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

Choice Based Credit System (CBSE)

Course Work
Ph.D Programmes
(Doctor of Philosophy)

(With Effect from 2018-2019 Batches)

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

Approved as per BOM-53/2018, [Resolution No. 4.5.5], Dated 19/05/2018

NAME: Ph. D. course work

AIMS OF THE PROGRAM

The course intends to build knowledge and skills of students in research. The aim of course is to learn how research is being done, and how to apply a great number of statistical techniques, draw conclusions from those, and determine what statistical technique would be appropriate for a given dataset and/or research design. In this course, here the emphasis lies on interpretation and communication of result. In other words, students can learn how to take a step back and think about what they can conclude from a certain experiment or statistical test. The course intends to build knowledge and skills of students in statistics and basic scientific competence.

Learning objectives and expectations

- To defend the use of Research Methodology
- To judge the reliability and validity of experiments
- To be able to perform exploratory data analysis
- To be acquainted with use of parametric and non-parametric tests (and interpreting their results).
- To be able to draw conclusions from categorical data
- Using computer-intensive methods for data analysis
- Drawing conclusions from statistical test results

Duration of Study: The duration of the study for PhD course work is 34 hours per week spread over for six months.

Instruction Methods: Lectures in this course are meant to be a complement to the knowledge student can obtain by reading the textbook and related literature from various sources.These objectives will be achieved by means of lectures, interactive sessions, group discussion, exercise or solving the problems, hands on training on computers and practical for analyzing the data using SPSS (version 24.0) and interpretation of output.Students will practice their skills by making use of datasets

DISTRIBUTION OF MARKS AND CREDIT HOURSOF COURSE WORK

Syllabus Ref. No.	Subject	Credit	Hours per week	Marks
PH101	Research Methodology	3	3	50
PH 102	Quantitative and Qualitative Analysis	2	2	50
PH 103	Computer Application	2	2	50
*GE 105	Bioethics, Biosafety, IPR & Technology transfer	2	2	50
*GE 106	Disaster management and mitigation resources			
*GE107	Human rights			
PH 104	Preparation for protocol of PhD thesis	5	15	100
	Total	**14**	**24**	**300**

Note: - * GE: Generic Elective (Any one)

Assessment Methods

FINAL THEORY marks will be **50 Marks (University Exam)**

Section	Question types	Marks distribution	Marks allotted per section
Sec A	SAQ	6 x 5 M	30
Sec B	LAQ	2 x 10 M	20
			Total = 50 M

Assessment of 'Preparation for protocol of PhD thesis'

Heading	Marks
Subject Knowledge	20 M
Concept and Methodology	20 M
Interpretation Skill and Discussion	20 M
Question and Answer	20 M
General Awareness, Manners, Personality, Enthusiasm	20 M
Total	**100M**

Name of the Programme	**Ph.D. Course Work**
Name of the Course	**Research Methodology**
Course Code	**PH-101**

Teaching objective	This course is to impart student's knowledge and skills on the principals and methods of Biomedical research to be used in health sciences analysis of various disease, health and injuries. 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.
Learning outcomes	To equip the students with the skill of writing research proposal and report, purpose of a dissertation content of report/ dissertation critical review of research report and journal article Introductory section, methodology adopted, Development of research tools Protocol preparation Analysis and inferences, Summary, conclusions and recommendations. References/Bibliography, Appendices, Footnotes. research Ethics, general principles informed consent and human subject protection ICMR ethical guidelines for biomedical research on human participants.

Sr.No.	Topics
1	Introduction to Research: Meaning of research, Definition, Scope, Limitations of research, and types of research objectives of Research, Motivation in Research, Research Process, Research Methods vs. Methodology, criteria for good research.
2	Scaling techniques: Concept, types of Scales, rating Scales & ranking scales, Construction techniques, multi dimensional scaling. Evaluation Strategies. Types of variable. and importance
3	Formulating a Research Problem , Definition and Process, Conceptualizing a Research Design, Need for research Design, Meaning and features of research design, Ethics and Ethical Practices in Research, Quality Control: Overview and Quality Control Tools, Quality Assurance.
4	Review of Literature: How to review the Library Resources and Information Service, e-resources and searching, how to write references in the thesis and research papers. Writing a Research Proposal and Writing a Research Report and research paper.What is Plagiarism? How to reduce and avoid plagiarism.
5	Tools & Methods of Data Collection, Conceptual Framework: Types of data, primary and secondary data, designing of Questionnaire, Methods of data collection, importance of Pilot study (with example)

BACHELOR IN PROSTHETICS AND ORTHOTICS (BPO)

Curriculum & Guidelines

REHABILITATION COUNCIL OF INDIA
B-22 Qutub Institutional Area
New Delhi 110016

2010

14. SUBJECTS, HOURS OF TEACHING AND DISTRIBUTION OF MARKS

First Year:

Sl. No.	Subjects	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks
1.	Anatomy	120	40	160	100	--	100
2.	Physiology	90	30	120	100	--	100
3.	Material and workshop Technology	90	60	150	100	--	100
4.	Applied Mechanics & Strength of Materials	90	50	140	100	---	100
5.	Engineering Drawing	30	30	60	100	--	100
6.	Biomechanics I	70	40	110	100	--	100
7..	*Prosthetics –I	80	160	240	100	100	200
8.	*Orthotics-I	80	160	240	100	100	200
	Total	**650**	**570**	**1220 hours**	**800**	**200**	**1000**

Second Year

Sl. No.	Subjects	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks
1.	Pathology	80	20	100	100	--	100
2.	Orthopaedics & Amputation Surgery	70	50	120	100	--	100
3.	Physical Medicine &Rehabilitation	70	30	100	100	100---	200
4.	Fundamentals of Electricity & Electronics	80	20	100	100	--	100
5.	Bio-Mechanics-II	80	40	120	100	--	100
6.	*Prosthetics Science-II	80	260	340	100	100	200
7	*Orthotics Science-II	80	260	340	100	100	200

	Total	**540**	**680**	**1220 hours**	**700**	**300**	**1000**

Third Year

Sl. No.	Subjects	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks
1.	Computer Science	60	100	160	100	100	200
2.	P & O Workshop Management	100	0	100	100	--	100
3.	Mobility & Rehabilitation Aids	80	140	220	100	100--	200
4.	*Prosthetics Science-III	80	260	340	100	100	200
5.	*Orthotics Science-III	80	260	340	100	100	200
6.	Research Methodology /Project development	60	---	60	100	---	100
	Total	**460**	**760**	**1220 hours**	**600**	**400**	**1000**

Fourth year:

Sl. No.	Subjects	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks
1.	*Prosthetics Science-IV	60	120	180	100	100	200
2.	*Orthotic Science-IV	60	120	180	100	100	200
3.	*Prosthetics Clinical Practice		360	360	-	200	200
4.	*Orthotics Clinical Practice		360	360	-	200	200
5	**Project Work**	--	140	140	---	200	200
	Total	**120**	**110**	**1220 hours**	**200**	**800**	**1000**

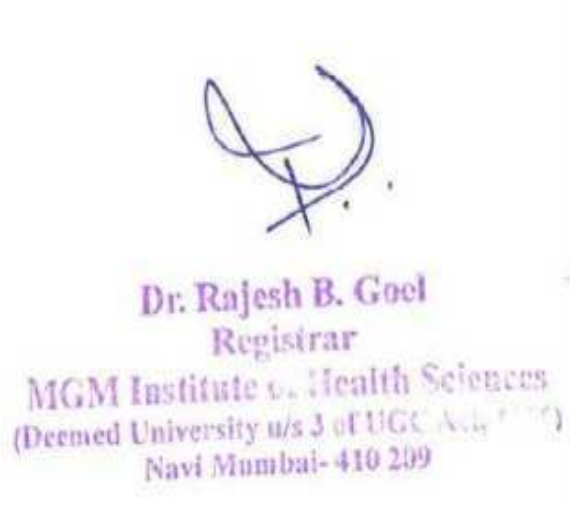
*** Theory & Practical examination for Prosthetics & Orthotics subject should be conducted by examiner from P & O discipline.**

15. INFRASTRUCTURAL FACILITIES REQUIREMENTS

1. Two lecture halls (To be increased to four after two years)
2. One room for clinical meeting

BACHELOR IN PROSTHETICS AND ORTHOTICS (BPO)

Curriculum & Guidelines



REHABILITATION COUNCIL OF INDIA
B-22 Qutub Institutional Area
New Delhi 110016

2010

14. SUBJECTS, HOURS OF TEACHING AND DISTRIBUTION OF MARKS

First Year:

Sl. No.	Subjects	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks
1.	Anatomy	120	40	160	100	--	100
2.	Physiology	90	30	120	100	--	100
3.	Material and workshop Technology	90	60	150	100	--	100
4.	Applied Mechanics & Strength of Materials	90	50	140	100	---	100
5.	Engineering Drawing	30	30	60	100	--	100
6.	Biomechanics I	70	40	110	100	--	100
7..	*Prosthetics –I	80	160	240	100	100	200
8.	*Orthotics-I	80	160	240	100	100	200
	Total	**650**	**570**	**1220 hours**	**800**	**200**	**1000**

Second Year

Sl. No.	Subjects	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks
1.	Pathology	80	20	100	100	--	100
2.	Orthopaedics & Amputation Surgery	70	50	120	100	--	100
3.	Physical Medicine &Rehabilitation	70	30	100	100	100---	200
4.	Fundamentals of Electricity & Electronics	80	20	100	100	--	100
5.	Bio-Mechanics-II	80	40	120	100	--	100
6.	*Prosthetics Science-II	80	260	340	100	100	200
7	*Orthotics Science-II	80	260	340	100	100	200

	Total	**540**	**680**	**1220 hours**	**700**	**300**	**1000**

Third Year

Sl. No.	Subjects	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks
1.	Computer Science	60	100	160	100	100	200
2.	P & O Workshop Management	100	0	100	100	--	100
3.	Mobility & Rehabilitation Aids	80	140	220	100	100--	200
4.	*Prosthetics Science-III	80	260	340	100	100	200
5.	*Orthotics Science-III	80	260	340	100	100	200
6.	Research Methodology /Project development	60	---	60	100	---	100
	Total	**460**	**760**	**1220 hours**	**600**	**400**	**1000**

Fourth year:

Sl. No.	Subjects	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks
1.	*Prosthetics Science-IV	60	120	180	100	100	200
2.	*Orthotic Science-IV	60	120	180	100	100	200
3.	*Prosthetics Clinical Practice		360	360	-	200	200
4.	*Orthotics Clinical Practice		360	360	-	200	200
5	**Project Work**	--	140	140	---	200	200
	Total	**120**	**110**	**1220 hours**	**200**	**800**	**1000**

*** Theory & Practical examination for Prosthetics & Orthotics subject should be conducted by examiner from P & O discipline.**

15. INFRASTRUCTURAL FACILITIES REQUIREMENTS

1. Two lecture halls (To be increased to four after two years)
2. One room for clinical meeting

Curriculum Framework

Bachelor in Prosthetics and Orthotics

(B.P.O.)

Norms, Regulations & Course Content

Effective from Academic Session 2017-18
Four and Half Years Duration (Annual)

भारतीय पुनर्वास परिषद

Rehabilitation Council of India
B-22, Qutab Institutional Area,
New Delhi - 110 016
Email: rehabstd@nde.vsnl.net.in, rehcouncil_delhi@bol.net.in
www.rehabcouncil.nic.in

2016

6. Acquire basic management & administrative skills in the areas of materials, financial and human resources related to prosthetics and orthotics

7. Develop the communication skills to establish effective communication with the stake holders

8. Practice prosthetics & orthotics ethics in patient care, service delivery, and research.

9. Develop attitude for self-learning and acquire necessary skills including the use of appropriate technologies.

III. NOMENCLATURE

BACHELOR IN PROSTHETICS & ORTHOTICS (B.P.O.)

IV. PROGRAMME STRUCTURE

FIRST YEAR

Course Code	Title	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks	Credit Points
BPO101	Anatomy	120	40	160	100	--	100	
BPO102	Physiology	90	30	120	100	--	100	
BPO103	Workshop Technology & Material Science	80	20	100	100	--	100	
BPO104	Applied Mechanics &Strength of Materials	80	20	100	100	---	100	
BPO105	Biomechanics I	60		60	100	--	100	
BPO106	Basic Electronics	60	-	60	100		100	
BPO107 / 151	*Prosthetic Science –I	80	230	310	100	100	200	
BPO108 / 152	*Orthotic Science -I	80	230	310	100	100	200	
	Total	650	**570**	**1220**	**800**	**200**	**1000**	

SECOND YEAR

Course Code	Subjects	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks	Credit Points
BPO201	Pathology	80		80	100	--	100	
BPO202	Orthopaedics, Amputation Surgery & Imaging Science	80	20	100	100	--	100	
BPO203	Community Rehabilitation & Disability Prevention	60		60	100		100	
BPO204	Biomechanics II	70	30	100	100		100	
BPO 205	Psychology & Sociology	60		60	100		100	
BPO206 / 251	*Prosthetic Science-II	80	300	380	100	100	200	
BPO207 / 252	*Orthotic Science-II	80	300	380	100	100	200	
BPO 208	Pharmacology	60		60	100		100	
	Total	**570**	**650**	**1220**	**800**	**200**	**1000**	

THIRD YEAR

Course Code	Subjects	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks	Credit Points
BPO301/ 353	Computer Science & graphical communication	80	120	200	100	100	200	
BPO302	Bio-Mechanics-III	80		80	100	--	100	
BPO303	Assistive Technology	80		80	100	-	100	
BPO304	Research Methodology & Bio Statistics	60	---	60	100	---	100	
BPO305/ 351	*Prosthetic Science-III	80	320	400	100	100	200	
BPO306/ 352	*Orthotic Science-III	80	320	400	100	100	200	
	Total	**460**	**760**	**1220**	**600**	**300**	**900**	

FOURTH YEAR

Course Code	Subjects	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks	Credit Points
BPO401/ 451	*Prosthetics Science-IV	60	160	220	100	100	200	
BPO402/ 452	*Orthotic Science-IV	80	160	240	100	100	200	
BPO403	Management & Administration	80	--	80	100	--	100	
BPO453	*Prosthetics Clinical Practice	--	250	250	-	200	200	
BPO454	*Orthotics Clinical Practice	---	250	250	-	200	200	
BPO455	**Project Work****	--	180	180	---	100	100	
	Total	**220**	**1000**	**1220**	**300**	**700**	**1000**	

**Joint projects may also be undertaken.

Note:- *All theory & Practical examinations in the discipline of Prosthetics and Orthotics shall be conducted only by the regular appointed Prosthetic and Orthotic Faculty / Teachers from a teaching institution.

TITLE----- RESEARCH METHODOLOGY&BIOSTATISTICS
COURSE CODE--- BPO 304
TEACHING HOURS----60
CREDITS --- As per affiliated university norms

Course description: The student would acquire the knowledge of the research problem, design, Sampling, data collection, analysis of data, Testing hypotheses, interpretation and report writing to prosthetics and Orthotics

The student should be able to meet the following learning objectives:

- Explain the process, types, design, needs, principles of research
- Formulate an appropriate research plan in order to solve a clinical problem
- Examine the concepts of estimation and hypothesis testing with applications to population proportions, means, variances
- Describe the sampling, data collection and processing of data
- Examine the data by using different measures
- Perform effective descriptive statistical analysis as well as statistical inference for a variety of mainstream applications
- Use appropriate empirical and probability distributions to model data.
- Conduct a basic research study in order to solve a clinical problem

DETAILED CONTENTS

Introduction to Biostatistics

1. Definition – Statistics, Biostatistics
2. Applications of Biostatistics
3. Data collection from experiments & surveys.
4. Variable – Qualitative & Quantitative, Discrete and continuous.
5. Presentation of Data: -

a) Tabular Presentation of Data – Statistical Table, Format of a Table.

b) Frequency Distribution – construction of Frequency Distribution, cumulative and relative frequency distribution, Exclusive and inclusive method of classification of Data.

c) Diagrammatic Presentation of Data: - Bar diagrams, Pie Diagram, Line Diagram, Pictogram, Cartogram or Statistical map.

d) Graphical representation of a Frequency distribution – Histogram, Frequency Polygon, Frequency curve, ogives or cumulative frequency curves.

Research methodology:

1. Introduction to Research methodology: Meaning of research, objectives of research,

Types of research & research approaches,

2. Research problem: Statement of research problem Statement of purpose and objectives of research problem, Necessity of defining the problem

3. Research design: Meaning of research design, Need for research design,

4. Sampling Design: Criteria for selecting sampling procedure

5. Measurement & scaling techniques: Measurement in research- Measurement scales, sources of error in measurement,

6. Methods of data collection: collection of primary data.

7. Sampling fundamentals, need for sampling

8. Analysis of data:, Types of analysis.

9. Testing of hypothesis: What is hypothesis? Basic concepts concerning testing of hypothesis.

RECOMMENDED BOOKS & JOURNALS

Sl. No.	Author	Title	Publisher	Year/Vol.
1.	Armstrong H.B.	Critical Moments in Quantitative Research	Butter worth- Heine Oxford	
2.	R.M. Scot	Orthotic system& research		

Curriculum Framework

Bachelor in Prosthetics and Orthotics

(B.P.O.)

Norms, Regulations & Course Content

Effective from Academic Session 2017-18
Four and Half Years Duration (Annual)

Rehabilitation Council of India
B-22, Qutab Institutional Area,
New Delhi - 110 016
Email: rehabstd@nde.vsnl.net.in, rehcouncil_delhi@bol.net.in
www.rehabcouncil.nic.in

2016

6. Acquire basic management & administrative skills in the areas of materials, financial and human resources related to prosthetics and orthotics

7. Develop the communication skills to establish effective communication with the stake holders

8. Practice prosthetics & orthotics ethics in patient care, service delivery, and research.

9. Develop attitude for self-learning and acquire necessary skills including the use of appropriate technologies.

III. NOMENCLATURE

BACHELOR IN PROSTHETICS & ORTHOTICS (B.P.O.)

IV. PROGRAMME STRUCTURE

FIRST YEAR

Course Code	Title	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks	Credit Points
BPO101	Anatomy	120	40	160	100	--	100	
BPO102	Physiology	90	30	120	100	--	100	
BPO103	Workshop Technology & Material Science	80	20	100	100	--	100	
BPO104	Applied Mechanics &Strength of Materials	80	20	100	100	---	100	
BPO105	Biomechanics I	60		60	100	--	100	
BPO106	Basic Electronics	60	-	60	100		100	
BPO107 / 151	*Prosthetic Science –I	80	230	310	100	100	200	
BPO108 / 152	*Orthotic Science -I	80	230	310	100	100	200	
	Total	650	**570**	**1220**	**800**	**200**	**1000**	

SECOND YEAR

Course Code	Subjects	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks	Credit Points
BPO201	Pathology	80		80	100	--	100	
BPO202	Orthopaedics, Amputation Surgery & Imaging Science	80	20	100	100	--	100	
BPO203	Community Rehabilitation & Disability Prevention	60		60	100		100	
BPO204	Biomechanics II	70	30	100	100		100	
BPO 205	Psychology & Sociology	60		60	100		100	
BPO206 / 251	*Prosthetic Science-II	80	300	380	100	100	200	
BPO207 / 252	*Orthotic Science-II	80	300	380	100	100	200	
BPO 208	Pharmacology	60		60	100		100	
	Total	**570**	**650**	**1220**	**800**	**200**	**1000**	

THIRD YEAR

Course Code	Subjects	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks	Credit Points
BPO301/ 353	Computer Science & graphical communication	80	120	200	100	100	200	
BPO302	Bio-Mechanics-III	80		80	100	--	100	
BPO303	Assistive Technology	80		80	100	-	100	
BPO304	Research Methodology & Bio Statistics	60	---	60	100	---	100	
BPO305/ 351	*Prosthetic Science-III	80	320	400	100	100	200	
BPO306/ 352	*Orthotic Science-III	80	320	400	100	100	200	
	Total	**460**	**760**	**1220**	**600**	**300**	**900**	

FOURTH YEAR

Course Code	Subjects	Theory Hrs	Practical Hrs	Total Hrs	Marks Theory	Marks Practical	Total Marks	Credit Points
BPO401/ 451	*Prosthetics Science-IV	60	160	220	100	100	200	
BPO402/ 452	*Orthotic Science-IV	80	160	240	100	100	200	
BPO403	Management & Administration	80	--	80	100	--	100	
BPO453	*Prosthetics Clinical Practice	--	250	250	-	200	200	
BPO454	*Orthotics Clinical Practice	---	250	250	-	200	200	
BPO455	**Project Work****	--	180	180	---	100	100	
	Total	**220**	**1000**	**1220**	**300**	**700**	**1000**	

**Joint projects may also be undertaken.

Note:- *All theory & Practical examinations in the discipline of Prosthetics and Orthotics shall be conducted only by the regular appointed Prosthetic and Orthotic Faculty / Teachers from a teaching institution.

TITLE----- RESEARCH METHODOLOGY&BIOSTATISTICS
COURSE CODE--- BPO 304
TEACHING HOURS----60
CREDITS --- As per affiliated university norms

Course description: The student would acquire the knowledge of the research problem, design, Sampling, data collection, analysis of data, Testing hypotheses, interpretation and report writing to prosthetics and Orthotics

The student should be able to meet the following learning objectives:

- Explain the process, types, design, needs, principles of research
- Formulate an appropriate research plan in order to solve a clinical problem
- Examine the concepts of estimation and hypothesis testing with applications to population proportions, means, variances
- Describe the sampling, data collection and processing of data
- Examine the data by using different measures
- Perform effective descriptive statistical analysis as well as statistical inference for a variety of mainstream applications
- Use appropriate empirical and probability distributions to model data.
- Conduct a basic research study in order to solve a clinical problem

DETAILED CONTENTS

Introduction to Biostatistics

1. Definition – Statistics, Biostatistics
2. Applications of Biostatistics
3. Data collection from experiments & surveys.
4. Variable – Qualitative & Quantitative, Discrete and continuous.
5. Presentation of Data: -

a) Tabular Presentation of Data – Statistical Table, Format of a Table.

b) Frequency Distribution – construction of Frequency Distribution, cumulative and relative frequency distribution, Exclusive and inclusive method of classification of Data.

c) Diagrammatic Presentation of Data: - Bar diagrams, Pie Diagram, Line Diagram, Pictogram, Cartogram or Statistical map.

d) Graphical representation of a Frequency distribution – Histogram, Frequency Polygon, Frequency curve, ogives or cumulative frequency curves.

