



MGM SCHOOL OF BIOMEDICAL SCIENCES, NAVI MUMBAI
(A constituent unit of MGM INSTITUTE OF HEALTH SCIENCES)

(Deemed University u/s 3 of UGC Act 1956)

Grade "A" Accredited by NAAC

Sector 1, Kamothe Navi Mumbai-410209, Tel.No.:022-27437631,27432890

Email. sbsnm@mgmuhs.com / Website : www.mgmsbsnm.edu.in

PROGRAM OBJECTIVE OF MSc. ALLIED HEALTH SCIENCES

- PO1. Nurture the scientific and/or clinical knowledge and skills for development of health care practices, industrial/community applications and entrepreneurship.
- PO2. Develop the ability of critical thinking to analyse, interpret problems in health care and to find out systematic approach for solution.
- PO3. Impart decision making capability for handling various circumstances in their respective areas
- PO4. Demonstrate research skills for planning, designing, implementation and effective utilization of research findings for community.
- PO5. Develop an ability to function as an efficient leader as well as team player in multidisciplinary sectors for effective outcomes and demonstrating managerial skills.
- PO6. Demonstrate an effective written and oral communication skills to communicate effectively in health care sector, industries, academia and research.
- PO7. Inculcate code of ethics in professional and social circumstances to execute them in daily practices and research irrespective areas of specialization
- PO8. Develop lifelong learning attitude and values for enhancement of professional and social skills for an overall development



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CO PO Matrix

Programme - M.Sc. Biotechnology

Sem I to IV

- PO1. Nurture the scientific and/or clinical knowledge and skills for development of industrial applications, health care practices and entrepreneurship.
 PO2. Develop the ability of critical thinking to analyse, interpret problems and to find out systematic approach for solution.
 PO3. Impart decision making capability for handling various circumstances in their respective areas
 PO4. Demonstrate research skills for planning, designing, implementation and effective utilization of research findings for community.
 PO5. Develop an ability to function as an efficient individual and team player in multidisciplinary sectors for effective outcomes
 PO6. Demonstrate an effective written and oral communication skills to communicate effectively in health care sector, industries, academia and research.
 PO7. Inculcate code of ethics in professional and social circumstances to execute them in daily practices and research in respective areas of specialization
 PO8. Develop lifelong learning attitude and values for enhancement of professional and social skills for an overall development

PO Mapping same with correlation level 3,2,1 The notation of 1 - low, 2 - moderate , 3 - high

				Knowledge and skill	Critical Thinking & problem solving	Decision making	Research skill	Individual and team work	Communication skills	Code of ethics	Lifelong learning	Average
Semester	Course / Course Code	Course Outcome	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	
Semester 1	Cell Biology	CO1	Describe the structure and function of cells including the cell metabolism	2	2	3	3	1	1	1	3	2.0
		CO2	Able to understand Cell signaling and cell to cell interaction	2	3	2	3	1	1	1	2	1.9
		CO3	Use of cells for thereapeutics and various biological applications	3	3	3	3	2	2	3	3	2.8
		Average		2.3	2.7	2.7	3.0	1.3	1.3	1.7	2.7	2.2
	Basic Biochemistry	CO1	Outline the structure and function of the biomolecules found in all living organisms	2	2	2	3	1	1	1	3	0.9
		CO2	Describe the role of biomolecules for regulation of various biological activities	3	3	3	3	1	1	1	3	2.3
		Average		2.5	2.5	2.5	3	1	1	1	3	3.2
	Immunology & Immunotechnology	CO1	Identify major components of the immune system at organ, cellular and molecular levels.	3	2	3	3	1	1	1	2	2.0
		CO2	Apply immunologic techniques to solve certain clinical and research problems.	3	3	3	3	1	1	1	3	2.3
		CO3	Regulation of Immune system and its components	3	3	2	3	1	1	1	2	2.0
		Average		3	2.7	2.7	3	1	1	1	2.3	2.1
	Biostatistics & Computer Applications	CO1	Understand the basic concepts of biostatistics and their application in research	3	2	2	2	1	1	1	3	1.9
		CO2	Describe the appropriate statistical methods required for a particular research design	2	2	2	3	1	1	1	2	1.8
		CO3	Develop a appropriate framework for research studies and Data Analysis	3	2	2	2	2	1	1	3	2.0
		Average		3	2	2	2.3	1	1	1	2.7	1.9

Semester 2	Analytical Techniques: Principles And Instrumentation	CO1	To develop analytical and critical thinking skills in biological phenomena through scientific methods	3	3	2	3	1	1	1	3	2.1
		CO2	To conduct the analytical experiments to solve the real world biotechnology problems	3	3	3	3	1	1	1	3	2.3
		CO3	To use the modern equipments and tools for fulfilling research experiment needs	3	2	2	3	1	1	1	3	2.0
		Average		3.0	2.7	2.3	3.0	1.0	1.0	1.0	3.0	2.1
	Bioinformatics, Research Methodology & Scientific Writing	CO1	To learn basic concepts of Bioinformatics and its significance in Biological data analysis.	3	2	3	3	1	1	1	3	2.1
		CO2	To get exposed to computational methods, tools and algorithms employed for Biological Data Interpretation	2	2	3	3	1	1	1	2	1.9
		CO3	To apply the different bioinformatics tools to solve the real world problem	3	3	3	3	1	1	1	3	2.3
		Average		2.7	2.3	3.0	3.0	1.0	1.0	1.0	2.7	2.1
	Molecular Biology	CO1	Demonstrate the knowledge of common and advanced laboratory practices in cell and molecular biology	3	3	3	3	1	1	2	3	2.4
		CO2	To utilize the knowledg of DNA, RNA and Protein to solve the cellular level problems	3	3	3	3	1	1	2	3	2.4
		CO3	To get exposed to various gene regulation concepts	2	3	3	3	1	1	1	2	2.0
		Average		2.7	3.0	3.0	3.0	1.0	1.0	1.7	2.7	2.3
	Recombinant Dna Technology	CO1	Acquire skills on techniques of construction of recombinant DNA - Cloning vectors and isolation of gene of interest	3	3	3	3	1	1	3	3	2.5
		CO2	Learning tools and techniques in rDNA technology- DNA manipulative enzymes.	3	3	3	3	1	1	2	3	2.4
		CO3	Learning various application of rDNA technology in evolving plants for resistance to pest and disease, tolerance to herbicides and abiotic factors.	3	3	3	3	1	1	3	3	2.5
		Average		3	3	3	3	1	1	2.7	3	2.5
	Human Genetics	CO1	Employ the scientific method to generate new knowledge, and to solve problems, regarding human heredity	3	3	2	3	1	1	1	3	2.1
		CO2	explain the genetic and epigenetic mechanisms of gene expression control and their role in human inherited disease	3	2	3	3	1	1	1	3	2.1
		CO3	explain the theoretical and practical basis for the use of modern molecular techniques in the diagnosis and treatment of cancer and inherited disease	3	2	3	3	1	1	1	3	2.1
		Average		3	2.3	2.7	3	1	1	1	3	2.1
Medical Microbiology	CO1	Able to learn basic microbial structure and similarities and differences among various groups of microorganisms.	3	3	3	3	1	1	1	3	2.3	
	CO2	To utilize basic knowledge of Microbiology for Isolation and Identification of microorganisms	3	3	3	3	1	1	1	3	2.3	
	CO3	Understand the basic of Infection machanism for Bacteria and Viruses	2	2	2	2	1	1	1	2	1.6	
	Average		2.7	2.7	2.7	2.7	1.0	1.0	1.0	2.7	2.0	

	Plant Biotechnology	CO1	Learning the basic techniques of the plant tissue culture techniques	3	2	3	3	1	1	1	3	2.1
		CO2	Performing procedures for plant tissue culture techniques for various research activities	3	3	3	3	1	1	1	3	2.3
		CO3	To study the chemistry of Natural products and quality control of Herbal Products	2	2	2	3	1	1	1	3	1.9
		Average		2.7	2.3	2.7	3.0	1.0	1.0	1.0	3.0	2.1
Semester 3	Animal Biotechnology	CO1	Demonstrate knowledge of basic cell culture techniques	3	3	3	3	1	1	3	3	2.5
		CO2	Comprehend basic concepts of establishing animal cell cultures	3	3	3	2	1	1	2	3	2.3
		CO3	To utilize the cell culture techniques for various research activities in cell biology	3	3	3	3	1	1	2	3	2.4
		Average		3.0	3.0	3.0	2.7	1.0	1.0	2.3	3.0	2.4
	Biosafety, Introduction To Quality Assurance, Accreditation & Sop Writing	CO1	Evaluate multiple perspectives concerning bioethical issues and recognize that different value systems may lead to different ethical decisions.	3	2	2	3	1	1	3	3	2.3
		CO2	Recognize the importance of biosafety practices and guidelines in research	3	2	3	3	1	1	2	3	2.3
		CO3	Students will gain awareness about Intellectual Property Rights (IPRs) to take measure for the protecting their ideas and funding	3	3	3	3	1	1	2	3	2.4
		Average		3.0	2.3	2.7	3.0	1.0	1.0	2.3	3.0	2.3
	Nanobiotechnology	CO1	To underst Nanotechnology and Nanobiotechnology and their applications in Healthcare	3	2	3	3	1	1	1	2	2.0
		CO2	To learn basic concepts of Nanoparticle Productions and their characterization	3	3	3	3	1	1	1	3	2.3
		CO3	To explore the science of Nanobiotechnology for development of Biosensors	3	3	3	3	1	1	1	3	2.3
		Average		3.0	2.7	3.0	3.0	1.0	1.0	1.0	2.7	2.2
	Semester 4	Pursuit Of Innerself Excellence (Poise)	CO1	Students will become self dependent, more decisive and develop intuitive ability for their study and career related matter.	1	2	3	1	3	2	2	3
CO2			Enhanced communication skills, public speaking & improved Presentation ability.	2	1	1	1	2	3	2	3	1.9
CO3			Development of personal attributes like Empathy, Compassion, Service, Love, brotherhood and Team work abilities	1	1	1	1	3	3	3	3	2.0
Average				1.3	1.3	1.7	1.0	2.7	2.7	2.3	3.0	2.0
Disaster Management And Mitigation Resources		CO1	Understand the world-wide distribution of hazards and disasters and know the similarities and differences between natural and technological disasters.	2	2	3	2	2	1	2	3	2.1
		CO2	Acquire mitigation skills that help communities reduce the amount of damage and loss from disaster.	2	2	1	1	2	1	2	2	1.6
		CO3	Gain preparedness skills that increase community effectiveness in responding to disaster.	2	2	2	1	2	1	2	3	1.9
		Average		2.0	2.0	2.0	1.3	2.0	1.0	2.0	2.7	1.9
Human Rights		CO1	Demonstrate a good understanding of the provisions under the Constitution of India dealing with human rights.	2	2	2	1	1	1	3	3	1.9

	CO2	Promote human rights through legal as well as non-legal means.	2	2	2	1	1	1	3	3	1.9
	CO3	Participate in legal, political and other debates involving human rights in a knowledgeable and constructive way	2	2	2	1	1	1	3	3	1.9
	Average		2.0	2.0	2.0	1.0	1.0	1.0	3.0	3.0	1.9

**Mapping Average
Programme - M.Sc. Biotechnology
Sem I to IV**

SEMESTER	COURSE	PO1	P02	PO3	PO4	PO5	PO6	PO7	PO8
Semester 1	Cell Biology	2.3	2.7	2.7	3.0	1.3	1.3	1.7	2.7
	Basic Biochemistry	2.5	2.5	2.5	3.0	1.0	1.0	1.0	3.0
	Immunology & Immunotechnology	3.0	2.6	2.6	3.0	1.0	1.0	1.0	2.3
	Biostatistics & Computer Applications	2.6	2.0	2.0	2.3	1.3	1.0	1.0	2.6
	Analytical Techniques: Principles And Instrumentation	3.0	2.7	2.3	3.0	1.0	1.0	1.0	3.0
semester 2	Bioinformatics, Research Methodology & Scientific Writing	2.7	2.3	3.0	3.0	1.0	1.0	1.0	2.7
	Molecular Biology	2.7	3.0	3.0	3.0	1.0	1.0	1.7	2.7
	Recombinant Dna Technology	3.0	3.0	3.0	3.0	1.0	1.0	2.6	3.0
	Human Genetics	3.0	2.3	2.6	3.0	1.0	1.0	1.0	3.0
	Medical Microbiology	2.7	2.7	2.7	2.7	1.0	1.0	1.0	2.7
Semester 3	Plant Biotechnology	2.7	2.3	2.7	3.0	1.0	1.0	1.0	3.0
	Animal Biotechnology	3.0	3.0	3.0	2.7	1.0	1.0	2.3	3.0
	Biosafety, Introduction To Quality Assurance, Accreditation & Sop Writing	3.0	2.3	2.7	3.0	1.0	1.0	2.3	3.0
	Nanobiotechnolog Y	3.0	2.7	3.0	3.0	1.0	1.0	1.0	2.7
Semester 4	Pursuit Of Innerself Excellence (Poise)	1.3	1.3	1.7	1.0	2.7	2.7	2.3	3.0
	Disaster Management And Mitigation Resources	2.0	2.0	2.0	1.3	2.0	1.0	2.0	2.7
	Human Rights	2.0	2.0	2.0	1.0	1.0	1.0	3.0	3.0

**PO CO Relationship
Programme - M.Sc. Biotechnology
Sem I to IV**

Semester	Course & Course code	CO	Details	CO & PO Relationship s	Domain	Unit	Lecture		Lab		Clinical		Total		Strength Level of CO addressing to PO Level 3:>50%, Level 2: 30%-50%, Level 1: <30% , Not addressed :<5%
				PO1-PO8	C.A.P	No	Hrs	%	Hrs	%	Hrs	%	Hrs	%	
Semester 1	Cell Biology	CO1	Describe the structure and function of cells including the cell metabolism	1,2,4,8	C	1, 2,3	34	56.7	36	60			70	58.3	3
		CO2	Able to understand Cell signaling and cell to cell interaction	1,2,4,8	C	4,5	20	33.3	0	0			20	17	1
		CO3	Use of cells for therepeutics and various biological applications	1,2,3,4,8	C	6	6	10	24	40			30	25	1
	Total						60	100	60	100			120	100	1.67
	Basic Biochemistry	CO1	Outline the structure and function of the biomolecules found in all living organisms	1,2,4,8,	C	2,3,4,5,6,7	46	76.7	36	60			82	68.3	3

