MGM INSTITUTE OF HEALTH SCIENCES
(Deemed University u/s 3 of UGC Act, 1956)
Grade 'A' Accredited by NAAC
Sector-01, Kamothe, Navi Mumbai - 410 209
Tel 022-27432471, 022-27432994, Fax 022 - 27431094
E-mail : registrar@mgmuhs.com | Website : www.mgmuhs.com

COURSE	**Program Outcome**
M.Sc. Medical Biotechnology	Medical Biotechnology post-graduate students will be able to:
	PO 1 Understand the difference between old biotechnology and modern biotechnology.
	PO 2 Provide examples of current applications of biotechnology and advances in the different areas like medical, microbial, environmental, bioremediation, agricultural, plant, animal, and forensic.
	PO 3Enumerate the concept and application of monoclonal antibody technology.
	PO 4Explain the general principles of generating transgenic plants, animals and microbes.
M.Sc. Medical Genetics	Medical Biotechnology post-graduate students will be able to:
	PO 1 Understand the difference between old biotechnology and modern biotechnology.
	PO 2 Provide examples of current applications of biotechnology and advances in the different areas like medical, microbial, environmental, bioremediation, agricultural, plant, animal, and forensic.
	PO 3Enumerate the concept and application of monoclonal antibody technology.
	PO 4Explain the general principles of generating transgenic plants, animals and microbes.
M.Sc. Clinical Embryology	Clinical embryology graduate students will be able to:
	PO 1 Perform the breath of knowledge in biology discipline
	PO 2 Demonstrate knowledge pf key biological principal in the general and sub branches of the biology dripline

	PO 3 To acquire the knowledge of embryology and technology skill through the use of:
	PO 4 Working interactive laboratory tutorial as per protocol
	PO 5 Using podcast to review class content
	PO 6 To become comfortable with online assessment in both laboratory works.
MHA	PO1 The students after completing this course would be able to manage hospitals, clinics, nursing homes, and other healthcare facilities.
	PO2 They would also be able to work for public health organizations, pharmaceutical companies, and other organizations.
	PO3 The students can take up responsibilities of managing specific departments, such as admissions, or supportive roles.
	PO4 The students will acquire skills and knowledge areas like Analysing Costs of Treatment Alternatives, Compliance With Healthcare Regulations, Conducting Medical Facility Inspections, Developing Strong Physician Relationships, Ensuring Compliance with Regulations, Handling Confidential Information, Health Care Issues, Health Insurance Processing, Hospital and Physician Billing, Medical Services Delivery, Resolving Patient Grievances, Treatment Services etc.
M.Sc. in Biostatistics	On completion of two years Master of Science in Biostatistics and Demography the passing out students shall be able to: PO1 design, analyse, interpret and criticise, epidemiological, health and public health research
	PO2 demonstrate an understanding of the essential principles of modern bio-statistical methods and statistical software and how to apply them PO3 Employ basic mathematical and computational skills used in the analysis of population, disease pathogenesis, transmission and control PO4 Undertake original research projects that makes a contribution to the body of knowledge for human wellbeing PO5 Exhibit the ability to disseminate research findings to the scientific community and the general public PO6 Prepare Statistical Analysis Plan (SAP) PO7 undertake analysis of clinical trials

M.Sc. Molecular Biology	PO 1 Understanding of molecular function in biology.
	PO 2 Fundamental understanding of genomics and proteomics and related applications.
	PO 3Importance of instrumentation in molecular biology.
	PO 4Advance understanding of genomics and proteomics
	PO 5 Understanding and manipulation of metabolic network
	PO 6 Importance of computation in molecular analysis and function.
	PO 7 Detail understanding of recombinant DNA technology for production of recombinant products.
	PO 8 Basic understanding of nano-biotechnology
	PO 9 Basic understanding of techniques /process involved in molecular diagnostics.
M.Optometry	Be able to develop skills to provide comprehensive eye examination
	a. To acquire knowledge on ocular structures, its functions and pathological changes
	b. To carryout ophthalmic investigations
	c. To impart knowledge with regard to common eye diseases
	d. To impart knowledge on treatment modalities from the perspective of counselling
	e. To acquire knowledge about the referral guidelines for ocular and systemic conditions
Master of Public Health	1. Analytical and assessment skills for collecting and interpreting information
	2. Policy planning and development skills to address public health challenges
	3. Communication skills for advocacy, dissemination and evaluation of public health data and information
	4. Financial planning and management skills for running public health programs in the country
	5. Leadership skills
M.Sc. Clinical Nutrition	**1.** To impart knowledge and develop capacities of the students through higher education in the area of Clinical Nutrition and Dietetics and application in Medical Nutrition Management.

	2. To develop students to become health care professionals for services
	3. To develop capacities and abilities and enable them to pursue higher education and research in Clinical Nutrition and Dietetics.
M.Sc. Cardiac Care Technology	• The course aims to provide students with the requisite clinical assessment, decision-making skills and management for a range of cardiology conditions and stroke including pharmacological and non-pharmacological therapeutic interventions.
M.Sc. Medical Radiology & Imaging Technology	• Students are expected to have an understanding of and implement various advanced image processing algorithms and analyse their performance on datasets to make improvements.
	• This is achieved through a series of hands on assignments and projects.