Research methodology:

1. Introduction to Research methodology: Meaning of research, objectives of research,

Types of research & research approaches,

2. Research problem: Statement of research problem Statement of purpose and objectives of research problem, Necessity of defining the problem

3. Research design: Meaning of research design, Need for research design,

4. Sampling Design: Criteria for selecting sampling procedure

5. Measurement & scaling techniques: Measurement in research- Measurement scales, sources of error in measurement,

6. Methods of data collection: collection of primary data.

7. Sampling fundamentals, need for sampling

8. Analysis of data:, Types of analysis.

9. Testing of hypothesis: What is hypothesis? Basic concepts concerning testing of hypothesis.

RECOMMENDED BOOKS & JOURNALS

Sl. No.	Author	Title	Publisher	Year/Vol.
1.	Armstrong H.B.	Critical Moments in Quantitative Research	Butter worth- Heine Oxford	
2.	R.M. Scot	Orthotic system& research		

MGM INSTITUTE OF HEALTH SCIENCES

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

CHOICE BASED CREDIT SYSTEM (CBCS)

(With effect from 2018-19 Batches)

Curriculum for B.Sc. Allied Health Sciences

B. Optometry

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai-410 209

Approved as per BOM –55/2018, [Resolution No. 4.4.1.6], Dated 27/11/2018

OUTLINE OF COURSE CURRICULUM

B.Optometry

Semester I

Code No.	Core Subjects	Credits/Week				Hrs/Semester				Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Total hrs.	Internal Assessment	Semester Exam	Total
Theory												
BOPTOM 101 L	Human Anatomy Part I	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BOPTOM 102 L	Human Physiology Part I	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BOPTOM 103 L	General Biochemistry Nutrition	3	1	-	**4**	45	15	-	**60**	20	80	**100**
BOPTOM 104 L	Introduction to National Health Care System (Multidisciplinary/ Interdisciplinary)	3	-	-	**3**	45	-	-	**45**	20	80	**100**
Practical												
BOPTOM 101 P	Human Anatomy Part I	-	-	4	-	-	-	60	**60**	-	-	-
BOPTOM 102 P	Human Physiology Part I	-	-	4	-	-	-	60	**60**	-	-	-
BOPTOM 103 P	General Biochemistry	-	-	4	-	-	-	60	**60**	-	-	-
BOPTOM 105 P	Community Orientation & Clinical Visit (Including related practicals to the Parent course)	-	-	8	-	-	-	120	**120**	-	-	-
Ability Enhancement Elective Course												
AEC 001 L	English & Communication skills	3	-	-	**3**	45	-	-	**45**	100	-	**100**
AEC 002 L	Envioronmental Sciences											
Total		**15**	**1**	**20**	**16**	**225**	**15**	**300**	**540**	**180**	**320**	**500**

OUTLINE OF COURSE CURRICULUM

B.Optometry

Semester II

Code No.	Core Subjects	Credits/Week				Hrs/Semester				Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Total hrs.	Internal Assessment	Semester Exam	Total
Theory												
BOPTOM 106 L	Human Anatomy Part II	2	-	-	**2**	30	-	-	**30**	10	40	**50**
BOPTOM 107 L	Human Physiology Part II	2	-	-	**2**	30	-	-	**30**	10	40	**50**
BOPTOM 108 L	General Microbiology	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BOPTOM 109 L	Basic Pathology & Hematology	3	1	-	**4**	45	15	-	**60**	20	80	**100**
BOPTOM 110 L	Introduction to Quality and Patient safety (Multidisciplinary/Interdisciplinary)	3	-	-	**3**	45	-	-	**45**	20	80	**100**
Practical												
BOPTOM 106 P	Human Anatomy Part II	-	-	4	-	-	-	60	**60**	-	-	-
BOPTOM 107 P	Human Physiology Part II	-	-	2	-	-	-	30	**30**	-	-	-
BOPTOM 108 P	General Microbiology	-	-	4	-	-	-	60	**60**	-	-	-
BOPTOM 109 P	Basic Pathology & Hematology	-	-	4	-	-	-	60	**60**	-	-	-
BOPTOM111 P	Community Orientation & Clinical Visit (Including related practicals to the parent course)	-	-	8	-	-	-	120	**120**	-	-	-
Skill Enhancement Elective Course												
SEC 001 L	Medical Bioethics & IPR	3	-	-	**3**	45	-	-	**45**	100	-	**100**
SEC 002 L	Human Rights & Professional Values											
Total		**16**	**1**	**22**	**17**	**240**	**15**	**330**	**585**	**180**	**320**	**500**

OUTLINE OF COURSE CURRICULUM

B.Optometry

Semester III

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BOPTOM 112 L	Physical Optics	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
BOPTOM 113 L	Geometrical Optics	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
BOPTOM 114 L	Visual Optics I/II	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
BOPTOM 115 L	Ocular diseases I	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
BOPTOM 116 L	Clinical Examinations and Visual systems	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
Practical														
BOPTOM 112 P	Physical Optics	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
BOPTOM 113 P	Geometrical Optics	-	-	4	-	**2**	-	-	60	-	**60**	50	-	**50**
BOPTOM 114 P	Visual Optics I/II	-	-	4	-	**2**	-	-	60	-	**60**	50	-	**50**
BOPTOM 116 P	Clinical Examinations and Visual systems	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
Generic Elective Course														
GEC 001 L	Pursuit of Inner Self Excellence (POIS)	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
GEC 002 L	Organisational Behaviour													
Total		**19**	**0**	**16**	**0**	**27**	**285**	**0**	**240**	**0**	**525**	**320**	**480**	**800**

OUTLINE OF COURSE CURRICULUM

B.Optometry

Semester IV

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing /Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BOPTOM 117 L	Optometric Optics I & II	**4**	-	-	-	**4**	60	-	-	-	**60**	**20**	80	**100**
BOPTOM 118 L	Ocular diseases II & Glaucoma	3	-	-	-	**3**	45	-	-	-	**45**	**20**	80	**100**
BOPTOM 119 L	Dispensing optics	3	0	-	-	**3**	45	-	-	-	**45**	**20**	80	**100**
BOPTOM 120 L	Optometric Instrumentation	3	-	-	-	**3**	45	-	-	-	**45**	**20**	80	**100**
BOPTOM 121 L	Basic & Occular Pharmacology	2	-	-	-	**2**	30	-	-	-	**30**	**20**	80	**100**
BOPTOM 122 CP	BOPTOM Directed Clinical Education- I	-	-	-	15	**5**	-	-	-	225	**225**	50	-	**50**
Practical														
BOPTOM 117 P	Optometric Optics I & II	-	-	6	-	**3**	-	-	90	-	**90**	**10**	40	**50**
BOPTOM 119 P	Dispensing optics	-	-	6	-	**3**	-	-	90	-	**90**	**10**	40	**50**
BOPTOM 120 P	Optometric Instrumentation	-	-	2	-	-	-	-	30	-	**30**	-	-	-
Ability Enhancement Elective Course														
AEC 003 L	Computer and Applications	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
AEC 004 L	Biostatistics and Research Methodology													
Total		**18**	**0**	**14**	**15**	**29**	**270**	**0**	**210**	**225**	**705**	**270**	**480**	**750**

OUTLINE OF COURSE CURRICULUM

B.Optometry

Semester V

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BOPTOM 123 L	Contact Lenses I	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
BOPTOM 124 L	Binocular Vision I&II	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
BOPTOM 125 L	Low Vision Aids	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
BOPTOM 126 L	Systemic Disease	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
BOPTOM 127 CP	BOPTOM Directed Clinical Education-II	-	-	-	27	**9**	-	-	-	405	**405**	50	-	**50**
Practical														
BOPTOM 123 P	Contact Lenses I	-	-	2		**1**	-	-	30	-	**30**	10	40	**50**
BOPTOM 124 P	Binocular Vision I&II	-	-	2		**1**	-	-	30	-	**30**	10	40	**50**
Core Elective Course														
CEC 005 L	Basics of Clinical Skill Learning	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
CEC 006 L	Hospital Operation Management													
Total		**15**	**0**	**4**	**27**	**26**	**225**	**0**	**60**	**405**	**690**	**250**	**400**	**650**

OUTLINE OF COURSE CURRICULUM

B.Optometry

Semester VI

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BOPTOM 128 L	Contact Lenses II	2	-	-	-	2	30	-	-	-	30	20	80	**100**
BOPTOM 129 L	Sports Vision	2	-	-	-	2	30	-	-	-	30	20	80	**100**
BOPTOM 130 L	Pediatric and Geriatric Optometry	2	-	-	-	2	30	-	-	-	30	20	80	**100**
BOPTOM 131 L	Occupational Optometry	2	-	-	-	2	30	-	-	-	30	20	80	**100**
BOPTOM 132 CP	BOPTOM Directed Clinical Education-III	-	-	-	36	12	-	-	-	540	540	50	-	**50**
Practical														
BOPTOM 128 P	Contact Lenses II	-	-	2	-	1	-	-	30	-	30	10	40	**50**
BOPTOM 130 P	Pediatric and Geriatric Optometry	-	-	2	-	1	-	-	30	-	30	10	40	**50**
Total		**8**	**0**	**4**	**36**	**22**	**120**	**0**	**60**	**540**	**720**	**150**	**400**	**550**

OUTLINE OF COURSE CURRICULUM

B.Optometry (Internship)

Semester VII & Semester VIII

Code No.	Core Subjects	Credits/Week				Hrs/Semester				
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.
	Sem VII (Internship)	-	-	-	720	-	-	-	720	**720**
	Sem VIII (Internship)				720				720	**720**
Total		**0**	**0**	**0**	**1440**	**0**	**0**	**0**	**1440**	**1440**

Name of the Programme	**B.Optometry**
Name of the Course	**Biostatistics and Research Methodology**
Course Code	**AEC 004 L**

Teaching Objective	• To enable students to present, analyze and interpret data. • To enable students to use concepts of probability in business situations. • To enable students to make inferences from samples drawn from large datasets. • To enable students to apply univariate and multivariate statistical techniques.
Learning Outcomes	• To understand the importance & Methodology for research • To learn in detail about sampling, probability and sampling distribution, significance tests correlation and regression, sample size determination, study design and multivariate analysis.

Sr. No.	Topics	No. of Hrs.
1	Introduction to research methods	5
2	Identifying research problem	5
3	Ethical issues in research	5
4	Research design	5
5	Basic Concepts of Biostatistics	5
6	Types of Data	5
7	Research tools and Data collection methods	5
8	Sampling methods	5
9	Developing a research proposal	5
Total		**45 hrs**

Text books:

(1) Mausner&bahn : Epidemiology-An Introductory text, 2nd Ed.,W.B.Saunders Co.
(2) Richard f. Morton & j. Richard hebd : A study guide to Epidemiology and Biostatistics, 2nd Ed., University Park Press, Baltimore.
(3) Sylvia W Smoller, J Smoller, Biostatistics & Epidemiology A Primer for health and Biomedical professionals, 4th edition, Springs, 2015

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

CHOICE BASED CREDIT SYSTEM (CBCS)

(With effect from 2018-19 Batches)

Curriculum for B.Sc. Allied Health Sciences

B.Sc. Cardiac Care Technology

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

Approved as per BOM –52/2018, [Resolution No. 3.10.1], Dated 13/01/2018
Approved as per BOM –53/2018, [Resolution No. 4.5.1], Dated 19/05/2018

OUTLINE OF COURSE CURRICULUM

B.Sc. Cardiac Care Technology

Semester I

Code No.	Core Subjects	Credits/Week				Hrs/Semester				Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Total hrs.	Internal Assessment	Semester Exam	Total
Theory												
BCCT 101 L	Human Anatomy Part I	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BCCT 102 L	Human Physiology Part I	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BCCT 103 L	General Biochemistry Nutrition	3	1	-	**4**	45	15	-	**60**	20	80	**100**
BCCT 104 L	Introduction to National Health Care System (Multidisciplinary/ Interdisciplinary)	3	-	-	**3**	45	-	-	**45**	20	80	**100**
Practical												
BCCT 101 P	Human Anatomy Part I	-	-	4	-	-	-	60	**60**	-	-	-
BCCT 102 P	Human Physiology Part I	-	-	4	-	-	-	60	**60**	-	-	-
BCCT 103 P	General Biochemistry	-	-	4	-	-	-	60	**60**	-	-	-
BCCT105 P	Community Orientation & Clinical Visit (Including related practicals to the Parent course)	-	-	8	-	-	-	120	**120**	-	-	-
Ability Enhancement Elective Course												
AEC 001 L	English & Communication skills	3	-	-	**3**	45	-	-	**45**	100	-	**100**
AEC 002 L	Envioronmental Sciences											
Total		**15**	**1**	**20**	**16**	**225**	**15**	**300**	**540**	**180**	**320**	**500**

OUTLINE OF COURSE CURRICULUM

B.Sc. Cardiac Care Technology

Semester II

Code No.	Core Subjects	Credits/Week				Hrs/Semester				Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Total hrs.	Internal Assessment	Semester Exam	Total
Theory												
BCCT 106 L	Human Anatomy Part II	2	-	-	**2**	30	-	-	**30**	10	40	**50**
BCCT 107 L	Human Physiology Part II	2	-	-	**2**	30	-	-	**30**	10	40	**50**
BCCT 108 L	General Microbiology	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BCCT 109 L	Basic Pathology & Hematology	3	1	-	**4**	45	15	-	**60**	20	80	**100**
BCCT 110 L	Introduction to Quality and Patient safety (Multidisciplinary/Interdisciplinary)	3	-	-	**3**	45	-	-	**45**	20	80	**100**
Practical												
BCCT 106 P	Human Anatomy Part II	-	-	4	-	-	-	60	**60**	-	-	-
BCCT 107 P	Human Physiology Part II	-	-	2	-	-	-	30	**30**	-	-	-
BCCT 108 P	General Microbiology	-	-	4	-	-	-	60	**60**	-	-	-
BCCT 109 P	Basic Pathology & Hematology	-	-	4	-	-	-	60	**60**	-	-	-
BCCT 111 P	Community Orientation & Clinical Visit (Including related practicals to the parent course)	-	-	8	-	-	-	120	**120**	-	-	-
Skill Enhancement Elective Course												
SEC 001 L	Medical Bioethics & IPR	3	-	-	**3**	45	-	-	**45**	100	-	**100**
SEC 002 L	Human Rights & Professional Values											
Total		**16**	**1**	**22**	**17**	**240**	**15**	**330**	**585**	**180**	**320**	**500**

OUTLINE OF COURSE CURRICULUM

B.Sc. Cardiac Care Technology

Semester III

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing /Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BCC T112 L	Applied Anatomy,Physiology, Pharmacology in Cardiac care	3	1	-	-	4	60	-	-	-	60	20	80	100
BCCT 113 L	Basic Electrocardiography	3	-	-	-	3	45	-	-	-	45	20	80	100
BCCT114 L	Basic Echocardiography	2	-	-	-	2	30	-	-	-	30	20	80	100
BCCT115 CP	CCT Directed Clinical Education-I	-	-	-	27	9	-	-		405	405	50	-	50
Practical														
BCCT113 P	Basic Electrocardiography	-	-	2	-	1	-	-	30	-	30	10	40	50
BCCT114 P	Basic Echocardiography	-	-	4	-	2	-	-	60	-	60	10	40	50
Generic Elective Course														
GEC 001 L	Pursuit of Inner Self Excellence (POIS)	3	-	-	-	3	45	-	-	-	45	100	-	100
GEC 002 L	Organisational Behaviour													
Total		11	1	6	27	24	180	0	90	405	675	230	320	550

OUTLINE OF COURSE CURRICULUM

B.Sc. Cardiac Care Technology

Semester IV

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing /Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BCCT 116 L	Development of Cardiovascular system : Fetal & Neonatal	2	1	-	-	3	45	-	-	-	45	20	80	100
BCCT 117 L	Cardiovascular diseases pertinent to Cardiac care technology	2	1	-	-	3	45	-	-	-	45	20	80	100
BCCT 118 L	Medical Instrumentation relevant to Cardiac care	1	1	-	-	2	30	-	-	-	30	20	80	100
BCCT 119 CP	CCT Directed Clinical Education-II	-	-	-	27	9	-	-	-	405	405	50	-	50
Practical														
BCCT 118 P	Medical Instrumentation relevant to Cardiac care	-	-	8	-	4	-	-	60	-	60	20	80	100
Ability Enhancement Elective Course														
AEC 003 L	Computer and Applications	3	-	-	-	3	45	-	-	-	45	100	-	100
AEC 004 L	Biostatistics and Research Methodology													
Total		8	3	8	27	24	165	0	60	405	630	230	320	550

OUTLINE OF COURSE CURRICULUM

B.Sc. Cardiac Care Technology

Semester V

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BCCT 120 L	Advanced Electrocardiography	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
BCCT 121 L	Advanced Echocardiography	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
BCCT 122 L	Invasive Cardiology	2	1	-	-	**3**	45	-	-	-	**45**	20	80	**100**
BCCT 123 CP	CCT Directed Clinical Education-III	-	-	-	24	**8**	-	-	-	360	**360**	50	-	**50**
Practical														
BCCT 120 P	Advanced Electrocardiography	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
BCCT 121 P	Advanced Echocardiography	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
Core Elective Course														
CEC 005 L	Basics of Clinical Skill Learning	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
CEC 006 L	Hospital Operation Management													
Total		**9**	**1**	**8**	**24**	**22**	**150**	**0**	**120**	**360**	**630**	**230**	**320**	**550**

OUTLINE OF COURSE CURRICULUM

B.Sc. Cardiac Care Technology

Semester VI

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BCCT 124 L	Cardiac Catheterization	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
BCCT 125 L	Pediatric Interventions	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
BCCT 126 L	CCT Directed Clinical Education-IV	-	-	-	30	**10**	-	-	-	450	**450**	50	-	**50**
Practical														
BCCT 124 P	Cardiac Catheterization	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
BCCT 125 P	Pediatric Interventions	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
Total		**4**	**0**	**8**	**30**	**18**	**60**	**0**	**120**	**450**	**630**	**110**	**240**	**350**

OUTLINE OF COURSE CURRICULUM

B.Sc. Cardiac Care Technology (Internship)

Semester VII & Semester VIII

Code No.	Core Subjects	Credits/Week				Hrs/Semester				
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/Rotation	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/Rotation	Total hrs.
	Sem VII (Internship)	-	-	-	720	-	-	-	720	**720**
	Sem VIII (Internship)				720				720	**720**
Total		**0**	**0**	**0**	**1440**	**0**	**0**	**0**	**1440**	**1440**

Name of the Programme	**B.Sc. Cardiac Care Technology**
Name of the Course	**Biostatistics and Research Methodology**
Course Code	**AEC 004 L**

Teaching Objective	• To enable students to present, analyze and interpret data. • To enable students to use concepts of probability in business situations. • To enable students to make inferences from samples drawn from large datasets. • To enable students to apply univariate and multivariate statistical techniques.
Learning Outcomes	• To understand the importance & Methodology for research • To learn in detail about sampling, probability and sampling distribution, significance tests correlation and regression, sample size determination, study design and multivariate analysis.

Sr. No.	Topics	No. of Hrs.
1	Introduction to research methods	5
2	Identifying research problem	5
3	Ethical issues in research	5
4	Research design	5
5	Basic Concepts of Biostatistics	5
6	Types of Data	5
7	Research tools and Data collection methods	5
8	Sampling methods	5
9	Developing a research proposal	5
Total		**45 hrs**

Text books:

(1) Mausner&bahn : Epidemiology-An Introductory text, 2nd Ed.,W.B.Saunders Co.
(2) Richard f. Morton & j. Richard hebd : A study guide to Epidemiology and Biostatistics, 2nd Ed., University Park Press, Baltimore.
(3) Sylvia W Smoller, J Smoller, Biostatistics & Epidemiology A Primer for health and Biomedical professionals, 4th edition, Springs, 2015

MGM INSTITUTE OF HEALTH SCIENCES

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

CHOICE BASED CREDIT SYSTEM (CBCS)

(With effect from 2018-19 Batches)

Curriculum for B.Sc. Allied Health Sciences

B.Sc. Medical Dialysis Technology

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

Approved as per BOM –52/2018, [Resolution No. 3.10.1], Dated 13/01/2018
Approved as per BOM –55/2018, [Resolution No. 4.4.1.1], Dated 27/11/2018

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Dialysis Technology

Semester I

Code No.	Core Subjects	Credits/Week				Hrs/Semester				Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Total hrs.	Internal Assessment	Semester Exam	Total
Theory												
BMDT 101 L	Human Anatomy Part I	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BMDT 102 L	Human Physiology Part I	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BMDT 103 L	General Biochemistry Nutrition	3	1	-	**4**	45	15	-	**60**	20	80	**100**
BMDT 104 L	Introduction to National Health Care System (Multidisciplinary/ Interdisciplinary)	3	-	-	**3**	45	-	-	**45**	20	80	**100**
Practical												
BMDT 101 P	Human Anatomy Part I	-	-	4		-	-	60	**60**	-	-	-
BMDT 102 P	Human Physiology Part I	-	-	4		-	-	60	**60**	-	-	-
BMDT 103 P	General Biochemistry	-	-	4		-	-	60	**60**	-	-	-
BMDT 105 P	Community Orientation & Clinical Visit (Including related practicals to the Parent course)	-	-	8		-	-	120	**120**	-	-	-
Ability Enhancement Elective Course												
AEC 001 L	English & Communication Skills	3	-	-	**3**	45	-	-	**45**	100	-	**100**
AEC 002 L	Envioronmental Sciences											
Total		**15**	**1**	**20**	**16**	**225**	**15**	**300**	**540**	**180**	**320**	**500**

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Dialysis Technology

Semester II

Code No.	Core Subjects	Credits/Week				Hrs/Semester				Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Total hrs.	Internal Assessment	Semester Exam	Total
Theory												
BMDT 106 L	Human Anatomy Part II	2	-	-	**2**	30	-	-	**30**	10	40	**50**
BMDT 107 L	Human Physiology Part II	2	-	-	**2**	30	-	-	**30**	10	40	**50**
BMDT 108 L	General Microbiology	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BMDT 109 L	Basic Pathology & Hematology	3	1	-	**4**	45	15	-	**60**	20	80	**100**
BMDT 110 L	Introduction to Quality and Patient safety (Multidisciplinary/Interdisciplinary)	3	-	-	**3**	45	-	-	**45**	20	80	**100**
Practical												
BMDT 106 P	Human Anatomy Part II	-	-	4		-	-	60	**60**	-	-	-
BMDT 107 P	Human Physiology Part II	-	-	2		-	-	30	**30**	-	-	-
BMDT 108 P	General Microbiology	-	-	4		-	-	60	**60**	-	-	-
BMDT 109 P	Basic Pathology & Hematology	-	-	4		-	-	60	**60**	-	-	-
BMDT 111 P	Community Orientation & Clinical Visit (Including related practicals to the parent course)	-	-	8		-	-	120	**120**	-	-	-
Skill Enhancement Elective Course												
SEC 001 L	Medical Bioethics & IPR	3	-	-	**3**	45	-	-	**45**	100	-	**100**
SEC 002 L	Human Rights & Professional Values											
Total		**16**	**1**	**22**	**17**	**240**	**15**	**330**	**585**	**180**	**320**	**500**

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Dialysis Technology

Semester III

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BMDT 112 L	Introduction To Dialysis	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
BMDT 113 L	Fundamentals of Dialysis	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
BMDT 114 L	Pharmacology in Dialysis	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
BMDT 115 CP	MDT Directed Clinical Education -I	-	-	-	24	**8**	-	-	-	360	**360**	50	-	50
Practical														
BMDT 112 P	Introduction To Dialysis	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
BMDT 113 P	Fundamentals of Dialysis	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
Generic Elective Course														
GEC 001 L	Pursuit of Inner Self Excellence (POIS)	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
GEC 002 L	Organisational Behaviour													
Total		**12**	**0**	**8**	**24**	**24**	**180**	**0**	**120**	**360**	**660**	**230**	**320**	**550**

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Dialysis Technology

Semester IV

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BMDT 116 L	Concept of Renal Disease & Disorders	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
BMDT 117 L	Nutrition in Dialysis	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
BMDT 118 CP	MDT Directed Clinical Education -II	-	-	-	30	**10**	-	-	-	450	**450**	50	-	50
Practical														
BMDT 116 P	Concept of Renal Disease & Disorders	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
BMDT 119	Seminar	-	-	-	-	**1**	-	-	-	-	-	**50**	-	**50**
Ability Enhancement Elective Course														
AEC 003 L	Computer and Applications	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
AEC 004 L	Biostatistics and Research Methodology													
Total		**10**	**0**	**2**	**30**	**22**	**150**	**0**	**30**	**450**	**630**	**250**	**200**	**450**

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Dialysis Technology

Semester V

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing /Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BMDT 120 L	Applied Dialysis Technology: Part – I	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
BMDT 121 L	Advance Dialysis Technology Part –1	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
BMDT 122 CP	MDT Directed Clinical Education-III	-	-	-	24	**8**	-	-	-	360	**360**	50	-	50
Practical														
BMDT 120 P	Applied Dialysis Technology: Part – 1	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
BDT 121 P	Advance Dialysis Technology Part –1	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
Core Elective Course														
CEC 005 L	Basics of Clinical Skill Learning	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
CEC 006 L	Hospital Operation Management													
Total		**11**	**0**	**8**	**24**	**23**	**165**	**0**	**120**	**360**	**645**	**210**	**240**	**450**

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Dialysis Technology

Semester VI

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BMDT 123 L	Applied Dialysis Technology - II	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
BMDT 124 L	Advance Dialysis Technology- II	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
BMDT 125 CP	MDT Directed Clinical Education -IV	-	-	-	30	**10**	-	-	-	450	**450**	50	-	50
Practical														
BDT 123 P	Applied Dialysis Technology - II	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
BDT 124 P	Advance Dialysis Technology - II	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
Total		**8**	**0**	**8**	**30**	**22**	**120**	**0**	**120**	**450**	**690**	**110**	**240**	**350**

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Dialysis Technology

Semester VII & Semester VIII

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
	Sem VII (Internship)	-	-	-	720	**16**	-	-	-	720	**720**		-	-
	Sem VIII (Internship)				720	**16**				720	**720**			
Total		**0**	**0**	**0**	**1440**	**32**	**0**	**0**	**0**	**1440**	**1440**	**0**	**0**	**0**

Name of the Programme	**B.Sc. Medical Dialysis Technology**
Name of the Course	**Biostatistics and Research Methodology**
Course Code	**AEC 004 L**

Teaching Objective	• To enable students to present, analyze and interpret data. • To enable students to use concepts of probability in business situations. • To enable students to make inferences from samples drawn from large datasets. • To enable students to apply univariate and multivariate statistical techniques.
Learning Outcomes	• To understand the importance & Methodology for research • To learn in detail about sampling, probability and sampling distribution, significance tests correlation and regression, sample size determination, study design and multivariate analysis.

