5</b>	<b>Biostatistics</b>			
	A	sampling, measures of central tendency, correlation, regression		CO1, CO5	
	B	standard error of sampling distribution, significance testing		CO1, CO5	
	C	probability, standard deviation, application of excel and SPSS software in research		CO1, CO5	
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*				
	Other References				

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 116.1	2	2	2	2	2	2	2
MCR 116.2	2	3	2	2	2	3	3
MCR 116.3	2	3	3	3	3	3	2
MCR 116.4	2	3	3	2	3	3	3
MCR 116.5	2	2	2	2	3	3	3

<b>School: SAHS</b>		<b>Batch : 2020-2022</b>
<b>Program: M.Sc</b>		<b>Current Academic Year: 2021-2022</b>
<b>Branch:</b>		<b>Semester: III</b>
1	Course Code	MCR 118
2	Course Title	Clinical Trial management
3	Credits	4
4	Contact Hours (L-T-P)	2-2-0
	Course Type	Compulsory
5	Course Objective	1. To provide Understanding of how to effectively manage clinical trials through applying a range skills and knowledge 2. To develop effective strategies and problem solving for managing clinical trials
6	Course Outcomes	On successful completion of this course, student will be able to: CO1:Identify the key issues involved in the conduct of a clinical study including investigator and site selection, site management and conflict resolution. CO2:Outline a study level feasibility plan and describe the structure of a study budget CO3:To provide a comprehensive introduction to the clinical research process, conduct & management of clinical trials. CO4:Reporting and managing serious adverse events on site, development of recruitment strategies and clinical study budget. CO5:Staff requirements and construct timelines to target the appropriate study population and to store, shift and dispense a study drug or device as well as how to review some documents, case report forms protocols and study budget
7	Course Description	This course will equip the students with the imperative skills of clinical trial management. This course gives a methodical understanding of the core areas of clinical trial management thus enhancing skills and



		knowledge to the level expected of a Clinical Trial Project Manager		
8	Outline syllabus			CO Mapping
	<b>Unit 1</b>	<b>Introduction, Training and meeting</b>		
	A	Introductionto CT Management and Importance		
	B	Roles and Responsibilities in CTM		
	C	Organizing Meetings – Investigator and vendors, CRC		
	<b>Unit 2</b>	<b>SOPs</b>		
	A	Introduction, concept, definition		
	B	SOP writing, review and editing		
	C	Implementation, challenges in implementation		
	<b>Unit 3</b>	<b>Monitoring and record retention</b>		
	A	Audit, inspection and monitoring- types and process, responsibilities of stakeholders		
	B	Regulatory binder and record retention		
	C	Master files		
	<b>Unit 4</b>	<b>IP management</b>		
	A	Storage and handling		
	B	IP accountability		
	C	Confidentiality and other challenges		
	<b>Unit 5</b>	<b>Outsourcing</b>		
	A	Overview, process and types		
	B	Finance and budgeting		
	C	Basis for selection for outsourcing to CROs/SMOs, Agreements		
	Mode of examination	Theory		
	Weightage	CA	MTE	ETE
	Distribution	30%	20%	50%
	Text book/s*			
	Other References			

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 118.1	2	3	3	1	2	3	2
MCR 118.2	2	3	3	1	2	3	3
MCR 118.3	2	3	3	2	2	3	2
MCR 118.4	2	3	3	2	3	3	3
MCR 118.5	2	3	3	2	2	3	3