	CO2	Describe the role of biomolecules for regulation of various biological activities	1,2,3,4,8	C	1,8	14	23.3	24	40			38	31.7	2	
	Total					60	100	60	100			120	100	2.5	
Immunology & Immunotechnology	CO1	Identify major components of the immune system at organ, cellular and molecular levels.	1,2,3,4,8	C	1	15	25	24	40			39	32.5	2	
	CO2	Apply immunologic techniques to solve certain clinical and research problems.	1,2,3,4,8	C	3	15	25	36	60			51	42.5	2	
	CO3	Regulation of Immune system and its components	1,2,4,8	C	2,4	30	50	0	0			30	25	1	
	Total					60	100	60	100			120	100	1.7	
Biostatistics & Computer Applications	CO1	Understand the basic concepts of biostatistics and their application in research	1,2,4,8	C	1,2,3,4,5,6,9	41	68.3	15	25			56	46.7	3	
	CO2	Describe the appropriate statistical methods required for a particular research design	1,2,4,8	C	7,8,10,11,12	14	23.3	33	55			47	39.2	2	
	CO3	Develop an appropriate framework for research studies and Data Analysis	1,2,4,8	C	13,14,15	13	21.7		0			13	10.8	1	
	Total					68	113.3	48	80			116	96.7	2	
Analytical Techniques: Principles And Instrumentation	CO1	To develop analytical and critical thinking skills in biological phenomena through scientific methods	1,2,3,4,8	C	2	17	28.3	0	0			17	14.2	1	
	CO2	To conduct the analytical experiments to solve the real world biotechnology problems	1,2,3,4,8	C	1,3	23	38.3	36	60			59	49.2	2	
	CO3	To use the modern equipments and tools for fulfilling research experiment needs	1,2,3,4,8	C	4,5	20	33.3	24	40			44	36.7	2	
	Total					60	100	60	100			120	100	1.7	
Semester 2	Bioinformatics, Research Methodology & Scientific Writing	CO1	To learn basic concepts of Bioinformatics and its significance in Biological data analysis.	1,2,4,8	C	1	10	16.7	24	40		34	28.3	2	
		CO2	To get exposed to computational methods, tools and algorithms employed for Biological Data Interpretation	1,2,4,8	C	2,5	30	50	24	40			54	45	2
		CO3	To apply the different bioinformatics tools to solve the real world problem	1,2,4,8	C	3,4	20	33.3	12	20			32	26.7	1
		Total					60	100	60	100			120	100	1.7
Molecular Biology	CO1	Demonstrate the knowledge of common and advanced laboratory practices in cell and molecular biology	1,2,3,4,8	C	1,2	18	30	36	60			54	45	2	
	CO2	To utilize the knowledge of DNA, RNA and Protein to solve the cellular level problems	1,2,3,4,8	C	3,4,5,6	34	56.7	24	40			58	48.33333333	2	
	CO3	To get exposed to various gene regulation concepts	1,2,3,4,8	C	7	8	13.3		0			8	6.7	1	
	Total					60	100	60	100			120	100	1.7	
Recombinant Dna Technology	CO1	Acquire skills on techniques of construction of recombinant DNA - Cloning vectors and isolation of gene of interest	1,2,3,4,8	C	1,3	22	36.7	12	20			34	28.3	1	
	CO2	Learning tools and techniques in rDNA technology- DNA manipulative enzymes.	1,2,3,4,8	C	4	14	23.3	24	40			38	31.7	2	
	CO3	Learning various application of rDNA technology in evolving plants for resistance to pest and disease, tolerance to herbicides and abiotic factors.	1,2,3,4,8	C	2,5	24	40	24	40			48	40	2	
	Total					60	100	60	100			120	100	1.67	

	Human Genetics	CO1	Employ the scientific method to generate new knowledge, and to solve problems, regarding human heredity	1,2,3,4,8	C	1,4	18	30	12	20			30	25	2
		CO2	explain the genetic and epigenetic mechanisms of gene expression control and their role in human inherited disease	1,2,3,4,8	C	2,6	20	33	24	40			44	36.7	2
		CO3	explain the theoretical and practical basis for the use of modern molecular techniques in the diagnosis and treatment of cancer and inherited disease	1,2,3,4,8	C	3,5	22	36.7	24	40			46	38.3	2
		Total					60	100	60	100			120	100	2
	Medical Microbiology	CO1	Able to learn basic microbial structure and similarities and differences among various groups of microorganisms.	1,2,3,4,8	C	1,2,3,4,5	27	45	36	60			63	52.5	3
		CO2	To utilize basic knowledge of Microbiology for Isolation and Identification of microorganisms	1,2,3,4,8	C	5,6	12	20	24	40			36	30	2
		CO3	Understand the basic of Infection mechanism for Bacteria and Viruses	1,2,3,4,8	C	7,8,9	21	35	0	0			21	17.5	1
		Total					60	100	60	100			120	100	2
	Plant Biotechnology	CO1	Learning the basic techniques of the plant tissue culture techniques	1,2,3,4,8	C	1	15	25	24	40			39	32.5	2
		CO2	Performing procedures for plant tissue culture techniques for various research activities	1,2,3,4,8	C	2	10	16.7	24	40			34	28.3	2
		CO3	To study the chemistry of Natural products and quality control of Herbal Products	1,2,3,4,8	C	3,4,5	35	58.3	12	20			47	39.2	2
		Total					60	100	60	100			120	100	2
	Semester 3	Animal Biotechnology	CO1	Demonstrate knowledge of basic cell culture techniques	1,2,3,4,8	C	1,2,3	30	50	24	40			54	45
CO2			Comprehend basic concepts of establishing animal cell cultures	1,2,3,4,8	C	4,5	18	30	24	40			42	35	2
CO3			To utilize the cell culture techniques for various research activities in cell biology	1,2,3,4,8	C	6	12	20	12	20			24	20	1
Total							60	100	60	100			120	100	1.7
Biosafety, Introduction To Quality Assurance, Accreditation & Sop Writing		CO1	Evaluate multiple perspectives concerning bioethical issues and recognize that different value systems may lead to different ethical decisions.	1,2,3,4,8	C	1	15	25	0	0			15	25	1
		CO2	Recognize the importance of biosafety practices and guidelines in research	1,2,3,4,8	C	3	15	25	0	0			15	25	1
		CO3	Students will gain awareness about Intellectual Property Rights (IPRs) to take measure for the protecting their ideas and funding	1,2,3,4,8	C	2,4	30	50	0	0			30	50	3
		Total					60	100	0	0			60	100	1.7
Nanobiotechnology		CO1	To underst Nanotechnology and Nanobiotechnology and their applications in Healthcare	1,2,3,4,8	C	1	10	16.7	24	40			34	28	1
		CO2	To learn basic concepts of Nanoparticle Productions and their characterization	1,2,3,4,8	C	2,3,4	40	66.7	36	60			76	63.3	3
	CO3	To explore the science of Nanobiotechnology for development of Biosensors	1,2,3,4,8	C	5	10	16.7	0	0			10	8.3	1	
	Total					60	100	60	100			120	100	1.7	
Semester 4	Pursuit Of Innerself Excellence (Poise)	CO1	Students will become self dependent, more decisive and develop intuitive ability for their study and career related matter.	2,3,5,6,8	C,A	3	15	25	0	0			15	25	1

	CO2	Enhanced communication skills, public speaking & improved Presentation ability.	2,3,5,6,8	C,A	4	15	25	0	0			15	25	1
	CO3	Development of personal attributes like Empathy, Compassion, Service, Love, brotherhood and Team work abilities	2,3,5,6,8	C,A	1,2	30	50	0	0			30	50	3
	Total					60	100	0	0			60	100	1.7
Disaster Management And Mitigation Resources	CO1	Understand the world-wide distribution of hazards and disasters and know the similarities and differences between natural and technological disasters.	1,2,3,5,6,7,8	C,A,P	1,2	23	38.3	0	0			23	38.3	2
	CO2	Acquire mitigation skills that help communities reduce the amount of damage and loss from disaster.	1,2,3,5,6,7,8	C,A,P	5	12	20	0	0			12	20	1
	CO3	Gain preparedness skills that increase community effectiveness in responding to disaster.	1,2,3,5,6,7,8	C,A,P	3,4	25	41.7	0	0			25	41.7	2
	Total					60	100	0	0			60	100	1.7
Human Rights	CO1	Demonstrate a good understanding of the provisions under the Constitution of India dealing with human rights.	1,2,7,8	C,A	3	12	20	0	0			12	20	1
	CO2	Promote human rights through legal as well as non-legal means.	1,2,7,8	C,A	4	13	21.7	0	0			13	21.7	1
	CO3	Participate in legal, political and other debates involving human rights in a knowledgeable and constructive way	1,2,7,8	C,A	1,2,5	35	58.3	0	0			35	58.3	3
	Total					60	100	0	0			60	100	1.7



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CO PO Matrix Programme - M.Sc. Molecular Biology Sem I to IV

- PO1. Nurture the scientific and/or clinical knowledge and skills for development of industrial applications, health care practices and entrepreneurship.
- PO2. Develop the ability of critical thinking to analyse, interpret problems and to find out systematic approach for solution.
- PO3. Impart decision making capability for handling various circumstances in their respective areas
- PO4. Demonstrate research skills for planning, designing, implementation and effective utilization of research findings for community.
- PO5. Develop an ability to function as an efficient individual and team player in multidisciplinary sectors for effective outcomes
- PO6. Demonstrate an effective written and oral communication skills to communicate effectively in health care sector, industries, academia and research.
- PO7. Inculcate code of ethics in professional and social circumstances to execute them in daily practices and research irrespective areas of specialization
- PO8. Develop lifelong learning attitude and values for enhancement of professional and social skills for an overall development

				Knowledge and skill	Critical Thinking & problem solving	Decision making	Research skill	Individual and team work	Communication skills	Code of ethics	Lifelong learning		
Semester	course/ course code	CO	Details	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Average	
Semester I	Cell Biology	CO1	Students will gain an understanding of Cell structure, components, and characteristics of cellular chemical and molecular processes	3	2	1	2	1	1	1	1	1.5	
		Average		3	2	1	2	1	1	1	1	1.5	
	Molecular Immunology	CO1	Student should be able to Show deeper understanding of fundamentals of molecular immunology.	3	1	1	2	1	1	1	2	2	1.7
		CO2	Student will get familiar with components of immune system, types of immune-deficiencies, basics of antibody engineering etc	3	2	2	1	1	3	1	1	2	1.9
		Average		3	1.5	1	1.5	1	2	1	2	1.8	

	Molecular Enzymology	CO1	Student will get deep knowledge about the concepts of molecular enzymology.	3	1	3	2	2	1	1	1	1.75	
		CO2	Student will get familiar with the enzyme kinetics & enzyme engineering	2	1	1	1	2	1	1	1	1.25	
		Average		2.5	1	2	1.5	2	1	1	1	1.5	
	Metabolic Engineering	CO1	Students will integrate the concept of pathway modification with cellular physiology	3	2	1	2	2	1	1	2	1.8	
		CO2	Metabolic networks. Students will visualize the complexity and connectivity of metabolic pathways	2	2	1	1	2	2	2	1	1.7	
		Average		2.5	2	1	1.5	1	1.5	1.5	1.5	1.6	
	Semester II	Gene and Protein Science	CO1	Students will gain an understanding of Cell structure, components, and characteristics of cellular chemical and molecular processes	3	1	2	1	1	2	1	1	1.5
			Average		3	1	2	1	1	2	1	1	1.5
		Bioinformatics and Computational Biology	CO1	Demonstrate knowledge of the world-renowned biotechnology information repositories, such as NCBI databases, and the proficient use of the search algorithms for genes, proteins, RNA's, peptides, disease biomarkers, compounds and biologics from these repositories;	3	2	1	3	1	1	1	2	1.8
CO2			Apply bioinformatics analysis knowledge and techniques to answer scientific questions in the health sciences	2	2	1	2	1	1	1	1	1.4	
Average				2.5	2	1	2.5	1	1	1	1	1.6	
DNA Recombinant technology		CO1	To expose students to application of recombinant DNA technology in biotechnological research.	2	1	1	2	2	1	1	1	1.4	

		CO2	To train students in strategizing research methodologies employing recombinant techniques.	2	2	1	2	3	1	1	1	1.7
		CO3	Student will get practical & theoretical knowledge in Recombinant DNA technology.	3	1	2	2	1	3	1	1	1.8
		Average		2.33	1.33	0.66	2	0.33	1.66	1	1	1.1
	Biostatistics & Research methodology	CO1	Understand the basic concept and scope of biostatistics and Research work, calculation and present of the data. It also informs the students, how the present research work writing and correlating.	3	2	1	1	1	3	1	1	1.7
		CO2	Learn to measure and analyze data	2	1	2	2	2	1	1	1	1.5
		CO3	Develop the ability to apply the methods while working on a research project work	1	2	1	2	1	1	1	1	1.3
		CO4	Describe the appropriate statistical methods required for a particular research design	1	1	1	2	1	2	1	1	1.3
		CO5	Understand principles of conducting ethical Research	3	1	1	1	2	1	1	1	1.4
		Average		2	1.4	1.2	1.6	1.4	1.6	1	1	1.4
Semester III	Genomics	CO1:	Upon completion of this course, the student will be familiar with most aspects of genomics.	2	1	1	2	1	1	2	1	1.4
		CO2	The student will learn how knowledge of genomics can be exploited for understanding cellular physiology, as well as for development of new diagnostics and vaccines, and other biotechnological purposes.	2	1	1	1	1	2	2	1	1.4
		Average		2	1	1	1.5	1	1.5	0.5	1	0.8
	Proteomics	CO1	Practical and theoretical knowledge in proteomics.	3	1	2	2	1	1	1	1	1.5
		CO2	Experience in protein identification and function.	1	1	1	1	1	1	2	1	1.2