Sr. No.	Topics	No. of Hrs.
1	Introduction to research methods	5
2	Identifying research problem	5
3	Ethical issues in research	5
4	Research design	5
5	Basic Concepts of Biostatistics	5
6	Types of Data	5
7	Research tools and Data collection methods	5
8	Sampling methods	5
9	Developing a research proposal	5
Total		**45 hrs**

Text books:

(1) Mausner&bahn : Epidemiology-An Introductory text, 2nd Ed.,W.B.Saunders Co.
(2) Richard f. Morton & j. Richard hebd : A study guide to Epidemiology and Biostatistics, 2nd Ed., University Park Press, Baltimore.
(3) Sylvia W Smoller, J Smoller, Biostatistics & Epidemiology A Primer for health and Biomedical professionals, 4th edition, Springs, 2015

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

CHOICE BASED CREDIT SYSTEM (CBCS)

(With effect from 2018-19 Batches)

Curriculum for B.Sc. Allied Health Sciences

B.Sc. Medical Laboratory Technology

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

Approved as per BOM –52/2018, [Resolution No. 3.10.1], Dated 13/01/2018
Approved as per BOM –53/2018, [Resolution No. 4.5.1], Dated 19/05/2018

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Laboratory Technology

Semester I

Code No.	Core Subjects	Credits/Week				Hrs/Semester				Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Total hrs.	Internal Assessment	Semester Exam	Total
Theory												
BMLT 101 L	Human Anatomy Part I	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BMLT 102 L	Human Physiology Part I	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BMLT 103 L	General Biochemistry Nutrition	3	1	-	**4**	45	15	-	**60**	20	80	**100**
BMLT 104 L	Introduction to National Health Care System (Multidisciplinary/ Interdisciplinary)	3	-	-	**3**	45	-	-	**45**	20	80	**100**
Practical												
BMLT 101 P	Human Anatomy Part I	-	-	4	-	-	-	60	**60**	-	-	-
BMLT 102 P	Human Physiology Part I	-	-	4	-	-	-	60	**60**	-	-	-
BMLT 103 P	General Biochemistry	-	-	4	-	-	-	60	**60**	-	-	-
BMLT 105 P	Community Orientation & Clinical Visit (Including related practicals to the Parent course)	-	-	8	-	-	-	120	**120**	-	-	-
Ability Enhancement Elective Course												
AEC 001 L	English & Communication skills	3	-	-	**3**	45	-	-	**45**	100	-	**100**
AEC 002 L	Envioronmental Sciences											
Total		**15**	**1**	**20**	**16**	**225**	**15**	**300**	**540**	**180**	**320**	**500**

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Laboratory Technology

Semester II

Code No.	Core Subjects	Credits/Week				Hrs/Semester				Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Total hrs.	Internal Assessment	Semester Exam	Total
Theory												
BMLT 106 L	Human Anatomy Part II	2	-	-	**2**	30	-	-	**30**	10	40	**50**
BMLT 107 L	Human Physiology Part II	2	-	-	**2**	30	-	-	**30**	10	40	**50**
BMLT 108 L	General Microbiology	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BMLT 109 L	Basic Pathology & Hematology	3	1	-	**4**	45	15	-	**60**	20	80	**100**
BMLT 110 L	Introduction to Quality and Patient safety (Multidisciplinary/Interdisciplinary)	3	-	-	**3**	45	-	-	**45**	20	80	**100**
Practical												
BMLT 106 P	Human Anatomy Part II	-	-	4	-	-	-	60	**60**	-	-	-
BMLT 107 P	Human Physiology Part II	-	-	2	-	-	-	30	**30**	-	-	-
BMLT 108 P	General Microbiology	-	-	4	-	-	-	60	**60**	-	-	-
BMLT 109 P	Basic Pathology & Hematology	-	-	4	-	-	-	60	**60**	-	-	-
BMLT 111 P	Community Orientation & Clinical Visit (Including related practicals to the parent course)	-	-	8	-	-	-	120	**120**	-	-	-
Skill Enhancement Elective Course												
SEC 001 L	Medical Bioethics & IPR	3	-	-	**3**	45	-	-	**45**	100	-	**100**
SEC 002 L	Human Rights & Professional Values											
Total		**16**	**1**	**22**	**17**	**240**	**15**	**330**	**585**	**180**	**320**	**500**

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Laboratory Technology

Semester III

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BMLT 112 L	Fundamental of Biochemistry - I	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
BMLT 113 L	Fundamentals of Microbiology-I	2	1	-	-	**3**	30	15	-	-	**45**	20	80	**100**
BMLT 114 L	Hematology and Clinical Pathology - I	2	1	-	-	**3**	30	15	-	-	**45**	20	80	**100**
BMLT 115 CP	MLT Directed Clinical Education -I	-	-	-	30	**10**	-	-	-	450	**450**	50	-	**50**
Practical														
BMLT 112 P	Fundamental of Biochemistry - I	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
BMLT 113 P	Fundamentals of Microbiology-I	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
BMLT 114 P	Hematology and Clinical Pathology - I	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
Generic Elective Course														
GEC 001 L	Pursuit of Inner Self Excellence (POIS)	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
GEC 002 L	Organisational Behaviour													
Total		**9**	**2**	**6**	**30**	**24**	**135**	**30**	**90**	**450**	**705**	**240**	**360**	**600**

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Laboratory Technology

Semester IV

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BMLT 116 L	Fundamental of Biochemistry - II	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
BMLT 117 L	Fundamentals of Microbiology-II	2	1	-	-	**3**	30	15	-	-	**45**	20	80	**100**
BMLT 118 L	Hematology and Clinical Pathology - II	2	1	-	-	**3**	30	15	-	-	**45**	20	80	**100**
BMLT 119 CP	MLT Directed Clinical Education -II	-	-	-	30	**10**	-	-	-	450	**450**	50	-	**50**
Practical														
BMLT 116 P	Fundamental of Biochemistry - II	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
BMLT 117 P	Fundamentals of Microbiology-II	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
BMLT 118 P	Hematology and Clinical Pathology - II	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
Ability Enhancement Elective Course														
AEC 003 L	Computer and Applications	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
AEC 004 L	Biostatistics and Research Methodology													
Total		**9**	**2**	**6**	**30**	**24**	**135**	**30**	**90**	**450**	**705**	**240**	**360**	**600**

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Laboratory Technology

Semester V

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing /Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BMLT 120 L	Clinical Biochemistry - I	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
BMLT 121 L	Medical Microbiology-I	2	1	-	-	**3**	30	15	-	-	**45**	20	80	**100**
BMLT 122 L	Blood Bank and General Pathology - I	2	1	-	-	**3**	30	15	-	-	**45**	20	80	**100**
BMLT 123 CP	MLT Directed Clinical Education-III	-	-	-	30	**10**	-	-	-	450	**450**	50	-	50
Practical														
BMLT 120 P	Clinical Biochemistry - I	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
BMLT 121 P	Medical Microbiology-I	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
BMLT 122 P	Blood Bank and General Pathology - I	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
Core Elective Course														
CEC 005 L	Basics of Clinical Skill Learning	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
CEC 006 L	Hospital Operation Management													
Total		**9**	**2**	**6**	**30**	**24**	**135**	**30**	**90**	**450**	**705**	**240**	**360**	**600**

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Laboratory Technology

Semester VI

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BMLT 124 L	Clinical Biochemistry - II	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
BMLT 125 L	Medical Microbiology-II	2	1	-	-	**3**	30	15	-	-	**45**	20	80	**100**
BMLT 126 L	Blood Bank and General Pathology - II	2	1	-	-	**3**	30	15	-	-	**45**	20	80	**100**
BMLT 127 CP	MLT Directed Clinical Education -IV	-	-	-	30	**10**	-	-	-	450	**450**	50	-	**50**
Practical														
BMLT 124 P	Clinical Biochemistry - II	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
BMLT 125 P	Medical Microbiology-II	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
BMLT 126 P	Blood Bank and General Pathology - II	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
Total		**6**	**2**	**6**	**30**	**21**	**90**	**30**	**90**	**450**	**660**	**140**	**360**	**500**

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Laboratory Technology (Internship)

Semester VII & Semester VIII

Code No.	Core Subjects	Credits/Week				Hrs/Semester				
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/Rotation	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/Rotation	Total hrs.
	Sem VII (Internship)	-	-	-	720	-	-	-	720	**720**
	Sem VIII (Internship)				720				720	**720**
Total		**0**	**0**	**0**	**1440**	**0**	**0**	**0**	**1440**	**1440**

Name of the Programme	**B.Sc. Medical Laboratory Technology**
Name of the Course	**Biostatistics and Research Methodology**
Course Code	**AEC 004 L**

Teaching Objective	• To enable students to present, analyze and interpret data. • To enable students to use concepts of probability in business situations. • To enable students to make inferences from samples drawn from large datasets. • To enable students to apply univariate and multivariate statistical techniques.
Learning Outcomes	• To understand the importance & Methodology for research • To learn in detail about sampling, probability and sampling distribution, significance tests correlation and regression, sample size determination, study design and multivariate analysis.

Sr. No.	Topics	No. of Hrs.
1	Introduction to research methods	5
2	Identifying research problem	5
3	Ethical issues in research	5
4	Research design	5
5	Basic Concepts of Biostatistics	5
6	Types of Data	5
7	Research tools and Data collection methods	5
8	Sampling methods	5
9	Developing a research proposal	5
Total		**45 hrs**

Text books:

(1) Mausner & bahn : Epidemiology-An Introductory text, 2nd Ed.,W.B.Saunders Co.
(2) Richard f. Morton & j. Richard hebd : A study guide to Epidemiology and Biostatistics, 2nd Ed., University Park Press, Baltimore.
(3) Sylvia W Smoller, J Smoller, Biostatistics & Epidemiology A Primer for health and Biomedical professionals, 4th edition, Springs, 2015

MGM INSTITUTE OF HEALTH SCIENCES

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

CHOICE BASED CREDIT SYSTEM (CBCS)

(With effect from 2018-19 Batches)

Curriculum for B.Sc. Allied Health Sciences

B.Sc. Medical Radiology & Imaging Technology

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

Approved as per BOM –52/2018, [Resolution No. 3.10.1], Dated 13/01/2018
Approved as per BOM –53/2018, [Resolution No. 4.5.1], Dated 19/05/2018

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Radiology and Imaging Technology

Semester I

Code No.	Core Subjects	Credits/Week				Hrs/Semester				Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Total hrs.	Internal Assessment	Semester Exam	Total
Theory												
BMRIT 101 L	Human Anatomy Part I	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BMRIT 102 L	Human Physiology Part I	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BMRIT 103 L	General Biochemistry Nutrition	3	1	-	**4**	45	15	-	**60**	20	80	**100**
BMRIT 104 L	Introduction to National Health Care System (Multidisciplinary/ Interdisciplinary)	3	-	-	**3**	45	-	-	**45**	20	80	**100**
Practical												
BMRIT 101 P	Human Anatomy Part I	-	-	4	-	-	-	60	**60**	-	-	-
BMRIT 102 P	Human Physiology Part I	-	-	4	-	-	-	60	**60**	-	-	-
BMRIT 103 P	General Biochemistry	-	-	4	-	-	-	60	**60**	-	-	-
BMRIT 105 P	Community Orientation & Clinical Visit (Including related practicals to the Parent course)	-	-	8	-	-	-	120	**120**	-	-	-
Ability Enhancement Elective Course												
AEC 001 L	English & Communication skills	3	-	-	**3**	45	-	-	**45**	100	-	**100**
AEC 002 L	Envioronmental Sciences											
Total		**15**	**1**	**20**	**16**	**225**	**15**	**300**	**540**	**180**	**320**	**500**

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Radiology and Imaging Technology

Semester II

Code No.	Core Subjects	Credits/Week				Hrs/Semester				Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Total hrs.	Internal Assessment	Semester Exam	Total
Theory												
BMRIT 106 L	Human Anatomy Part II	2	-	-	**2**	30	-	-	**30**	10	40	**50**
BMRIT 107 L	Human Physiology Part II	2	-	-	**2**	30	-	-	**30**	10	40	**50**
BMRIT 108 L	General Microbiology	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BMRIT 109 L	Basic Pathology & Hematology	3	1	-	**4**	45	15	-	**60**	20	80	**100**
BMRIT 110 L	Introduction to Quality and Patient safety (Multidisciplinary/Interdisciplinary)	3	-	-	**3**	45	-	-	**45**	20	80	**100**
Practical												
BMRIT 106 P	Human Anatomy Part II	-	-	4	-	-	-	60	**60**	-	-	-
BMRIT 107 P	Human Physiology Part II	-	-	2	-	-	-	30	**30**	-	-	-
BMRIT 108 P	General Microbiology	-	-	4	-	-	-	60	**60**	-	-	-
BMRIT 109 P	Basic Pathology & Hematology	-	-	4	-	-	-	60	**60**	-	-	-
BMIT 111 P	Community Orientation & Clinical Visit (Including related practicals to the parent course)	-	-	8	-	-	-	120	**120**	-	-	-
Skill Enhancement Elective Course												
SEC 001 L	Medical Bioethics & IPR	3	-	-	**3**	45	-	-	**45**	100	-	**100**
SEC 002 L	Human Rights & Professional Values											
Total		**16**	**1**	**22**	**17**	**240**	**15**	**330**	**585**	**180**	**320**	**500**

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Radiology and Imaging Technology

Semester III

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BMRIT 112 L	Physics for Medical Imaging - 1	3	1	-	-	4	45	15	-	-	60	20	80	100
BMRIT 113 L	Radiographic Techniques - 1	3	-	-	-	3	45	-	-	-	45	20	80	100
BMRIT 114 L	Dark Room Techniques	3	-	-	-	3	45	-	-	-	45	20	80	100
BMRIT 115 CP	MRIT Directed Clinical Education - 1	-	-	-	21	7	-	-		315	315	50	-	50
Practical														
BMRIT 112 P	Physics for Medical Imaging - 1	-	-	4	-	2	-	-	60	-	60	10	40	50
BMRIT 113 P	Radiographic Techniques - 1	-	-	4	-	2	-	-	60	-	60	10	40	50
Generic Elective Course														
GEC 001 L	Pursuit of Inner Self Excellence (POIS)	3	-	-	-	3	45	-	-	-	45	100	-	100
GEC 002 L	Organisational Behaviour													
Total		12	1	8	21	24	180	15	120	315	630	230	320	550

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Radiology and Imaging Technology

Semester IV

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing /Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BMRIT 116 L	Physics for Medical Imaging - 2	3	1	-	-	4	45	15	-	-	60	20	80	100
BMRIT 117 L	Radiographic Techniques - 2	3	-	-	-	3	45	-	-	-	45	20	80	100
BMRIT 118 L	Digital Imaging	3	-	-	-	3	45	-	-	-	45	20	80	100
BMRIT 119 CP	MRIT Directed Clinical Education - 2	-	-	-	21	7	-	-	-	315	315	50	-	50
Practical														
BMRIT 116 P	Physics for Medical Imaging - 2	-	-	4	-	2	-	-	60	-	60	10	40	50
BMRIT 117 P	Radiographic Techniques - 2	-	-	4	-	2	-	-	60	-	60	10	40	50
Ability Enhancement Elective Course														
AEC 003 L	Computer and Applications	3	-	-	-	3	45	-	-	-	45	100	-	100
AEC 004 L	Biostatistics and Research Methodology													
Total		12	1	8	21	24	180	15	120	315	630	230	320	550

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Radiology and Imaging Technology

Semester V

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BMRIT 120 L	Advanced Radiographic Techniques	3	1	-	-	4	45	15	-	-	60	20	80	100
BMRIT 121 L	Equipment for Medical Imaging	4	-	-	-	4	60	-	-	-	60	20	80	100
BMRIT 122 L	Special Procedures in Medical Imaging	3	-	-	-	3	45	-	-	-	45	20	80	100
BMRIT 123 CP	MRIT Directed Clinical Education - 3	-	-	-	30	10	-	-	-	450	450	50	-	50
Practical														
BMRIT 120 P	Advanced Radiographic Techniques	-	-	4	-	2	-	-	60	-	60	10	40	50
BMRIT 121 P	Equipment for Medical Imaging	-	-	4	-	2	-	-	60	-	60	10	40	50
Core Elective Course														
CEC 005 L	Basics of Clinical Skill Learning	3	-	-	-	3	45	-	-	-	45	100	-	100
CEC 006 L	Hospital Operation Management													
Total		13	1	8	30	28	195	15	120	450	780	230	320	550

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Radiology and Imaging Technology

Semester VI

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BMRIT 124 L	Quality Assurance in Medical Imaging	3	1	-	-	4	45	15	-	-	60	20	80	100
BMRIT 125 L	Modern Technologies in Imaging	4	-	-	-	4	60	-	-	-	60	20	80	100
BMRIT 126 L	Protection	3	-	-	-	3	45	-	-	-	45	20	80	100
BMRIT 127 CP	MRIT Directed Clinical Education - 4	-	-	-	30	10	-	-	-	450	450	50	-	50
Practical														
BMRIT 124 P	Quality Assurance in Medical Imaging	-	-	4	-	2	-	-	60	-	60	10	40	50
BMRIT 125 P	Modern Technologies in Imaging	-	-	4	-	2	-	-	60	-	60	10	40	50
Total		10	1	8	30	25	150	15	120	450	735	130	320	450

OUTLINE OF COURSE CURRICULUM

B.Sc. Medical Radiology and Imaging Technology (Internship)

Semester VII & Semester VIII

Code No.	Core Subjects	Credits/Week				Hrs/Semester				
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.
	Sem VII (Internship)	-	-	-	720	-	-	-	720	720
	Sem VIII (Internship)				720				720	720
Total		0	0	0	1440	0	0	0	1440	1440

Name of the Programme	**B.Sc. Medical Radiology and Imaging Technology**
Name of the Course	**Biostatistics and Research Methodology**
Course Code	**AEC 004 L**

Teaching Objective	• To enable students to present, analyze and interpret data. • To enable students to use concepts of probability in business situations. • To enable students to make inferences from samples drawn from large datasets. • To enable students to apply univariate and multivariate statistical techniques.
Learning Outcomes	• To understand the importance & Methodology for research • To learn in detail about sampling, probability and sampling distribution, significance tests correlation and regression, sample size determination, study design and multivariate analysis.