Dr. Rajesh B. Goel
Registrar
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Program Name	Program Specific Outcome
M.Sc. Medical Biotechnology	PSO1 Exhibit a knowledge based in genetics, cell and molecular biology, microbiology, biochemistry etc.
	PSO2 Design & perform experiments, interpret & investigate data of medical biotechnology and related fields
	PSO3 Demonstrate the knowledge of common and advanced laboratory practices in biotechnology.
	PSO4 Decide and apply appropriate tools and techniques in biotechnological manipulation.
	PSO5 Exhibit the knowledge and understanding of biotechnological related issues.
	PSO6 Demonstrate proficiency in maintaining a safety at work place, including observation of lab safety procedures, use of personal protective equipment, identification of hazards and proper handling, storage and disposal of commonly used chemicals and biohazardous materials.
	PSO7 Exhibit clear and concise communication of scientific data
	PSO8 Engage in review of scientific literature in the areas of biomedical sciences
	PSO9 Critique and professionally present primary literature articles in the general biomedical sciences field
	PSO10 Develop ethics in biotechnology, including confidentiality and scientific accountability
	PSO11 Use, calibrate, troubleshoot a variety of common types of lab equipment used in molecular biology, recombinant DNA technology, biochemistry and microbiology
	PSO12 Develop good oral presentation skills and identify careers in biotechnology & skills required for landing job.
M.Sc. Medical Genetics	PSO 1 Explain the key concepts in population, evolutionary and quantitative genetics including: the basis of genetic variation; heritability; Hardy-Weinberg Equilibrium; roles of migration, mutation
	PSO 2 Understand the range of molecular laboratory techniques used routinely in human forensic analysis and population genetic analysis including sex typing, DNA profiling, Single Nucleotide Polymorphism (SNP) detection and DNA sequencing.
	PSO 3 Can explain the technical and medical aspects of diagnostic, screening methods and reproductive options including associated risks with its benefits and limitations.
	PSO 4 Can understand, listen, communicate, and manage a genetic counseling case in a culturally responsive manner.
M.Sc. Clinical Embryology	Clinical embryology graduate students will be able to:

	PSO 1 Understand complete knowledge about the structures, development of human embryo at different stages including gametogenesis, fertilization and implantation. Also, the students have the ability to correlate between the embryological structure and its clinical significance. This course trains the student to solve and understand any related clinical problems by simple and short way.
	PSO 2 Demonstrate the ability to assimilate and integrate information from lectures, practical, tutorial and independent activities on the gametogenesis, fertilization, implantation, embryonic period, foetal period and development of the pharyngeal arches and their derivatives.
	PSO 3 Experience through small group teaching and group discussion to analyse any related clinical problem or congenital anomaly and to communicate with other students and teaching staff.
Masters in Hospital Administration	PSO1 Hospital Administration is a branch which is gaining increasing importance. As successful management is required in the ever-expanding field of corporate, Similarly, able and capable managers/ administrators are required in the hospitals too, who serve as a strong 'Back Bone' of the health care industry.
	PSO2 Hospitals in India whether it belongs to a private or public sector, should have at least 2-3 qualified and trained Hospital Administrators.
	PSO3 There are about 2.5 lac hospitals and for their smooth administration, about 15000 trained hospital administrators are required every year.
	PSO4 The demand for trained hospital administrators is increasing not only in government sectors like "National Rural Health Mission" but also in private sectors like- Medical Diagnostic Hardware and Software Companies, Health Insurance Companies, Pharma-Companies, Health Diagnostic Centre, Medico - Legal Consulting Companies and also in companies involved in the production of Hospital Equipments, Hospital Information System (H.I.S).
	PSO5 The programme is design to impart multi-dimensional knowledge of the aforesaid domain to the students.
	PSO6 Masters in Hospital Administration can be taken up by any student who has completed any medical related graduation degree or has completed B.Sc (Nursing). It's a two year course which deals with the subjects like, Mathematics, Accounts, Principles of Management, Business Communication etc. Along with these, various other subjects related to hospitals like- Hospital Planning & Design, Medico - Legal, Operation Management, Health Statistics, Health-Economics etc. are also being taught in it.
	PSO7 This course is a fantastic option for the graduates like- M.B.B.S, B.D.S, B.A.MS, B.H.M.S, Bio-Technology), B.P.T., B.Sc.(Nursing), Pharmacy ,etc.

M.Sc. in Biostatistics	The Master of Science in Biostatistics and will provide students knowledge and understanding of modern statistical biomedical methods. The students will learn about their application in all areas of public health, health, demography, and social sciences aimed at understanding and improving human wellbeing. The course offers a thorough grounding in modern biomedical research and the application of statistical methods to biomedical investigation and practice. Students will be given the opportunity to apply research techniques to a variety of challenging epidemiological and biomedical problems. The course also aim at providing students scope for professional development in understanding and use of statistical software packages including SPSS, In the second year of the course students shall write a dissertation on the basis of contemporary applications of boimedical and statistical methods and statistical softwares in public health, health and demography. Opportunities are given to develop presentation and consultancy skills which are much valued by employers.
M.Sc. Molecular Biology	The students of M.Sc. Molecular Biology course (2 years) should be able to
	PSO1 Deep knowledge and understanding of molecular biology and its applications
	PSO2 Understand key implications of proteomics, Genomics and related aspects.
	PSO3 Research driven education
	PSO4 Read and analyze the primary research literature, critically assess scientific experiments and evaluate the impact of a scientific discovery.
	PSO5 Be primed and able to conduct quality research in latest molecular biology based research topics.
M.Optometry	1.Be able to correct refractive error and provide spectacle prescription
	2 . Be able to fit, evaluate, prescribe and dispense contact lenses for refractive correction and other ocular conditions
	3. Be able to assess the low vision and provide comprehensive low vision care
	4. Be able to have adequate knowledge to develop skill in manufacturing of spectacle lenses, contact lenses and low vision devices.
	5. Be able to do complete binocular vision assessment, manage non-strabismic binocular vision anomalies and refer condition which warrants surgery
	6. Be able to assess the visual demands for various occupations and match it to the visual capabilities. Also be able to advice on eye safety wear for various occupations.
	7. Have knowledge and skill for early detection of various ocular conditions and pathologies – Refractive error, Strabismus, Cataract, Diabetic retinopathy, Glaucoma etc.
	8. Have knowledge regarding organizations of eye banks and preservation of ocular tissues.
	9. Have knowledge on sensory substitution and other rehabilitation measures for totally visually challenged.