	Average		2	1	1.5	1.5	1	1	1.5	1	1.4
Nanotechnology	CO1	Understand the fundamental of nanomaterial in reference to characterization, synthesis and application.	3	1	2	2	2	2	2	1	2
	CO2	Student will get practical & theoretical knowledge in nano-biotechnology related field.	2	1	1	1	1	1	2	1	1
	Average		2.5	1	1.5	1.5	1.5	1	2	1	1.5
Molecular Diagnostics	CO1	learn the advance laboratory techniques, interpret results and prepare reports.	3	1	1	1	2	2	1	1	1.5
	CO2	Student will get practical & theoretical knowledge in Molecular Diagnostics.	3	1	1	2	1	1	1	1	1.4
	Average		3	1	1	1.5	1.5	1.5	1	1	1.2
Drug Discovery	CO1	Student will get the knowledge about basic and advance concepts of drug discovery and gain an awareness of the current approaches to global drug discovery.	3	2	1	2	2	2	2	1	1.9
	CO2	Student will get practical & theoretical knowledge in the field of drug discovery.	2	2	1	1	1	1	1	1	1.3
	Average		2.5	2	1	1.5	1.5	1.5	1	1	1.6
Seminar	CO1	Class seminars are conducted every semester to develop communication skills of students.	3	1	2	2	2	3	1	2	1.8
	CO2	Students will be able to comprehend the current research and should be able to put forward major ideas in front of their colleagues and teachers.	1	2	1	2	1	1	1	2	1.4

		CO3	Students will be evaluated on the basis of their presentation and questions and answer session.	1	2	2	2	1	3	1	2	1.8	
		Average		1.7	1.7	1.7	2	1.3	2.3	1	2	1.7	
Semester IV	Analytical Instrumentation	CO1	student will get deep knowledge of the fundamentals of analytical instrumentation	3	1	2	2	2	2	2	2	2	
		CO2	Student will get practical & theoretical knowledge in analytical instrumentation	2	1	2	2	2	1	2	2	1.8	
		Average		2	1.4	2	2	2	1.5	2	2	1.9	
	Bioethics, Biosafety, IPR & Technology transfer	CO1	Interpret basics of Bio-safety and Bio-ethics and its impact on all the biological sciences	3	1	1	1	1	1	1	2	2	1.5
		CO2	Recognize importance of Bio-safety practices, guidelines.	2	2	2	2	2	2	2	2	2	2
		CO3	Able to understand and analyse ethical aspects related to biological, biomedical, health care and life science research	2	1	1	1	1	1	1	2	2	1.4
		CO4	Get knowledge of biosafety and risk assessment of products derived from recombinant DNA research and environment release of genetically modified organisms, national and international regulations.	3	2	3	3	2	3	2	2	2	2.5
		CO5	Analyze different types of intellectual property rights in general and protection of products derived from life science research and issues related to application and obtaining patents	2	3	3	3	3	3	3	2	2	2.7
		Average		2.4	1.8	2	2	1.8	2	2	2	2	1.4

Quality Assurance & Quality Control	CO1	Students will be able to implement qualitative programs required for the progression of the molecular laboratories	1	2	2	1	1	1	2	1	1.4
	CO2	Students will be able to function accurately in quality improvement programs in accordance to development of laboratories.	1	2	2	1	1	1	2	2	1.5
	CO3	Students will be able to develop and conduct experiments to define important product development areas and analyze the results and draw recommendations for quality improvement	1	2	1	1	1	1	2	2	1.4
	Average		1	2	1.7	1	1	1	2	1.7	1.4
Project /Dissertation	CO1	Develop the critical thinking ability and communication skills.	1	2	3	2	1	2	1	1	1.6
	CO2	Understand and apply the scientific method.	1	3	2	2	1	1	2	1	1.6
	CO3	Develop the aptitude to work on a scientific problem and look for alternative solution.	1	2	2	3	1	2	2	1	1.8
	CO4	Write their finding in a form of a thesis and defend it by presenting it in front of their teachers and examiners.	1	1	1	1	1	3	2	1	1.4
	CO5	Experience and embrace the habit of ethical practice in performing experiments and communicating them	1	1	2	2	2	3	3	3	2.1
	Average		1	1.8	2	2	1.2	2.2	2	1.4	1.7
Educational tour/field work/Industrial visit/ Hospital visit	CO1	Student will improve the critical thinking ability	2	3	3	2	3	2	3	3	2.7
	CO2	This also helps students to enhance their interpersonal skills.	3	2	2	3	2	3	3	2	2.5
	Average		2.5	2.5	2.5	2.5	2.5	2.5	3	3.5	2.6

Semester I	Cell Biology	CO1	Students will gain an understanding of Cell structure, components, and characteristics of cellular chemical and molecular processes.	PO1 & PO8	A	1,2,3,4,5,6,	60	100	60	100	NA	NA	120	100	3	
		Total												100	Average :3	
	Molecular Immunology	CO1	Show deeper understanding of fundamentals of molecular immunology.	PO1, PO2, PO4, PO6	C, A	1,2,3,,8,	26	43.3	38	63.3	NA		64	53.3	3	
		CO2	Student will get familiar with components of immune system, types of immune deficiencies, basics of antibody engineering etc	PO1, PO2, PO3, PO4, PO6	C,A,P	4,5,6,7	34	56	22	36.6	NA	NA	56	46.6	2	
		Total					60		60				120	100	Average: 2.5	
	Molecular Enzymology	CO1	Student will get deep knowledge about the concepts of molecular enzymology.	PO1 , PO2, PO4, PO6, PO7, PO8	C,A,P	1,2,3	20	33.33	24	40	NA	NA	44	36.6	2	
		CO2	Student will get familiar with the enzyme kinetics & enzyme engineering.	PO1, PO2, PO3, PO4, PO6, PO7, PO8	C,A,P	4,5,6,7	40	66.66	36	60	NA	NA	76	63.3	3	
		Total					60	100	60	100			120	100	Average: 2.5	
	Metabolic engineering	CO1	Metabolic engineering. Students will integrate the concept of pathway modification with cellular physiology.	PO1,PO2, PO3, PO4, PO6, PO7	C,A,P	1,2,3	28	46.6	36	60	NA	NA	64	53.33	3	
		CO2	Metabolic networks. Students will visualize the complexity and connectivity of metabolic pathways	PO1, PO2, PO3, PO4, PO8	C,A,P	4,5	32	53.3	24	40	NA	NA	56	46.66	2	
		Total					60	100	60	100			120	100	Average: 2.5	
	Semester II	Gene & Protein Sciences	CO1	Understand the basic concepts of gene & protein science and its application in the field of molecular biology.	PO1, PO2, PO4, PO7, PO8	C,A	1,2,3,4,5,6,	60	100	60	100	NA	NA	120	100	3
			Total					60	100	60	100			120	100	Average : 3

Bioinformatics and Computational Biology	CO1	Demonstrate knowledge of the world-renowned biotechnology information repositories, such as NCBI databases, and the proficient use of the search algorithms for genes, proteins, RNA's, peptides, disease biomarkers, compounds and biologics from these repositories;	PO1-PO8	C,A,P	1,5,7,8,9	30	50	27	45	NA	NA	57	47.5	2
	CO2	Apply bioinformatics analysis knowledge and techniques to answer scientific questions in the health sciences	PO1-PO8	C,A,P	2,3,4,6,7	30	50	33	55	NA	NA	63	52.4	3
	Total					60	100	60	100			120	100	Average: 2.5
	DNA Recombinant technology													
CO1	To expose students to application of recombinant DNA technology in biotechnological research.	PO1, PO2, PO3, PO4, PO6, PO7, PO8	C,A	1,8	14	23.33	12	20	NA	NA	26	21.6	1	
CO2	To train students in strategizing research methodologies employing recombinant techniques.	PO1, PO2, PO3, PO4, PO6, PO7, PO8	C,A,P	2,3,4,7	28	46.66	28	46.6	NA	NA	56	46.66	2	
CO3	Student will get practical & theoretical knowledge in Recombinant DNA technology.	PO1, PO2, PO4, PO5, PO6, PO7, PO8	C,A,P	5,6	18	30	16	26.6	NA	NA	34	28.33	2	
Total					60	100	60	100			120	100	Average: 1.66	
Biostatistics & Research methodology														
CO1	Understand the basic concept and scope of biostatistics and Research work, calculation and present of the data. It also informs the students, how the present research work writing and correlating.	PO1, PO2, PO3, PO4, PO6, PO7, PO8	C,A	2,3	8	13.33	10	16.6	NA	NA	18	15	1	
CO2	Learn to measure and analyze data	PO1, PO2, PO6, PO7, PO8	C,A,P	4,5,6	12	20	15	25	NA	NA	27	22.5	2	
CO3	Develop the ability to apply the methods while working on a research project work	PO1-PO8	C,A,P	7,8,9,10	16	26.66	14	23.33	NA	NA	30	25	2	
CO4	Describe the appropriate statistical methods required for a particular research design	PO1-PO8	C,P	11,12,13,14	22	36.66	20	33.33	NA	NA	42	35	2	

		CO5	Understand principles of conducting ethical Research	PO1, PO2, PO3, PO4, PO6, PO7, PO8	C,A,P	1	2	3.33	1	1.66	NA	NA	3	2.5	_	
		Total					60	100	60	100			120	100	Average: 1.75	
Semester III	Genomics	CO1	Upon completion of this course, the student will be familiar with most aspects of genomics.	PO1, PO2, PO6, PO8	C,A	1,2,3	29	48.33	28	46.66	NA	NA	57	47.5	2	
		CO2	The student will learn how knowledge of genomics can be exploited for understanding cellular physiology, as well as for development of new diagnostics and vaccines, and other biotechnological purposes.	PO1,PO2, PO3, PO4, PO5, PO8	C,P											
		Total					4,5,6	31	51.66	32	53.33	NA	NA	63	52.5	3
		Total						60	100	60	100			120	100	Average: 2.5
	Proteomics	CO1	Practical and theoretical knowledge in proteomics.	PO1, PO2, PO5, PO6, PO8	C,P	1,2,3,6	34	56.66	33	55	NA	NA	67	55.83	3	
		CO2	Experience in protein identification and function.	PO1-PO8	C,A,P	4,5	26	43.33	27	45	NA	NA	53	44.16	2	
		Total					60	100	60	100			120	100	Average: 2.5	
	Nanobiotechnology	CO1	Understand the fundamental of nanomaterial in reference to characterization, synthesis and application.	PO1, PO2, PO6, PO8	C	1,2,3,7,8,9,	38	63.33	24	40	NA	NA	62	51.6	3	
		CO2	Student will get practical & theoretical knowledge in nano-biotechnology related field.	PO1, PO2, PO3, PO4, PO5, PO6, PO8	C,P	4,5,6	22	36.66	36	60	NA	NA	58	48.33	2	
		Total					60	100	60	100			120	100	Average: 2.5	
	Moleclar Diagnostics	CO1	Advance laboratory techniques, interpret results and prepare reports.	PO1, PO2, PO3, PO4, PO7, PO8	C,A	1,,5	25	41.66	22	36.66	NA	NA	47	39.1	2	
		CO2	Student will get practical & theoretical knowledge in Molecular Diagnostics.	PO1-PO8	C,A,P	2,3,4	35	58.33	38	63.33	NA	NA	73	60.8	3	
		Total					60	100	60	100			120	100	Average: 2.5	

Drug discovery	CO1	Student will get the knowledge about basic and advance concepts of drug discovery and gain an awareness of the current approaches to global drug discovery.	PO1, PO2, PO3, PO6, PO7, PO8	C,A,P	1,2,3,5,6	42	70	21	35	NA	Na	63	52.5	3
	CO2	Student will get practical & theoretical knowledge in the field of drug discovery.	PO1-PO8	C,P	4	18	30	39	65	NA	NA	57	47.5	2
	Total					60	100	60	100			120	100	Average: 2.5
Seminar	CO1	Class seminars are conducted every semester to develop communication skills of students.	PO1, PO2, PO6, PO7, PO8	C,A,P	0	20	33.33	0	0	NA	NA			
	CO2	Students will be able to comprehend the current research and should be able to put forward major ideas in front of their colleagues and teachers.	PO1-PO8	C,A,P	0	20	33.33	0	0	NA	NA			
	CO3	Students will be evaluated on the basis of their presentation and questions and answer session.	PO1, PO2, PO5, PO6, PO7, PO8	C,A,P	0	20	33.33	0	0	NA	NA			
	Total													
Analytical Instrumentation	CO1	student will get deep knowledge of the fundamentals of analytical instrumentation	PO1, PO2, PO8	C,A	1,2,4,5,	35	58.33	23	38.66	NA	NA	58	48.33	2
	CO2	Student will get practical & theoretical knowledge in analytical instrumentation	PO1, PO2, PO3, PO4, PO5, PO6, PO8	C,P	3,6,7	25	41.66	37	61.66	NA	NA	62	51.66	3
	Total					60	100	60	100			120	100	Average: 2.5
Bioethics, Biosafety, IPR & Technology Transfer	CO1	Interpret basics of Bio-safety and Bio-ethics and its impact on all the biological sciences	PO1-PO8	C,A,P	1	10	16.6	0	0	NA	NA	10	16.6	2
	CO2	Recognize importance of Bio-safety practices, guidelines.	PO1, PO2, PO6, PO7, PO8	C,A,P	2	10	16.6	0	0	NA	NA	10	16.6	2
	CO3	Able to understand and analyse ethical aspects related to biological, biomedical, health care and life science research	PO1-PO8	C,A,P	3	10	16.6	0	0	NA	NA	10	16.6	2



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Email: sbsnm@mgsnuhs.com / Website : www.mgsnuhs.edu.in