Sr. No.	Topics	No. of Hrs.
1	Introduction to research methods	5
2	Identifying research problem	5
3	Ethical issues in research	5
4	Research design	5
5	Basic Concepts of Biostatistics	5
6	Types of Data	5
7	Research tools and Data collection methods	5
8	Sampling methods	5
9	Developing a research proposal	5
Total		**45 hrs**

Text books:

(1) Mausner & bahn : Epidemiology-An Introductory text, 2nd Ed.,W.B.Saunders Co.
(2) Richard f. Morton & j. Richard hebd : A study guide to Epidemiology and Biostatistics, 2nd Ed., University Park Press, Baltimore.
(3) Sylvia W Smoller, J Smoller, Biostatistics & Epidemiology A Primer for health and Biomedical professionals, 4th edition, Springs, 2015

MGM INSTITUTE OF HEALTH SCIENCES

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

CHOICE BASED CREDIT SYSTEM (CBCS)

(With effect from 2018-19 Batches)

Curriculum for B.Sc. Allied Health Sciences

B.Sc. Operation Theater & Anesthesia Technology

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

Approved as per BOM –52/2018, [Resolution No. 3.10.1], Dated 13/01/2018
Approved as per BOM –53/2018, [Resolution No. 4.5.1], Dated 19/05/2018

OUTLINE OF COURSE CURRICULUM

B.Sc. Operation Theatre and Anaesthesia Technology

Semester I

Code No.	Core Subjects	Credits/Week				Hrs/Semester				Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Total hrs.	Internal Assessment	Semester Exam	Total
Theory												
BATOT 101 L	Human Anatomy Part I	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BATOT 102 L	Human Physiology Part I	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BATOT 103 L	General Biochemistry Nutrition	3	1	-	**4**	45	15	-	**60**	20	80	**100**
BATOT 104 L	Introduction to National Health Care System (Multidisciplinary/ Interdisciplinary)	3	-	-	**3**	45	-	-	**45**	20	80	**100**
Practical												
BATOT 101 P	Human Anatomy Part I	-	-	4	-	-	-	60	**60**	-	-	-
BATOT 102 P	Human Physiology Part I	-	-	4	-	-	-	60	**60**	-	-	-
BATOT 103 P	General Biochemistry	-	-	4	-	-	-	60	**60**	-	-	-
BATOT105 P	Community Orientation & Clinical Visit (Including related practicals to the Parent course)	-	-	8	-	-	-	120	**120**	-	-	-
Ability Enhancement Elective Course												
AEC 001 L	English & Communication skills	3	-	-	**3**	45	-	-	**45**	100	-	**100**
AEC 002 L	Envioronmental Sciences											
Total		**15**	**1**	**20**	**16**	**225**	**15**	**300**	**540**	**180**	**320**	**500**

OUTLINE OF COURSE CURRICULUM

B.Sc. Operation Theatre and Anaesthesia Technology

Semester II

Code No.	Core Subjects	Credits/Week				Hrs/Semester				Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Total hrs.	Internal Assessment	Semester Exam	Total
Theory												
BATOT 106 L	Human Anatomy Part II	2	-	-	**2**	30	-	-	**30**	10	40	**50**
BATOT 107 L	Human Physiology Part II	2	-	-	**2**	30	-	-	**30**	10	40	**50**
BATOT 108 L	General Microbiology	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BATOT 109 L	Basic Pathology & Hematology	3	1	-	**4**	45	15	-	**60**	20	80	**100**
BATOT 110 L	Introduction to Quality and Patient safety (Multidisciplinary/Interdisciplinary)	3	-	-	**3**	45	-	-	**45**	20	80	**100**
Practical												
BATOT 106 P	Human Anatomy Part II	-	-	4	-	-	-	60	**60**	-	-	-
BATOT 107 P	Human Physiology Part II	-	-	2	-	-	-	30	**30**	-	-	-
BATOT 108 P	General Microbiology	-	-	4	-	-	-	60	**60**	-	-	-
BATOT 109 P	Basic Pathology & Hematology	-	-	4	-	-	-	60	**60**	-	-	-
BATOT 111 P	Community Orientation & Clinical Visit (Including related practicals to the parent course)	-	-	8	-	-	-	120	**120**	-	-	-
Skill Enhancement Elective Course												
SEC 001 L	Medical Bioethics & IPR	3	-	-	**3**	45	-	-	**45**	100	-	**100**
SEC 002 L	Human Rights & Professional Values											
Total		**16**	**1**	**22**	**17**	**240**	**15**	**330**	**585**	**180**	**320**	**500**

OUTLINE OF COURSE CURRICULUM

B.Sc. Operation Theatre and Anaesthesia Technology

Semester III

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing /Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BATOT 112 L	Introduction To Operation Theatre Technology (OT)	2	1	-	-	**3**	30	15	-	-	**45**	20	80	**100**
BATOT 113 L	Introduction To Anesthesia Technology (AT)	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
BATOT 114 L	Principles of Anesthesia	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
BATO T115 CP	ATOT Directed Clinical Education-I	-	-	-	27	**9**	-	-	-	405	**405**	50	-	**50**
Practical														
BATOT 112 P	Introduction To Operation Theatre Technology (OT)	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
BATOT 113 P	Introduction To Anesthesia Technology (AT)	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
Generic Elective Course														
GEC 001 L	Pursuit of Inner Self Excellence (POIS)	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
GEC 002 L	Organisational Behaviour													
Total		**11**	**1**	**8**	**27**	**25**	**165**	**15**	**120**	**405**	**705**	**230**	**320**	**550**

OUTLINE OF COURSE CURRICULUM

B.Sc. Operation Theatre and Anaesthesia Technology

Semester IV

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing /Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BATOT 116 L	Basic techniques of Anesthesia	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
BATOT 117 L	Medical diseases influencing choice of Anesthesia	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
BATOT 118 L	Medicine relevant to OT technology	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
BATOT 119 CP	ATOT Directed Clinical Education-II	-	-	-	30	**10**	-	-	-	450	**450**	50	-	**50**
Practical														
BATOT 116 P	Basic techniques of Anesthesia	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
Ability Enhancement Elective Course														
AEC 003 L	Computer and Applications	3	-	-	-	**3**	45	-	-	-	**60**	100	-	**100**
AEC 004 L	Biostatistics and Research Methodology													
Total		**11**	**0**	**4**	**30**	**23**	**165**	**0**	**60**	**450**	**690**	**220**	**280**	**500**

OUTLINE OF COURSE CURRICULUM

B.Sc. Operation Theatre and Anaesthesia Technology

Semester V

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BATOT 120 L	Basics of Surgical Procedures	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
BATOT 121 L	CSSD Procedures	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
BATOT 122 L	Advance Anesthetic Techniques	2	1	-	-	**3**	45	-	-	-	**45**	20	80	**100**
BATOT 123 CP	ATOT Directed Clinical Education-III	-	-	-	30	**10**	-	-	-	450	**450**	50	-	**50**
Practical														
BATOT 120 P	Basics of Surgical Procedures	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
BATOT 122 P	Advance Anesthetic Techniques	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
Core Elective Course														
CEC 005 L	Basics of Clinical Skill Learning	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
CEC 006 L	Hospital Operation Management													
Total		**9**	**1**	**8**	**30**	**24**	**150**	**0**	**120**	**450**	**720**	**230**	**320**	**550**

OUTLINE OF COURSE CURRICULUM

B.Sc. Operation Theatre and Anaesthesia Technology

Semester VI

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BATOT 124 L	Basic Intensive Care	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
BATOT 125 L	Specialized Surgery and Anesthesia	4	-	-	-	**2**	60	-	-	-	**60**	20	80	**100**
BATOT 126 L	Electronics and technology in Surgery and Anesthesia	2	1	-	-	**3**	30	15	-	-	**45**	20	80	**100**
BATOT 127 CP	ATOT Directed Clinical Education-IV	-	-	-	45	**15**	-	-	-	675	**675**	50	-	50
Total		**8**	**1**	**0**	**45**	**22**	**120**	**15**	**0**	**675**	**810**	**110**	**240**	**350**

OUTLINE OF COURSE CURRICULUM

B.Sc. Operation Theatre and Anaesthesia Technology

Semester VII & Semester VIII

Code No.	Core Subjects	Credits/Week				Hrs/Semester				
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/Rotation	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/Rotation	Total hrs.
	Sem VII (Internship)	-	-	-	720	-	-	-	720	**720**
	Sem VIII (Internship)				720				720	**720**
Total		**0**	**0**	**0**	**1440**	**0**	**0**	**0**	**1440**	**1440**

Name of the Programme	**B.Sc. Operation Theatre & Anaesthesia Technology**
Name of the Course	**Biostatistics and Research Methodology**
Course Code	**AEC 004 L**

Teaching Objective	• To enable students to present, analyze and interpret data. • To enable students to use concepts of probability in business situations. • To enable students to make inferences from samples drawn from large datasets. • To enable students to apply univariate and multivariate statistical techniques.
Learning Outcomes	• To understand the importance & Methodology for research • To learn in detail about sampling, probability and sampling distribution, significance tests correlation and regression, sample size determination, study design and multivariate analysis.

Sr. No.	Topics	No. of Hrs.
1	Introduction to research methods	5
2	Identifying research problem	5
3	Ethical issues in research	5
4	Research design	5
5	Basic Concepts of Biostatistics	5
6	Types of Data	5
7	Research tools and Data collection methods	5
8	Sampling methods	5
9	Developing a research proposal	5
Total		**45 hrs**

Text books:

(1) Mausner & bahn : Epidemiology-An Introductory text, 2nd Ed.,W.B.Saunders Co.
(2) Richard f. Morton & j. Richard hebd : A study guide to Epidemiology and Biostatistics, 2nd Ed., University Park Press, Baltimore.
(3) Sylvia W Smoller, J Smoller, Biostatistics & Epidemiology A Primer for health and Biomedical professionals, 4th edition, Springs, 2015

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

CHOICE BASED CREDIT SYSTEM (CBCS)

(With effect from 2018-19 Batches)

Curriculum for B.Sc. Allied Health Sciences

B.Sc. B.Sc. Perfusion Technology

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

Approved as per BOM –52/2018, [Resolution No. 3.10.1], Dated 13/01/2018
Approved as per BOM –55/2018, [Resolution No. 4.4.1.1], Dated 27/11/2018

OUTLINE OF COURSE CURRICULUM

B.Sc. Perfusion Technology

Semester I

Code No.	Core Subjects	Credits/Week				Hrs/Semester				Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Total hrs.	Internal Assessment	Semester Exam	Total
Theory												
BPT 101 L	Human Anatomy Part I	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BPT 102 L	Human Physiology Part I	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BPT 103 L	General Biochemistry Nutrition	3	1	-	**4**	45	15	-	**60**	20	80	**100**
BPT 104 L	Introduction to National Health Care System (Multidisciplinary/ Interdisciplinary)	3	-	-	**3**	45	-	-	**45**	20	80	**100**
Practical												
BPT 101 P	Human Anatomy Part I	-	-	4		-	-	60	**60**	-	-	-
BPT 102 P	Human Physiology Part I	-	-	4		-	-	60	**60**	-	-	-
BPT 103 P	General Biochemistry	-	-	4		-	-	60	**60**	-	-	-
BPT 105 P	Community Orientation & Clinical Visit (Including related practicals to the Parent course)	-	-	8		-	-	120	**120**	-	-	-
Ability Enhancement Elective Course												
AEC 001 L	English & Communication Skills	3	-	-	**3**	45	-	-	**45**	100	-	**100**
AEC 002 L	Envioronmental Sciences											
Total		**15**	**1**	**20**	**16**	**225**	**15**	**300**	**540**	**180**	**320**	**500**

OUTLINE OF COURSE CURRICULUM

B.Sc. Perfusion Technology

Semester II

Code No.	Core Subjects	Credits/Week				Hrs/Semester				Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Total hrs.	Internal Assessment	Semester Exam	Total
Theory												
BPT 106 L	Human Anatomy Part II	2	-	-	**2**	30	-	-	**30**	10	40	**50**
BPT 107 L	Human Physiology Part II	2	-	-	**2**	30	-	-	**30**	10	40	**50**
BPT 108 L	General Microbiology	3	-	-	**3**	45	-	-	**45**	20	80	**100**
BPT 109 L	Basic Pathology & Hematology	3	1	-	**4**	45	15	-	**60**	20	80	**100**
BPT 110 L	Introduction to Quality and Patient safety (Multidisciplinary/Interdisciplinary)	3	-	-	**3**	45	-	-	**45**	20	80	**100**
Practical												
BPT 106 P	Human Anatomy Part II	-	-	4		-	-	60	**60**	-	-	-
BPT 107 P	Human Physiology Part II	-	-	2		-	-	30	**30**	-	-	-
BPT 108 P	General Microbiology	-	-	4		-	-	60	**60**	-	-	-
BPT 109 P	Basic Pathology & Hematology	-	-	4		-	-	60	**60**	-	-	-
BPT 111 P	Community Orientation & Clinical Visit (Including related practicals to the parent course)	-	-	8		-	-	120	**120**	-	-	-
Skill Enhancement Elective Course												
SEC 001 L	Medical Bioethics & IPR	3	-	-	**3**	45	-	-	**45**	100	-	**100**
SEC 002 L	Human Rights & Professional Values											
Total		**16**	**1**	**22**	**17**	**240**	**15**	**330**	**585**	**180**	**320**	**500**

B.Sc. Allied Health Sciences

DIRECTOR'S DESK

OUTLINE OF COURSE CURRICULUM

B.Sc. Perfusion Technology

Semester III

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posting /Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posting/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BPT 112 L	Applied Pharmacology	3	1	-	-	**4**	45	15	-	-	**60**	20	80	**100**
BPT 113 L	Applied Anatomy and Physiology of Cardiovascular system related to PT	3	1	-	-	**4**	45	15	-	-	**60**	20	80	**100**
BPT 114 L	Basics of Perfusion Technology	2	1	-	-	**3**	30	15	-	-	**45**	20	80	**100**
BPT 115 CP	PT Directed Clinical Education-III	-	-	-	24	**8**	-	-		360	**360**	50	-	**50**
Practicals														
BPT 113 P	Applied Anatomy and Physiology of Cardiovascular system related to PT	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
BPT 114 P	Basics of Perfusion Technology	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
Generic Elective Course														
GEC 001 L	Pursuit of Inner Self Excellence (POIS)	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
GEC 002 L	Organisational Behaviour													
Total		**11**	**3**	**8**	**24**	**26**	**165**	**45**	**120**	**360**	**690**	**230**	**320**	**550**

OUTLINE OF COURSE CURRICULUM

B.Sc. Perfusion Technology

Semester IV

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing /Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BPT 116 L	Applied Physiology and Biochemistry	2	1	-	-	**3**	30	15	-	-	**45**	20	80	**100**
BPT 117 L	Introduction of Perfusion Techniques	2	1	-	-	**3**	30	15		-	**45**	20	80	**100**
BPT 118 CP	PT Directed Clinical Education-IV	-	-	-	30	**10**	-	-		450	**450**	50	-	**50**
Practicals														
BPT 116 P	Applied Physiology and Biochemistry	-	-	4	-	**2**	-	-	60	-	60	10	40	**50**
BPT 117 P	Introduction of Perfusion Techniques	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
Ability Enhancement Elective Course														
AEC 003 L	Computer and Applications	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
AEC 004 L	Biostats and Research Methodology													
Total		**7**	**2**	**8**	**30**	**23**	**105**	**30**	**120**	**450**	**225**	**210**	**240**	**450**

OUTLINE OF COURSE CURRICULUM

B.Sc. Perfusion Technology

Semester V

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing /Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BPT 119 L	Perfusion Technology: Clinical	3	1	-	-	**4**	45	15	-	-	**60**	20	80	**100**
BPT 120 L	Perfusion technology: Applied	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
BPT 121 CP	PT Directed Clinical Education-V	-	-	-	30	**10**	-	-		450	**100**	50	-	**50**
Practicals														
BPT 119 P	Perfusion Technology: Clinical	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
BPT 120 P	Perfusion Technology: Applied	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
Core Elective Course														
CEC 005 L	Basics of Clinical Skills Learning	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
CEC 006 L	Hospital Operation Management													
Total		**9**	**1**	**8**	**30**	**24**	**135**	**15**	**120**	**450**	**265**	**210**	**240**	**450**

OUTLINE OF COURSE CURRICULUM

B.Sc. Perfusion Technology

Semester VI

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing /Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
BPT 122 L	Perfusion technology: Advanced	3	1	-	-	**4**	45	15	-	-	**60**	20	80	**100**
BPT 123 L	Recent advances in Cardiopulmonary bypass & Perfusion	2	1	-	-	**3**	30	15	-	-	**45**	20	80	**100**
BPT 124 CP	PT Directed Clinical Education-VI	-	-	-	30	**10**	-	-		450	**450**	50	-	**50**
Practicals														
BPT 122 P	Perfusion technology: Advanced			4	-	**2**	-	-	60	-	**60**	10	40	**50**
Total		**5**	**2**	**4**	**30**	**19**	**75**	**30**	**60**	**450**	**165**	**100**	**200**	**300**

OUTLINE OF COURSE CURRICULUM

B.Sc. Perfusion Technology

Semester VII & Semester VIII

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
	PT Internship	-	-	-	96	**32**	-	-	-	1440	**1440**	-	-	-
Total		**0**	**0**	**0**	**96**	**32**	**0**	**0**	**0**	**1440**	**1440**	**0**	**0**	**0**

Name of the Programme	B.Sc. Perfusion Technology
Name of the Course	Biostatistics and Research Methodology
Course Code	AEC 004 L

Teaching Objective	• To enable students to present, analyze and interpret data. • To enable students to use concepts of probability in business situations. • To enable students to make inferences from samples drawn from large datasets. • To enable students to apply univariate and multivariate statistical techniques.
Learning Outcomes	• To understand the importance & Methodology for research • To learn in detail about sampling, probability and sampling distribution, significance tests correlation and regression, sample size determination, study design and multivariate analysis.

Sr. No.	Topics	No. of Hrs.
1	Introduction to research methods	5
2	Identifying research problem	5
3	Ethical issues in research	5
4	Research design	5
5	Basic Concepts of Biostatistics	5
6	Types of Data	5
7	Research tools and Data collection methods	5
8	Sampling methods	5
9	Developing a research proposal	5
Total		**45 hrs**

Text books:

(1) Mausner & bahn : Epidemiology-An Introductory text, 2nd Ed.,W.B.Saunders Co.
(2) Richard f. Morton & j. Richard hebd : A study guide to Epidemiology and Biostatistics, 2nd Ed., University Park Press, Baltimore.
(3) Sylvia W Smoller, J Smoller, Biostatistics & Epidemiology A Primer for health and Biomedical professionals, 4th edition, Springs, 2015

MGM INSTITUTE OF HEALTH SCIENCES

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

CHOICE BASED CREDIT SYSTEM (CBCS)

(With effect from 2018-19 Batches)

Curriculum for M. Optometry

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

Approved as per BOM –53/2018, [Resolution No. 4.5.2], Dated 19/05/2018
Approved as per BOM –55/2018, [Resolution No. 4.4.1.2], Dated 27/11/2018

OUTLINE OF COURSE CURRICULUM

M.Optometry

Semester I

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
MOPTOM 101 L	Epidemiology Public health & Community Eye Health	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
MOPTOM 102 L	Ocular Diseases	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
MOPTOM 103 L	Anterior Segment Dignostic	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
MOPTOM 104 CP	Optometry Directed Clinical Education-I	-	-	-	21	**7**	-	-	-	**315**	**315**	50	-	**50**
Practical														
MOPTOM 101 P	Epidemiology Public health & Community Eye Health	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
MOPTOM 103 P	Anterior Segment Diagnostic	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
Total		**10**	**0**	**8**	**21**	**21**	**150**	**0**	**120**	**315**	**585**	**130**	**320**	**450**

OUTLINE OF COURSE CURRICULUM

M.Optometry

Semester II

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
MOPTOM 105 L	Ocular Diseases and Diagnostics II	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
MOPTOM 106 L	Advanced Contact Lenses I	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
MOPTOM 107 L	Binocular Vision and Pediatric Optometry	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
MOPTOM 108 L	Low vision and Geriatric Optometry	2	-	-	-	**2**	30	-	-	-	**30**	20	80	**100**
MOPTOM 109 CP	Optometry Directed Clinical Education-II	-	-	-	15	**5**	-	-	-	**225**	**225**	50	-	**50**
CC 001 L	Research Methodology & Biostatistics (Core Course)	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
Practical														
MOPTOM 105 P	Ocular Diseases and Diagnostics II	-	-	2	-	1	-	-	30	-	**30**	50	-	**50**
MOPTOM 106 P	Advanced Contact Lenses I	-	-	2	-	1	-	-	30	-	**30**	50	-	**50**
MOPTOM 107 L	Binocular Vision and Pediatric Optometry	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
MOPTOM 108 P	Low vision and Geriatric Optometry	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
CC 001 P	Research Methodology & Biostatistics (Core Course)	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
Core Elective Course														
CEC 001 L	Basics of Clinical Skill Learning	3	-	-	-	**3**	45	-	-	-	**45**	100	-	**100**
CEC 002 L	Hospital Operation Management													
Total		**18**	**0**	**16**	**15**	**31**	**270**	**0**	**240**	**225**	**735**	**380**	**520**	**900**

Name of the Programme	**M.Optometry**
Name of the Course	**Research Methodology & Biostatistics (Core Course)**
Course Code	**CC 001 L**

Teaching Objective	The course is intended to give an overview of research andstatistical models commonly used in medical and bio-medical sciences. Thegoal is to impart an intuitive understanding and working knowledge ofresearch designs and statistical analysis. The strategy would be tosimplify, analyse the treatment of statistical inference and to focus primarily onhow to specify and interpret the outcome of research.
Learning Outcomes	Student will be able to understand develop statistical models, researchdesigns with the understating of background theory of various commonly usedstatistical techniques as well as analysis interpretation & reporting ofresults and use of statistical software.

Sr. No.	Topics	No. of Hrs.
A	**Research Methodology:**	
1	Scientific Methods of Research: Definition of Research, Assumptions, Operations and Aims of Scientific Research. Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	5
2	Research Designs: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	5
3	Sampling Designs: Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5
4	Measurement in research: Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	5
5	Methods of Data Collection: Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5
6	Sampling Fundamentals : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population Mean Estimating Population Proportion, Sample Size and its Determination,	5

	Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	
B	**Biostatistics**	
7	Data Presentation: Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	3
8	Measures of Central Tendency and Dispersion: Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3
9	Testing of Hypotheses: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformationImportant Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6
10	Chi-square Test: Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2
11	Measures of Relationship: Need and meaning, Correlation and Simple Regression Analysis	2
12	Analysis of Variance and Covariance: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4
13	Nonparametric or Distribution-free Tests: Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test Kruskal Walli's test, Friedman's test, and Spearman Correlation test.	3
14	Vital Health Statistics: Measurement of Population: rate, crude rate, specific rate, Measurement of fertility: specific fertility rate, Total fertility rate, Reproduction rate, Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR), Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4
15	Computer Application Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way ANOVA& post HOC test. Testing for normality,Chi-square test with measures of association. Pearson correlation. Non parametric test.	3
Total		**60 hrs**

CC 001P –Research Methodology & Biostatistics

Sr. No.	Topics	No. of Hrs
A	**Research Methodology**	
1	Sampling Designs	4
2	Measurement in research	5
3	Methods of Data Collection	3
4	Sampling Fundamentals	3
B	**Biostatistics**	
5	Data Presentation	4
6	Measures of Central Tendency and Dispersion	4
7	Testing of Hypotheses	12
8	Chi-square Test	2
9	Measures of Relationship	3
10	Analysis of Variance and Covariance	4
11	Nonparametric or Distribution-free Tests	4
12	Vital Health Statistics: Measurement of Population	6
13	Computer Application Using Statistical Software	6
Total		**60 hrs**

OUTLINE OF COURSE CURRICULUM

M.Optometry

Semester III

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
MOPTOM 110 L	Advanced Dispensing optics	3	-	-	-	3	45	-	-	-	45	20	80	100
MOPTOM 111 L	Advance Contact Lense II	2	1	-	-	3	30	-	-	-	30	20	80	100
MOPTOM 112 L	Visual Perception Neuroscience & Psychophysics	2	1	-	-	3	30	-	-	-	30	20	80	100
MOPTOM 113 L	Applied Vision Therapy	4	-	-	-	4	60	-	-	-	60	20	80	100
MOPTOM 114 CP	Optometry Directed Clinical Education-III	-	-	-	15	5	-	-	-	225	225	50	-	50
MOPTOM 115	Dissertation/Project*	10	-			5	-	-	-	-	-	50	-	50
Practical														
MOPTOM 110 P	Advanced Dispensing optics	-	-	2	-	1	-	-	30	-	30	10	40	50
MOPTOM 111 P	Advance Contact Lense II	-	-	2	-	1	-	-	30	-	30	10	40	50
MOPTOM 113 P	Applied Vision Therapy	-	-	2	-	1	-	-	30	-	30	10	40	50
Seminar														
MOPTOM 116	Seminars	-	-	-	-	1	-	-	-	-	-	50	-	50
Total		21	2	6	15	27	165	0	90	225	480	260	440	700

OUTLINE OF COURSE CURRICULUM

M.Optometry

Semester IV

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory (General Elective)**														
GE 001 L	Pursuit of Inner self Excellence(POISE)	4	-	-	-	4	60	-	-	-	60	100	-	100
GE 002 L	Bioethics, Biosafety, IPR and Technology Transfer													
GE 003 L	Disaster Management and Mitigation Resources													
GE 004 L	Human Rights													
Practical														
MOPTOM 115	Dissertation / Project	-	-	36	-	18	-	-	-	-	-	-	200	200
MOPTOM 117	Educational Tour / Field Work/IV/Hospital Visit	-	-	-	-	2	-	-	-	-	-	50	-	50
Total		4	0	36	0	24	60	0	0	0	60	150	200	350

Final

O/C

MGM INSTITUTE OF HEALTH SCIENCES

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

Curriculum for M.Sc. Allied Health Sciences [Based on Choice Based Credit System (CBCS)]

M. Sc. in Biostatistics

(With effect from 2018-19 Batches)

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

(Approved in BOM – 53/2018, dated 19/05/2018)

23-10-2018

Received
2/11/2018

CURRICULUM FOR M. Sc. IN BIOSTATISTICS

1ST YEAR

Semester I							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MBS 101 T	Basic Mathematics and Introduction to Statistical Methods	4	4	20	80	100
	MBS 102 T	Epidemiology	4	4	20	80	100
	MBS 103 T	Health Economics	4	4	20	80	100
	MBS 104 T	Demography	4	4	20	80	100
	MBS 105 T	Health Care System and Policies & Health Surveys	4	4	20	80	100
	Practical						
	MBS 101 P	Basic Mathematics and Introduction to Statistical Methods	2	4	10	40	50
	MBS 102 P	Epidemiology	2	4	10	40	50
	MBS 103 P	Health Economics	2	4	10	40	50
	MBS 104 P	Demography	2	4	10	40	50
		Total	28	36	140	560	700

Semester II							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MBS 106 T	Research Methodology-I	4	4	20	80	100
	MBS 107 T	Sampling Techniques in Health	4	4	20	80	100
	MBS 108 T	Estimation and Testing of Hypothesis	4	4	20	80	100
	MBS 109 T	Applied Multivariate Analysis	4	4	20	80	100
	Practical						
	MBS 106 P	Research Methodology-I	2	4	10	40	50
	MBS 107 P	Sampling Techniques in Health	2	4	10	40	50
	MBS 108 P	Estimation and Testing of Hypothesis	2	4	10	40	50
	MBS 109 P	Applied Multivariate Analysis	2	4	10	40	50
	MBS 110	Seminar	1	2	50	0	50
		Total	25	34	170	480	650

2ND YEAR

Semester III							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MBS 111 T	Biostatistics and Research Methodology-II	4	4	20	80	100
	MBS 112 T	Survival Analysis	4	4	20	80	100
	MBS 113 T	Design of Experiment and Clinical Trial	4	4	20	80	100
		Core Elective course**	4	4	20	80	100
	MBS 114 T	Non parametric Test					
	MBS 115 T	Advance Statistical Computing					
	MBS 116 T	Time Series Analysis					
	MBS 117 T	Operations Research					
	MBS 118	Dissertation/Project*	6	12	50	-	50
	Practical						
	MBS 111 P	Biostatistics and Research Methodology-II	2	4	10	40	50
	MBS 112 P	Survival Analysis	2	4	10	40	50
	MBS 113 P	Design of Experiment and Clinical Trial	2	4	10	40	50
		***Core Electives**	2	4	10	40	50
	MBS 114 P	Non parametric Test					
	MBS 115 P	Advance Statistical Computing					
	MBS 116 P	Time Series Analysis					
	MBS 117 P	Operations Research					
	MBS 119	Seminar	1	2	50	0	50
		Total	31	46	220	480	700

Semester IV							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
		General elective **	4	4	100	-	100
	GE 001 T	Pursuit of Inner Self Excellence (POISE)					
	GE 002 T	Bioethics, Biosafety, IPR & Technology Transfer					
	GE 003 T	Disaster management and mitigation resources					
	GE 004 T	Human rights					
	MBS118	Dissertation / Project*	18	36	-	200	200
	Practical						
	MBS120 P	Educational Tour / Field Work/Industrial Visit/Hospital Visit*	2	0	50	-	50
		Total	24	40	150	200	350

10. Indian Council of Social Science Research and Indian Council of Medical Research (1981) Health for All by 2000 A. D. ICSSR Delhi.
11. Madan T.N. (1969) "Who Chooses Modern Medicine and Why" Economic and Political Weekly pp. 1475-84.