	10. Have knowledge of counselling on visual/ocular hygiene, nutritional and environmental modifications
Master of Public Health	1. Apply the course learning to the public health system and its challenges
	2. Develop, implement and evaluate key public health policies
	3. Develop and demonstrate competency in managing health systems at different levels
	4. Develop competency in research
M.Sc. Clinical Nutrition	After this course the students will be able to become health care professionals in the hospitals can perform teaching and research work in the institutions and the industries and can give nutrition education and create awareness among the society.
M.Sc. Cardiac Care Technology	• This course offers the opportunity to study all aspects of clinical cardiology including expert assessment and management of a range of cardiac conditions, cardiac interventions, interpretation and practical skills.
	• Includes hyper acute stroke, thrombolysis, interpretation of cardiac CT and MRI, TIA management, maximising stroke care, rehabilitation and long term.
	• The programme can be regarded as vital training for the early stages of cardiology or stroke specialist training with clear learning objectives.
M.Sc. Medical Radiology & Imaging Technology	After taking this course...
	• The student will learn principles of tomographic imaging with different modalities such as x-ray, PET and SPECT, NMR/MRI, ultra sound and optical with non-diffracting and diffracting energy sources.
	• Learn principles of non-invasive medical imaging techniques and non destructive techniques for industrial imaging.
	• After completion of this curriculum, a Medical Radiology & Imaging Technologist gets opportunities to work at various health care institutes under designations as:
	Radiographer
	Radiological Technologist
	X-ray Technologist
	CT scan Technologist
	MRI Technologist
	Mammography Technologist
	Cathlab Technologist
	Ultrasonography Technologist
	Applications Specialist
	Radiological Safety Officer
	Interventional Technologist
	Quality control Technologist

	PACS manager
	Sales and marketing of radiology industry
	Diagnostic Manager
	Teaching & research faculty in Medical colleges.

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M.Sc. Medical & Other courses (New CBCS)2 yr courses		
M.Sc. Medical Biotechnology M.Sc. Medical Genetics (Common Subject)	Cell Biology	CO1. On satisfying the requirements of this course, students will have the knowledge and skills to Compare
		CO2. The structure and function of cells from different domains.
		CO3. Discuss the elementary biochemistry of the molecules of life and describe the relationship between the structure and function of biomolecules.
		CO4. Discuss the development of cells and the role of cell specialization in multicellular organisms
		CO5. Accurately record raw experimental data and use this to synthesize written reports to present data meaningfully and discuss the significance of results.

M.Sc. Medical Biotechnology M.Sc. Medical Genetics (Common Subject)	Immunology &Immunotechnology	On satisfying the requirements of this course, students will have the knowledge and skills to CO1. Compare the structure and function of cells from different domains. CO2. Discuss the elementary biochemistry of the molecules of life and describe the relationship between the structure and function of biomolecules. CO3. Discuss the development of cells and the role of cell specialisation in multicellular organisms. CO 4. Accurately record raw experimental data and use this to synthesise written reports to present data meaningfully and discuss the significance of results.
M.Sc. Medical Biotechnology M.Sc. Medical Genetics (Common Subject)	Analytical Instrumentation	At end of the course accomplishment the students will marvel in CO1.The Analytical Instrumentation course covers principles, installation, calibration, and maintenance of conductivity probes, and methods of stack gas monitoring. CO2. To install, calibrate, and maintain pH and ORP measurement instruments and operation, installation, calibration, and maintenance of several optical analyzers. CO3.Discusses principles and safe practices governing sensors used in measuring oxygen, carbon monoxide, carbon dioxide, and other products of combustion. CO4.With operation, calibration, and system components in liquid and gas chromatography.
M.Sc. Medical Biotechnology M.Sc. Medical Genetics (Common Subject)	Molecular Biology & Genomics	At end of the course accomplishment the students will marvel in
		CO1. Molecular biology is the basic science that has as its goal an explanation of life processes at the sub cellular and molecular level.

		CO2. The organization of the genome, the replication, the formation of RNA (transcription), the processing of pre mRNA and the protein synthesis (translation).
		CO3. Relate properties of cancerous cells to mutational changes in gene function.
		CO4. Account for regulation of cell form and movement; including cytoskeleton organization and generation of force and cell motility.
		CO5. Describe and carry out basic molecular genetic methods; including work with bacteria, PCR amplification and analysis and electrophoresis of nucleic acid.
		CO6. They will generate and test hypotheses, analyze data using statistical methods where appropriate, and appreciate the limitations of conclusions drawn from experimental data.
M.Sc. Medical Biotechnology M.Sc. Medical Genetics (Common Subject)	Recombinant DNA Technology	At end of the course accomplishment the students will marvel in:
		CO1. The arrangement of genes on human chromosomes.
		CO2. The polymerase chain reaction can be used to amplify DNA segments, and how it may be used to analyze DNA. Contrast in vivo and ex vivo gene therapy techniques.
		CO3. Evaluate and understand the meaning of DNA sequence and amino acidpolymorphisms.
		CO4. A general understanding of methods for gene transferinto tissue culture cells and the power of transgenictechnologies.
		CO5. Analyze significance of model organisms in recombinant DNA technology.
M.Sc. Medical Biotechnology M.Sc. Medical Genetics (Common Subject)	Bioinformatics	At end of the course accomplishment the students will marvel in
		CO1. Locate and use the main databases at the NCBI and EBI resources.