CO PO Matrix
Program - M.Sc. Clinical Embryology
Sem I to IV

- PO1. Nurture the scientific and/or clinical knowledge and skills for development of industrial applications, health care practices and entrepreneurship.
- PO2. Develop the ability of critical thinking to analyse, interpret problems and to find out systematic approach for solution.
- PO3. Impart decision making capability for handling various circumstances in their respective areas
- PO4. Demonstrate research skills for planning, designing, implementation and effective utilization of research findings for community.
- PO5. Develop an ability to function as an efficient individual and team player in multidisciplinary sectors for effective outcomes
- PO6. Demonstrate an effective written and oral communication skills to communicate effectively in health care sector, industries, academia and research.
- PO7. Inculcate code of ethics in professional and social circumstances to execute them in daily practices and research in respective areas of specialization
- PO8. Develop lifelong learning attitude and values for enhancement of professional and social skills for an overall development

PO Mapping same with correlation level 3,2,1 The notation of 1 - low, 2 - moderate , 3 - high

				Knowledge and skill	Critical Thinking & problem solving	Decision making	Research skill	Individual and team work	Communication skills	Code of ethics	Lifelong learning	Average
Semester	Course / Course Code	Course Outcome	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	
Semester 1	Relevant Gross Anatomy CE 101	CO 1	To demonstrate and understand the relevant gross anatomy of male and female reproductive system.	3	3	2	2	1	2	3	3	2.4
		CO 2	To understand the relevant gross anatomy of urinary system.	3	3	2	2	1	2	3	3	2.4
		CO 3	To understand the relevant gross anatomy of endocrine system.	3	3	2	2	1	2	3	3	2.4
		Average		3.0	3.0	2.0	2.0	1.0	2.0	3.0	3.0	2.4
	Histology CE 102	CO 1	To describe the histology of male and female reproductive system	3	3	3	3	1	2	3	3	2.6
		CO 2	To identify and study the histology of urinary system.	3	3	3	3	1	2	3	3	2.6
		CO 3	To understand the histology of endocrine system	3	3	3	3	1	2	3	3	2.6
		Average		3	3	3	3	1	2	3	3	2.6
	Genetics and Reproductive Hormone CE 103	CO 1	To have detail knowledge about Chromosomes, Molecular genetics, Developmental genetics, Prenatal diagnosis and genetic counselling, Genetics in Infertility, Epigenetics and The Human Genome Project.	3	3	3	3	1	2	3	3	2.6
		CO 2	To study the physiology of reproductive hormones such as Pituitary and thyroid hormones, Male and Female sex hormones.	3	3	3	3	1	2	3	3	2.6

		Average	3	3	3	3	1	2	3	3	2.6	
	General and Systemic Embryology CE 104	CO 1	To able to understand in detail General Embryology as week wise development from 1st week to 4th week and trophoblast development with twinning	3	3	3	3	1	2	3	3	2.6
		CO 2	To able to understand in detail Systemic Embryology under CVS, Urinary system , MRS, FRS, Teratogenesis.	3	3	3	3	1	2	3	3	2.6
		Average	3	3	3	3	1	2	3	3	2.6	
Semester 2	Infertility and Ovulation Induction Methods CE 105	CO 1	To have a detail knowledge about Male and Female Infertility.	3	3	3	3	1	2	3	3	2.6
		CO 2	To have a detail knowledge about drugs of infertility and their use.	3	3	3	3	1	2	3	3	2.6
		CO 3	To understand in detail methods and protocols of ovulation induction, Patient monitoring, complications and OHSS and Ovum pick up.	3	3	3	3	1	2	3	3	2.6
		Average	3.0	3.0	3.0	3.0	1.0	2.0	3.0	3.0	2.6	
	Quality Assessment, Statistics, Handling data, Ethics, Legislation CE 106	CO 1	To study the Ethical and legal issues such as Lab ethics, Legislation in India, Policies and principles, Reeregulatory bodies, Ethics in health care.	3	3	3	3	1	1	3	3	2.5
		CO 2	To have a detail knowledge about ART- legal issues and Acts, Surrogacy and Gamete donation programme.	3	3	3	3	1	1	3	3	2.5
		CO 3	To have a detail knowledge of their practical application.	3	3	3	3	1	1	3	3	2.5
		Average	3.0	3.0	3.0	3.0	1.0	1.0	3.0	3.0	2.5	
	IVF Procedures CE 107	CO 1	To study in detail about IVF procedure under embryo development and metabolism, Sperm preparation, Grading of gamete and embryo, Embryo culture and transfer techniques.	3	3	3	3	1	2	3	3	2.6
		CO 2	To study in detail about Complications how to deal with them and counselling.	3	3	3	3	1	2	3	3	2.6
		Average	3	3	3	3	1	2	3	3	2.6	
	Research Methodology and Biostatistics CE 108	CO 1	To have a basic knowledge about concepts related to Biostatistics such as Data presentation, sampling, correlation and vital statistics.	3	3	3	3	1	2	3	3	2.6
		CO 2	To have a basic knowledge about research methodology for project purpose such as material and time management with documentation and presentation	3	3	3	3	1	2	3	3	2.6

	CC 001	CO 3	To able to understand basic Biostatistics and research concepts and be able to use them to prepare thesis research protocol.	3	3	3	3	1	2	3	3	2.6	
		Average		3	3	3	3	1	2	3	3	2.6	
Semester 3	Introduction to IVF Lab CE 108	CO 1	To study and understand about various Lab set ups, lab designing and establishment, Record maintenance, Quality improvement.	3	3	3	3	1	2	3	3	2.6	
		Average		3.0	3.0	3.0	3.0	1.0	2.0	3.0	3.0	2.6	
	Techniques used in IVF Lab CE 109	CO 1	To know in detail about Cryoprotectant, Cryopreservation of various sample freezing and retrieval techniques and recent development.	3	3	3	3	1	3	3	3	3	2.8
		CO 2	To have a detail knowledge about different culture media and theie handling, various culture media techniques and co-culture.	3	3	3	3	1	3	3	3	3	2.8
		Average		3.0	3.0	3.0	3.0	1.0	3.0	3.0	3.0	3.0	2.7
	ICSI CE 110	CO 1	To have a knowledge about ICSI- indications and contraindications, techniques, Micromanipulator, Equipment, Pre procedure, Risk of anomalies, IMSI, Microscopy, Assessment and counselling.	3	3	3	3	2	3	3	3	3	2.9
		Average		3	3	3	3	2	3	3	3	3	2.9
	Biochemistry Including Steroid Metabolism	CO 1	To study Radiology in ART as Basic principle og Ultrasonography, Follicular study, Diagnosis of pregnancy, Ectopic pregnancy and various tests.	3	3	3	3	1	3	3	3	3	2.8
		Average		3	3	3	3	1	3	3	3	3	2.8
	Lab Equipment CE 112	CO 1	To study various laboratory equipment like Micro-manipulator, Micropipette, other equipments of ICSI, Microscopes,	3	3	3	3	2	3	3	3	3	2.9
		CO 2	To have a detail knowledge about Instrument handling, Maintenance, Calibration and Trouble shooting	3	3	3	3	1	2	3	3	3	2.6
		CO 3	To have a detail knowledge about their practical aplication	3	3	3	3	1	3	3	3	3	2.8
		Average		3	3	3	3	1.3	2.6	3	3	3	2.8
	Semester 4	Pursuit Of Inner self Excellence GE 001	CO1	To have a knowledge about spiritual values for human excellence, correlation between valuees and the subjects	3	3	3	1	3	3	3	3	2.8
			CO2	To know the intergrating values and	3	3	3	1	3	3	3	3	2.8
CO3			To study experiencing through the heart for self transformation.	3	3	3	1	3	3	3	3	2.8	
Average				3.0	3.0	3.0	1.0	3.0	3.0	3.0	3.0	2.8	
Bioethics, Biosafety, IPR		CO1	To study the ethics and patenting its benefits and their application.	3	3	3	2	3	3	3	3	2.9	

and Technology Transfer GE 002	CO 2	Introduction to quality assurance, accreditation & SOP writing and its application.	3	3	3	2	3	3	3	3	2.9
	CO 3	To study in detail about fundings in biotech business, roles of knowledge centres R&D	3	3	3	3	3	3	3	3	3.0
	Average		3.0	3.0	3.0	2.3	3.0	3.0	3.0	3.0	2.9
Disaster Management and Mitigation Resources GE 003	CO 1	To have a detailed knowledge and understanding of the disaster phenomenon, its different contextual aspects, impacts and public health consequences.	3	3	2	2	3	3	3	3	2.8
	CO 2	To understand various disaster management policy and administration	3	3	2	2	3	3	3	3	2.8
	CO 3	To study ways to raise finance for relief expenditure, role of government agencies and NGO's in this process, Legal aspects related to finance raising as well as preventive and mitigation measures.	3	3	2	2	3	3	3	3	2.8
	Average		3	3	2	2	3	3	3	3	2.8
Human Rights GE 004	CO1	To study Human Rights at various levels , Human Rights in India	3	3	3	3	2	3	3	3	2.9
	CO2	To study in detail Huan Rights violation and political issue	3	3	3	3	2	3	3	3	2.9
	Average		3	3	3	3	2	3	3	3	2.9

CO & PO Relationships
Programme - MSc. Clinical Embryology
Sem I to IV

Semester	Course & Course	CO	Details	CO & PO Relationships		Unit	Lecture	Lab	Clinical	Total	Strength Level of CO addressing to PO Level 3:>40%, Level 2: 25%-40%, Level 1: 5%-24%, Not addressed :<5%				
				PO1-PO8	C.A.P							No	Hrs	%	Hrs
Semester 1	Relevant Gross Anatomy CE 101	CO1	To demonstrate and understand the relevant gross anatomy of male and female reproductive system.	PO1, PO2,PO3,	C,A,P	1'-3	39	65	40	66.7	0	0	79	0.6	3
		CO 2	To understand the relevant gross anatomy of urinary system.	PO4	C,A,P	4'	6	10	4	6.7	0	0	10	0.08	1
		CO 3	To understand the relevant gross anatomy of endocrine system.	PO5	C,A,P	5'	15	25	16	26.7	0	0	31	0.25	2
		Total					60	60	0	120	1	2			
	Histology CE 102	CO1	To describe the histology of male and female reproductive system	PO1, PO2,PO3,	C,A,P	1'-3	34	75.6	26	43.3	0	0	60	0.57	3
		CO 2	To identify and study the istology of urinary system.	PO4	C,A,P	4'	3	6.7	14	23.3	0	0	17	0.16	1
		CO 3	To understand the histology of endocrine system	PO5	C,A,P	5'	5	11.1	23	38.3	0	0	28	0.26	2

		Total				42		63		0		60	1	2	
Genetics and Reproductive Hormone CE 103	CO1	To have detail knowledge about Chromosomes, Molecular genetics, Developmental genetics, Prenatal diagnosis and genetic counselling, Genetics in Infertility, Epigenetics and The Human Genome Project.	PO1	C,A,P	1'	56	93.3	10	16.7	0	0	66	0.55	3	
	CO 2	To study the physiology of reproductive hormones such as Pituitary and thyroid hormones, Male and Female sex hormones.	PO2	C,A,P	2'	12	20	42	70	0	0	54	0.45	3	
	Total					56		52		0		120	1	3	
General and Systemic Embryology CE 104	CO1	To able to understand in detail General Embryology as week wise development from 1st week to 4th week and trophoblast development with twinning	PO1 ,PO2, PO3,PO4,PO5, PO6	C ,A, P	1'-5	42	70	40	66.7	0	0	82	0.68	3	
	CO 2	To able to understand in detail Systemic Embryology under CVS, Urinary system , MRS, FRS, Teratogenesis.	PO7, PO8	C ,A, P	7-8	18	30	20	33.3	0	0	38	0.31	2	
	Total					60		60		0		82	1	3	
Semester 2	Infertility and Ovulation Induction Methods CE 105	CO1	To have a detail knowledge about Male and Female Infertility.	PO1,PO2,PO3	C,A,P	1'-3	22	36.7	10	33.3	12	40	44	0.37	2
		CO 2	To have a detail knowledge about drugs of infertility and their use.	PO4	C,A,P	4'	16	26.7	8	26.7	13	43.3	37	0.3	2
		CO 3	To understand in detail methods and protocols of ovulation induction, Patient monitoring, complications and OHSS and Ovum pick up.	PO5,PO6,PO7 ,PO8,PO9	C,A,P	5-9	22	36.7	12	40	5	16.7	39	0.325	2
	Total					60		30		30		120	1	2	
Quality Assessment, Statistics, Handling data, Ethics, Legislation CE 106	CO1	To study the Ethical and legal issues such as Lab ethics, Legislation in India, Policies and principles, Reeregulatory bodies, Ethics in health care.	PO1 ,PO2, PO3	C,A,P	1'-3	22	36.7	10	33.3	13	43.3	45	1	3	
	CO 2	To have a detail knowledge about ART- legal issues and Acts, Surrogacy and Gamete donation programme.	PO4, PO5, PO6	C,A,P	4'-6	22	36.7	6	20	9	30	37	0.82	3	
	CO 3	To have a detail knowledge of their practical application.	PO7, PO8	C,A,P	7-8	16	26.7	14	46.7	8	26.7	38	0.84	3	
	Total					60		30		30		120	100	3	
IVF Procedures CE 107	CO1	To study in detail about IVF procedure under embryo development and metabolism, Sperm preparation, Grading of gamete and embryo, Embryo culture and transfer techniques.	PO1, PO2, PO3, PO4	C,A,P	1'-4	36	60	17	56.7	14	46.7	67	0.6	3	
	CO2	To study in detail about Complications how to deal with them and counselling.	PO5	C,A,P	5'	24	40	13	43.3	16	53.3	53	0.44	3	
	Total					60		30		30		120	1	3	