SEMESTER – II

PAPER VI(Theory-60 hrs & Practical- 60 hrs)

MBS-106 T & P :RESEARCH METHODOLOGY- I

Objectives: Thiscourse is to impart student's knowledge and skills on the principals and methods of social research to be used in epidemiological analysis of various disease, health and injuries.

Outcome: 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.

1. Scientific Methods of Research Definition of Research, Assumptions, Operations and Aims of Scientific Research. The Research Process: conceptual, Empirical and Analytical Phases of Research Essentials Criterions of Scientific methods.
2. Research Designs Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, threats to internal validity Cohort Studies Case Control Studies Cross sectional studies Monitoring and evaluative studies Action research/Intervention studies, Panel Studies.

3. Measurement Reliability and validity of measurement Face, construct, concurrent, and predictive validity Inter-coder reliability and stability, Non random and random errors, Reliability and validity of screening and diagnostic tests, Concept of Golden Test, Specificity and Sensitivity Predictive power of positive and negative test ROC Curve and its interpretation Scaling and composite indices, Attitude Scales: Point scales, ranking scales, rating scales, limitations of attitude scales, Types of Scales: Bogardus, Guttman, Likert, Semantic, Thurstone scale. Use of standards in measurements Gold standards for measuring biomarkers field settings

4. Writing research proposal and report Purpose of a proposal/report Content of proposal/report Critical review of research report and journal article Introductory section, methodology adopted, Development of research tools Protocol preparation Analysis and inferences, Summary, conclusions and recommendations. References/Bibliography, Appendices, Footnotes. 5. Research Ethics, History of ethical guidelines and general principles Informed consent and human subject protection ICMR ethical guidelines for biomedical research on human participants.

Text Books: 1. Bernard, H. Russell, (1995): Research Methods in Anthropology: Qualitative and Quantitative Approaches, Altamira Press, Walnut Creek. 2. Goode W J and Hatt P K. 1952. Methods in Social Research. McGraw Hills, New York.3. Mukherji, P.N., (1999): Methodologies in Social Science, Sage Publications, New Delhi. 4. Royce A. Singleton and Bruce C. Straits, (1999): Approaches to Social

MBS 110 SEMINAR:

For seminar/presentation there will be a maximum of 50 marks. Seminar / presentations will be evaluated by the teachers of the dept. The marks obtained in the same will be kept confidentially with the Head of the Dept. and will be submitted along with the internal assessment marks.

SEMESTER –III

PAPER X (Theory-60 hrs & Practical- 60 hrs)

MBS 111 T& P :Biostatistics and Research Methodology II

Objectives: The main objective of this course is to prepare students to design, carry out, report, and present a research projects based on the fieldwork carried out by them. Students learn how to collect data using methods different methods in a real population. The course equips students with conceptual understandings of current academic debates regarding methods of data collection with practical skills to put those methods into practice. Students submit a written report and present their practical work for assessment.

Outcome: 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.

1**. Methods of Data Collection** – Quantitative and qualitative

Quantitative Methods: Questionnaire (mail method, interviews through telephone, internet and computers), interview schedule (face-to-face interviews or personal interviews). Questionnaire/interview schedule design and construction: Principles of constructing a questionnaire/interview schedule, Types of questions, framing of questions, sequencing of sections and questions and Interview techniques

Qualitative Method: Walk through and observation (participatory and non-participatory),

Social mapping, key informant interview, In-depth interviews, Focus group discussion, content analysis, free listing, pile sorting, mechanical devices (camera, tape recorder)

2. Data Collection - Field work

3. Data processing and analysis, research report

4. Presentation of research report

Biostatistics

1 Measuring the occurrence of disease, Measures of morbidity - prevalence and incidence rate, association between prevalence and incidence, uses of prevalence and incidence, problems with incidence and prevalence measurements; Clinical agreement: kappa statistics, Mantel-Haenszel test; intra-class correlation; Surveillance

2 Assessing the validity and reliability of diagnostic and screening test: Validity of screening test – sensitivity, specificity, positive predictive value and negative predictive value; Reliability; Relationship between validity and reliability; ROC curve and its applications; Overall accuracy

3 Issues in epidemiology: Association; causation; causal inference; Errors and bias; Confounding; Controlling confounding; Measurement of interactions; Generalizability Estimating risk: Estimating association – absolute risk, relative risk, odds ratio;

4. Estimating potential for prevention – attributable risk; comparison of relative risk and attributable risk; Odds ratios for retrospective studies; Odds ratios approximating the prospective RR; Exact inference for odds ratio analysis of matched case-control data

Statistical process control: special and common causes of variation, Shewhart, CUSUM and EWMA charts

Text Books:Research Methodology

1. Bernard, H. Russell, (1995): Research Methods in Anthropology: Qualitative and Quantitative Approaches, Altamira Press, Walnut Creek.
2. Goode W J and Hatt P K. 1952. Methods in Social Research. McGraw Hills, New York.
3. Pullum W. 2006. An Assessment of Age and Data Reporting in the DHS Surveys, 1985-2003. DHS Methodological Report No. 5. Calverton, Maryland, Marco International Inc.
4. Royce A. Singleton and Bruce C. Straits, (1999): Approaches to Social Research, Oxford, Oxford University Press.
5. Young P V. 1994. Scientific Social Surveys and Research. Prentice-Hall, New York (4th Edition).
6. Altman D G: Practical Statistics for Medical Research, London: Chapman and Hall, 2006.
7. Rosner B: Fundamentals of Biostatistics, ed. 6, 2006.
8. Dunn G, Everitt B: Clinical Biostatistics: An Introduction to Evidence-based Medicine. Edward Arnold, 1995.

PAPER XI(Theory-60 hrs & Practical- 60 hrs)

MBS 112 T& P: SURVIVAL ANALYSIS

Objectives: The main objective of this course is to equip students with the basic concepts and methods employed in survival analysis. At the same time, the course aims to equip the student with recent advances in the field of Survival Analysis. The idea is to emphasize concepts over details, with recent applications in public health. 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.

Outcome: 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.

Unit I : Introduction to survival analysis; motivating the need; concepts and definitions; concept of censoring and type of censoring.

Unit II. Survival function, probability density function, hazard function; relationship between the three types of function; survival curve; estimating medium survival time;estimation of these function in the absence and presence of censoring; application ofthese functions in survival analysis.

Unit III. Survival distributions- Weibull distribution; exponential distribution; lognormal distribution; gamma distribution.

Unit IV. Survival Model: Introduction, Acturial Life Table, Product Limit Life Table, Life Table in Continuous form, Nonparametric methods of estimating survival function-introduction; Kaplan-Meierestimates; life table estimates; clinical life tables; life table vs. Kaplan-Meier estimates; The Mantel-Haenszel test.

Unit V Estimating survival rates using large scale data like DHS, NFHS, DLHS, etc. Comparing survival curves- Generalized Wilconxon (Breslow, Gehan); logrank test

Unit VI. Regression methods for survival analysis- Proportional Hazard Models, Calculation of Life Tables from the Proportional Hazard Models, Statistical Inference and Goodness of Fit, MCA adapted to Proportional Hazard Model, in Epidemiology and Public Health.

Unit VII. Hazard Model with Time dependent, Time Dependent Predictor variables and Time Dependent Coefficient.

Text Books

1. Altman D G: Practical Statistics for Medical Research, London: Chapman and Hall,2006
2. Lee E T: Statistical Methods for survival Data Analysis, ed. 2. New York, John Wiley & Sons.
3. Armitage P, Berry G: Statistical Methods in Medical Research, ed.4, Wiley Blackwell, 2001.
4. Choe MK, Retherford RD: Statistical Models for Causal Analysis, Wiley- Interscience, 1993.

MGM INSTITUTE OF HEALTH SCIENCES

M. Sc. Students

Syllabus for Research Methodology and Biostatistics

		No. of Hours	
	I. Research Methodology:	Theory	Practical
1	**Scientific Methods of Research** : Definition of Research, Assumptions, Operations and Aims of Scientific Research, Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	5	---
2	**Research Designs**: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	5	---
3	Sampling Designs : Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5	4
4	**Measurement in research:** Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	5	5
5	**Methods of Data Collection:** Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5	3
6	**Sampling Fundamentals** : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population Mean Estimating Population Proportion, Sample Size and its Determination, Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	5	3
	II. Biostatistics		
1	**Data Presentation** : Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	3	4
2	**Measures of Central Tendency and Dispersion** : Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3	4

3	**Testing of Hypotheses**: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformationImportant Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6	
4	**Chi-square Test:** Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2	2
5	**Measures of Relationship**: Need and meaning, Correlation and Simple Regression Analysis	2	3
6	**Analysis of Variance and Covariance**: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4	4
7	**Nonparametric or Distribution-free Tests:** Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test Kruskal Walli's test, Friedman's test, and Spearman Correlation test.	3	4
8	**Vital Health Statistics:** Measurement of Population: rate, crude rate, specific rate, *Measurement of fertility* : specific fertility rate, Total fertility rate, *Reproduction rate,* Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR) , Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4	6
9	**Computer Application** Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way ANOVA& post HOC test. Testing for normality,Chi-square test with measures of association. Pearson correlation. Non parametric test	3	6
	Total hours	60	60

MGM INSTITUTE OF HEALTH SCIENCES

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

CHOICE BASED CREDIT SYSTEM (CBCS)

(With effect from 2018-19 Batches)

Curriculum for M.Sc. Cardiac Care Technology

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

Approved as per BOM –53/2018, [Resolution No. 4.5.2], Dated 19/05/2018
Approved as per BOM –55/2018, [Resolution No. 4.4.1.2], Dated 27/11/2018

OUTLINE OF COURSE CURRICULUM

M.Sc. Cardiac Care Technology

Semester I

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
MCCT 101 L	Introduction to Clinical Cardiology	4	-	-	-	4	60	-	-	-	60	20	80	100
MCCT 102 L	Fundamentals of Cardiac Diagnostic Procedures and Investigations	3	1	-	-	4	45	15	-	-	60	20	80	100
MCCT 103 L	Introduction to Pacing and Electrophysiology Study Techniques	3	1	-	-	4	45	15	-	-	60	20	80	100
MCCT 104 CP	CCT Directed Clinical Education-I	-	-	-	21	7	-	-	-	315	315	50	-	50
Practical														
MCCT 101 P	Introduction to Clinical Cardiology	`	-	4	-	2	-	-	60	-	60	10	40	50
MCCT 102 P	Fundamentals of Cardiac Diagnostic Procedures and Investigations	-	-	4	-	2	-	-	60	-	60	10	40	50
Total		10	2	8	21	23	150	30	120	315	615	130	320	450

OUTLINE OF COURSE CURRICULUM

M.Sc. Cardiac Care Technology

Semester II

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
MCCT 105 L	Introduction to Non-Invasive Techniques in Cardiology	4	0	-	-	4	60	0	-	-	60	20	80	100
MCCT 106 L	Invasive Cardiology	3	1	-	-	4	45	15	-	-	60	20	80	100
MCCT 107 CP	CCT Directed Clinical Education-II	-	-	-	33	11	-	-	-	495	495	50	-	50
CC 001 L	Research Methodology & Biostatistics (Core Course)	4	-	-	-	4	60	-	-	-	60	20	80	100
Practical														
MCCT 105 P	Introduction to Non-Invasive Techniques in Cardiology	-	-	4	-	2	-	-	60	60	60	10	40	50
MCCT 106 P	Invasive Cardiology	-	-	4	-	2	-	-	60	60	60	10	40	50
CC 001 P	Research Methodology & Biostatistics (Core Course)	-	-	4	-	2	-	-	60	-	60	10	40	50
Core Elective Course														
CEC 001 L	Basics of Clinical Skill Learning	3	-	-	-	3	45	-	-	-	45	100	-	100
CEC 002 L	Hospital Operation Management													
Total		14	1	12	33	32	210	15	180	615	900	240	360	600

Name of the Programme	**M.Sc. Medical Radiology & Imaging Technology**
Name of the Course	**Research Methodology & Biostatistics (Core Course)**
Course Code	**CC 001 L**

Teaching Objective	The course is intended to give an overview of research andstatistical models commonly used in medical and bio-medical sciences. Thegoal is to impart an intuitive understanding and working knowledge ofresearch designs and statistical analysis. The strategy would be tosimplify, analyse the treatment of statistical inference and to focus primarily onhow to specify and interpret the outcome of research.
Learning Outcomes	Student will be able to understand develop statistical models, researchdesigns with the understating of background theory of various commonly usedstatistical techniques as well as analysis interpretation & reporting ofresults and use of statistical software.

Sr. No.	Topics	No. of Hrs.
A	**Research Methodology:**	
1	Scientific Methods of Research: Definition of Research, Assumptions, Operations and Aims of Scientific Research. Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	5
2	Research Designs: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	5
3	Sampling Designs: Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5
4	Measurement in research: Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	5
5	Methods of Data Collection: Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5
6	Sampling Fundamentals : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population	5

	Mean Estimating Population Proportion, Sample Size and its Determination, Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	
B	**Biostatistics**	
7	Data Presentation: Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	3
8	Measures of Central Tendency and Dispersion: Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3
9	Testing of Hypotheses: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformationImportant Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6
10	Chi-square Test: Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2
11	Measures of Relationship: Need and meaning, Correlation and Simple Regression Analysis	2
12	Analysis of Variance and Covariance: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4
13	Nonparametric or Distribution-free Tests: Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test Kruskal Walli's test, Friedman's test, and Spearman Correlation test.	3
14	Vital Health Statistics: Measurement of Population: rate, crude rate, specific rate, Measurement of fertility: specific fertility rate, Total fertility rate, Reproduction rate, Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR), Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4
15	Computer Application Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way ANOVA& post HOC test. Testing for normality,Chi-square test with measures of association. Pearson correlation. Non parametric test.	3

Total	60 hrs

CC 001P – Research Methodology & Biostatistics

Sr. No.	Topics	No. of Hrs
A	**Research Methodology**	
1	Sampling Designs	4
2	Measurement in research	5
3	Methods of Data Collection	3
4	Sampling Fundamentals	3
B	**Biostatistics**	
5	Data Presentation	4
6	Measures of Central Tendency and Dispersion	4
7	Testing of Hypotheses	12
8	Chi-square Test	2
9	Measures of Relationship	3
10	Analysis of Variance and Covariance	4
11	Nonparametric or Distribution-free Tests	4
12	Vital Health Statistics: Measurement of Population	6
13	Computer Application Using Statistical Software	6
Total		**60 hrs**

OUTLINE OF COURSE CURRICULUM

M.Sc. Cardiac Care Technology

Semester III

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
MCCT 108 L	Echocardiography- Advanced	4	-	-	-	**4**	60	-	-	-	60	20	80	**100**
MCCT 109 L	Quality Assurance, Standardization & Accreditation (Cardiac Care)	4	-	-	-	**4**	60	-	-	-	60	20	80	**100**
MCCT 110 CP	CCT Directed Clinical Education-III	-	-	-	21	**7**	-	-	-	405	405	50	-	**50**
MCCT 111	Dissertation / Project*	10	-	-	-	**5**	-	-	-	-	-	50	-	**50**
Practical														
MCCT 108 P	Echocardiography- Advanced	-	-	4	-	**2**	-	-	120	-	120	10	40	**50**
Seminar														
MCCT 112	Seminars	-	-	-	-	**1**	-	-	-	-	-	50	-	**50**
Total		**18**	**0**	**4**	**21**	**23**	**120**	**0**	**120**	**405**	**645**	**200**	**200**	**400**

OUTLINE OF COURSE CURRICULUM

M.Sc. Cardiac Care Technology

Semester IV

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory (General Elective)**														
GE 001 L	Pursuit of Inner self Excellence (POISE)	4	-	-	-	**4**	60	-	-	-	60	100	-	**100**
GE 002 L	Bioethics, Biosafety, IPR and Technology Transfer													
GE 003 L	Disaster Management and Mitigation Resources													
GE 004 L	Human Rights													
Practical														
MCCT 111	Dissertation / Project	-	-	36	-	**18**	-	-	-	-	-	-	200	**200**
MCCT 113	Educational Tour / Field Work/IV/Hospital Visit	-	-	-	-	**2**	-	-	-	-	-	50	-	**50**
Total		**4**	**0**	**36**	**0**	**24**	**60**	**0**	**0**	**0**	**60**	**150**	**200**	**350**

Final O/C

MGM INSTITUTE OF HEALTH SCIENCES

Accredited by NAAC with 'A' Grade

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

Sector-01, Kamothe, Navi Mumbai - 410 209

Tel 022-27432471, 022-27432994, Fax 022 - 27431094

E-mail : registrar@mgmuhs.com ; Website : www.mgmuhs.com

Curriculum for M.Sc. Allied Health Sciences [Based on Choice Based Credit System (CBCS)]

M. Sc. (Clinical Embryology)

(With effect from 2018-19 Batches)

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

(Approved in BOM – 53/2018, dated 19/05/2018)

Received
2/11/2018

23-10-2018

Semester I							
Sr. No.	**Syllabus Ref. No.**	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
1	CE 101 T	Relevant Gross Anatomy	4	4	20	80	100
2	CE102 T	Histology	3	3	20	80	100
3	CE103 T	Genetics and Reproductive Hormone	4	4	20	80	100
4	CE 104 T	General& Systemic Embryology	4	4	20	80	100
	Practical						
1	CE 101 P	Relevant Gross Anatomy	2	4	10	40	50
2	CE 102 P	Histology	2	4	10	40	50
3	CE 103 P	Genetics and Reproductive Hormone	2	4	10	40	50
4	CE 104 P	General& Systemic Embryology	2	4	10	40	50
		Total	23	31	120	480	600

Semester II							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	CE 105 T	Infertility & Ovulation induction methods	4	4	20	80	100
	CE 106 T	Quality assessment, statistics, handling data, ethics, legislation	4	4	20	80	100
	CE 107 T	IVF procedure	4	4	20	80	100
	CC 001 T	Research Methodology & Biostatistics(Core Course)	4	4	20	80	100
	Practical						
	CE 105 P	Infertility & Ovulation induction methods	2	4	10	40	50
	CE 106 P	Quality assessment, statistics, handling data, ethics, legislation	2	4	10	40	50
	CE 107 P	IVF procedure	2	4	10	40	50
	CC 001 P	Research Methodology & Biostatistics (Core Course)	2	4	10	40	50
		Total	24	32	120	480	600

Semester III							
Sr. No.	**Syllabus Ref. No.**	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	CE 108 T	Introduction to IVF lab	3	3	20	80	100
	CE 109 T	Techniques used in IVF Lab	4	4	20	80	100
	Core Elective course**						
	CE 110 T	ICSI	4	4	20	80	100
	CE 111 T	Biochemistry including steroid metabolism					
	CE 112 T	Lab equipment					
	CE 113	Dissertation/Project Proposal*	6	12	50	-	50
	Practical						
	CE 108 P	Introduction to IVF lab	2	4	10	40	50
	CE 109 P	Techniques used in IVF Lab	2	4	10	40	50
	Core Elective practical						
	CE 110 P	ICSI	1	2	10	40	50
	CE 111 P	Biochemistry including steroid metabolism					
	CE 112 P	Lab equipment					
	CE 114	Seminar*	1	2	50	0	50
		Total	23	35	190	360	550

Semester IV							
Sr. No.	**Syllabus Ref. No.**	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
1	**	**General elective**					
	GE 001 T	Pursuit of Inner Self Excellence (POISE)	4	4	100	-	100
	GE 002 T	IPR & Bioethics ▲(Multidisciplinary/ Interdisciplinary)					
	GE 003 T	Disaster management and mitigation resources					
	GE 004 T	Human rights					
2	CE 113	Dissertation / Project*	18	36	-	200	200
	Practical						
1	CE 115 P	Educational Tour / Field Work/Industrial Visit/Hospital Visit*	2	0	50	-	50
		Total	24	40	150	200	350

*(a) ***Dissertation / Project*** **Course** commences in III Semester

(b) ***Educational Tours / Field Works*** Course may be carried out in any Semester or all Semesters but evaluated and Grade Points are to be added in 4th Semester.

(Elective): Any one subject is to be chosen from the following (Subjects offered may change from time to time depending on the availability of expertise)

**Elective courses may or may not have practical and/or field work.

▲ Multidisciplinary / Interdisciplinary

EDUCATIONAL/INDUSTRIAL TOUR:

Industrial visit has its own importance in building a career of a student which is pursuing a professional degree. Objections of industrial visit are to provide students an insight regarding internal working of reputed hospitals and labs. Industrial visits provides students an opportunity to learn practically thoughts interactions, working methods and employment practices as theoretical knowledge is not enough for making a competent and skilful professionals.