<b>School: SAHS</b>		<b>Batch : 2020-22</b>	
<b>Program: M.Sc.</b>		<b>Current Academic Year: 2021-2022</b>	
<b>Branch: Clinical research</b>		<b>Semester:III</b>	
1	Course Code	MCR 119	
2	Course Title	Regulations in Clinical research	
3	Credits	4	
4	Contact Hours (L-T-P)	2-2-0	
	Course Type	Compulsory	
5	Course Objective	<ol style="list-style-type: none"> <li>1. To gain the essential knowledge and skills required to help companies to work in regulatory environment.</li> <li>2. Acquire the foundation to work within or in variety of areas including medical products development, pharmaceutical formulations, sales, strategic marketing and clinical investigations.</li> <li>3. To know about regulatory process in drug development, formulations, API.</li> <li>4. To sharpen the understanding of the laws that governs the development, manufacturing and commercialization along with the distribution of drugs, biologics and medical devices.</li> </ol>	
6	Course Outcomes	<p>On successful completion of this course, student will be able to:</p> <p>CO1: Categorize the general principles of drug regulations and device regulation during the different phases of their life cycle.</p> <p>CO2: Understand and follow the Regulatory guidance's and guidelines for filing and approval process</p> <p>CO3: Compare the role of national and international bodies such as USA, Europe and the rest of the world.</p> <p>CO4: Preparation of Dossiers and their submission to regulatory agencies in different countries</p> <p>CO5: Understand the concept of intellectual property rights, procedural knowledge to Legal system and solving the problem relating to intellectual property rights.</p>	
7	Course Description	<p>The courses will provide integrated knowledge and broad perspectives needed to effectively manage the regulatory process from Innovation →Discovery → Approval→ Commercialization which implies regulatory affairs are essential to bring the product to the market globally.</p>	
8	Outline syllabus		CO Mapping
	<b>Unit 1</b>	<b>EMA and US FDA</b>	
	A	Importance and functioning, Roles and responsibilities	CO1, CO3
	B	Powers, authorities, submissions	CO4, CO2
	C	Grants, compensations, promotion of research	CO3

	<b>Unit 2</b>	<b>Schedule Y and HIPAA</b>			
	A	Introduction, Importance, History			CO1
	B	Guidelines			CO1, CO3
	C	Details and implications			CO1
	<b>Unit 3</b>	<b>ICMR and CDSCO</b>			
	A	Importance and functioning, Roles and responsibilities			CO3
	B	Submissions			CO4,CO2
	C	Grants, compensations, promotion of research			CO3
	<b>Unit 4</b>	<b>Intellectual Property Rights</b>			
	A	Patent			CO1, CO5
	B	Copyright			CO1, CO5
	C	Trademark			CO1, CO5
	<b>Unit 5</b>	<b>Insurance and Indemnity</b>			
	A	Introduction, concept, advantages, disadvantages			CO1, CO5
	B	Legal implications			CO5
	C	Compensation			CO1, CO5
	Mode of examination	Theory			
	Weightage	CA	MTE	ETE	
	Distribution	30%	20%	50%	
	Text book/s*				
	Other References				

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 119.1	3	2	3	2	2	2	3
MCR 119.2	3	3	3	3	2	2	3
MCR 119.3	2	3	2	2	2	2	3
MCR 119.4	3	3	2	2	3	3	3
MCR 119.5	3	2	2	3	2	2	3

<b>School: SAHS</b>		<b>Batch : 2020-22</b>	
<b>Program: M.Sc</b>		<b>Current Academic Year: 2021-2022</b>	
<b>Branch: Clinical research</b>		<b>Semester: III</b>	
1	Course Code	MCR 120	
2	Course Title	Documentation and data management in clinical research	
3	Credits	4	
4	Contact	2-2-0	