	Research Methodology and Biostatistics CC 001	CO1	To have a basic knowledge about concepts related to Biostatistics such as Data presentation, sampling, correlation and vital statistics.	PO7,PO3,PO11,PO14	C,A,P	3, 7, 11,14	14	23.3	15	25	0	0	29	0.24	1
		CO 2	To have a basic knowledge about research methodology for project purpose such as material and time management with documentation and presentation	PO1, PO2, PO4, PO5	C,A,P	1',2,4,5	20	33.3	25	41.6			45	0.375	2
		CO 3	To able to understand basic Biostatistics and research concepts and be able to use them to prepare thesis research protocol.	PO8, PO9, PO10, PO11, PO12, PO13, PO15	C,A,P	10,11,12,13	26	43.3	20	33.3			46	0.38	2
		Total					60		60		0		120	1	2
Semester 3	Introduction to IVF Lab CE 108	CO1	To study and understand about various Lab set ups, lab designing and establishment, Record maintenance, Quality improvement.	PO1,PO2,PO3,PO4,PO5	C,A,P	1'-5	45	100	30	100	30	100	105	1	3
		Total					45		30		30		105	100	3
	Techniques used in IVF Lab CE 109	CO1	To know in detail about Cryoprotectant, Cryopreservation of various sample freezing and retrieval techniques and recent development.	PO1	C,A,P	1	34	56.7	16	26.7	18	30	68	0.56	3
		CO2	To have a detail knowledge about different culture media and their handling, various culture media techniques and co-culture.	PO2	C,A,P	2	26	43.3	14	23.3	12	20	52	0.43	3
		Total					60		30		30		120	1	3
	ICSI CE 110	CO1	To have a knowledge about ICSI- indications and contraindications, techniques, Micromanipulator, Equipment, Pre procedure, Risk of anomalies, IMSI, Microscopy, Assessment and counselling.	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8,PO9,PO10,PO11	C,A,P	1'-6	60	66.7	17	56.7	13	43.3	90	1	3
		Total					59		17		13		90	1	3
	Biochemistry Including Steroid Metabolism CE 111	CO1	To study Radiology in ART as Basic principle of Ultrasonography, Follicular study, Diagnosis of pregnancy, Ectopic pregnancy and various tests.	PO1,PO2,PO5,PO6	C,A,P	1,2,5,6	60	66.7	30	33.3	0	0	90	1	3
		Total					60		30		0		90	100	3
	Lab Equipment CE 112	CO1	To study various laboratory equipment like Micro-manipulator, Micropipette, other equipments of ICSI, Microscopes,	PO1,PO2,PO3	C,A,P	1'-3	32	53.3	5	33.3	6	40	43	0.5	3
To have a detail knowledge about Instrument handling, Maintenance, Calibration and Trouble shooting			PO5,PO6,PO7	C,A,P	5'-7	15	25	4	26.7	4	26.7	23	0.25	2	
CO 3		To have a detail knowledge about their practical application	PO4	C,A,P	4	13	21.7	6	40	5	33.3	24	0.26	2	
Total						60		15	100	15	100	90	1	2	

				Knowledge and skill	Critical Thinking & problem solving	Decision making	Research skill	Individual and team work	Communication skills	Code of ethics	Lifelong learning	Average	
Semester	Course / Course Code	Course Outcome	CO Details	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8		
Semester 2	Ocular Diseases and Diagnostics II (105 L & P)	CO1	To be able to perform and interpret posterior segment diagnostic procedures.	3	3	3.0	3.0	3.0	2.0	2.0	3.0	2.8	
		CO2	To be able to diagnose and co-manage diseases and disorders of posterior segmen	3	3	3.0	3.0	3.0	2.0	2.0	3.0	2.8	
		Average		3	3	3.0	3.0	3.0	2.0	2.0	3.0	2.8	
	Advanced Contact Lenses I	CO1	•To be able to understand corneal physiology and oxygen needs	3	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.3
		CO2	To be able to fit specialized contact lenses for various ocular conditions	3	3	3.0	3.0	2.0	3.0	3.0	3.0	3.0	2.9
		CO3	To be able to diagnose and manage complications due to contact lenses	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		Average		3	3	3.0	3.0	2.5	3.0	3.0	3.0	3.0	2.9
	Binocular Vision and Pediatric Optometry	CO1	To be able to diagnose and manage and co-manage binocular vision anomalies	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		CO2	•To be able to diagnose and co-manage visual perceptual anomalies	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		Average		3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	Low vision and Geriatric Optometry	CO1	• To be able to diagnose and manage patients with vision impairment	3	3	3.0	3.0	2.0	3.0	3.0	3.0	3.0	2.9
		CO2	To be able to perform specialized diagnostics for patients with low vision and with multiple disabilities	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		CO3	• To be able to train for eccentric viewing and steady eye technique	3	3	3.0	1.0	3.0	3.0	3.0	3.0	3.0	2.8
		CO4	To be able to rehabilitate patients with VI with vocational counseling and activities of daily living	3	3	3.0	1.0	3.0	3.0	3.0	3.0	3.0	2.8
		Average		3	3	3.0	1.0	3.0	3.0	3.0	3.0	3.0	2.8
	Optometry Directed Clinical Education- (109CP)	CO1	Students will demonstrate competence in basic, intermediate and Advance procedures.	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		Average		3	3	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
	Research Methodology & Biostatistics (CC001)	CO1	Student will be able to understand develop statistical models, research designs with the understating of background theory of various commonly used statistical techniques as well as analysis interpretation & reporting of results and use of statistical software	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		Average		3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	Basics of Clinical Skills Learning (CEC002)	CO1	After successful accomplishment of the course, the students would be able to Measure Vital Signs, do basic physical Examination of the patients, NG tube basics, Administration of Medicines	3	3	3.0	1.0	3.0	3.0	3.0	3.0	3.0	2.8
CO2		The students will learn about Asepsis, and the Cleanliness related to asepsis and on mobility of the patients	3	3	3.0	1.0	1.0	3.0	3.0	3.0	3.0	2.5	
Average			3	3	3.0	3.0	2.0	3.0	3.0	3.0	3.0	2.6	
		CO1	Understand and apply resource management concepts (personnel, finance, and material resources) and the processes and strategies needed in specific hospital sectors	3	3	3.0	1.0	3.0	3.0	3.0	3.0	2.8	

				Knowledge and skill	Critical Thinking & problem solving	Decision making	Research skill	Individual and team work	Communication skills	Code of ethics	Lifelong learning	Average	
Semester	Course / Course Code	Course Outcome	CO Details	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8		
	Hospital Operation Management (CEC003)	CO2	Communicate effectively and develop their leadership and teambuilding abilities	3	3	3.0	1.0	3.0	3.0	3.0	3.0	2.8	
		CO3	Apply modern change management and innovation management concepts to optimize structures	3	3	3.0	1.0	3.0	3.0	3.0	3.0	2.8	
		CO4	Analyze existing hospital service policies and enhance their alignment within the local and national context	3	3	3.0	1.0	1.0	3.0	3.0	3.0	2.5	
		Average		3	3	3.0	1.0	2.0	3.0	3.0	3.0	2.7	
SEMESTER 3	Advanced Dispensing Optics (110 L & P)	CO1	To design and dispense appropriate eyewear for a variety of patients.	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
		CO2	To demonstrate knowledge about troubleshooting and patient handling	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
		Average		3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
	Advanced Contact Lenses II(111L & P)	CO1	To be able to fit specialized contact lenses for various ocular conditions	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		CO2	To be able to diagnose and manage complications due to contact lenses	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		Average		3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	Visual Perception, Neuroscience and Psychophysics (112 L)	CO1	To be able to diagnose and manage patients with neuro- optometric disorders	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		CO2	To be able to provide therapy for rehabili	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		Average		3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	Applied Vision Therapy (113L & P)	CO1	To demonstrate knowledge of the unique qualities, scientific, and clinical principles of each clinical condition.	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		CO2	. To identify the characteristic history, signs and symptoms for each clinical condition	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		CO3	to assess each clinical condition, including specific test protocols and their interpretation	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		CO4	The specific treatment and management of each clinical condition including: Prognostic indicators , Treatment options , Duration and frequency of treatment , Treatment philosophy and goals , Specific lens treatment and therapy procedures including rationale for treatment ,Ergonomics and visual hygiene , Outcomes to determine successful completion of treatment ,Frequency of follow-up care and patient instructions , Referral criteria (medical, neurological, educational, etc.)	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		Average		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	Optometry Directed Clinical Education- III (CP 114)	CO1	Students will demonstrate competence in basic, intermediate and Advance procedures.	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Average			3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
		CO1	Students will become self dependent, more decisive and develop intuitive ability for their study and career related matter.	1	2	3.0	1.0	3.0	2.0	2.0	3.0	2.1	

				Knowledge and skill	Critical Thinking & problem solving	Decision making	Research skill	Individual and team work	Communication skills	Code of ethics	Lifelong learning	Average	
Semester	Course / Course Code	Course Outcome	CO Details	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8		
SEMESTER 4	Pursuit of Innerself Excellence (POISE)	CO2	Enhanced communication skills, public speaking & improved Presentation ability.	2	1	1.0	1.0	2.0	3.0	2.0	3.0	1.9	
		CO3	Development of personal attributes like Empathy, Compassion, Service, Love, brotherhood and Team work abilities	1	1	1.0	1.0	3.0	3.0	3.0	3.0	2.0	
		Average		1.3	1.3	1.7	1.0	2.7	2.7	2.3	3.0	2.0	
	Disaster management and Mitigation Resources	CO1	Understand the world-wide distribution of hazards and disasters and know the similarities and differences between natural and technological disasters.	2	2	3.0	2.0	2.0	2.0	1.0	2.0	3.0	2.1
		CO2	Acquire mitigation skills that help communities reduce the amount of damage and loss from disaster.	2	2	1.0	1.0	2.0	2.0	1.0	2.0	2.0	1.6
		CO3	Gain preparedness skills that increase community effectiveness in responding to disaster.	2	2	2.0	1.0	2.0	2.0	1.0	2.0	3.0	1.9
		Average		2.0	2.0	2.0	1.3	2.0	1.0	2.0	2.7	1.9	
	Human Rights	CO1	Demonstrate a good understanding of the provisions under the Constitution of India dealing with human rights.	2	2	2.0	1.0	1.0	1.0	1.0	3.0	3.0	1.9
		CO2	Promote human rights through legal as well as non-legal means.	2	2	2.0	1.0	1.0	1.0	1.0	3.0	3.0	1.9
		CO3	Participate in legal, political and other debates involving human rights in a knowledgeable and constructive way	2	2	2.0	1.0	1.0	1.0	1.0	3.0	3.0	1.9
		Average		2.0	2.0	2.0	1.0	1.0	1.0	1.0	3.0	3.0	1.9

**PO CO Relationship
Program M.Optomety
Sem I-IV**

				CO & PO Relation		Domain	Unit	Lecture		Lab		Clinical		Total	Strength Level of CO addressing to PO Level 3:>50%, Level 2: 30%-50%, Level 1:<30%, Not addressed :<5%
Semester	Course / Course Code	Course Outcome	CO Details	PO1-PO8	C.A.P	No	Hrs	%	Hrs	%	Hrs	%	Hrs	%	
Semester 1	Epidemiology Public health & Community Eye Health (101 L &P)	CO1	To have a thorough understanding of epidemiological concepts.	PO1,PO3,PO4,PO6,PO8	C	2.0	5.0	16.7	-	-	10.0	16.7	15.0	16.7	1.0
		CO2	To have a thorough understanding of conducting of screening for specific eye conditions, and resultant implications through theoretical and practical exposure	PO1,PO3,PO5,PO6,PO8	C.A.P	4,6	12.0	40.0	-	-	20.0	33.3	32.0	35.6	2.0
		CO3	To understand role of optometrists in community eye health	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8	C.A.P	1,3,5	13.0	43.3	-	-	30.0	50.0	43.0	47.8	2.0
		Total					30.0	100.0	-	-	60.0	100.0	90.0	100.0	3.0
	Ocular Diseases 1 (102)	CO1	To be able to diagnose anterior segment Ocular abnormalities	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8	C.A.P	1.0	40.0	66.7	-	-	-	-	40.0	66.7	3.0
		CO2	To be able to manage and co-manage therapeutics for anterior segment	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8	C.A.P	1.0	20.0	33.3	-	-	-	-	20.0	33.3	2.0
		Total					60.0	100.0	-	-	60.0	100.0	60.0	100.0	3.0