Name of the Programme	**M. SC MEDICAL BIOTECHNOLOGY**
Course Code	**CC 001 T**
Name of the Course	**RESEARCH METHODOLOGY & BIOSTATISTICS (CORE COURSE)**

Teaching Objective	The course is intended to give an overview of research and statistical models commonly used in medical and bio-medical sciences. The goal is to impart an intuitive understanding and working knowledge of research designs and statistical analysis. The strategy would be to simplify, analyse the treatment of statistical inference and to focus primarily on how to specify and interpret the outcome of research.
Learning Outcomes	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.

Sr. No.	**Topics**	**Allotted 60 Hrs.**
A	**Research Methodology:**	
1	Scientific Methods of Research: Definition of Research, Assumptions, Operations and Aims of Scientific Research. Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	**5 hrs**
2	Research Designs: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	**5 hrs**
3	Sampling Designs: Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	**5 hrs**
4	Measurement in research: Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	**5 hrs**
5	Methods of Data Collection: Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	**5 hrs**

6	Sampling Fundamentals : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population Mean Estimating Population Proportion, Sample Size and its Determination, Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	**5 hrs**
B	**Biostatistics**	
7	Data Presentation: Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	**3 hrs**
8	Measures of Central Tendency and Dispersion: Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	**3 hrs**
9	Testing of Hypotheses: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformation Important Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	**6 hrs**
10	Chi-square Test: Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	**2 hrs**
11	Measures of Relationship: Need and meaning, Correlation and Simple Regression Analysis	**2 hrs**
12	Analysis of Variance and Covariance: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	**4 hrs**
13	Nonparametric or Distribution-free Tests: Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test Kruskal Walli's test, Friedman's test, and Spearman Correlation test.	**3 hrs**
14	Vital Health Statistics: Measurement of Population: rate, crude rate, specific rate, Measurement of fertility: specific fertility rate, Total fertility rate, Reproduction rate, Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR), Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	**4 hrs**
15	Computer Application Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way ANOVA& post HOC test. Testing for normality, Chi-square test with measures of association. Pearson correlation. Non parametric test.	**3 hrs**

Name of the Programme	**M. Sc. Clinical Embryology**
Course Code	**CC 001 P**
Name of the Course	**Research Methodology & Biostatistics (Practical 60 hrs)**

Sr. No.	**Topics**	**Allotted 60 Hrs**
A	**Research Methodology**	
1	Sampling Designs	**4 hrs**
2	Measurement in research	**5 hrs**
3	Methods of Data Collection	**3 hrs**
4	Sampling Fundamentals	**3 hrs**
B	**Biostatistics**	
5	Data Presentation	**4 hrs**
6	Measures of Central Tendency and Dispersion	**4 hrs**
7	Testing of Hypotheses	**12 hrs**
8	Chi-square Test	**2 hrs**
9	Measures of Relationship	**3 hrs**
10	Analysis of Variance and Covariance	**4 hrs**
11	Nonparametric or Distribution-free Tests	**4 hrs**
12	Vital Health Statistics: Measurement of Population	**6 hrs**
13	Computer Application Using Statistical Software	**6 hrs**

MGM INSTITUTE OF HEALTH SCIENCES

M. Sc. Students

Syllabus for Research Methodology and Biostatistics

		No. of Hours	
	I. Research Methodology:	Theory	Practical
1	**Scientific Methods of Research** : Definition of Research, Assumptions, Operations and Aims of Scientific Research, Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	5	---
2	**Research Designs**: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	5	---
3	Sampling Designs : Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5	4
4	**Measurement in research:** Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	5	5
5	**Methods of Data Collection:** Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5	3
6	**Sampling Fundamentals** : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population Mean Estimating Population Proportion, Sample Size and its Determination, Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	5	3
	II. Biostatistics		
1	**Data Presentation** : Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	3	4
2	**Measures of Central Tendency and Dispersion** : Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3	4

3	**Testing of Hypotheses**: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformationImportant Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6	
4	**Chi-square Test:** Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2	2
5	**Measures of Relationship**: Need and meaning, Correlation and Simple Regression Analysis	2	3
6	**Analysis of Variance and Covariance**: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4	4
7	**Nonparametric or Distribution-free Tests:** Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test Kruskal Walli's test, Friedman's test, and Spearman Correlation test.	3	4
8	**Vital Health Statistics:** Measurement of Population: rate, crude rate, specific rate, *Measurement of fertility* : specific fertility rate, Total fertility rate, *Reproduction rate,* Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR) , Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4	6
9	**Computer Application** Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way ANOVA& post HOC test. Testing for normality,Chi-square test with measures of association. Pearson correlation. Non parametric test	3	6
	Total hours	60	60

Final

O/C

MGM INSTITUTE OF HEALTH SCIENCES

Accredited by NAAC with 'A' Grade

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

Sector-01, Kamothe, Navi Mumbai - 410 209

Tel 022-27432471, 022-27432994, Fax 022 - 27431094

E-mail : registrar@mgmuhs.com ; Website : www.mgmuhs.com

Curriculum for M.Sc. Allied Health Sciences [Based on Choice Based Credit System (CBCS)]

M.Sc. (Medical Biotechnology)

(With effect from 2018-19 Batches)

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

(Approved in BOM – 53/2018, dated 19/05/2018)

23/10/2018

Received
Favour
2/11/2018

CURRICULUM FOR M. Sc. MEDICAL BIOTECHNOLOGY

1ST YEAR

Semester I							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	BT 101 T	Cell Biology	4	4	20	80	100
	BT 102 T	Immunology &Immunotechnology	4	4	20	80	100
	BT 103 T	Analytical Instrumentation	4	4	20	80	100
	BT 104 T	Basic Biochemistry & Biomolecules ▲ (Multidisciplinary/Interdisciplinary)	4	4	20	80	100
	Practical						
	BT 101 P	Cell Biology	2	4	10	40	50
	BT 102 P	Immunology &Immunotechnology	2	4	10	40	50
	BT 103 P	Analytical Instrumentation	2	4	10	40	50
	BT 104 P	Basic Biochemistry & Biomolecules ▲ (Multidisciplinary/Interdisciplinary)	2	4	10	40	50
		Total	24	32	120	480	600

Semester II							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	BT 105 T	Molecular Biology & Genomics	4	4	20	80	100
	BT 106 T	Recombinant DNA Technology	4	4	20	80	100
	BT 107 T	Bioinformatics	4	4	20	80	100
	CC 001 T	Research Methodology & Biostatistics (Core Course)	4	4	20	80	100
	Practical						
	BT 105 P	Molecular Biology & Genomics	2	4	10	40	50
	BT 106 P	Recombinant DNA Technology	2	4	10	40	50
	BT 107 P	Bioinformatics	2	4	10	40	50
	CC 001 P	Research Methodology & Biostatistics (Core Course)	2	4	10	40	50
		Total	24	32	120	480	600

2ND YEAR

Semester III							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	BT 108 T	Plant Biotechnology	4	4	20	80	100
	BT 109 T	Animal Biotechnology	4	4	20	80	100
		Core Elective course**	4	4	20	80	100
	BT 110 T	Medical Microbiology					
	BT 111 T	Human Genetics					
	BT 112 T	Nanobiotechnology					
	BT 113	Dissertation/Project Proposal*	6	12	50	-	50
	Practical						
	BT 108P	Plant Biotechnology	2	4	10	40	50
	BT 109 P	Animal Biotechnology	2	4	10	40	50
	BT 110 P BT 111 P BT 112 P	Core Elective practical Medical Microbiology Human Genetics Nanobiotechnology	1	2	10	40	50
	BT 114	Seminar*	1	2	50	0	50
		Total	24	36	190	360	550

Semester IV							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
		General elective **	4	4	100	0	100
	GE 001 T	Pursuit of Inner Self Excellence (POISE)					
	GE 002 T	Bioethics, Biosafety, IPR & Technology Transfer					
	GE 003 T	Disaster Management and Mitigation Resources					
	GE 004 T	Human rights					
	BT 113	Dissertation / Project*	18	36	-	200	200
	Practical						
	BT 115 P	Educational Tour / Field Work/Industrial Visit/Hospital Visit*	2	0	50	-	50
		Total	24	40	150	200	350

Name of the Programme	**M. SC MEDICAL BIOTECHNOLOGY**
Course Code	**CC 001 T**
Name of the Course	**RESEARCH METHODOLOGY & BIOSTATISTICS (CORE COURSE)**

Teaching Objective	The course is intended to give an overview of research and statistical models commonly used in medical and bio-medical sciences. The goal is to impart an intuitive understanding and working knowledge of research designs and statistical analysis. The strategy would be to simplify, analyse the treatment of statistical inference and to focus primarily on how to specify and interpret the outcome of research.
Learning Outcomes	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.

Sr. No.	**Topics**	**Hours allotted 60hrs**
A	**Research Methodology:**	
1	Scientific Methods of Research: Definition of Research, Assumptions, Operations and Aims of Scientific Research. Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	5
2	Research Designs: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	5
3	Sampling Designs: Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5
4	Measurement in research: Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	5

5	Methods of Data Collection: Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5
6	Sampling Fundamentals : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population Mean Estimating Population Proportion, Sample Size and its Determination, Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	5
B	**Biostatistics**	
7	Data Presentation: Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	3
8	Measures of Central Tendency and Dispersion: Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3
9	Testing of Hypotheses: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformation Important Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6
10	Chi-square Test: Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2
11	Measures of Relationship: Need and meaning, Correlation and Simple Regression Analysis	2
12	Analysis of Variance and Covariance: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4
13	Nonparametric or Distribution-free Tests: Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test Kruskal Walli's test, Friedman's test, and Spearman Correlation test.	3
14	Vital Health Statistics: Measurement of Population: rate, crude rate, specific rate, Measurement of fertility: specific fertility rate, Total fertility rate, Reproduction rate, Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR), Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4
15	Computer Application Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way ANOVA& post HOC test. Testing for normality, Chi-square test with measures of association. Pearson correlation. Non parametric test.	3

MGM INSTITUTE OF HEALTH SCIENCES

M. Sc. Students

Syllabus for Research Methodology and Biostatistics

		No. of Hours	
	I. Research Methodology:	Theory	Practical
1	**Scientific Methods of Research** : Definition of Research, Assumptions, Operations and Aims of Scientific Research, Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	5	---
2	**Research Designs**: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	5	---
3	Sampling Designs : Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5	4
4	**Measurement in research:** Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	5	5
5	**Methods of Data Collection:** Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5	3
6	**Sampling Fundamentals** : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population Mean Estimating Population Proportion, Sample Size and its Determination, Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	5	3
	II. Biostatistics		
1	**Data Presentation** : Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	3	4
2	**Measures of Central Tendency and Dispersion** : Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3	4

3	**Testing of Hypotheses**: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformationImportant Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6	
4	**Chi-square Test:** Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2	2
5	**Measures of Relationship**: Need and meaning, Correlation and Simple Regression Analysis	2	3
6	**Analysis of Variance and Covariance**: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4	4
7	**Nonparametric or Distribution-free Tests:** Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test Kruskal Walli's test, Friedman's test, and Spearman Correlation test.	3	4
8	**Vital Health Statistics:** Measurement of Population: rate, crude rate, specific rate, *Measurement of fertility* : specific fertility rate, Total fertility rate, *Reproduction rate,* Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR) , Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4	6
9	**Computer Application** Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way ANOVA& post HOC test. Testing for normality,Chi-square test with measures of association. Pearson correlation. Non parametric test	3	6
	Total hours	60	60

MGM INSTITUTE OF HEALTH SCIENCES

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

CHOICE BASED CREDIT SYSTEM (CBCS)

(With effect from 2018-19 Batches)

Curriculum for M.Sc. Medical Radiology & Imaging Technology

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

Approved as per BOM –53/2018, [Resolution No. 4.5.2], Dated 19/05/2018
Approved as per BOM –55/2018, [Resolution No. 4.4.1.2], Dated 27/11/2018

Annexure- XX- A

MGM SCHOOL OF BIOMEDICAL SCIENCES
(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, KamotheNavi Mumbai-410209,
Tel.No.:022-27437631,27437632,27432890
Email. sbsnm@mgmuhs.com/Website : www.mgmsbsnm.edu.in

CHOICE BASED CREDIT SYSTEM(CBCS)

(Academic Year 2018 - 19)

Curriculum for

M.Sc. Allied Health Sciences

M.Sc. Medical Radiology and Imaging Technology

OUTLINE OF COURSE CURRICULUM

M.Sc. Medical Radiology and Imaging Technology

Semester I

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
MMRIT 101 L	Conventional Radiology and Imaging Equipments	4	-	-	-	4	60	-	-	-	60	20	80	100
MMRIT 102 L	Modern Radiological and Imaging Equipment	4	-	-	-	4	60	-	-	-	60	20	80	100
MMRIT 103 L	Radiation Safety and Protection	3	-	-	-	3	45	-	-	-	45	20	80	100
MMRIT 104 CP	MRIT Directed Clinical Education - 1	-	-	-	27	9	-	-	-	405	405	50	-	50
Practical														
MMRIT 101 P	Conventional Radiology and Imaging Equipments	-	-	4	-	2	-	-	60	-	60	10	40	50
MMRIT 102 P	Modern Radiological and Imaging Equipment	-	-	4	-	2	-	-	60	-	60	10	40	50
Total		11	0	8	27	24	165	0	120	405	690	130	320	450

OUTLINE OF COURSE CURRICULUM

M.Sc. Medical Radiology and Imaging Technology

Semester II

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
MMRIT 105 L	Radiographic and Imaging Techniques	3	-	-	-	3	45	-	-	-	45	20	80	100
MMRIT 106 L	Interventional Radiological Techniques	4	-	-	-	4	60	-	-	-	60	20	80	100
MMRIT 107 L	Radiological Physics for Imaging	3	-	-	-	3	45	-	-	-	45	20	80	100
MMRIT 108 CP	MRIT Directed Clinical Education - II	-	-	-	27	9	-	-	-	405	405	50	-	50
CC 001 L	Research Methodology & Biostatistics (Core Course)	4	-	-	-	4	60	-	-	-	60	20	80	100
Practical														
MMRIT 105 P	Radiographic and Imaging Techniques	-	-	4	-	2	-	-	60	-	60	10	40	50
MMRIT 107 P	Radiological Physics for Imaging	-	-	4	-	2	-	-	60	-	60	10	40	50
CC 001 P	Research Methodology & Biostatistics (Core Course)	-	-	4	-	2	-	-	60	-	60	10	40	50
Core Elective Course														
CEC 001 L	Basics of Clinical Skill Learning	3	-	-	-	3	45	-	-	-	45	100	-	100
CEC 002 L	Hospital Operation Management													
Total		17	0	12	27	32	255	0	180	405	840	260	440	700

Name of the Programme	**M.Sc. Medical Radiology & Imaging Technology**
Name of the Course	**Research Methodology & Biostatistics (Core Course)**
Course Code	**CC 001 L**

Teaching Objective	The course is intended to give an overview of research andstatistical models commonly used in medical and bio-medical sciences. Thegoal is to impart an intuitive understanding and working knowledge ofresearch designs and statistical analysis. The strategy would be tosimplify, analyse the treatment of statistical inference and to focus primarily onhow to specify and interpret the outcome of research.
Learning Outcomes	Student will be able to understand develop statistical models, researchdesigns with the understating of background theory of various commonly usedstatistical techniques as well as analysis interpretation & reporting ofresults and use of statistical software.

Sr. No.	Topics	No. of Hrs.
A	**Research Methodology:**	
1	Scientific Methods of Research: Definition of Research, Assumptions, Operations and Aims of Scientific Research. Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	5
2	Research Designs: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	5
3	Sampling Designs: Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5
4	Measurement in research: Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	5
5	Methods of Data Collection: Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5
6	Sampling Fundamentals : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population Mean Estimating Population Proportion, Sample Size and its Determination,	5

	Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	
B	**Biostatistics**	
7	Data Presentation: Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	3
8	Measures of Central Tendency and Dispersion: Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3
9	Testing of Hypotheses: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformationImportant Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6
10	Chi-square Test: Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2
11	Measures of Relationship: Need and meaning, Correlation and Simple Regression Analysis	2
12	Analysis of Variance and Covariance: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4
13	Nonparametric or Distribution-free Tests: Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test KruskalWalli's test, Friedman's test, and Spearman Correlation test.	3
14	Vital Health Statistics: Measurement of Population: rate, crude rate, specific rate, Measurement of fertility: specific fertility rate, Total fertility rate, Reproduction rate, Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR), Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4
15	Computer Application Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way ANOVA& post HOC test. Testing for normality,Chi-square test with measures of association. Pearson correlation. Non parametric test.	3
Total		**60 hrs**

CC 001P –Research Methodology & Biostatistics

Sr. No.	Topics	No. of Hrs
A	**Research Methodology**	
1	Sampling Designs	4
2	Measurement in research	5
3	Methods of Data Collection	3
4	Sampling Fundamentals	3
B	**Biostatistics**	
5	Data Presentation	4
6	Measures of Central Tendency and Dispersion	4
7	Testing of Hypotheses	12
8	Chi-square Test	2
9	Measures of Relationship	3
10	Analysis of Variance and Covariance	4
11	Nonparametric or Distribution-free Tests	4
12	Vital Health Statistics: Measurement of Population	6
13	Computer Application Using Statistical Software	6
Total		**60 hrs**

MGM INSTITUTE OF HEALTH SCIENCES

Accredited by NAAC with 'A' Grade

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

Sector-01, Kamothe, Navi Mumbai - 410 209

Tel 022-27432471, 022-27432994, Fax 022 - 27431094

E-mail : registrar@mgmuhs.com ; Website : www.mgmuhs.com

CHOICE BASED CREDIT SYSTEM (CBCS)

(With effect from 2018-19 Batches)

Curriculum for M.Sc. Allied Health Sciences

M.Sc. Medical Radiology and Imaging Technology

(from Sem III & Sem IV)

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai-410 209

Approved as per BOM –55/2018, [Resolution No. 4.4.1.2], Dated 27/11/2018

30/1/2019

OUTLINE OF COURSE CURRICULUM

M.Sc Medical Radiology and Imaging Technology

Semester III

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
MMRIT 109 L	Radiological and Imaging Procedures	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
MMRIT 110 L	Quality Assurance in Diagnostic Imaging	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
MMRIT 111 CP	MRIT Directed Clinical Education - III	-	-	-	21	**7**	-	-	-	405	**405**	50	-	**50**
MMRIT 112	Dissertation / Project*	10	-	-	-	**5**	-	-	-	-	-	50	-	**50**
Practical														
MMRIT 110 P	Quality Assurance in Diagnostic Imaging	-	-	4	-	**2**	-	-	120	-	**120**	10	40	**50**
Seminar														
MMRIT 113	Seminars	-	-	-	-	1	-	-	-	-	-	50	-	**50**
Total		**18**	**0**	**4**	**21**	**23**	**120**	**0**	**120**	**405**	**645**	**200**	**200**	**400**

OUTLINE OF COURSE CURRICULUM

M.Sc Medical Radiology and Imaging Technology

Semester IV

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory (General Elective)**														
GE 001 L	Pursuit of Inner self Excellence (POISE)	4	-	-	-	**4**	60	-	-	-	60	100	-	**100**
GE 002 L	Bioethics, Biosafety, IPR and Technology Transfer													
GE 003 L	Disaster Management and Mitigation Resources													
GE 004 L	Human Rights													
Practical														
MCCT 112	Dissertation / Project	-	-	36	-	**18**	-	-	-	-	-	-	200	**200**
MCCT 114	Educational Tour / Field Work/IV/Hospital Visit	-	-	-	-	**2**	-	-	-	-	-	50	-	**50**
Total		**4**	**0**	**36**	**0**	**24**	**60**	**0**	**0**	**0**	**60**	**150**	**200**	**350**

Final O/C

MGM INSTITUTE OF HEALTH SCIENCES

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

Curriculum for M.Sc. Allied Health Sciences [Based on Choice Based Credit System (CBCS)]

M.Sc. (Molecular Biology)

(With effect from 2018-19 Batches)

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

(Approved in BOM – 53/2018, dated 19/05/2018)

23-10-2018.

Received
2/11/2018

Semester I							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MB 101 T	Cell Biology	4	4	20	80	100
	MB 102 T	Molecular Immunology	4	4	20	80	100
	MB 103 T	Molecular Enzymology	4	4	20	80	100
	MB 104 T	Metabolic Engineering	4	4	20	80	100
	Practical						
	MB 101 P	Cell Biology	2	4	10	40	50
	MB 102 P	Molecular Immunology	2	4	10	40	50
	MB 103 P	Molecular Enzymology	2	4	10	40	50
	MB 104 P	Metabolic Engineering	2	4	10	40	50
		Total	24	32	120	480	600

Semester II							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MB105 T	Gene and Protein Science	4	4	20	80	100
	MB106 T	Bioinformatics &Computational biology	4	4	20	80	100
	MB 107 T	DNA Recombinant Technology	4	4	20	80	100
	CC 001 T	Research Methodology and Biostatistics (Core Course)	4	4	20	80	100
	Practical						
	MB 105 P	Gene and Protein Science	2	4	10	40	50
	MB 106 P	Bioinformatics &Computational biology	2	4	10	40	50
	MB 107 P	DNA Recombinant Technology	2	4	10	40	50
	CC 001 P	Research Methodology and Biostatistics (Core Course)	2	4	10	40	50
		Total	24	32	120	480	600

Semester III							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MB 108 T	Genomics	4	4	20	80	100
	MB 109 T	Proteomics	4	4	20	80	100
		Core Elective course**	4	4	20	80	100
	MB 110 T	Nanobiotechnology					
	MB 111 T	Molecular Diagnostics					
	MB 112 T	Drug discovery					
	MB 113	Dissertation/Project Proposal*	6	12	50	-	50
	Practical						
	MB 108 P	Genomics	2	4	10	40	50
	MB 109 P	Proteomics	2	4	10	40	50
	MB110 P MB111 P MB112 P	Core Elective Practical Nanobiotechnology Molecular diagnostics Drug discovery	1	2	10	40	50
	MB 114	Seminar*	1	2	50	0	50
		Total	24	36	190	360	550

Semester IV							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	**	**General Elective**	4	4	100	-	100
	GE 001 T	Analytical Instrumentation					
	GE002 T	Bioethics, Biosafety, IPR & Technology transfer					
	GE003 T	Quality Assurance & Quality Control					
	MB 113	Dissertation / Project*	18	36	-	200	200
	Practical						
	MB 115 P	Educational Tour / Field Work/Industrial Visit/Hospital Visit*	2	0	50	-	50
		Total	24	40	150	200	350

CC 001 T: BIOSTATISTICS & RESEARCH METHODOLOGY(THEORY)-60 hrs

Teaching Objective	The course is intended to give an overview of research and statistical models commonly used in medical and bio-medical sciences. The goal is to impart an intuitive understanding and working knowledge of research designs and statistical analysis. The strategy would be to simplify, analyse the treatment of statistical inference and to focus primarily on how to specify and interpret the outcome of research.
Learning Outcomes	Student will be able to understand 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.