	Hours (L-T-P)	
	Course Type	Compulsory
5	Course Objective	1.To understand what data management is and the purpose of a data management plan 2.To realize factors to be considered in the design and type of a case report form 3.Considerations for data analysis 4.What is important when deciding on a data management system
6	Course Outcomes	On successful completion of this course, student will be able to: CO1: Summarize the key documents related to the ethical conduct of clinical trials CO2: Outline the Investigators Brochure sections and describe its use, approval, and distribution. CO3: Describe the procedures for clinical trial data collection and data management to ensure optimal quality data and outline the various quality management issues in clinical trials. CO4: Outline the various data management issues in clinical trials CO5: Discuss the evaluation and interpretation of clinical trials results
7	Course Description	Clinical Data Management is an integral part of the clinical trial process to transform raw data into consistent, accurate, reliable, meaningful trial output in full compliance with regulatory guidelines. This course provides a comprehensive training on scientific, practical, ethical and technical concepts of clinical data management.
8	Outline syllabus	
	<b>Unit 1</b>	<b>Investigator Brochure and Clinical study protocol</b>
	A	IB- Importance, contents- preclinical and clinical, other details
	B	Protocol- importance, objectives
	C	Protocol- Design, contents, adherence, challenges
	<b>Unit 2</b>	<b>Clinical study report and publication</b>
	A	Importance and guidelines
	B	Format and components
	C	Applicable regulatory requirements
	<b>Unit 3</b>	<b>Essential documents and source documents</b>
	A	Documents before the trial
	B	Documents during the trial
	C	Documents after the trial
	<b>Unit 4</b>	<b>Clinical data management</b>
	A	Introduction to CDM, CRF Design
	B	Clinical data entry and electronic data capture
	C	Data validation and database lock
	<b>Unit 5</b>	<b>Data Coding and Decoding</b>
	A	Introduction
	B	Learning
	C	Practice

	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*				
	Other References				

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 120.1	3	3	3	2	3	2	3
MCR 120.2	2	3	3	2	3	3	3
MCR 120.3	3	3	3	2	2	3	2
MCR 120.4	2	2	3	2	3	3	2
MCR 120.5	2	2	3	2	2	3	3

<b>School: SAHS</b>		<b>Batch : 2020-22</b>	
<b>Program: M.Sc.</b>		<b>Current Academic Year: 2021-2022</b>	
<b>Branch: Clinical research</b>		<b>Semester: III</b>	
1	Course Code	MCR 121	
2	Course Title	Pharmacovigilance and pharmacoeconomics	
3	Credits	4	
4	Contact Hours (L-T-P)	2-2-0	
	Course Type	Compulsory	
5	Course Objective	<ol style="list-style-type: none"> <li>1. to understand the key concepts in the responsible conduct of research a</li> <li>2. tounderstand how to conduct research that conforms to the highest standards for the protection of human research subjects.</li> <li>3. To sensitize and equip with knowledge on Pharmacovigilance practices worldwide and on the Indian scenario in detail</li> <li>4. List four primary perspectives that a pharmacoeconomic analysis can be conducted from and describe how they differ.</li> <li>5. Discern between different medical cost categories that can be identified, measured, and compared in a</li> </ol>	

		pharmacoeconomic analysis.
6	Course Outcomes	On successful completion of this course, student will be able to: CO1: Revise the principles and practical relevance of ethical issues in clinical research and the legal and ethical provision for the protection of clinical trial subjects. CO2: Value the role of pharmacoepidemiology, Pharmacoeconomics in the lifecycle management of a medicine. CO3: Appraise adverse events/adverse drug reactions in terms of severity and then describe the safety reporting requirements pre and post-approval. CO4: Evaluate the ongoing management of drug safety issues (including risk management plans, periodic safety update reports) and the ongoing benefit/risk assessment throughout the lifecycle of a medicine. CO5: Discuss the collection, evaluation, and reporting of adverse event data in clinical trials
7	Course Description	This course provides insight in to pharmacoeconomics and its effect at healthcare industry. Also, gives comprehensive knowledge, understanding, emphasises importance of pharmacovigilance in the field of research.
8	Outline syllabus	CO Mapping
	<b>Unit 1</b>	<b>Introduction PV</b>
	A	Basic understanding, concept and definition-PV, ADR, AE, SE, SUSAR
	B	Legal basis in selected countries
	C	Pharmacovigilance program of India
	<b>Unit 2</b>	<b>Mechanism of ADR</b>
	A	Renal, Hepatic
	B	Cardiac, Haematological
	C	Ocular, Dermatological, Gastro-intestinal
	<b>Unit 3</b>	<b>Drug safety and risk management in special conditions</b>
	A	Pregnancy
	B	Paediatric Populations
	C	Geriatric Populations
	<b>Unit 4</b>	<b>Ethical oversight</b>
	A	Introduction, importance and understanding ethical principles
	B	Consent and confidentiality
	C	CIOMS- Working groups and their Contribution to Pharmacovigilance
	<b>Unit 5</b>	<b>Pharmacoeconomics</b>
	A	Health Economics : Overview ,Healthcare Demands and Markets, Medical Economics, Behavioral Economics, Health consumerism, Health Insurance, Health Policy /analysis
	B	Health Planning & Management -Health Policies, healthcare models, healthcare systems, Strategic Planning & its Parameters, Direction and clinical management of