		CO2. Know the difference between databases, tools, repositories and be able touse each one to extract specific information.
		CO3. Extract data from specific databases using accessions numbers, gene namesetc.
		CO4. Use selected tools at NCBI and EBI to run simple analyses on genomic sequences.
M.Sc. Medical Biotechnology M.Sc. Medical Genetics (Common Subject)	Research Methodology & Biostatistics	At end of the course accomplishment the students will marvel in:
		CO1. The arrange Select from, use and interpret results of, descriptive statistical methods effectively.
		CO2. Demonstrate an understanding of the central concepts of modern statistical theory and their probabilistic foundation.
		CO3. Select from, use, and interpret results of, the principal methods of statistical inference and design.
		CO4. Communicate the results of statistical analyses accurately and effectively.
		CO5. Read and learn new statistical procedures independently.
M.Sc. Medical Biotechnology	Basic Biochemistry & Biomolecules	At end of the course accomplishment the students will marvel in CO1.Intermediates in enzyme-catalysed reactions and their investigations. CO2.The principles of globular protein structure, as well as the techniques used for elucidation of structures and approaches to their prediction from sequence. CO3.The behaviour of proteins in solution and the principles of molecular recognition. The principles of membrane protein structure determination. CO4.Intermediates in enzyme-catalysed reactions and their investigations. CO5.Identification/quantitation of polypeptide similarity. Identification of polypeptide families &superfamilies. Large scale sequencing projects, data analysis including comparative analysis.

M.Sc. Medical Genetics	Basic Biochemistry & Inborn errors of	At end of the course accomplishment the students will marvel in
		CO1. Intermediates in enzyme-catalyzed reactions and their investigations.
		CO2. The principles of globular protein structure, as well as the techniques used for elucidation of structures and approaches to their prediction from sequence.
		CO3. The behavior of proteins in solution and the principles of molecular recognition. The principles of membrane protein structure determination.
		CO4. Intermediates in enzyme-catalyzed reactions and their investigations.
		CO5.Identification/quantization of polypeptide
M.Sc. Medical Biotechnology	Plant Biotechnology	At the end of the course student will be eexcecuteCO1.To explain the basics of the physiological and molecular processes that occur during plant growth and development and during environmental adaptations. CO2.To understand how biotechnology has been used to develop knowledge of complex processes that occur in the plant. CO3.To use basic biotechnological techniques to explore molecular biology of plants. CO4.To understand the processes involved in the planning, conduct and execution of plant biotechnology experiments. CO4.Explain how biotechnology is used for plant improvement and discuss the ethical implications of that use
M.Sc. Medical Biotechnology	Animal Biotechnology	At the end of the course the student will adroit:
		CO1. Describe the limitations and challenges facing the animal industries and discipline.
		CO2. Describe the various biotechnologies available to the animal related fields.
		CO3. Explain how developments in biotechnology may have applications in those fields.

		CO4. Evaluate and discuss public and ethical concerns over the use of animal biotechnology.
		CO5. Locate and critically evaluate scientific literature and experimental studies relating to animal biotechnology and be able to effectively communicate the findings in oral and written form.
M.Sc. Medical Biotechnology	Medical Microbiology	At the end of course students will adroit :
		CO1. Students will be able to acquire, articulate, retain and apply specialized language and knowledge relevant to microbiology.
		CO2. Students will acquire and demonstrate competency in laboratory safety and in routine and specialized microbiological laboratory skills applicable to microbiological research or clinical methods, including accurately reporting observations and analysis.
		CO3. Students will communicate scientific concepts, experimental results and analytical arguments clearly and concisely, both verbally and in writing. Students will demonstrate engagement in the Microbiology discipline through involvement in research or internship activities.
M.Sc. Medical Biotechnology	Human Genetics	At the end of course accomplishment the student will adroit in:
		CO1. Demonstrate a high level of proficiency in navigating relevant literature, web sites and databases for research into human genetics and in using these sources to develop and test hypotheses in the field of human genetics
		CO2. Describe the approaches used to identify the genetic basis of simple, heterogeneous and complex traits and appreciate the duties, responsibilities and challenges facing the professionals who perform these analyses.