Sr. No.	**Topics**	**Hrs. Alloted 60 Hrs.**
A	**Research Methodology:**	
1	Scientific Methods of Research: Definition of Research, Assumptions, Operations and Aims of Scientific Research. Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	5
2	Research Designs: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	5
3	Sampling Designs: Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5
4	Measurement in research: Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	5
5	Methods of Data Collection: Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5
6	Sampling Fundamentals : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population Mean Estimating Population Proportion, Sample Size and its Determination, Determination of Sample Size through the Approach Based on	5

	Precision Rate and Confidence Level.	
B	**Biostatistics**	
7	Data Presentation: Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	3
8	Measures of Central Tendency and Dispersion: Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3
9	Testing of Hypotheses: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformation Important Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6
10	Chi-square Test: Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2
11	Measures of Relationship: Need and meaning, Correlation and Simple Regression Analysis	2
12	Analysis of Variance and Covariance: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4
13	Nonparametric or Distribution-free Tests: Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test Kruskal Walli's test, Friedman's test, and Spearman Correlation test.	3
14	Vital Health Statistics: Measurement of Population: rate, crude rate, specific rate, Measurement of fertility: specific fertility rate, Total fertility rate, Reproduction rate, Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR), Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4
15	Computer Application Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way	3

Sr. No.	Topics	Hours allotted 60hrs
A	**Research Methodology**	
1	Sampling Designs	4 hrs
2	Measurement in research	5 hrs
3	Methods of Data Collection	3 hrs
4	Sampling Fundamentals	3 hrs
B	**Biostatistics**	
5	Data Presentation	4 hrs
6	Measures of Central Tendency and Dispersion	4 hrs
7	Testing of Hypotheses	12 hrs
8	Chi\-square Test	2 hrs
9	Measures of Relationship	3 hrs
10	Analysis of Variance and Covariance	4 hrs
11	Nonparametric or Distribution-free Tests	4 hrs
12	Vital Health Statistics: Measurement of Population	6 hrs
13	Computer Application Using Statistical Software	6 hrs

MGM INSTITUTE OF HEALTH SCIENCES

M. Sc. Students

Syllabus for Research Methodology and Biostatistics

		No. of Hours	
	I. Research Methodology:	Theory	Practical
1	**Scientific Methods of Research** : Definition of Research, Assumptions, Operations and Aims of Scientific Research, Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	5	---
2	**Research Designs**: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	5	---
3	Sampling Designs : Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5	4
4	**Measurement in research:** Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	5	5
5	**Methods of Data Collection:** Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5	3
6	**Sampling Fundamentals** : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population Mean Estimating Population Proportion, Sample Size and its Determination, Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	5	3
	II. Biostatistics		
1	**Data Presentation** : Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	3	4
2	**Measures of Central Tendency and Dispersion** : Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3	4

3	**Testing of Hypotheses**: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformationImportant Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6	
4	**Chi-square Test:** Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2	2
5	**Measures of Relationship**: Need and meaning, Correlation and Simple Regression Analysis	2	3
6	**Analysis of Variance and Covariance**: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4	4
7	**Nonparametric or Distribution-free Tests:** Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test Kruskal Walli's test, Friedman's test, and Spearman Correlation test.	3	4
8	**Vital Health Statistics:** Measurement of Population: rate, crude rate, specific rate, *Measurement of fertility* : specific fertility rate, Total fertility rate, *Reproduction rate,* Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR) , Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4	6
9	**Computer Application** Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way ANOVA& post HOC test. Testing for normality,Chi-square test with measures of association. Pearson correlation. Non parametric test	3	6
	Total hours	60	60

Final

O/C

MGM INSTITUTE OF HEALTH SCIENCES

Accredited by NAAC with 'A' Grade

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

Sector-01, Kamothe, Navi Mumbai - 410 209

Tel 022-27432471, 022-27432994, Fax 022 - 27431094

E-mail : registrar@mgmuhs.com ; Website : www.mgmuhs.com

Curriculum for M.Sc. Allied Health Sciences [Based on Choice Based Credit System (CBCS)]

Master of Medical Genetics

(With effect from 2018-19 Batches)

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

(Approved in BOM – 53/2018, dated 19/05/2018)

23-10-2018

Recd
Pawar
2/11/2018

CURRICULUM FOR M.Sc.MEDICAL GENETICS

1ST YEAR

Semester I							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	GEN 101 T	Cell Biology	4	4	20	80	100
	GEN 102 T	Immunology &Immunotechnology	4	4	20	80	100
	GEN 103 T	Analytical Instrumentation	4	4	20	80	100
	GEN 104 T	Basic Biochemistry &Inborn Errors of Metabolism)▲ (Multidisciplinary/Interdisciplinary)	4	4	20	80	100
	Practical						
	GEN 101 P	Cell Biology	2	4	10	40	50
	GEN 102 P	Immunology &Immunotechnology	2	4	10	40	50
	GEN 103 P	Analytical Instrumentation	2	4	10	40	50
	GEN 104 P	Basic Biochemistry & Biomolecules ▲ (Multidisciplinary/Interdisciplinary)	2	4	10	40	50
		Total	24	32	120	480	600

Semester II							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	GEN 105 T	Molecular Biology & Genomics	4	4	20	80	100
	GEN 106 T	Recombinant DNA Technology	4	4	20	80	100
	GEN 107 T	Bioinformatics	4	4	20	80	100
	CC 001 T	Research Methodology & Biostatistics (Core Course)	4	4	20	80	100
	Practical						
	GEN 105 P	Molecular Biology & Genomics	2	4	10	40	50
	GEN 106 P	Recombinant DNA Technology	2	4	10	40	50
	GEN 107 P	Bioinformatics	2	4	10	40	50
	CC 001 P	Research Methodology & Biostatistics (Core Course)	2	4	10	40	50
		Total	24	32	120	480	600

2ND YEAR

Semester III							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	GEN 108 T	Clinical Genetics& Genetic Counselling	4	4	20	80	100
	GEN 109 T	Developmental Genetics& Environment Genetics	4	4	20	80	100
		Core Elective course**	4	4	20	80	100
	GEN 110 T	Cancer genetics and Pharmacogenomics					
	GEN 111 T	Principles of Genetics&Population Genetics					
	GEN 112 T	Stem Cell					
	GEN 113	Dissertation/Project Proposal*	6	12	50	-	50
	Practical						
	GE108 P	Clinical Genetics	2	4	10	40	50
	GE 109 P	Developmental Genetics	2	4	10	40	50
	GE 110 P GE 111 P GE 112 P	**Core Elective Practical** Cancer Genetics and Pharmacogenomics Principles of Genetics & Population Genetics Stem Cell	1	2	10	40	50
	GEN 114	Seminar*	1	2	50	0	50
		Total	24	36	190	360	550

Semester IV							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
		General elective **	4	4	100	0	100
	GEN 001 T	Pursuit of Inner Self Excellence (POISE)					
	GEN 002 T	Bioethics, Biosafety, IPR & Technology Transfer					
	GEN 003 T	Disaster Management and Mitigation Resources					
	GEN 004 T	Human rights					
	GEN 113	Dissertation / Project*	18	36	-	200	200
	Practical						
	GEN 115 P	Educational Tour / Field Work/Industrial Visit/Hospital Visit*	2	0	50	-	50

5	Methods of Data Collection: Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5
6	Sampling Fundamentals : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population Mean Estimating Population Proportion, Sample Size and its Determination, Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	5
B	**Biostatistics**	
7	Data Presentation: Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	3
8	Measures of Central Tendency and Dispersion: Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3
9	Testing of Hypotheses: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformation Important Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6
10	Chi-square Test: Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2
11	Measures of Relationship: Need and meaning, Correlation and Simple Regression Analysis	2
12	Analysis of Variance and Covariance: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4
13	Nonparametric or Distribution-free Tests: Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test Kruskal Walli's test, Friedman's test, and Spearman Correlation test.	3
14	Vital Health Statistics: Measurement of Population: rate, crude rate, specific rate, Measurement of fertility: specific fertility rate, Total fertility rate, Reproduction rate, Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR), Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4
15	Computer Application Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way ANOVA& post HOC test. Testing for normality, Chi-square test with measures of association. Pearson correlation. Non parametric test.	3

Name of the Programme	**M. SC MEDICAL GENETICS**
Course Code	**CC 001 P**
Name of the Course	**RESEARCH METHODOLOGY & BIOSTATISTICS (PRACTICAL)**

Sr. No.	**Topics**	**Total Hrs. Alloted (60 Hrs.)**
A	**Research Methodology**	
1	Sampling Designs	4
2	Measurement in research	5
3	Methods of Data Collection	3
4	Sampling Fundamentals	3
B	**Biostatistics**	
5	Data Presentation	4
6	Measures of Central Tendency and Dispersion	4
7	Testing of Hypotheses	12
8	Chi-square Test	2
9	Measures of Relationship	3
10	Analysis of Variance and Covariance	4
11	Nonparametric or Distribution-free Tests	4
12	Vital Health Statistics: Measurement of Population	6
13	Computer Application Using Statistical Software	6

****Note: Any 5 Practical from each paper is mandatory.**

MGM INSTITUTE OF HEALTH SCIENCES

M. Sc. Students

Syllabus for Research Methodology and Biostatistics

		No. of Hours	
	I. Research Methodology:	Theory	Practical
1	**Scientific Methods of Research** : Definition of Research, Assumptions, Operations and Aims of Scientific Research, Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	5	---
2	**Research Designs**: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	5	---
3	Sampling Designs : Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5	4
4	**Measurement in research:** Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	5	5
5	**Methods of Data Collection:** Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5	3
6	**Sampling Fundamentals** : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population Mean Estimating Population Proportion, Sample Size and its Determination, Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	5	3
	II. Biostatistics		
1	**Data Presentation** : Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	3	4
2	**Measures of Central Tendency and Dispersion** : Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3	4

3	**Testing of Hypotheses**: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformationImportant Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6	
4	**Chi-square Test:** Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2	2
5	**Measures of Relationship**: Need and meaning, Correlation and Simple Regression Analysis	2	3
6	**Analysis of Variance and Covariance**: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4	4
7	**Nonparametric or Distribution-free Tests:** Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test Kruskal Walli's test, Friedman's test, and Spearman Correlation test.	3	4
8	**Vital Health Statistics:** Measurement of Population: rate, crude rate, specific rate, *Measurement of fertility* : specific fertility rate, Total fertility rate, *Reproduction rate,* Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR) , Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4	6
9	**Computer Application** Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way ANOVA& post HOC test. Testing for normality,Chi-square test with measures of association. Pearson correlation. Non parametric test	3	6
	Total hours	60	60

01C

MGM INSTITUTE OF HEALTH SCIENCES

Accredited by NAAC with 'A' Grade

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

Sector-01, Kamothe, Navi Mumbai - 410 209

Tel 022-27432471, 022-27432994, Fax 022 - 27431094

E-mail : registrar@mgmuhs.com ; Website : www.mgmuhs.com

CHOICE BASED CREDIT SYSTEM (CBCS)

(With effect from 2018-19 Batches)

Curriculum for Masters in Public Health (MPH)

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

Approved as per BOM –55/2018, [Resolution No. 4.17], Dated 27/11/2018

30/11/2018.
received.

OUTLINE OF COURSE CURRICULUM

Master in Public Health (MPH)

Semester I

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
MPH 101 L	Concept of Public Health & Basic Epidemiology	4	-	-	-	4	60	-	-	-	60	20	80	100
MPH 102 L	Introduction to Demography & Basic Biostatistics	4	-	-	-	4	60	-	-	-	60	20	80	100
MPH 103 L	Introduction to Health System, Policy and Programs	4	-	-	-	4	60	-	-	-	60	20	80	100
MPH 104 L	Introduction to Health Economics	4	-	-	-	4	60	-	-	-	60	20	80	100
MPH 105 L	Practice of Public Health (Basic)	-	-	-	24	8	-	-	-	360	360	50	-	50
Total		16	0	0	24	24	240	0	0	360	600	130	320	450

OUTLINE OF COURSE CURRICULUM

Master in Public Health (MPH)

Semester II

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
MPH 106 L	Health Management: Principles and Practices	4	-	-	-	4	60	-	-	-	60	20	80	100
MPH 107 L	Reproductive, Maternal Health, Child Health and Adolescent Health	3	-	-	-	3	45	-	-	-	45	20	80	100
MPH 108 L	Communicable and Non-Communicable Diseases & Nutrition	3	-	-	-	3	45	-	-	-	45	20	80	100
MPH 109 L	Practice of Public Health (Advanced) – Rural Outreach	-	-	-	24	8	-	-	-	360	360	50	-	50
CC 001 L	Research Methodology & Biostatistics (Core Course)	4	-	-	-	4	60	-	-	-	60	20	80	100
Practical														
CC 001 P	Research Methodology & Biostatistics (Core Course)	-	-	4	-	2	-	-	60	-	60	10	40	50
Total		14	0	4	24	24	210	0	60	360	630	140	360	500

OUTLINE OF COURSE CURRICULUM

Master in Public Health (MPH)

Semester III

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
MPH 110 L	Environment and Occupational Health and Public Health Laws	4	-	-	-	4	60	-	-	-	60	20	80	100
MPH 111 L	Introduction to Financial Management and Budgeting	3	-	-	-	3	45	-	-	-	45	20	80	100
MPH 112 L	Medical Sociology and Effective Communication in Health Care	3	-	-	-	3	45	-	-	-	45	20	80	100
MPH 113 L	Practice of Public Health (Advanced) – Urban Outreach	-	-	-	18	6	-	-	-	270	270	50	-	50
MPH 114	Internship/Dissertation / Project*	10	-	-		5	-	-	-	-	-	50	-	50
Core Elective Course														
CEC 001 L	Advanced Epidemiology & Biostatistics	3	-	-	-	3	45	-	-	-	45	100	-	100
CEC 002 L	Health Systems, Policy, Planning and Programme Management													
Total		23	0	0	18	28	255	0	0	270	525	280	240	600

OUTLINE OF COURSE CURRICULUM

Master in Public Health (MPH)

Semester IV

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
General Electives														
GE 001 L	Pursuit of Inner self Excellence(POISE)	4	-	-	-	4	60	-	-	-	60	20	80	100
GE 002 L	Bioethics, Biosafety, IPR and Technology Transfer													
GE 003 L	Disaster Management and Mitigation Resources													
GE 004 L	Human Rights													
Practicals														
MPH 115	Dissertation / Project*	-	-	-	36	18	-	-	-	-	540	-	200	200
Total		4	0	0	36	22	60	0	0	0	600	20	280	300

Teaching Objective	The course is intended to give an overview of research and statistical models commonly used in medical and bio-medical sciences. The goal is to impart an intuitive understanding and working knowledge of research designs and statistical analysis. The strategy would be to simplify, analyse the treatment of statistical inference and to focus primarily on how to specify and interpret the outcome of research.
Learning Outcomes	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.

Sr. No.	Topics	No. of Hrs.
A	**Research Methodology:**	
1	Scientific Methods of Research: Definition of Research, Assumptions, Operations and Aims of Scientific Research. Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	5
2	Research Designs: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	5
3	Sampling Designs: Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5
4	Measurement in research: Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	5
5	Methods of Data Collection: Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5
6	Sampling Fundamentals : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population Mean Estimating Population Proportion, Sample Size and its Determination, Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	5
B	**Biostatistics**	
7	Data Presentation: Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts,	3

	Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	
8	Measures of Central Tendency and Dispersion: Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3
9	Testing of Hypotheses: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformation Important Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6
10	Chi-square Test: Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2
11	Measures of Relationship: Need and meaning, Correlation and Simple Regression Analysis	2
12	Analysis of Variance and Covariance: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4
13	Nonparametric or Distribution-free Tests: Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test KruskalWalli's test, Friedman's test, and Spearman Correlation test.	3
14	Vital Health Statistics: Measurement of Population: rate, crude rate, specific rate, Measurement of fertility: specific fertility rate, Total fertility rate, Reproduction rate, Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR), Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4
15	Computer Application Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labelling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of Hypothesis-one sample, Independent and paired sample t test, one way ANOVA& post HOC test. Testing for normality, Chi-square test with measures of association. Pearson correlation. Non parametric test.	3
Total		**60 hrs**

CC 001 P – Research Methodology & Biostatistics

Sr. No.	Topics	No. of Hrs
A	**Research Methodology**	
1	Sampling Designs	4
2	Measurement in research	5
3	Methods of Data Collection	3
4	Sampling Fundamentals	3
B	**Biostatistics**	
5	Data Presentation	4
6	Measures of Central Tendency and Dispersion	4
7	Testing of Hypotheses	12
8	Chi-square Test	2
9	Measures of Relationship	3
10	Analysis of Variance and Covariance	4
11	Nonparametric or Distribution-free Tests	4
12	Vital Health Statistics: Measurement of Population	6
13	Computer Application Using Statistical Software	6
Total		**60 hrs**

Final O/C

MGM INSTITUTE OF HEALTH SCIENCES

Accredited by NAAC with 'A' Grade

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

Sector-01, Kamothe, Navi Mumbai - 410 209

Tel 022-27432471, 022-27432994, Fax 022 - 27431094

E-mail : registrar@mgmuhs.com ; Website : www.mgmuhs.com

Curriculum for M.Sc. Allied Health Sciences [Based on Choice Based Credit System (CBCS)]

Masters In Hospital Administration

(With effect from 2018-19 Batches)

(Approved in BOM – 53/2018, dated 19/05/2018)

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

23-10-2018

Received
2/11/2018

Semester I

	Syllabus Ref. No.	Subject	Credits	Teaching hours	Marks		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MHA 101 T	Epidemiology and Demography	4	4	20	80	100
	MHA 102 T	Health Economics	4	4	20	80	100
	MHA 103 T	Business Communication	4	4	20	80	100
	MHA 104 T	Health Care System and Policies & Health Surveys	4	4	20	80	100
	MHA 105 T	Principles of Management	2	2	10	40	50
	MHA 106 T	Orientation of Hospital Industry	2	2	10	40	50
	Practical						
	MHA 107 P	Industry Posting	4	8	20	80	100
		Total	**24**	**28**	**120**	**480**	**600**

Semester II

	Syllabus Ref. No.	Subject	Credits	Teaching hours	Marks		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MHA 108 T	Hospital Planning and Management	4	4	20	80	100
	MHA 109 T	Organizational Behaviour	2	2	10	40	50
	MHA 110 T	Managerial Communication	2	2	10	40	50
	MHA 111 T	Accounting & Costing	2	2	10	40	50
	MHA 112 T	Management Information System	2	2	10	40	50
	MHA 113 T	Human Resource Management	2	2	10	40	50
	MHA 114 T	Project Management	2	2	10	40	50
	CC 001 T	Research Methodology & Biostatistics (Core Course)	4	4	20	80	100
	Practical						
	MHA 115 P	Hospital Project	8	16	20	80	100
	CC 001 P	Research Methodology & Biostatistics (Core Course)	2	4	10	40	50

		Total	**30**	**40**	**130**	**520**	**650**

Semester III

	Syllabus Ref. No.	Subject	Credits	Teaching hours	Marks		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
		Core Electives (Any one)**	4	4	20	80	100
	MHA 116 T	1. Quality Management & Accreditation in Hospital					
	MHA 117 T	2. Health Insurance					
	MHA 118 T	3. Hospital Super-specialty					
	MHA 119 T	4. Services Management					
	MHA 120 T	Legal Framework in Hospital	4	4	20	80	100
	MHA 121 T	Marketing Management for Hospital	4	4	20	80	100
	MHA 122 T	Material Management	2	2	10	40	50
	MHA 123 T	Financial Management	2	2	10	40	50
	MHA 124 T	Strategic Management	2	2	10	40	50
	MHA 125 T	Medical Technology management	2	2	10	40	50
	MHA 126	Dissertation/Project Proposal*	6	12	50	-	50
	Practical						
	MHA 127 P	Internship	8	16	20	80	100
		Total	**34**	**48**	**170**	**480**	**650**

Semester IV

	Syllabus Ref. No.	Subject	Credits	Teaching hours	Marks		
					Internal Assessment	**Semester Exam**	**Total**
	Theory						
		General Electives (Any one)**	4	4	100	-	100
	GE 001 T	Pursuit of Inner Self Excellence (POISE)					
	GE 002 T	Bioethics, Biosafety, IPR & Technology Transfer					
	GE 003 T	Disaster management and mitigation resources					
	GE 004 T	Human Rights					

	MHA 126	Dissertation/Project*	18	36	-	200	200
	Practical						
	MHA 128 P	Educational Tour / Field Work/Industrial Visit/Hospital Visit*	2	0	50	-	50
		Total	**24**	**40**	**150**	**200**	350

*(a) ***Dissertation / Project*Course**commences in III Semester

(b) ***Educational Tours / Field Works*** Course may be carried out in any Semester or all Semestersbut evaluated and Grade Points are to be added in 4th Semester.

(Elective): Any one subject is to be chosen from the following (Subjects offered may change from time to time depending on the availability of expertise)

**Elective courses may or may not have practical and/or field work.

▲ Multidisciplinary / Interdisciplinary

EDUCATIONAL/INDUSTRIAL TOUR IN THE PROGRAM:

Industrial visit (National and International) has its own importance in building a career of a student which is pursuing a professional degree. Objections of industrial visit are to provide students an insight regarding internal working of reputed hospitals and labs. Industrial visits provides students an opportunity to learn practically thoughts interactions, working methods and employment practices as theoretical knowledge is not enough for making a competent and skilful professionals.

Course Code	CC 001 T
Name of the Course	RESEARCH METHODOLOGY & BIOSTATISTICS (Core Course)

Teaching Objective	The course is intended to give an overview of research and statistical models commonly used in medical and bio-medical sciences. The goal is to impart an intuitive understanding and working knowledge of research designs and statistical analysis. The strategy would be to simplify, analyse the treatment of statistical inference and to focus primarily on how to specify and interpret the outcome of research.
Learning Outcomes	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.

Sr. No.	Topics	Hours allotted 60hrs
A	**Research Methodology:**	
1	Scientific Methods of Research: Definition of Research, Assumptions, Operations and Aims of Scientific Research. Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	5
2	Research Designs: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	5
3	Sampling Designs: Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5
4	Measurement in research: Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	5
5	Methods of Data Collection: Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5
6	Sampling Fundamentals : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population	5

	Mean Estimating Population Proportion, Sample Size and its Determination, Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	
B	**Biostatistics**	
7	Data Presentation: Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	3
8	Measures of Central Tendency and Dispersion: Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3
9	Testing of Hypotheses: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformation Important Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6
10	Chi-square Test: Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2
11	Measures of Relationship: Need and meaning, Correlation and Simple Regression Analysis	2
12	Analysis of Variance and Covariance: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4
13	Nonparametric or Distribution-free Tests: Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test Kruskal Walli's test, Friedman's test, and Spearman Correlation test.	3
14	Vital Health Statistics: Measurement of Population: rate, crude rate, specific rate, Measurement of fertility: specific fertility rate, Total fertility rate, Reproduction rate, Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR), Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4
15	Computer Application Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way ANOVA& post HOC test. Testing for normality, Chi-square test with measures of association. Pearson correlation. Non parametric test.	3

Name of the Programme	**MHA**

Course Code	**CC 001 P**
Name of the Course	**RESEARCH METHODOLOGY & BIOSTATISTICS (PRACTICAL)**

Sr. No.	**Topics**	**Total Hrs. Alloted (60 Hrs.)**
A	**Research Methodology**	
1	Sampling Designs	4
2	Measurement in research	5
3	Methods of Data Collection	3
4	Sampling Fundamentals	3
B	**Biostatistics**	
5	Data Presentation	4
6	Measures of Central Tendency and Dispersion	4
7	Testing of Hypotheses	12
8	Chi-square Test	2
9	Measures of Relationship	3
10	Analysis of Variance and Covariance	4
11	Nonparametric or Distribution-free Tests	4
12	Vital Health Statistics: Measurement of Population	6
13	Computer Application Using Statistical Software	6

****Note: Any 5 Practical from each paper is mandatory.**

MHA 115P:HOSPITAL PROJECT **Total Hours: 240**

Project work based on given responsibilities in the department

In this Phase students would be identifying some issues or challenges at the hospital and will be applying comprehensive research approach and submit the project in consultation with the academic as well as Hospital mentor. The student will make report and presentation for the project work during the practical examination.