		health services – Foundations of Clinical Management, Information /system, HRM in Healthcare			
	C	Financial Management – Measurement & analysis of costs and results in healthcare, Economic assessment of health activities, Minimizing costs, Cost-benefit analysis, Cost-effectiveness analysis, Cost-Utility analysis			CO2
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*				
	Other References				

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 121.1	2	2	2	3	2	2	3
MCR 121.2	2	2	2	2	2	3	3
MCR 121.3	2	1	2	3	2	3	2
MCR 121.4	2	1	2	3	2	3	2
MCR 121.5	2	1	3	2	2	3	3

<b>School: SAHS</b>		<b>Batch : 2020-22</b>
<b>Program: M. Sc</b>		<b>Current Academic Year: 2021-2022</b>
<b>Branch: Clinical research</b>		<b>Semester: III</b>
1	Course Code	MCR 122
2	Course Title	Psychology and patient counselling
3	Credits	4
4	Contact Hours (L-T-P)	2-2-0
	Course Type	Compulsory
5	Course Objective	1.To help students understand the processes of emotion and relating them to diverse contexts. 2.To prepare students learn organizing their personal lives better by gaining insights into their own emotional strengths. 3. To develop skills how to deal better with peers and patients.
6	Course Outcomes	On successful completion of this course, student will be able to: CO1: Describe key concepts, principles, and overarching themes in psychology. CO2: Demonstrates understanding of counselling and psychological

		practice as an applied behavioural science CO3: Formulates and conceptualizes cases; plans and implements interventions utilizing at least one consistent theoretical orientation CO4: analyse a range of factors within and outside individuals which influence mind and behaviour CO5: Forms and maintains productive and respectful relationships with clients, peers/colleagues, supervisors, and professionals from within and across disciplines			
7	Course Description	This course provides a comprehensive overview of cognitive psychology, the scientific study of mental processes: how people acquire, store, transform, use, and communicate information. Topics may include perception, attention, language, memory, reasoning, problem solving, decision-making, and creativity.			
8	Outline syllabus			CO Mapping	
	<b>Unit 1</b>	<b>Psychology</b>			
	A	Introduction, scope, evolution and definition of psychology		CO1, CO2	
	B	Branches of psychology		CO1	
	C	Concept of normality and abnormality		CO1	
	<b>Unit 2</b>	<b>Psychological disorders</b>			
	A	Identifying psychological disorders		CO1, CO4	
	B	Anxiety disorders- panic, phobia; their signs, symptoms and management.		CO1, CO4	
	C	Anxiety disorders-OCD, PTSD; their signs, symptoms and management.		CO1, CO4, CO3	
	<b>Unit 3</b>	<b>Stress and learning</b>			
	A	Hans Selye Model of stress, Lazarus and Folkman model of stress, Sources of stress		CO1, CO4	
	B	Stress, disease and health. Changing health- impairing behaviour.		CO1, CO4	
	C	Learning- Meaning, definition, Theories of learning , Pavlov's classical conditioning, Skinner's operant conditioning		CO1, CO4	
	<b>Unit 4</b>	<b>Therapeutic techniques</b>			
	A	Various techniques and their applications, Assessment and management, alcohol dependence		CO1, CO3	
	B	Psychotherapy- meaning and definition. (Brief introduction to psychoanalytical, behavioral and cbt techniques)		CO1, CO3	
	C	Relaxation-types. (Brief introduction to psychoanalytical, behavioral and cbt techniques)		CO1, CO3	
	<b>Unit 5</b>	<b>Communication</b>			
	A	Patient communication		CO1, CO5	
	B	History taking		CO1, CO5	
	C	Patient counselling		CO1, CO2	
	Mode of examination	Theory/Jury/Practical/Viva			
	Weightage	CA	MTE	ETE	