		CO3. Explain the genetic (coding and non-coding) and epigenetic mechanisms of gene expression control and their role in human inherited disease.
		CO4. Explain the theoretical and practical basis of the latest advances in genomic technologies and their application to disease gene identification and personalized medicine.
M.Sc. Medical Biotechnology	Nanobiotechnology	At the successfulcompletion of the course the student will:
		CO1. Describe the basic science behind the properties of materials at the nanometer scale, and the principles behind advanced experimental and computational techniques for studying nonmaterials.
		CO2. Communicate clearly, precisely and effectively using conventional scientific language and mathematical notation.
		CO3. Systematically solve scientific problems related specifically to nanotechnological materials using conventional scientific and mathematical notation.
M.Sc. Medical Genetics	Clinical Genetics & Genetics Counseling	To apprehend the candidate with:
		CO1. Understand chromatin as it relates to gene expression.
		CO2. Understand epigenetics and somatic genetic changes in tumors.
		CO3. Understand the cell cycle, angiogenesis and apoptosis.
		CO4. Be familiar with basic principals and applications of cell culture and animal models to study cancer.
		CO5. Understand how genetics contributes to predisposition and progression of cancer.
		CO6. Understand how immunotherapy is, and can be, used to treat human illness: strategies, advantages, and hurdles to overcome to realize its potential.

M.Sc. Medical Genetics	Developmental Genetics & Environment Genetics	CO1. To have detail knowledge of Develop of human feturesCO2. To have detail knowledge Embryological basis of genetic CO3.To have detail knowledge Molecular regulation of develop of human fetures
M.Sc. Medical Genetics	Cancer genetics and Pharmacogenomics	CO1. To have detail knowledge about genetic basis of different cancer CO2. To have detail knowledge about classification of cancer CO3. o have detail knowledge about epidemiology of different cancers CO4.To have detail knowledge about etiology of different cancers
M.Sc. Medical Genetics	PRINCIPLES OF GENETICS & POPULATION GENETICS	CO1.To have detail knowledge about population genetics CO2.To have detail knowledge about different principles of population genetics
M.Sc. Medical Genetics	**Stem Cell**	CO1.To have detail knowledge about Stem Cell Research
Clinical Embryology	Relevant gross anatomy	CO1.To understand the relevant gross anatomy of Male reproductive system CO2.To understand the relevant gross anatomy of female reproductive system CO3.To understand the relevant gross anatomy of Urinary system CO4.To understand the relevant gross anatomy of Endocrine system CO5.To understand relevant gross anatomy of Cardio vascular system
	Histology	CO1.To understand the histology of Male reproductive system,
		CO2.To understand the histology of female reproductive system,
		CO3.To understand the histology of Urinary system
		CO4.To understand the histology of Endocrine system

	Research Methodology & Biostatistics	CO1.To have basic knowledge about concepts related to Biostatistics such as Data presentation, sampling, correlation and vital statistics
		CO2.To have basic knowledge about research methodology for Project purpose such as – material and time management with Documentation and presentation
		CO3.To able to understand basic Biostatistic and research concepts and be able to use them to prepare Thesis research protocol.
	General & Systemic Embryology	CO1.To able to understand in detail General Embryology as week wise development (1st week, 2nd week, 3rd week,4th week) and Trophoblast development with twinning,
		CO2.To able to understand in detail Systemic Embryology under CVS, Urinary system, MRS, FRS, GIT, HFN, CNS, Teratogenesis
	Genetics and physiology of reproductive hormones	CO1.To have detail knowledge about Genetics under Chromosomes, Molecular genetics, Developmental Genetics, Prenatal diagnosis and genetic counseling, Genetic techniques, Genetics in infertility, Epigenetics and The Human genome project.
		CO2.To have detail knowledge about physiology of reproductive hormones such as Pituitary and Thyroid hormones, Male and female sex hormones
	Infertility & Ovulation	CO1.To have detail knowledge about Male, Female infertility
		CO2.To have detail knowledge about Drugs of infertility and their use
		CO3.To have detail knowledge about Ovulation induction methods and protocols, Patient monitoring, Complications and OHSS and Ovum pick up
	Quality Assessment , Statistics, Handling Data, Ethics, Legislation	CO1.To have detail knowledge about Ethical and legal issues such as Lab ethics, Legislation in India, Policies and principles, Regulatory bodies, Ethics in health care, CO2.To have detail knowledge about ART – legal issues and Acts, Surrogacy and Gamete donation programme
		CO3.To have detail knowledge of their practicl application

	IVF procedure	CO1.To have detail knowledge about IVF procedure under Embryo development and metabolism, Sperm preparation, Grading of gamete and embryo, Embryo culture and transfer techniques,
		CO2.To know in detail about Complications, how to deal with them and counselling
	Techniques use in IVF Lab	CO1.To have detail knowledge about Laboratory set up as Various types of lab set ups, Lab designing and establishment, Records and maintenance, Quality improvement
	Introduction to IVF Lab	CO1.To have detail knowledge about Cryo protectant, Cryopreservation of various samples, Freezing and Retrieval techniques and Recent development
		CO2.To have detail knowledge about different culture media and their handling, Various culture media techniques and Co-culture
	ICSI	CO1.To have detail knowledge about ICSI under Indications and contraindications, Techniques, Micromanipulator, Equipment, Pre procedure, Procedure, Risk of anomalies, IMSI, Microscopy, Assessment and counselling
	Laboratory equipment	CO1.To have detail knowledge about Various Laboratory equipment like micro-manipulator, micropipette, other equipments of ICSI , Microscopes
		CO2.To have detail knowledge about Instruments handling, Maintenance, Calibration and Trouble shooting
		CO3.To have detail knowledge of their practicl application
	Biochemistry Including Steroid Metabolism	a) Students will be able to understand the fundamental concepts of biology, chemistry and biochemical metabolisms.
		b) Students will be able to co-relate the biological systems and molecular biological concept of bimolecular.
		c) Students will obtain the intellect on the drug metabolisms and its function and effect in human reproductive system.
		d) A general awareness of steroid mechanics in human body along with its necessary and its adverse effect will be learnt by the students.