				Knowledge and skill	Critical Thinking & problem solving	Decision making	Research skill	Individual and team work	Communication skills	Code of ethics	Lifelong learning	Average				
Semester	Course / Course Code	Course Outcome	CO Details	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8					
	Anterior Segment Diagnostic (103 L & P)	CO1	To be able to perform and interpret corneal diagnostics including, Topography/Pentacam/Orbscan, Secular microscopy,Tachymetry, Abberometry, A-Scan OCT UBM ,	PO1,PO2,PO3,P04,PO5,PO6,PO7 ,P08	C.A.P	1.0	30.0	50.0	15.0	50.0	20.0	66.7	65.0	54.2	3.0	
		CO2	To be able to interpret glaucoma diagnostic reports OCT, HRT, Gonioscopy, and ONH evaluation.	PO1,PO2,PO3,P04,PO5,PO6,PO7 ,P08	C.A.P	1.0	15.0	25.0	5.0	16.7	5.0	16.7	25.0	20.8	1.0	
		CO3	To be able to perform anterior segment photography and ophthalmic imaging	PO1,PO2,PO3,P04,PO5,PO6,PO7 ,P08	C.A.P	1.0	15.0	25.0	25.0	10.0	33.3	5.0	16.7	30.0	25.0	1.0
		Total						60.0	100.0	30.0	100.0	30.0	100.0	120.0	100.0	3.0
	Optometry Directed Clinical Education-I (104 CP)	CO1	Students will demonstrate competence in basic, intermediate and Advance procedures.	PO1,PO2,PO3,P04,PO5,PO6,PO7 ,P08	C.A.P	1.0	-	-	-	-	315.0	100.0	315.0	100.0	100.0	3.0
	Total						-	-	-	-	315.0	100.0	315.0	100.0	3.0	
Semester 2	Ocular Diseases and Diagnostics II (105 L & P)	CO1	To be able to perform and interpret posterior segment diagnostic procedures.	PO1,PO2,PO3,P04,PO5,PO6,PO7 ,P08	C.A.P	2,3	30.0	66.7	10.0	66.7	8.0	53.3	48.0	64.0	3.0	
		CO2	To be able to diagnose and co-manage diseases and disorders of posterior segmen	PO1,PO2,PO3,P04,PO5,PO6,PO7 ,P08	C.A.P	1.0	15.0	33.3	5.0	33.3	7.0	46.7	27.0	36.0	2.0	
		Total					45.0	100.0	15.0	100.0	330.0	100.0	75.0	100.0	3.0	
	Advanced Contact Lenses I	CO1	•To be able to understand corneal physiology and oxygen needs	PO1,PO3,PO4,P06,P08	C	1,2	8.0	26.7	5.0	33.3	-	-	13.0	21.7	1.0	
		CO2	To be able to fit specialized contact lenses for various ocular conditions	PO1,PO2,PO3,P04,PO5,PO6,PO7 ,P08	C.A.P	5.0	15.0	50.0	5.0	33.3	10.0	66.7	30.0	50.0	3.0	
		CO3	To be able to diagnose and manage complications due to contact lenses	PO1,PO2,PO3,P04,PO5,PO6,PO7 ,P08	C.A.P	3,4	7.0	23.3	5.0	33.3	5.0	33.3	17.0	28.3	1.0	
		Total					30.0	100.0	15.0	100.0	15.0	100.0	60.0	100.0	3.0	
	Binocular Vision and Pediatric Optometry	CO1	To be able to diagnose and manage and co-manage binocular vision anomalies	PO1,PO2,PO3,P04,PO5,PO6,PO7 ,P08	C.A.P	1,2,4,	30.0	50.0	10.0	50.0	25.0	62.5	65.0	54.2	3.0	
		CO2	•To be able to diagnose and co-manage visual perceptual anomalies	PO1,PO2,PO3,P04,PO5,PO6,PO7 ,P08	C.A.P	3,5,6	30.0	50.0	10.0	50.0	15.0	37.5	55.0	45.8	2.0	
		Total					60.0	100.0	20.0	100.0	40.0	100.0	120.0	100.0	3.0	
	Low vision and Geriatric Optometry	CO1	• To be able to diagnose and manage patients with vision impairment	PO1,PO2,PO3,P05,PO7,P08	C.A.P	1,2	14.0	46.7	7.0	35.0	10.0	25.0	31.0	34.4	2.0	
		CO2	To be able to perform specialized diagnostics for patients with low vision and with multiple disabilities	PO1,PO2,PO3,P04,PO5,PO6,PO7 ,P08	C.A.P	3.0	6.0	20.0	6.0	30.0	15.0	37.5	27.0	30.0	2.0	
		CO3	• To be able to train for eccentric viewing and steady eye technique	PO1,PO2,PO3,P04,PO5,PO6,PO7 ,P08	C.A.P	4.0	5.0	16.7	7.0	35.0	10.0	25.0	22.0	24.4	1.0	
		CO4	To be able to rehabilitate patients with VI with vocational counseling and activities of daily living	PO1,PO2,PO3,P05,PO7,P08	C.A.P	5.0	5.0	16.7	-	-	5.0	12.5	10.0	11.1	1.0	
Total						30.0	100.0	20.0	100.0	40.0	100.0	90.0	100.0	3.0		
Optometry Directed Clinical Education- (109CP)	CO1	Students will demonstrate competence in basic, intermediate and Advance procedures.	PO1,PO2,PO3,P04,PO5,PO6,PO7 ,P08	C.A.P	1.0	-	-	100.0	100.0	125.0	100.0	225.0	100.0	3.0		
	Total					-	-	100.0	100.0	125.0	100.0	225.0	100.0	3.0		
Research Methodology & Biostatistics (CC001)	CO1	Student will be able to understand develop statistical models, research designs with the understating of background theory of various commonly used statistical techniques as well as analysis interpretation & reporting of results and use of statistical software	PO1,PO3,PO4,P06,P08	C.A	1 -15,	60.0	100.0	60.0	100.0	-	-	120.0	100.0	3.0		

				Knowledge and skill	Critical Thinking & problem solving	Decision making	Research skill	Individual and team work	Communication skills	Code of ethics	Lifelong learning	Average					
Semester	Course / Course Code	Course Outcome	CO Details	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8						
		Total					60.0	100.0	60.0	100.0	-	-	120.0	100.0	3.0		
	Basics of Clinical Skills Learning (CEC002)	CO1	After successful accomplishment of the course, the students would be able to Measure Vital Signs, do basic physical Examination of the patients, NG tube basics, Administration of Medicines	PO1,PO2,PO3,P05,P06,,P08	C.A	1-4,	35.0	77.8	-	-	-	-	35.0	77.8	3.0		
		CO2	The students will learn about Asepsis, and the Cleanliness related to asepsis and on mobility of the patients	PO1,PO2,PO3,P05,P06,,P08	C.A.P	5,6	10.0	22.2	-	-	-	-	10.0	22.2	1.0		
		Total						45.0	100.0	-	-	-	-	45.0	100.0	3.0	
		Hospital Operation Management (CEC003)	CO1	Understand and apply resource management concepts (personnel, finance, and material resources) and the processes and strategies needed in specific hospital sectors	PO1,PO3,PO4,P06,P08	C.A	1,2	15.0	33.3	-	-	-	-	15.0	33.3	2.0	
	CO2		Communicate effectively and develop their leadership and teambuilding abilities	PO1,PO3,PO4,P06,P08	C.A	3,0	10.0	22.2	-	-	-	-	10.0	22.2	1.0		
	CO3		Apply modern change management and innovation management concepts to optimize structures	PO1,PO3,PO4,P06,P08	C.A.P	4,0	10.0	22.2	-	-	-	-	10.0	22.2	1.0		
	CO4		Analyze existing hospital service policies and enhance their alignment within the local and national context	PO1,PO3,PO4,P06,P08	C	5,0	10.0	22.2	-	-	-	-	10.0	22.2	1.0		
	Total							45.0	100.0	-	-	-	-	45.0	100.0	3.0	
SEMESTER 3	Advanced Dispensing Optics (110 L & P)	CO1	To design and dispense appropriate eyewear for a variety of patients.	PO1-8	C.A.P	1-5,	22.0	48.9	23.0	76.7	-	-	45.0	60.0	3.0		
		CO2	To demonstrate knowledge about troubleshooting and patient handling	PO1-8	C.A.P	6,7	23.0	51.1	7.0	23.3	-	-	30.0	40.0	2.0		
		Total						45.0	100.0	30.0	100.0	-	-	75.0	100.0	3.0	
	Advanced Contact Lenses II(111L & P)	CO1	To be able to fit specialized contact lenses for various ocular conditions	PO1-8	C.A.P	1,2,4-12,	24.0	80.0	5.0	50.0	10.0	50.0	39.0	65.0	3.0		
		CO2	To be able to diagnose and manage complications due to contact lenses	PO1-8	C.A.P	3,13,14	6.0	20.0	5.0	50.0	10.0	50.0	21.0	35.0	2.0		
		Total						30.0	100.0	10.0	100.0	20.0	100.0	60.0	100.0	3.0	
	Visual Perception, Neuroscience and Psychophysics (112 L)	CO1	To obtain a knowledge about functional anatomy and neuro physiological aspects of the visual systems	PO1,PO3,PO4,P06,P08	C.A	5,6,7,11,14	20.0	66.7	-	-	-	-	20.0	66.7	3.0		
		CO2	To understand the neural activities associated with visual perception and visually guided behaviour for diagnosis, management and neuro optometric rehabilitation of patients	PO1,PO3,PO4,P06,P08	C.A	,9,10,12,15	10.0	33.3	-	-	-	-	10.0	33.3	2.0		
		Total						30.0	100.0	-	-	-	-	30.0	100.0	3.0	
	Applied Vision Therapy (113L & P)	CO1	To demonstrate knowledge of the unique qualities, scientific, and clinical principles of each clinical condition.	PO1,PO3,PO4,P06,P08	C.A	1,2	6.0	10.0	-	-	-	-	6.0	6.7	1.0		
CO2		. To identify the characteristic history, signs and symptoms for each clinical condition	PO1,PO2,PO3,P05,P07,P08	C.A.P	3,0	5.0	8.3	2.0	18.2	6.0	31.6	13.0	14.4	1.0			
CO3		to assess each clinical condition, including specific test protocols and their interpretation	PO1,PO2,PO3,P05,P07,P08	C.A.P	3,0	5.0	8.3	2.0	18.2	6.0	31.6	13.0	14.4	1.0			

				Knowledge and skill	Critical Thinking & problem solving	Decision making	Research skill	Individual and team work	Communication skills	Code of ethics	Lifelong learning	Average			
Semester	Course / Course Code	Course Outcome	CO Details	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8				
		CO4	The specific treatment and management of each clinical condition including: Prognostic indicators , Treatment options , Duration and frequency of treatment , Treatment philosophy and goals , Specific lens treatment and therapy procedures including rationale for treatment ,Ergonomics and visual hygiene , Outcomes to determine successful completion of treatment ,Frequency of follow-up care and patient instructions , Referral criteria (medical, neurological, educational, etc.)	P01-8	C.A.P	4-10,	44.0	73.3	7.0	63.6	7.0	36.8	58.0	64.4	3.0
		Total					60.0	100.0	11.0	100.0	19.0	100.0	90.0	100.0	3.0
	Optometry Directed Clinical Education-III (CP 114)	CO1	Students will demonstrate competence in basic, intermediate and Advance procedures.	PO1,PO2,PO3,P04,PO5,PO6,PO7 ,PO8	C.A.P	1.0	-	-	100.0	100.0	125.0	100.0	225.0	100.0	3.0
		Total					-	-	100.0	100.0	125.0	100.0	225.0	100.0	3.0
SEMESTER 4	Pursuit of Innerself Excellence (POISE)	CO1	Students will become self dependent, more decisive and develop intuitive ability for their study and career related matter.	PO2,PO3,PO5PO6,PO8	C,A	3.0	15.0	25.0	-	-	-	-	15.0	25.0	1.0
		CO2	Enhanced communication skills, public speaking & improved Presentation ability.	PO2,PO3,PO5PO6,PO8	C,A	4.0	15.0	25.0	-	-	-	-	15.0	25.0	1.0
		CO3	Development of personal attributes like Empathy, Compassion, Service, Love, brotherhood and Team work abilities	PO2,PO3,PO5PO6,PO8	C,A	1,2	30.0	50.0	-	-	-	-	30.0	50.0	3.0
		Total					60.0	100.0	-	-	-	-	60.0	100.0	3.0
	Disaster management and Mitigation Resources	CO1	Understand the world-wide distribution of hazards and disasters and know the similarities and differences between natural and technological disasters.	PO1,PO2,PO3,P05,PO6,PO7,PO8	C,A,P	1,2	23.0	38.3	-	-	-	-	23.0	38.3	2.0
		CO2	Acquire mitigation skills that help communities reduce the amount of damage and loss from disaster.	PO1,PO2,PO3,P05,PO6,PO7,PO8	C,A,P	5.0	12.0	20.0	-	-	-	-	12.0	20.0	1.0
		CO3	Gain preparedness skills that increase community effectiveness in responding to disaster.	PO1,PO2,PO3,P05,PO6,PO7,PO8	C,A,P	3,4	25.0	41.7	-	-	-	-	25.0	41.7	2.0
		Total					60.0	100.0	-	-	-	-	60.0	100.0	3.0
	Human Rights	CO1	Demonstrate a good understanding of the provisions under the Constitution of India dealing with human rights.	PO1,PO2,PO7,P08	C,A	3.0	12.0	20.0	-	-	-	-	12.0	20.0	1.0
		CO2	Promote human rights through legal as well as non-legal means.	PO1,PO2,PO7,P08	C,A	4.0	13.0	21.7	-	-	-	-	13.0	21.7	1.0
		CO3	Participate in legal, political and other debates involving human rights in a knowledgeable and constructive way	PO1,PO2,PO7,P08	C,A	1,2,5	35.0	58.3	-	-	-	-	35.0	58.3	3.0
		Total					60.0	100.0	-	-	-	-	60.0	100.0	3.0

PO CO Mapping average

Semester	Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Average
Semester 1	Epidemiology Public health & Community Eye Health (101 L &P)	3	3	3	3	3	1	2	3	3
	Ocular Diseases 1 (102)	3	3	3	3	3	2	3	3	3
	Anterior Segment Diagnostic (103 L & P)	3	3	3	3	3	2	3	3	3
	ometry Directed Clinical Education-I (104	3	3	3	3	3	3	3	3	3
	Ocular Diseases and Diagnostics II (105 L & P)	3	3	3	3	3	2	2	3	3

				Knowledge and skill	Critical Thinking & problem solving	Decision making	Research skill	Individual and team work	Communication skills	Code of ethics	Lifelong learning	Average	
Semester	Course / Course Code	Course Outcome	CO Details	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8		
Semester 2			Advanced Contact Lenses I	3	3	3	3	3	3	3	3	3	
			Binocular Vision and Pediatric Optometry	3	3	3	3	3	3	3	3	3	3
			Low vision and Geriatric Optometry	3	3	3	1	3	3	3	3	3	3
			Optometry Directed Clinical Education-(109CP)	3	3	3	2	3	3	3	3	3	3
			Research Methodology & Biostatistics (CC001)	3	3	3	3	3	3	3	3	3	3
			Basics of Clinical Skills Learning (CEC002)	3	3	3	3	2	3	3	3	3	3
			Hospital Operation Management (CEC003)	3	3	3	1	2	3	3	3	3	3
Semester 3			Advanced Dispensing Optics (110 L & P)	3	3	3	3	3	3	3	3	3	
			Advanced Contact Lenses II(111L & P)	3	3	3	3	3	3	3	3	3	
			Visual Perception, Neuroscience and Psychophysics (112 L)	3	3	3	3	3	3	3	3	3	3
			Applied Vision Therapy (113L & P)	3	3	3	3	3	3	3	3	3	3
			Optometry Directed Clinical Education-III (CP 114)	3	3	3	3	3	3	3	3	3	3
Semester 4			Pursuit of Innerself Excellence (POISE)	1.0	1.0	2.0	1.0	3.0	3.0	2.0	3.0	2	
			Disaster management and Mitigation Resources	2.0	2.0	2.0	1.0	2.0	1.0	2.0	3.0	2	
			Human Rights	2.0	2.0	2.0	1.0	1.0	1.0	3.0	3.0	2	

CO PO Matrix
Programme - MHA - MASTERS IN HOSPITAL ADMINISTRATION

Semester - Semester I to Semester IV

PO1 – Knowledge & Skill Development - an ability to apply knowledge of healthcare technology (Including, clinical subjects,investigations/procedures,handling instruments

PO2 – Critical Thinking – To apply professional judgment and rational thinking in decision-making

PO3 - Problem solving – Correlation of professional knowledge applied to current clinical or healthcare practices.