	Distribution	30%	20%	50%	
	Text book/s*				
	Other References				

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 122.1	2	1	1	2	2	1	2
MCR 122.2	2	1	1	2	2	1	2
MCR 122.3	1	1	1	1	3	1	2
MCR 122.4	1	1	1	2	3	2	3
MCR 122.5	2	1	1	2	3	2	3

<b>School: SAHS</b>		<b>Batch : 2020-2022</b>
<b>Program: M.Sc</b>		<b>Current Academic Year: 2021-2022</b>
<b>Branch: Clinical research</b>		<b>Semester: IV</b>
1	Course Code	MCR 123
2	Course Title	Research methodology
3	Credits	2
4	Contact Hours (L-T-P)	1-1-0
	Course Type	Compulsory
5	Course Objective	1.To equip with knowledge and skills necessary in conducting research work and formulating research synopsis and report. 2.To impart knowledge for enabling students to develop data analytics skills and meaningful interpretation to the data sets so as to solve any research problem. 3.To Use theory and previous research to create research questions and hypotheses and to identify and analyze the appropriate method and variables needed for research questions
6	Course Outcomes	On successful completion of this course, student will be able to: CO1: Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling. CO2: demonstrate basic knowledge on qualitative and quantitative research techniques CO3: Demonstrate adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis CO4: Show basic awareness of data analysis-and hypothesis testing

		procedures CO5: Understand values, responsibilities and ethical issues in research, including those issues that arise in using quantitative and qualitative research	
7	Course Description	This course is designed to provide students with the practical tools of doing research and the theoretical background for critiquing and designing research on various topics. This course will also engage students in the discussion of ethics, studying how personal values, ethical models and reflective processes shape our ethical decision making in a leadership context.	
8	Outline syllabus		CO Mapping
	<b>Unit 1</b>	<b>Purpose of research</b>	
	A	Foundations of Research Methodology, Introduction to research, what is Research?	CO1
	B	Objectives and motivations for research	CO1
	C	Types of Research, Introduction to Qualitative Research, Quantitative Research Conceptualization, Problem Formulation	CO1
	<b>Unit 2</b>	<b>Principles of Research in quantitative and qualitative approaches: Research design</b>	
	A	Research Process & Research Design, Introduction to Research Process, Steps in Research Process	CO1, CO2
	B	Introduction to Research Design, nature of good design	CO1, CO2
	C	Types of Research Design: Exploratory, Descriptive and Causal research	CO1, CO2
	<b>Unit 3</b>	<b>Methods of data collection and types of data</b>	
	A	Data Collection Method, Introduction to Primary & Secondary data, Methods of collecting primary and secondary data	CO4
	B	Advantages & disadvantages of data collection. Measurement & Scaling Technique	CO4
	C	Scales of Measurement, Questionnaire Designing.	CO3
	<b>Unit 4</b>	<b>The Research Cycle</b>	
	A	Analysis & Report Writing, Data Preparation, Data aggregation, Data accuracy, Data structure, Data transformation	CO3
	B	Descriptive Statistics, Univariate analysis, Correlation/Regression, Inferential Statistics, Hypothesis Testing Process, Large sample test, Small sample, Parametric and NonParametric Test	CO3
	C	Report Writing, Types of Research output, Key Elements of Report Writing	CO3, CO4
	<b>Unit 5</b>	<b>Values, Social Responsibility and Ethics in Research</b>	
	A	Morals, Values and Ethics, Integrity, Work Ethic, Service Learning, Civic Virtue, Respect	CO5