		f) Overall knowledge in clinical and quantitative skills along with its importance in research will be obtained by students.
MASTERS IN HOSPITAL ADMINISTRATION	Epidemiology & Demography	CO1.To understand the study of distribution and determination of disease control. CO2. To understand the relationship between demography and its effects on public health
	Health Economics	CO1.It shows issues related to effectiveness, value and behaviour of production and consumption of health and healthcare.
	Business Communication	CO1.to understand the relationship between demography and its effects on public health
	Health Care System and	CO1.it's about all the policies related healthcare and Acts and also about health system of India . to know
	Orientation of Hospital Industry	CO1.to know about the basic hospital structure in india and around the globe and its different perview
	Principles of Management	CO1.to know about the basic management principles
	Organizational Behaviour	CO1.to know about the basic management principles
	Managerial	CO1.Information sharing between people within and
	Accounting & Costing	CO1.to learn the basic accounts, balance sheet, profit and loss and statement sheets. To understand importance of finance and accounting in
	Management Information system	CO1.to understand the different level of MIS in organization
	Human Resource	CO1.a basic understanding of human resources and
	Project Management	CO1.to understand the different stages working on projects
	Research	CO1.to apply the research methods in various
	Hospital Planning and Management	CO1.To know about the infrastructure planning and its management
	Quality	CO1.it is procedure to collecting the data from
	Health Insurance	CO1.it's related to insurance, policy of less treatment charges.
	HOSPITAL	CO1 The students after completing this course would

		CO2 Students would know all aspect of dealing with all facilities and stakeholders of super specialty service for organizing better patients' management.
		CO3 They would also be able to work in any hospitals, which plans to extend it services for critical care and also those, who have already established
		CO4 The students can take up responsibilities of managing hospital super specialty departments and services in any hospital.
	SERVICES MANAGEMENT	CO1 The students after completing this course would be able to understand about hospital services.
		CO2 Students would know all aspect of dealing with all facilities and stakeholders of hospital service for organizing better patients' management.
		CO3 They would also be able to work in any hospitals.
		CO4 The students can take up responsibilities of managing hospital services in any hospital.
	Legal Framework in Hospital	CO1 The students after completing this course would be able to understand about legal implications in the hospital.
		CO2 Students would know all aspect of those areas, which create or may create areas of legal consequences for the hospital.
		CO3 They would also be able to understand, how to deal with such situations, where hospital is facing legal actions or may face such situations.
		CO4 The students will be made aware and taught to be empowered to deal with legal issues.
	Marketing Management for Hospital	CO1 The students after completing this course would be able to understand about hospital marketing services.
		CO2 Students would be able to create marketing activities to maintain a better relationship with all stakeholders.
		CO3 These future health care administrators feel empowered for creating better value proposition for the hospital.

		CO4 They would also be able to work in any organization, when given an opportunity for brand positioning.
		CO5 The students can take up responsibilities of managing hospital marketing services in any hospital.
	Material Management	CO1 The students after completing this course would be able to understand about hospital material management.
		CO2 Students would be able to understand about necessary inventories and its management in-house and outside by maintaining a better relationship with all stakeholders.
		CO3 These future health care administrators feel empowered for creating better value proposition for the hospital through the better control of its inventory planning.
		CO4 They would also be able to work in any organization, when given an opportunity for this area.
		CO5 The students can take up responsibilities of managing hospital material planning in any hospital.
	Financial Management	CO1 The students after completing this course would be able to understand about hospital's financial aspects.
		CO2 Students would be able to understand the direct, indirect costs, investment and expenditures.
		CO3 These future health care administrators feel empowered for financial decisions for the hospital.
		CO4 The students can take up responsibilities of managing hospital financial services in any hospital.
	Strategic Management	CO1 The students after completing this course would be able to understand about hospital strategic management.
		CO2 These future health care administrators feel empowered forstrategymanagement for the hospital.
		CO3 They would also be able to work in any organization, when given an opportunity for leading position.

		CO4 The students can take up responsibilities of managing hospital departments in any hospital.
	Medical Technology management	CO1 The students after completing this course would be able to understand about medical technology management.
		CO2 Students would be able to maintain effective operations in hospital by equipments and instruments.
		CO3 These future health care administrators feel empowered by creating better maintenance of equipment and instruments for the hospital.
		CO4 The students can take up responsibilities of managing hospital medical technology management in any hospital.
	Basic Mathematics and Introduction to Statistical Methods	CO1 Students are expected to understand correlation matrix and other Statistical equations, formulas to calculate and interpret Statistical measures.
	Epidemiology	CO1 It is expected that students will get familiar with various observational study designs and distinguish between confounding and interaction, Introduction to Epidemiology and function of human body
	Health Economics	CO1 It is expected that students will be familiar with basic concepts theories and models in health economics , its application and tool in analyzing performance of health care sector. like health care markets and health care industry. Student will know economics of health and micro financing of health care.
	Demography	CO1 It is expected that students will be able to understand the basic concepts of demography. Get skilled in the basic measures of population growth fertility mortality migration and urbanization, understand socio-economic factors influencing fertility mortality and migration