PO4 -Professional ethics – To adopt and apply code of ethics prescribed by professional bodies in professional and social context. Maintain appropriate boundaries with patients and care givers and maintain confidentiality.

PO5 – Communication skills – To communicate effectively with the patients, care givers and other healthcare professional for addressing patient related issues and to deliver and information

PO6 – Individual / Team work - ability to function on multi-disciplinary teams

PO7 - Holistic development: Development of intellectual mental, Physical, Emotional & Social abilities, so as to be capable of facing the demands & challenges of every day life.

PO8 – Lifelong learning - To develop continuous learning attitude in context of research, advances in clinical practices and to inculcate professionalism and evidence based practices

PO Mapping same with correlation level 3,2,1 The notation of 1 denotes- low, 2 - moderate , 3 - high

Semester	Course / Course Code	Course Outcome	CO Details	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Average
Semester 1												
	Epidemiology and demography MHA 101T	CO1	Dealing with public health problems and its determinants. Will be able to apply their skills in the discipline	3	2	3	3	2	3	3	2	2.625
		CO2	Support the healthcare system by understanding the distribution and determination of disease control	2	3	3	2	2	2	3	2	2.375
		CO3	To apply the inputs of statistics such as statistics of births, deaths, marriage etc in drafting policies or operational plan	2	2	2	2	2	2	3	2	2.125
		CO4	Understanding the relationship between demography and its effect on public health	3	2	3	2	2	2	3	1	2.25
		Average			2.5	2.25	2.75	2.25	2	2.25	3	1.75
	Health Economics MHA 102T	CO1	Understanding the dynamics of economics in healthcare	3	3	2	3	2	2	3	2	2.5
		CO2	Understanding the demands and necessary inputs to be made available as hospital administrators	2	3	3	2	2	3	3	1	2.375
		CO3	Understanding the stakeholders and their behaviour in healthcare market	2	3	2	3	3	2	3	2	2.5
		CO4	To develop skills and to understand the issues related to effectiveness , value and behavior of production and consumption of health and healthcare.	3	3	2	3	2	2	3	2	2.5
Average				2.5	3	2.25	2.75	2.25	2.25	3	1.75	2.46875

Semester 1

Business communication MHA 103T	CO1	Understanding of etiquette and protocol of verbal and written communication for effective business interaction	3	3	2	3	3	2	2	3	2.625
	CO2	Understanding of critical skills of business communication and business writing	2	2	2	3	3	2	2	2	2.25
	Average		2.5	2.5	2	3	3	2	2	2.5	2.4
Health Care System and Policies & Health Surveys MHA 104T	CO1	Decisions related to policies which has to deal with healthcare as macro system	3	3	3	2	2	2	3	3	2.625
	CO2	Based on their knowledge will be able to guide the colleague and healthcare stake holders about operational activities	3	3	3	3	2	3	2	2	2.625
	CO3	knowing about healthcare system on different levels and different national health programmes	3	3	2	3	2	2	3	3	2.625
	CO4	Applying the health surveys whenever and wherever it is needed	3	3	3	3	2	3	3	3	2.875
	Average		3	3	2.75	2.75	2	2.5	2.75	2.75	2.6875
Principles of management MHA 105T	CO1	Learning about management and basics , which will help them about managing healthcare industry	3	3	3	3	3	3	2	1	2.625
	CO2	Acquire the skills - sets of managers	3	3	3	3	3	3	2	2	2.75
	CO3	Having a strong understanding about basic management principles	3	3	3	3	3	3	3	2	2.875
	CO4	Applying the management functions in the organisation. Practice of management will help them to become a successful administrator	3	3	3	3	3	3	3	3	3
	Average		3	3	3	3	3	3	2.5	2	2.8125
Orientation of Hospital Industry MHA 106 T	CO1	Understanding about healthcare organisations in hospitals , clinics , nursing homes and other healthcare facilities	3	2	2	3	2	3	2	2	2.375
	CO2	knowing the difference in the operational and dimensional aspect of all stake holders of hospital industry	2	2	2	3	3	2	2	2	2.25
	CO3	They would also be able to work for public health organisations , pharmaceutical companies and other organisations	3	2	3	2	2	2	3	2	2.375

		CO4	Taking responsibility of managing specific departments such as admissions or supportive roles	3	3	3	2	2	2	2	1	2.25
		Average		2.75	2.25	2.5	2.5	2.25	2.25	2.25	1.75	2.3
	Industry Posting MHA 107 P											
Semester II												
	Research Methodology MHA 208T	CO1	Arranging select from, use and interpret results of, descriptive statistical methods effectively	3	2	2	2	2	2	2	3	2.25
		CO2	Demonstrate an understanding of the central concepts of modern statistical theory and their probabilistic foundation	2	2	2	2	3	3	2	3	2.375
		CO3	Select from, use and interpret results of, the principle methods of statistical interference and design	3	3	2	1	1	1	2	3	2
		CO4	Communicating the results of statistical analysis accurately and effectively	3	2	1	1	3	3	2	3	2.25
		CO5	Reading and learning new statistical procedures independently.	3	2	1	1	1	1	2	3	1.75
		Average			2.8	2.2	1.6	1.4	2	2	2	3
	Hospital Planning and Management MHA 209T	CO1	Understanding about hospital and facility	3	2	2	3	1	1	3	1	2
		CO2	learning about the operational aspect of hospital industry.	3	3	3	3	2	2	2	1	2.375
		CO3	learning about hospital, its operation, facilities so that they can work in the areas of formulating policies, planning operational action plans and become a successful administrator.	3	3	3	3	2	2	2	2	2.5
		CO4	Taking up responsibilities of managing specific departments, such as admissions or supportive roles.	3	3	3	2	3	2	1	1	2.25
		Average			3	2.75	2.75	2.75	2	1.75	2	1.25
		CO1	Learning about dealing with human being at the organization. Managing healthcare industry by learning multidisciplinary work force work for a common goal	3	3	3	3	3	3	3	2	2.875
		CO2	Acquiring the skill-sets of managers	3	3	3	3	3	3	3	2	2.875

SEMESTER 2	Organisational Behaviour MHA 210T	CO3	Having a strong understanding about leadership. Team behaviour and related implications of human principles in healthcare industry.	2	3	3	2	3	3	3	2	2.625	
		CO4	To apply the management functions in the organization. To practice human resource management, will help to become a successful administrator.	3	3	3	3	3	3	3	3	2	2.875
		Average		2.75	3	3	2.75	3	3	3	3	2	2.8
		CO1	To apply the critical skills of managerial communication.	3	3	3	2	3	3	2	1	2.5	
	Managerial Communication MHA 211 T	CO2	learning basic communication at the work place .	3	3	1	2	3	3	2	1	2.25	
		CO3	To communicate appropriately	2	3	3	3	3	3	3	1	2.625	
		CO4	Ensuring the learning of etiquette and protocol of verbal communication for effective business interactions.	3	3	3	3	3	3	3	2	2.875	
		Average		2.75	3	2.5	2.5	3	3	2.5	1.25	2.6	
	Accounting and costing MHA 212T	CO1	Learning about the process of analysis, recording, classifying and evaluating various alternative courses of cost.	2	3	3	1	1	2	2	2	2	
		CO2	Learning the basic accounts, balance sheet, profit and loss and statement sheets. Understanding importance of finance and accounting in management.	3	3	3	2	1	1	3	1	2.125	
		Average		2.5	3	3	1.5	1	1.5	2.5	1.5	2.1	
	Management information system MHA 213 T	CO1	Learning about the computer, will be able to use it for the value addition in the hospital and healthcare organisation .	3	3	1	2	1	1	1	1	1.625	
CO2		use of computer and logic development for programming will help to create value added activity and process.	2	2	3	2	2	2	2	1	2		
CO3		Understanding the application software used in different offices and department in a hospital	3	2	1	1	1	2	3	1	1.75		
Average			2.7	2.3	1.7	1.7	1.3	1.7	2	1	1.8		

Human Resource Management MHA 214 T	CO1	Dealing with human being and the organization , enabling for managing healthcare industry in multidisciplinary workforce work										2.375
	CO2	Acquiring the skill-sets of managers	3	3	2	2	3	3	3	2	1	2.25
	CO3	Strong understanding about leadership, team behaviour and related implications of human principles in healthcare industry. Applying the management functions in the organizations.	3	3	3	3	3	3	3	3	1	2.75
	Average		2.7	2.7	2.3	2.7	3	3	2.3	1	2.5	
Project Management MHA 215 T	CO1	Empowering to plan, organize, lead and control any projects	3	2	2	3	3	3	2	1	2.4	
	CO2	able to use the tools of project management	2	2	2	2	1	3	2	1	1.9	
	CO3	able to take a proactive role and prove their skill set for a better healthcare administrators	3	3	2	3	2	2	2	1	2.3	
	Average		2.7	2.3	2	2.7	2	2.7	2	1	2.2	
Hospital Project MHA 216 P	CO1	Helps to identify some issues or challenges at the hospital and deal with it	3	3	3	2	2	2	3	3	2.6	
	Average		3	3	3	2	2	2	3	3	2.6	

Semester 3 & 4

Quality management & accreditation in hospital industry MHA 318 T	CO1	To understand about quality management in hospitals and other healthcare facilities	3	3	3	3	2	2	2	1	2.4
	CO2	To know the Quality in operational activities and role of each stakeholder of hospital industry in maintaining quality management	3	3	2	2	3	2	2	1	2.3
	CO3	To take up responsibilities of managing specific departments in the hospital for initiating, maintaining and controlling quality in the hospital	3	3	3	3	2	1	3	1	2.4
	Average		3	3	2.7	2.7	2.3	1.7	2.3	1	2.3
	CO1	Able to understand about the legal implications in the hospital	3	3	3	3	2	1	2	2	2.375
	CO2	Know all aspect of those area, which create or may create areas of legal consequences for the hospital	2	3	3	3	1	2	2	3	2.375

Semester 3

Legal Framework in Hospital MHA 322T	CO3	Able to understand, how to deal with such situations, where hospital is facing legal actions or may face such situations.	3	3	3	3	2	3	2	1	2.5
	CO4	Made aware and taught to be empowered to deal with legal issues	3	3	2	3	2	3	1	1	2.3
	Average		2.75	3	2.75	3	1.75	2.25	1.75	1.75	2.4
Marketing management for hospital MHA323T	CO1	Able to understand about hospital marketing services	3	3	2	3	2	2	2	1	2.25
	CO2	Able to create marketing activities to maintain a better relationship with all stakeholders	3	2	3	3	3	2	2	1	2.375
	CO3	Empowered for creating better value proposition for the hospital	3	3	3	2	3	2	3	2	2.6
	CO4	Able to work in any organization, when given an opportunity for brand positioning .	2	3	2	3	2	3	2	1	2.3
	CO5	Take up responsibilities of managing hospital marketing services in any hospital	3	2	2	3	3	3	2	1	2.4
	Average		2.8	2.6	2.4	2.8	2.6	2.4	2.2	1.2	2.4
Material management MHA 324T	CO1	Able to understand about hospital material management	3	3	2	3	3	2	2	3	2.6
	CO2	Able to understand about necessary inventories and its management in-house and outside by maintaining a better relationship with all stakeholders	2	3	2	2	3	3	2	2	2.4
	CO3	Feel empowered for creating better value proposition for the hospital through the better control of its inventory planning	2	3	3	2	2	2	3	1	2.3
	CO4	Take up responsibilities of managing hospital material planning in any hospital	3	3	2	2	2	2	2	1	2.1
	Average		2.5	3	2.25	2.25	2.5	2.25	2.25	1.75	2.3
Financial management MHA 325T	CO1	Able to understand about hospital's financial aspects	3	2	2	2	1	2	2	1	1.875
	CO2	Able to understand the direct, indirect costs, investment and expenditures	3	3	3	3	2	2	3	1	2.5
	CO3	Feel empowered for financial decisions for the hospital	3	2	2	3	2	2	3	1	2.25
	CO4	Take up responsibilities of managing hospital financial services in any hospital	3	2	2	2	2	2	3	1	2.1
	Average		3	2.25	2.25	2.5	1.75	2	2.75	1	2.2

Strategic management MHA 326 T	CO1	Able to understand about hospital strategic management	2	2	2	3	2	3	2	1	2.125
	CO2	Feel empowered for strategy management for the hospital	3	3	3	3	2	3	3	2	2.6125
	CO3	Able to work in any organization, when given an opportunity for leading positioning	3	3	3	2	3	3	2	2	2.6
	CO4	Take up responsibilities of managing hospital departments in any hospital	3	3	2	3	3	3	2	1	1.8
Average			2.75	2.75	2.5	2.75	2.5	3	2.25	1.5	2.3
Medical technology management MHA 327 T	CO1	Able to understand about medical technology management	3	2	2	3	2	2	2	1	2.125
	CO2	Able to maintain effective operations in hospital by equipments and instruments	3	3	2	2	3	3	2	1	2.375
	CO3	Feel empowered by creating better maintenance of equipment and instruments of the hospital	2	2	2	2	2	2	2	1	1.875
	CO4	Take up responsibilities of managing hospital medical technology management in any hospital.	3	3	3	2	2	3	2	1	2.375
Average			2.75	2.5	2.25	2.25	2.25	2.5	2	1	2.1875
Internship MHA 328 P	CO1										
	Average			0	0	0	0	0	0	0	0
Disaster management and mitigation resources GE 003T	CO1	Knowledge and understanding of the disaster phenomenon, its different contextual aspects, impacts and public health consequences	3	2	2	2	2	2	2	1	2
	CO2	Knowledge and understanding of the international strategy for disaster reduction (UN-ISDR) and to increase skills and abilities for implementing the disaster risk reduction (DRR) strategy	3	2	2	4	2	2	3	1	2.375
	CO3	Ensure skills and abilities to analyse potential effects of disasters and of the strategies and methods to deliver public health response to avert these effects	3	3	2	3	2	1	3	1	2.25
	Average			3	2.333333333	2	3	2	1.666666667	2.666666667	1