		for Others, Living Peacefully, caring, Sharing, Honesty, Valuing Time, Cooperation, Commitment, Empathy, Self-Confidence, Character, Spirituality	
	B	Models of Professional Roles, theories about right action, Self-interest, uses of ethical theories, Multinational corporations, Environmental ethics, computer ethics	CO5
	C	Safety and risk, risk benefit analysis and reducing risk – the three-mile island and Chernobyl case studies, Collegiality and loyalty, respect for authority, collective bargaining – confidentiality, conflicts of interest, occupational crime professional rights, employee rights, Intellectual Property Rights (IPR), discrimination.	CO5
	Mode of examination	Theory	
	Weightage Distribution	CA 30%	MTE 20%
			ETE 50%
	Text book/s*	Malhotra N.K. (2011) Marketing Research, Pearson Education, Inc. Zikmund W.G. (2007) Business research Methods, Thomson, Akash Press New Delhi.	
	Other References	Beri G.C. (2010) Marketing Research 3rd Edition, TMH Publishers Ltd, New Delhi	

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 123.1	3	3	3	2	2	2	3
MCR 123.2	3	3	3	2	2	1	3
MCR 123.3	3	3	3	2	2	1	3
MCR 123.4	3	3	3	2	2	1	2
MCR 123.5	3	3	3	3	2	2	3

<b>School: SAHS</b>	<b>Batch : 2020-2022</b>
<b>Program: M.SC</b>	<b>Current Academic Year: 2021-2022</b>
<b>Branch: Clinical research</b>	<b>Semester: IV</b>
1 Course Code	MCR 124
2 Course Title	Recent advances in clinical research
3 Credits	2
4 Contact	1-1-0

	Hours (L-T-P)	
	Course Type	Compulsory
5	Course Objective	1. To achieve a basic understanding of recombinant DNA technology, human genome structure, Genetic Tests, Prenatal Diagnosis of Genetic Diseases etc. 2. To equip with knowledge of Oncogenes and Malignancy, Detection of Oncogenic activation, Functions of oncogenes 3. To achieve basic understanding of Stem Cell Research and New Targets for Drug Designs
6	Course Outcomes	On successful completion of this course, student will be able to: CO1: Employ the scientific method to generate new knowledge, and to solve problems, regarding human heredity. CO2: understand advanced techniques in genome analysis, recombinant DNA technology. CO3: To develop the understanding for Management of inherited human diseases CO4: Demonstrate knowledge of oncogenes and malignancy, their detection and management CO5: synthesize and incorporate the fundamentals of gene and nanotechnology in order to understand how such technology impacts humans.
7	Course Description	This course gives in sight into human genetics, oncogenes, stem cell research and Biopharmaceuticals, Re-generative Medicine, Nano technology and Nano medicine etc which will lay foundation and motivate students to pick up and conduct recent challenging research proposals.
8	Outline syllabus	CO Mapping
	<b>Unit 1</b>	<b>Human Genetics</b>
	A	Recombinant DNA Technology
	B	Genetic Tests, Prenatal Diagnosis of Genetic Diseases
	C	Human Genome Project, Gene Therapy
	<b>Unit 2</b>	<b>Cancer Research</b>
	A	Oncogenes and Malignancy
	B	Detection of Oncogenic activation
	C	Functions of oncogenes
	<b>Unit 3</b>	<b>Stem Cell Research</b>
	A	Cell, growth & regulation
	B	Proliferative Disorders-I
	C	Proliferative Disorders-II
	<b>Unit 4</b>	<b>New Targets for Drug Designs</b>
	A	Biopharmaceuticals
	B	Re-generative Medicine
	C	Others
	<b>Unit 5</b>	<b>Nano technology and Nano medicine</b>

	A	Nano technology			CO5
	B	Nano medicine			CO5
	C	Others			CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Gene cloning and DNA analysis, T.A. Brown Biotechnology, B.D.Singh			
	Other References				

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
MCR 124.1	2	2	2	1	1	1	2
MCR 124.2	2	2	3	1	1	1	3
MCR 124.3	2	2	2	1	1	1	2
MCR 124.4	2	3	3	2	1	1	3
MCR 124.5	2	3	3	1	1	1	3

**Signature of HOD**