	Health Care System and Policies & Health Surveys	CO1 The students will understand the interrelationships among the system's components /structure/ functions.Students will get familiar with national and international health policies and programs. Students are expected acquire the knowledge for a variety of perspectives substantive areas and methodological approaches to health services and policy research.
	Research Methodology-I	CO1 The purpose is to equip students with the skill to prepare a scientific research proposal with application of various bio statistical techniques and skills learnt during the course and also to conduct social science research with the help of hospital data.
	Sampling Techniques in Health	CO1 Students will be able to utilize fundamentals and use of the sampling Techniques in
		biostatistics ; like student will be able to decide about research design, sampling
		methodology, calculation of sample size for health related studies
	Estimation and Testing of Hypothesis	CO1 Students will be able to utilize fundamentals and use of theParametric statistical
		methods in biostatistics ; Analysis and Interpretation of results using various
		parametric methods; Strength of association using contingency tables.
	Applied Multivariate Analysis	CO1 Student will be able to develop statistical models with the understating of background
		theory of various commonly used multivariate techniques situations of applications of
		each methods as well as analysis interpretation & reporting of results
	Biostatistics and Research Methodology – II	CO1 The course equips students with conceptual understandings of current academic
		debates regarding methods of data collection with practical skills to put those methods

		into Students submit a written report and present their practical work for assessment,
		practice.
	Survival Analysis	CO1 After going through this course, the student should be capable enough to take up responsibility and actively participate in academics, government organizations, pharmaceutical companies, health organizations, etc.
	Design of Experiment and Clinical Trial	CO1 Student is expected to understand the essential design issues of randomized clinical
		trials and apply statistical principles concepts and methods for analysis of data in a
		clinical trial.
	Non parametric Test	CO1 Expected from student the concept, fundamentals and use of the Non parametric statistical methods in biostatistics Analysis and Interpretation of results using various software packages
	Advance Statistical Computing	CO1 Expected that basic concepts and use of the advance statistical computing techniques in biostatistics Analysis (say R programming) and Interpretation of results using various statistical methods.
	Time Series Analysis	CO1 Student is expected to analyze and interpret Time series data used in epidemiological analysis of various disease, health and injuries.
	Operations Research	CO1 Students will be able to utilize fundamentals and use of the applications of operations research and to provide concepts, identification of Problem student will be able to decide about application of operation research and its role for health related studies.
	Pursuit of Inner Self Excellence (POISE)	CO1 Students will become self dependent, more decisive and develop intuitive ability for their study and career related matter.
		CO2 Students ability to present their ideas will be developed.
		CO3 Enhanced communication skills, public speaking & improved Presentation ability.

		CO4 Students will be able to explore their inner potential and inner ability to become a successful researcher or technician & hence become more focused.
		CO5 Students will observe significant reduction in stress level.
		CO6. With the development of personal attributes like Empathy, Compassion, Service, Love & brotherhood , students will serve the society and industry in better way with teamwork and thus grow professionally.
	Bioethics, Biosafety, IPR & Technology transfer	Students will learn to:
		CO1. Effectively manage the health and safety aspects of a biological laboratory.
		CO2. Give reliable, professional and informed advice and information to colleagues and managers.
		CO3. Help to ensure that their institution complies with relevant legislation, liaise effectively with enforcing authorities and be aware of the penalties for failing to comply.
		CO4. Build a context of understanding through communication.
		CO5. Mediate between other conflicting parties.
		6. Exhibit de-escalatory behaviors in situations of conflict.
		CO7. Demonstrate acknowledgment and validation of the feelings, opinions, andcontributions of others.
	Disaster management and mitigation resources	At the successful completion of course the student will gain:
		CO1. knowledge and understanding of the disaster phenomenon, its different contextual aspects, impacts and public health consequences.
		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.

		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.
	Human rights	Student will be able to virtue:
		CO1. identify, contextualise and use information about the human rights situation in a given country
		CO2. Critically appraise source material, including cases from human rights committees and tribunals and reports and summary records from treaty bodies
		CO3. analyze a country's situation or an international situation in terms of human rights and formulate human rights-based initiatives and policies
		CO4. Promote human rights through legal as well as non-legal means.
		CO5. Participate in legal, political and other debates involving human rights in a knowledgeable and constructive way
	Cell Biology	CO1Students will gain an understanding of Cell structure, components, and characteristics of cellular chemical and molecular processes.
	Molecular Immunology	student should be able to: -
		CO1 Show deeper understanding of fundamentals of molecular immunology. CO2 Student will get familiar with components of immune system, types of immune-deficiencies, basics of antibody engineering etc
	Molecular Enzymology	CO1 Student will get deep knowledge about the concepts of molecular enzymology.
		CO2 Student will get familiar with the enzyme kinetics & enzyme engineering.
	Research	CO1 Understand concepts of hypothesis testing, p
		CO4 Design a study
		CO5 Learn to measure and analyze data
		CO6 Understand principles of conducting ethical research
	Gene and Protein Science	CO1 Understand the basic concepts of gene & protein science and its application in the field of molecular biology.

	Bioinformatics &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; CO2 Apply bioinformatics analysis knowledge and techniques to answer scientific questions in the health sciences
	DNA Recombinant Technology	CO1 To expose students to application of recombinant DNA technology in biotechnological research.
		CO2 To train students in strategizing research methodologies employing recombinant techniques.
		CO3 Student will get practical & theoretical knowledge in Recombinant DNA technology.
	Metabolic Engineering	CO1 Metabolic engineering. Students will integrate the concept of pathway modification with cellular physiology.
		CO2 Metabolic networks. Students will visualize the complexity and connectivity of metabolic pathways
		CO3 Student will get practical & theoretical knowledge in Metabolic Engineering
	Genomics	CO1.Upon completion of this course, the student will be familiar with most aspects of genomics.
		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.
	Proteomics	After successfully completing this course, student will have the following knowledge:
		CO1.Practical and theoretical knowledge in proteomics.
		CO2.Experience in protein identification and function.
	Nanobiotechnology	**Nanobiotechnology:**
		Students will
		CO1.Understand the fundamental of nonmaterial in reference to characterization, synthesis and application.