Semester IV

subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
Semester 1 Epidemiology and Demography	2.5	2.25	2.75	2.25	2	2.25	3	1.75

	Health Economics	2.5	3	2.25	2.75	2.25	2.25	3	1.75	
	Business Communication	2.5	2.5	2	3	3	2	2	2.5	
	Health Care System and Policies	3	3	2.75	2.75	2	2.5	2.75	2.75	
	Principles Of Management	3	3	3	3	3	3	2.5	2	
	Orientation of Hospital Industry	2.75	2.25	2.5	2.5	2.25	2.25	2.25	1.75	
semester 2	Hospital Planning and Management	3	2.75	2.75	2.75	2	1.75	2	1.25	
	Organizational Behaviour	2.75	3	3	2.75	3	3	3	2	
	Managerial Communication	2.75	3	2.5	2.5	3	3	2.5	1.25	
	Accounting And Costing	2.5	3	3	1.5	1	1.5	2.5	1.5	AVERAGE
	Management Information System	2.666	2.333	1.666	1.666	1.333	1.666	2	1	2.34375
	Human Resource Management	2.666	2.666	2.333	2.666	3	3	2.333	1	2.46875
	project Management	2.666	2.333	2	2.666	2	2.666	2	1	2.4375
	Resesrch Methodology And Biostatistics	2.8	2.2	1.6	1.4	2	2	2	3	2.6875
Semester 3	Quality Management and Accreditation in Hospital	3	3	2.666	2.666	2.333	1.666	2.333	1	2.8125
	Legal Framework in Hospital	2.75	3	2.75	3	1.75	2.25	1.75	1.75	2.3125
	Marketing Management For Hos	2.8	2.6	2.4	2.8	2.6	2.4	2.2	1.2	2.28125
	Material Managemnt	2.5	3	2.25	2.25	2.5	2.25	2.25	1.75	2.8125
	Financial Management	3	2.25	2.25	2.5	1.75	2	2.75	1	2.5625
	Strategic Management	2.75	2.75	2.5	2.75	2.5	3	2.25	1.5	2.0625
	Medical Technology Management	2.75	2.5	2.25	2.25	2.25	2.5	2	1	1.791
Semester 4	Disaster management and mitigation resources	3	2.333	2	3	2	1.666	2.666	1	2.4583

CO & PO Relationships
Programme - Masters in Hospital Administration
Semester - Semester I, II, III, IV

Semester	Course & Course code	CO	Details	CO & PO Relationship	Domain	Unit	Lecture	%	Lab	Clinical	Total	Strength	Level of CO addressing to PO		
				PO1-PO8	C.A.P	No	Hrs	%	Hrs	%	Hrs	%			
	Epidemiology and demography M	CO1	Dealing with public	PO1,PO2, PO3, PO6	C.A	Epi 1, Demo 1	14	0.2	NA	NA	NA	NA	2		
		CO2	Support the health	PO1, PO3, PO6	C	Epi2,3 Demo2	18		NA	NA	NA	NA	2		
		CO3	To apply the inputs	PO1	C	Epi 4	12		NA	NA	NA	NA	2		
		CO4	Understanding the r	PO8	C	Epi 5	16		NA	NA	NA	NA	1		
		Total							NA	NA	NA	NA			
	Health Economics MHA 102T	CO1	Understanding the d	PO1	C	1,2	12		NA	NA	NA	NA	3		
		CO2	Understanding the d	PO2, PO3, PO7	C	3,4,5	15		NA	NA	NA	NA	3		
		CO3	Understanding the s	PO1, PO2, PO4	C	6,7	20		NA	NA	NA	NA	3		
		CO4	To develop skills an	PO1, PO2, PO3,	C	8,9,10	13		NA	NA	NA	NA	1		
		Total							NA	NA	NA	NA			
	Business communication MHA 1	CO1	Understanding of et	PO1	C.A	1,2,3,4,5,	30	0.3	NA	NA	NA	NA	1		
		CO2	Understanding of cr	PO4, PO5	C.A	6,7,8,9,10	30	0.3	NA	NA	NA	NA	1		
		Total							NA	NA	NA	NA			
	Health care system and policies a	CO1	Decisions related to	PO1, PO2, PO3,	C		1	15	0.1	NA	NA	NA	2		
		CO2	Based on their know	PO4, PO5, PO6	C.A	2,3		15		NA	NA	NA	2		
		CO3	knowing about heal	PO1, PO2, PO3,	C		4	15	0.1	NA	NA	NA	2		
		CO4	Applying the health	PO2, PO3, PO8	C		5	15	0.1	NA	NA	NA	2		
		Total							NA	NA	NA	NA			
	Principles of management MHA	CO1	Learning about man	PO1, PO2, PO3,	C.A	1,2		5	0.0	NA	NA	NA	1		
		CO2	Acquire the skills -	PO2, PO3, PO5,	C. A. P		3	10	0.0	NA	NA	NA	1		
		CO3	Having a strong und	PO1, PO2, PO4,	C		4	7	0.1	NA	NA	NA	1		
		CO4	Applying the manag	PO1, PO2, PO6,	C.A		5	8		NA	NA	NA	3		
		Total							NA	NA	NA	NA			
	Orientation of hospital industry M	CO1	Understanding about	PO1, PO7	C.A		0	5	0.0	NA	NA	NA	1		
		CO2	knowing the differe	PO1	C	3,4		5	0.0	NA	NA	NA	3		
		CO3	They would also be	PO1, PO2, PO5,	C.A.P	3,4,5		5	0.0	NA	NA	NA	3		
		CO4	Taking responsibilit	PO1, PO2	C.A			5		NA	NA	NA	2		
		Total								NA	NA	NA			
	Industry posting 107 P	CO1	To understand the p	PO1, PO2, PO3,	C, A, P			NA	NA	NA	120	1.14286	1		
		Total													
	SEMESTER 2														
Semester 2	Research Methodology MHA 208	CO1	Arranging select fro	PO7, PO8	C	1,2,3		10	0.1	45	0.428571429	10	0.09524	3	3
		CO2	Demonstrate an und	PO8	C	4,5,6		10	0.1	0		10	0.09524	1	1
		CO3	Select from, use and	PO1, PO8	C	7,8,9,		15				15		23	23
		CO4	Communicating the	PO5	C	10,11,12		10	0.1	0	0	10	0.09524	1	1
		CO5	Reading and learnin	PO1, PO8	C	13,14,15		15	0.1	0	0	15	0.14286	1	1
		Total													
	Hospital Planning and Managem	CO1	Understanding about	PO1, PO2	C	1,2,3,4		10	0.1	0	0	10	0.09524	2	2
		CO2	learning about the o	PO1, PO2, PO7	C	5,6,		20				20			
		CO3	learning about hosp	PO1, PO2,PO3, P	C.A.P	7,8,9		20	0.2	0	0	20	0.19048	1	1
		CO4	Taking up responsib	PO1, PO2, PO5,P	C.A	10,11		10	0.1	0	0	10	0.09524	2	2
		Total													
	Organisational Behaviour MHA	CO1	Learning about deal	PO1, PO2, PO3,	C.A	1,2		10	0.1	0	0	10	0.09524	1	1
		CO2	Acquiring the skill-	PO1, PO2, PO6	C.A.P		3	5	0.0	0	0	5	0.04762	1	1
		CO3	Having a strong und	PO2, PO5, PO6	C.A		4	5	0.0	0	0	5	0.04762	1	1
		CO4	To apply the manag	PO1, PO2, PO7	C.A.P		5	10	0.1			10		3	3
		Total													
	Managerial Communication MH	CO1	To apply the critical	PO1, PO2, PO3,	C.A		1	5	4.8	0	0	5	0.04762	3	3
		CO2	learning basic com	PO1, PO5, PO6	C.A		2	5				5			
		CO3	To communicate ap	PO1, PO5, PO6	C.A	3,4		10	9.5	0	0	10	0.09524	3	3
		CO4	Ensuring the learni	PO1, PO3, PO5,	C.A		5	10				10			
		Total													
	Accounting and costing MHA	CO1	Learning about the	PO1, PO2	C	1,2,3,4		25	23.8	0	0	25	0.2381	3	3

Level 3:>40%, Level 2: 25%-40%, Level 1: 5%-24%, Not addressed :<5%

		CO2	Learning the basic a	PO1, PO2	C	5,6,7,8,9		35						35		2	2
		Total															
	Management Information System	CO1	Learning about the	PO1, PO3, PO7	C		1	8	7.6	0	0	0	0	8	0.13333	3	3
		CO2	use of computer and	PO1, PO2, PO7		2,3		12						12		3	3
		CO3	Understanding the a	PO1, PO7	C, A, P	4,5		10	9.5	0	0	0	0	10	0.11111	3	3
		Total															
	Human Resource Management M	CO1	Dealing with human	PO1, PO2, PO3,	C, A	1,2,3		12	0.1					12	0.13333	3	3
		CO2	Acquiring the skill-	PO2, PO3, PO4	C, A, P	4,5,6		8	0.1					8	0.08889		
		CO3	Strong understandin	PO1, PO2, PO3,	C, A, P	7,8,9		10	0.1					10	0.11111	3	3
		Total															
	Project Management MHA 215 T	CO1	Empowering to plan	PO1, PO2, PO3,	C, A	1,2		10	9.5					10	0.09524	3	3
		CO2	able to use the tools	PO1, PO2, PO7	C, A, P			13	12.4					13	0.12381	3	3
		CO3	able to take a proact	PO1	C, A			7	6.7					7	0.06667	3	3
		Total															
	Hospital Project MHA 216 P	CO1										0	0	0	0	3	3
		Total					NA					240		240			
	Semester 3	Quality management & accredita	To understand about	PO1	C		1	20	33.3	0	0	0	0	20	0.26667	3	3
		CO2	To know the Quality	PO1, PO2	C, A	2,3		20						20		2	2
		CO3	To take up responsi	PO1, PO2, PO5, P	C, A, P		4	20	66.7	0	0	0	0	20	0.66667	3	3
		total															
	Legal Framework in hospital MH	CO1	Able to understand	PO1, PO4	C			15	0.1					15	0.14286	1	1
		CO2	Know all aspect of	PO1, PO2, PO3	C			15	0.1					15	0.14286	1	1
		CO3	Able to understand,	PO1, PO3	C, A			15	0.1					15	0.14286	1	1
		CO4	Made aware and tan	PO1, PO2, PO3	C			15						15			
		total															
	Marketing management for hosp	CO1	Able to understand	PO1	C		1	10	0.1					10	0.09524	1	1
		CO2	Able to create mark	PO1, PO2, PO4,	C, A		2	14	0.1					14	0.13333	1	1
		CO3	Empowered for crea	PO2, PO7	C		3	10						10			
		CO4	Able to work in any	PO1	C		4	11						11		1	1
		CO5	Take up responsibi	PO1, PO2, PO3,	C, A, P		5	15	0.2	0	0			15	0.14286	1	1
		total															
	Material management MHA 324	CO1	Able to understand	PO1, PO2	C	1,2		10	0.1	0	0			10	0.09524	2	2
		CO2	Able to understand	PO1, PO2, PO3,	C, A	3,4		10	0.1	0	0			10	0.09524	1	1
		CO3	Feel empowered for	PO1, PO2	C, A, P	5,6		5	0.0	0	0			5	0.04762	1	1
		CO4	Take up responsibi	PO1, PO2, PO4,	C, A, P		7	5	0.0	0	0			5	0.04762	1	1
		total															
	Financial management MHA 325	CO1	Able to understand	PO1	C		1	5	0.0	0	0			5	0.04762	1	1
		CO2	Able to understand	PO2	C		2	5	0.0	0	0			5	0.04762	1	1
		CO3	Feel empowered for	PO2, PO3	C		3	10	0.1	0	0			10	0.09524	1	1
		CO4	Take up responsibi	PO2, PO7	C	4,5		10	0.1					10			
		total															
	Strategic Management MHA 326	CO1	Able to understand	PO1, PO7	C	1,2		10	0.1	0	0			10	0.11111	1	1
		CO2	Feel empowered for	PO1, PO2, PO3,	C		3	10	0.1	0	0			10	0.11111	3	3
		CO3	Able to work in any	PO1, PO2, PO5,	C, A		4	5	0.1	0	0			5	0.05556	3	3
		CO4	Take up responsibi	PO1, PO2, PO6	C, A, P		5	5	0.1	0	0			5	0.05556	3	3
		total															
	Medical Technology magement	CO1	Able to understand	PO1	C	1,2		10	0.3	0				10	0.09524	1	1
		CO2	Able to maintain eff	PO1, PO2	C, P		3	5	0.2	0				5	0.04762	1	1
		CO3	Feel empowered by	PO2, PO3	C		4	5	0.2	0				5	0.04762	1	1
		CO4	Take up responsibi	PO1, PO2, PO3,	C, A, P		5	10	0.3	0				10	0.09524	1	1
		total															
	Internship MHA 328 P	CO1										0.0		240		0	3
		total															
	Semester 4	Disaster management and mitiga	Knowledge and und	PO1	C	1,2		20	0.4					20	0.44444	3	3
		CO2	Knowledge and und	PO1, PO7	C, A, P	3,4		20	0.4					20	0.44444	3	3
		CO3	Ensure skills and ab	PO1, PO2, PO3,	C, A, P		5	20						20		2	2
		total														169	169