		CO2.Student will get practical & theoretical knowledge in nano-biotechnology related field.
	Molecular diagnostics	Molecular Diagnostics:
		Students will be able to
		CO1.Do advance laboratory techniques, interpret results and prepare reports.
		CO2.Student will get practical & theoretical knowledge in Molecular Diagnostics.
	Drug discovery	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.
		CO2.Student will get practical & theoretical knowledge in the field of drug discovery.
	Analytical Instrumentation	On successful completion of this course, CO1.student will get deep knowledge of the fundamentals of analytical instrumentation
		CO2.Student will get practical & theoretical knowledge in analytical instrumentation
	Bioethics, Biosafety, IPR & Technology transfer	Students will be able to:
		CO1.Interpret basics of Bio-safety and Bio-ethics and its impact on all the biological sciences
		CO2.Recognize importance of Bio-safety practices, guidelines.
		CO3.knowledge of IPR in research Case study will enrich the knowledge of IPR.
	Quality Assurance	a) Students will be able to understand the concept of
		b) Students will be able to implement qualitative programs required for the progression of the molecular laboratories
		c) Students will be able to function accurately in quality improvement programs in accordance to development of laboratories.
		d) 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

Master in Public Health (MPH)	Concept of Public Health & Basic Epidemiology	Co1 Understands the Concept of Public Health Co2 Knows about various types of epidemiological studies
	Introduction to Demography & Basic Biostatistics	Co1 Understand the concept of Demography. Co2 Use various statistical tests for data analysis
	Introduction to Health System, Policy and Programs	Co1 Understand the structure, components and characteristics of global & local health care system. Co2 Understand policy, framework, process, impact and design, analysis and interpretation of Health program. Co3 Critically analyze the progress of various National Health Program
	Introduction to Health Economics	Co1 Understand the Basic concepts in Health economics
	Practice of Public Health (Basic)	Co1 Act as a implementer in field situation for the health program
	Health Management: Principles and Practices	CO1 Understand planning, implementation, monitoring and evaluation of health program
		CO2 Understand concept and organization management and communication skills.
	Reproductive, Maternal Health, Child Health and	CO1 Understand the concept in Reproductive Health care. CO2 Identify the concepts in program management in MCH care.
	Adolescent Health	
	Communicable and Non-	Co1 Understand the epidemiology and prevention and control of communicable diseases.
	Nutrition	CO2 Understand the epidemiology and prevention and control of non- communicable diseases.
		CO3 Understand the utility and application of epidemiology in Nutritional Science
	Practice of Public Health (Advanced) – Rural Outreach	CO1 Plan and implement the health services in rural, outreach area.

		CO2 Evaluate the impact of Health services in rural area.
	Research Methodology & Biostatistics (Core Course)	CO1 Understand, develop statistical models, research design with the understanding of background theory of various commonly used statistical techniques as well interpretation of results and use of statistical software like SPSS.
	Environment and Occupational Health and Public Health	CO1 Understand role of environment in health.
	Laws	CO2. Understand role of occupation in health & disease & various occupational health hazards.
		CO3 Identify the relevance of various laws related to public health.
	Introduction to Financial Management and Budgeting	CO1 Understand the basic concept in financial management and budgeting.
	Medical Sociology & Effective Communication in Health	Co1 Role of social factors in health and disease.
	Care	Co2 Understand the effective communication concept.
	Practice of Public Health (Advanced) – Urban Outreach	Co1 Plan and implement health services in urban outreach area.
		Co2 Evaluate the impact of health services in urban area.
M.Sc. Clinical Nutrition	Principles of Nutrition	• Discuss the role of nutrients for human health and certain disorders.
		Describe the different forms of nutrients and about the procurement and requirement of nutrien**ts.**
	Biochemistry &Applied	Understand integration of cellular level metabolic events to nutritional disorders and imbalances
	Basic Human Physiology	• To discuss the physiology of the different organ system
		To understand the functions of various organs of human body.
	Pathophysiology	• To know and interpret the various diagnostic indicators/parameters

		To apply this knowledge for planning nutritional care of individuals**.**
	Medical Nutrition Therapy I	• To explain about the basics of therapeutic diet
		To discuss about the medical nutrition management of various disease condition
	Advance Nutrition	• To explain about the basics of nutrition
		To discuss about the nutritional requirement according to age, sex and physiological condition and how to apply them in practical diettics.
	Food Microbiology and Safety	• To prevent the contamination and spoilage of food items by microorganism.
		• To control the contamination and maintain the hygienic condition during the handling of food items.
		To assess the quality of food items available in market by seeing the packaging and labelling.
	Research Methodology & Biostatistics (Core	Student will be able to understand develop statistical models, researchdesigns with the understating of background theory of various commonly usedstatistical
	Medical Nutrition Therapy II	To explain about the basics of therapeutic diet
		To discuss about the medical nutrition management of various disease condition
	Community Nutrition	Discuss about the nutrition related problems prevalent in community.
	Food Science and analysis	Conserve the nutrient composition of food by applying their knowledge.
		Familiar with the principles of food analysis.
	Pediatric and Geriatric Nutrition	Assess the nutritional status of the child and elderly person
		Plan nutritional management for child and elder person

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