MGM INSTITUTE OF HEALTH SCIENCES

M. Sc. Students

Syllabus for Research Methodology and Biostatistics

		No. of Hours	
	I. Research Methodology:	Theory	Practical
1	**Scientific Methods of Research** : Definition of Research, Assumptions, Operations and Aims of Scientific Research, Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	5	---
2	**Research Designs**: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	5	---
3	Sampling Designs : Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5	4
4	**Measurement in research:** Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	5	5
5	**Methods of Data Collection:** Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5	3
6	**Sampling Fundamentals** : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population Mean Estimating Population Proportion, Sample Size and its Determination, Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	5	3
	II. Biostatistics		
1	**Data Presentation** : Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	3	4
2	**Measures of Central Tendency and Dispersion** : Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3	4

3	**Testing of Hypotheses**: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformationImportant Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6	
4	**Chi-square Test:** Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2	2
5	**Measures of Relationship**: Need and meaning, Correlation and Simple Regression Analysis	2	3
6	**Analysis of Variance and Covariance**: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4	4
7	**Nonparametric or Distribution-free Tests:** Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test Kruskal Walli's test, Friedman's test, and Spearman Correlation test.	3	4
8	**Vital Health Statistics:** Measurement of Population: rate, crude rate, specific rate, *Measurement of fertility* : specific fertility rate, Total fertility rate, *Reproduction rate,* Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR) , Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4	6
9	**Computer Application** Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way ANOVA& post HOC test. Testing for normality,Chi-square test with measures of association. Pearson correlation. Non parametric test	3	6
	Total hours	60	60

Annexure-46

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

M.Sc.Clinical Nutrition

((As per **CHOICE BASED CREDIT SYSTEM** With effect

From the Academic Year 2018-2019)

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act)
Navi Mumbai- 410 209

OUTLINE OF COURSE CURRICULUM

M.Sc. Clinical Nutrition

Semester I

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
MCN 101 L	Principles of Nutrition	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
MCN 102 L	Biochemistry & Applied Biochemistry	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
MCN 103 L	Basic Human Physiology	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
MCN 104 L	Pathophysiology	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
MCN 105 CP	Nutrition Directed Clinical Education-I	-	-	-	21	**7**	-	-	-	315	**315**	50	-	**50**
Practical														
MCN 102 P	Biochemistry & Applied Biochemistry	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
MCN 103 P	Basic Human Physiology	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
MCN 104 P	Pathophysiology	-	-	2	-	**1**	-	-	30	-	**30**	10	40	**50**
Total		**14**	**0**	**6**	**21**	**24**	**210**	**0**	**90**	**315**	**615**	**160**	**440**	**600**

OUTLINE OF COURSE CURRICULUM

M.Sc. Clinical Nutrition

Semester II

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
MCN 106 L	Medical Nutrition Therapy I	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
MCN 107 L	Advance Nutrition	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
MCN 108 L	Food Microbiology and Safety	3	-	-	-	**3**	45	-	-	-	**45**	20	80	**100**
MCN 109 CP	Nutrition Directed Clinical Education-II	-	-	-	21	**7**	-	-	-	-	**315**	50	-	**50**
CC 001 L	Research Methodology & Biostatistics (Core Course)	4	-	-	-	**4**	60	-	-	-	**60**	20	80	**100**
Practical														
MCN 106 P	Medical Nutrition Therapy I	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
CC 001 P	Research Methodology & Biostatistics (Core Course)	-	-	4	-	**2**	-	-	60	-	**60**	10	40	**50**
Total		**14**	**0**	**8**	**21**	**25**	**210**	**0**	**120**	**0**	**645**	**150**	**400**	**550**

OUTLINE OF COURSE CURRICULUM

M.Sc. Clinical Nutrition

Semester III

Code No.	Core Subjects	Credits/Week					Hrs/Semester					Marks		
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total Credits (C)	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.	Internal Assessment	Semester Exam	Total
Theory														
MCN 110L	Medical Nutrition Therapy II	4	0	-	-	**4**	60	0	-	-	**60**	20	80	**100**
MCN111 L	Community Nutrition	3	0	-	-	**3**	45	0	-	-	**45**	20	80	**100**
MCN 112 L	Food Science and analysis	3		-		**3**	45	-	-		**45**	20	80	**100**
MCN 113 L	Pediatric and geriatric Nutrition	4				**4**	60				**60**	20	80	**100**
MCN 114	Nutrition Directed Clinical Education III	4		-	21	**7**		-	-	-	**315**	50		**50**
Practical														
MCN 107P	Medical Nutrition Therapy II	-	-	4	-	**2**	-	-	60	60	**60**	10	40	**50**
MCN 108P	Food Science and analysis	-	-	4	-	**2**	-	-	60	60	**60**	10	40	**50**
Total		**18**	**0**	**8**	**21**	**25**	**210**	**0**	**120**	**120**	**645**	**150**	**400**	**550**

Semester IV

	Syllabus Ref. No.	Subject	Credits	Teaching hours	Marks		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
		General elective **	4	4	20	80	100
	GE 001 T	Pursuit of Inner Self Excellence (POISE)					
	GE 002 T	Bioethics, Biosafety, IPR & Technology transfer ▲ (Multidisciplinary/ Interdisciplinary)					
	GE 003 T	Disaster management and mitigation resources					
	GE 004 T	Human rights					
	MCN 115	Seminar	1	2	50	-	50
	MCN 116	Dissertation / Project*	18	36	-	200	200
	Practical						
	MCN117 P	Educational Tour / Field Work*	2	0	-	-	0
		Total	24	40	20	280	300

Name of the Programme	**M.Sc. Clinical Nutrition**
Name of the Course	**Research Methodology & Biostatistics** **(Core Course)**
Course Code	**CC 001 L**

Teaching Objective	The course is intended to give an overview of research andstatistical models commonly used in medical and bio-medical sciences. Thegoal is to impart an intuitive understanding and working knowledge ofresearch designs and statistical analysis. The strategy would be tosimplify, analyse the treatment of statistical inference and to focus primarily onhow to specify and interpret the outcome of research.
Learning Outcomes	Student will be able to understand develop statistical models, researchdesigns with the understating of background theory of various commonly usedstatistical techniques as well as analysis interpretation & reporting ofresults and use of statistical software.

Sr. No	Topic	No. of Hrs.
A	**Research Methodology:**	
1	Scientific Methods of Research: Definition of Research, Assumptions, Operations and Aims of Scientific Research. Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	5
2	Research Designs: Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	5
3	Sampling Designs: Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5
4	Measurement in research: Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	5
5	Methods of Data Collection: Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5

6	Sampling Fundamentals : Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population Mean Estimating Population Proportion, Sample Size and its Determination, Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	5
B	**Biostatistics**	
7	Data Presentation: Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	3
8	Measures of Central Tendency and Dispersion: Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3
9	Testing of Hypotheses: Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformationImportant Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6
10	Chi-square Test: Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2
11	Measures of Relationship: Need and meaning, Correlation and Simple Regression Analysis	2
12	Analysis of Variance and Covariance: Analysis of Variance (ANOVA):Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4
13	Nonparametric or Distribution-free Tests: Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test KruskalWalli's test, Friedman's test, and Spearman Correlation test.	3
14	Vital Health Statistics: Measurement of Population: rate, crude rate, specific rate, Measurement of fertility: specific fertility rate, Total fertility rate, Reproduction rate, Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR), Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4
15	Computer Application Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way ANOVA& post HOC test. Testing for normality,Chi-square test with measures of association. Pearson correlation. Non parametric test.	3
Total		**60 hrs**

CC 001P –Research Methodology & Biostatistics

Sr. No.	Topics	No. of Hrs
A	**Research Methodology**	
1	Sampling Designs	4
2	Measurement in research	5
3	Methods of Data Collection	3
4	Sampling Fundamentals	3
B	**Biostatistics**	
5	Data Presentation	4
6	Measures of Central Tendency and Dispersion	4
7	Testing of Hypotheses	12
8	Chi-square Test	2
9	Measures of Relationship	3
10	Analysis of Variance and Covariance	4
11	Nonparametric or Distribution-free Tests	4
12	Vital Health Statistics: Measurement of Population	6
13	Computer Application Using Statistical Software	6
Total0		**60 hrs**

Mahatma Gandhi Mission's
MEDICAL COLLEGE
Sector-1, Kamothe, Navi Mumbai - 410 209, India
Ph: (022) 27433404, 27437900Fax: (022) 27430320
E-mail: mgmmcnb@gmail..com, Web: www.mgmuhs.com

POST GRADUATE INDUCTION PROGRAMME 2018
MD/MS/DIPLOMA

FROM 02ND MAY TO 08TH MAY 2018

(GR. FL. AUDITORIUM)

Mahatma Gandhi Mission's
MEDICAL COLLEGE
Sector-1, Kamothe, Navi Mumbai - 410 209.
Ph: (022) 7433404,
E-mail: mgmmcnb@gmail.com, Web: www.mgmuhs.com

SCHEDULE OF INAUGURAL FUNCTION OF MD/ MS/DIPLOMA INDUCTION CEREMONY 2018

02/05/18 **(TIME : 10AM TO 5PM)**

• Address by DEAN
• Address by REGISTRAR
• SELF INTRODUCTION BY EACH STUDENT
• HODs Brief address
• Quires/Questions if any by student/Parents
• Refreshment
• Visit to the College & Hospital
1. Central Library : I/c. Dr. R.P. Dixit 2. Central Research Laboratory : I/c. Tech Director, Dr. Raman Yadav 3. Blood Bank : I/c. Dr. Seema Gupta 4. Central Lab : I/C. Dr. Maheshwari 5. EMS : I/c. : Dr. Sagar Sinha
• BIOMETRIC REGISTRATION AT MS OFFICE

***Attendance is compulsory,**

O/C

Mahatma Gandhi Mission's
MEDICAL COLLEGE
Sector-1, Kamothe, Navi Mumbai - 410 209.
Ph: (022) 7433404,
E-mail: mgmmcnb@gmail.com, Web: www.mgmuhs.com

MGM/MED-C/2018 Date : 30/04/2018

DATE: 03/05/2018 POST GRADUATE INDUCTION PROGRAMME

Time	Subject	Faculty
10 AM TO 10.45 AM	Handling of Surgical Specimens & Scrubs	Dr. Siddharth Dubhashi Surgery
10.45AM to 11.30AM	Lab Services	Dr. Maheshwari
11.30AM TO 12.00 PM	Hospital SOPs	Dr. KR. Salgotra MS Ophick.
12.30 PM to 1.30PM	Lunch Break	
1.30PM to 2.15 PM	Procedures & OT SOPs	Dr. OLvina Anaesthesia
2.15PM to 3PM	Emergency Services	Dr. D. Bhussare/ Dr. Sagar Sinha EM
3PM to 3.30 PM	Critical Care	
3.30 PM to 4.00 PM	Bank form	Office

- Attendance is Compulsory

All By
Intern Dr & SMS

S.R. Shabad
3/5/18.

Mahatma Gandhi Mission's
MEDICAL COLLEGE
Sector-1, Kamothe, Navi Mumbai - 410 209.
Ph: (022) 7433404,
E-mail: mgmmcnb@gmail.com, Web: www.mgmuhs.com

MGM/MED-C/2017-18 Date : 02/05/2018

DATE: 04/05/2018 POST GRADUATE INDUCTION PROGRAMME

Time	Subject	Faculty
10 AM TO 10.45 AM	Universal Safety Precautions & Infectious control	Dr. AD Urhekar & Dr. Sameer Micro 03/05/2018
10.45AM to 11.00AM	Collection of Samples	
11.00AM TO 11.30AM	Blood Bank Services	Dr. Seema Gupta IHBT
11.30AM TO 12.15 PM	Prescription writing & Pharmaco vigilance	Dr. Ipsita Ray Pharmac
12.15AM -- 1 PM	Documentalisation & informed consent	Dr. J. Ghanekar & Dr. Salgotra, Medicine
1PM to 1.30PM	LUNCH	
1.30PM -2PM	Doctor Patient Relationship	Dr. J. Ghanekar Medicine
2.PM – 2.30PM	Confidentiality	Dr. B. Seth OBG4
2.30PM to 3PM	Medico legal Aspects	Dr. R. Choudhary FMT
3PM to 4 PM	Communication Skills	Dr. Shilpi Sahu & Dr. Anjali Sabnis Anatomy

- Attendance is Compulsory

POST GRADUATE INDUCTION PROGRAMME

DATE: 05/05/2018 Saturday

Time	Subject	Faculty
10 AM TO 12 PM	Out Reach Programme & Rajiv Gandhi MJPJAY	Dr. Prasad Waingankar
12PM to 1PM	Issue of Welcome Kit Containing A/c. No., Debit Card/ Pin Etc	By IDBI

DATE: 07/05/2018

Time	Subject	Faculty
10 AM TO 11 AM	Professionalism	Dr. Siddharth Dubhashi
11AM to 11.30AM	Synopsis writing	Dr. Siddharth Dubhashi
11.30AM TO 12..30 PM	Basics of Research Methodology	Dr. Rita Abbi
12 30NOON to 1.30PM	Lunch	
1.30PM to 3.00PM	Basics of Research Methodology	Dr. Prasad Waignankar Mr. Raut
3.00PM to 3.30PM	Pharmaco-vigilance & Prescription writing	Dr. Ipsita Ray

POST GRADUATE INDUCTION PROGRAMME

DATE: 08/05/2018

Time	Subject	Faculty
10 AM TO 3 PM With 1/2 Hour Lunch	Airway & Basic Life Support	Dr. Sameer kadam & Dr. Viswas Sathe, I/c. Skill's Lab
3 PM to 4PM	Address by Dean Feed Back by IQAC Issue Log Book, Residents Manual	

Circular No. PG INDUCTION 2018 date 02/5/2018

Subject : (Faculty Attendance)

Sr. No.	Name of The Department	Sign
1	Anatomy	Jabrin
2	Physiology	2/5/2018
3	Biochemistry	
4	Pathology	SSalvi 02/5/18
5	Microbiology	Dr Utkelar
6	Pharmacology	2/5/18
7	Community Medicine	2/5/18.
8	FMT	
9	General Medicine	2.5.18
10	Paediatrics	2.5.18
11	Dermatology	
12	Respiratory Medicine	2/5/18
13	Psychiatry	2/5/18.
14	Surgery	Prof. Dr. SUDHANSH P. DESHMUKH 2.5.18.
15	Orthopaedics	
16	Ophthalmology	2/5/18 DR GBhosale DR G Bhosale AP Opth
17	ENT	Dr. Padma Rawat 02/05/18
18	OBGY	
19	Radiology	
20	Anaesthesiology	2 MAY 2018
21	Emergency Medicine	DR Singh
22	Immuno Haematology & Blood Transfusion	2/5/18
23	Geriatrics	—
24	Cardiology	—
25	CVTS	S. KADAM 2/5/18
26	Urology	
27	MS Office, MGM Hospital Kamothe ✓	ok
28	MS Office, MGM Hospital Kalamboli ✓	ok
29	Central Research Lab (Dr. Raman Yadav) ✓	ok

Induction Programme 2018

Attendance Sheet ↔ 02/05/2018

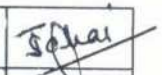
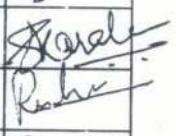
MGM MEDICAL COLLEGE, NAVI MUMBAI

LIST OF PG STUDENTS 2018-19 (ADMITTED THROUGH DGHS ROUND I & II)

No.	Roll No	AIR	NAME	COURSE	CAT	DOA	QUOTA	MOB	EMAIL	SIGN
1	1805014977	10088	RAUSHAN KUMAR	M.D. (GENERAL MEDICINE)	UR	Apr 23 2018	MNG	918404869096	raushan.thakur1947@gmail.com	
2	1805040745	13085	AVIRAL KASHYAP	M.D. (GENERAL MEDICINE)	UR	Apr 4 2018	MNG	918229811136	kashyapaviral@gmail.com	
3	1805046688	18989	ARCOT KRISHNA KISHORE	M.D. (GENERAL MEDICINE)	UR	Apr 4 2018	MNG	919912103084	arcotkrishnakishore@gmail.com	
4	1805061500	17114	INDERJOT KAUR	M.D. (GENERAL MEDICINE)	UR	Apr 5 2018	MNG	919872953241	dr.inderjotkaur92@gmail.com	
5	1805068751	16530	SHRUTI SINHA	M.D. (GENERAL MEDICINE)	UR	Apr 3 2018	MNG	919740838575	sinhashruti06@gmail.com	
6	1805117034	10476	GARG MAYUR SUNIL	M.D. (GENERAL MEDICINE)	UR	Apr 2 2018	MNG	918097110336	gargmayurcr7@gmail.com	
7	1805013350	20399	VISHAL VIVEKANAND JALI	M.D. (PAEDIATRICS)	UR	Apr 3 2018	MNG	919901348164	jaliguddu@gmail.com	
8	1805062867	10146	BALLAMUDI KRISHNA	M.D. (PAEDIATRICS)	UR	Apr 2 2018	MNG	918294035065	krishna_b108@yahoo.in	
9	1805087155	15930	SHAH RISHABH KIRAN	M.D. (PAEDIATRICS)	UR	Apr 4 2018	MNG	919664473322	drrishabhshah@gmail.com	
10	1805096891	14798	PRAJVI JAIN	M.D. (PAEDIATRICS)	UR	Apr 3 2018	MNG	918080089140	prajvi157@gmail.com	
11	1805086620	21884	BHANUSHALI DISHA NARESH	DCH	UR	Apr 20 2018	MNG	919821332374	dr.disha.n.b@gmail.com	
12	1805032349	32302	ASHU KUMAR SINHA	DCH	UR	Apr 3 2018	MNG	919970599969	aashu.sinha@gmail.com	
13	1805091148	9478	VADERA KOPAL AJAY	MD (DERMATOLOGY	UR	Apr 5 2018	MNG	919921017332	kopal.v158@gmail.com	
14	1805046179	33503	SURAJ S HORAKERI	MD (Emergency Medicine)	UR	Apr 19 2018	MNG	919591235044	suraj.sh138@gmail.com	
15	1805098957	32306	VERNICA KALA	MD (Emergency Medicine)	UR	Apr 4 2018	MNG	919870436099	vernicakala19@gmail.com	
16	1805080870	38291	ABHISHEK GUPTA	M.D. (PSYCHIATRY)	UR	Apr 4 2018	MNG	919779541413	gupta.abhishek1234@gmail.com	
17	1805117663	40708	VERMA RISHAB MAHINDER	M.D. (PSYCHIATRY)	UR	Apr 3 2018	MNG	918369791426	rishireco@gmail.com	

18	1805010003	35185	ANTARIKHYA BORDOLOI	M.D. GERIATRICS	UR	Apr 5 2018	MNG	919435748039	dr.antarikhyabordoloi@gmail.com	
19	1805086280	43669	ANITA KUMAR	M.D. GERIATRICS	UR	Apr 5 2018	MNG	919022200700	diva2000in@gmail.com	
20	1805123602	21104	H ABISHEK KARTHIK	M.S. (GENERAL SURGERY)	UR	Apr 19 2018	MNG	919003239384	abishek.karthik12@gmail.com	
21	1805012488	28535	SHAUNAK SAHA	M.S. (GENERAL SURGERY)	UR	Apr 3 2018	MNG	918050598052	shaunak_saha@yahoo.com	
22	1805059384	28367	ANIRUDDH KHARE	M.S. (GENERAL SURGERY)	UR	Apr 4 2018	MNG	919535619002	aniruddhdoc07@gmail.com	
23	1805095632	28288	GUNJAN MISHRA	M.S. (GENERAL SURGERY)	UR	Mar 31 2018	MNG	919969038523	mishrabdm@gmail.com	
24	1805118479	55505	VISHNU VIKRAMAN NAIR	M.S. (ORTHOPAEDICS)	UR	Apr 17 2018	NRI	00919567382831	vishnunair212@gmail.com	
25	1805085122	6654	SHAH MANAN NILEN	M.S. (ORTHOPAEDICS)	UR	Apr 4 2018	MNG	919930759007	manan243@gmail.com	
26	1805117656	11472	MHATRE JUILEE NITIN	M.S. (ORTHOPAEDICS)	UR	Apr 3 2018	MNG	919867466909	juileemhatre22@gmail.com	
27	1805133277	11934	ABHIJEET MOHAN KADAM	M.S. (ORTHOPAEDICS)	UR	Apr 3 2018	MNG	919892803280	abhijeetkadam93@gmail.com	
28	1805086989	38755	MANASI DIWAKAR SAWANT	DIPLOMA IN ORTHOPAEDICS	UR	Apr 4 2018	MNG	919833305813	manasi92@hotmail.com	
29	1805109642	29236	TALSANIA KATHAN ATULBHAI	DIPLOMA IN ORTHOPAEDICS	UR	Apr 4 2018	MNG	919724117179	kathan.talsania@gmail.com	
30	1805084921	15676	AGRAWAL MAMTA RAMESH	M.S. (OPHTHALMOLOGY)	UR	Apr 21 2018	MNG	918850163075	himamta14@yahoo.com	
31	1805058656	15623	AYUSHI CHOUDHARY	M.S. (OPHTHALMOLOGY)	UR	Apr 3 2018	MNG	919826032532	ayushichoudhary10@gmail.com	
32	1805011980	47271	AARZOO S	M.S. (E.N.T.)	UR	Apr 4 2018	MNG	919481302986	zu.saliya@gmail.com	
33	1805098544	45662	SIVASUBRAMANIAM NAGARAJAN	M.S. (E.N.T.)	UR	Mar 31 2018	MNG	919900457693	sivan020393@gmail.com	
34	1805057390	9033	ANSHU BASER	MS(OBGY))	UR	Apr 21 2018	MNG	919009719379	anshubaser@gmail.com	
35	1805033061	14760	AKRITI GUPTA	MS(OBGY))	UR	Apr 4 2018	MNG	917038487997	dr.akriti21@gmail.com	

36	1805086379	17232	KALNAWAT NARAYANI RAMESH	MS(OBGY))	UR	Apr 2 2018	MNG	919820978282	nkalnawat@gmail.com	
37	1805106735	17229	SIYA SETHI	MS(OBGY))	UR	Apr 4 2018	MNG	917049909999	siyasethi@gmail.com	
38	1805091934	31044	KAKANI SHREYA PREMKISHOR	DGO	UR	Apr 1 2018	MNG	918928181559	shreyakakani9@gmail.com	
39	1805133871	25774	JUVERIYA JIKARBHAI KACHCHI	DGO	UR	Apr 4 2018	MNG	918530346465	juveriya.jk@gmail.com	
40	1805013518	7732	KRISHNAKUMAR K M	M.D. (RADIO-DIAGNOSIS)	UR	Apr 4 2013	MNG	919562614845	principalvasudevan@gmail.com	
41	1805091939	7087	KHANDEDIYA OJASWI BHARAT KUMAR	M.D. (RADIO-DIAGNOSIS)	UR	Apr 4 2018	MNG	918956455890	ojaswi.khandediya@gmail.com	
42	1805098918	14726	WARKAD SONALI LAXMAN	DIP.IN MEDICAL RADIO-DIAGNOSIS	UR	Mar 31 2018	MNG	919205567882	sonaliwarkad.sw@gmail.com	
43	1805117794	27840	AMBAREEN HASAN MOMIN	M.D. (ANAESTHESIOLOGY)	UR	Apr 19 2018	MNG	917045133607	ambareenhmomin@gmail.com	
44	1805018585	23724	PRAKRUT JENA	M.D. (ANAESTHESIOLOGY)	UR	Apr 20 2018	MNG	918249814156	jena.prakrut@gmail.com	
45	1805085707	37353	AKANSHA SHARMA	M.D. (ANAESTHESIOLOGY)	UR	Apr 2 2018	MNG	917089159284	akanshasharma45@gmail.com	
46	1805085961	47919	SHAH MANSI KETANKUMAR	M.D. (ANAESTHESIOLOGY)	UR	Apr 3 2018	MNG	919730997409	shahmansi586@gmail.com	
47	1805087134	49530	SIRIL NITIN PATIL	M.D. (ANAESTHESIOLOGY)	UR	Apr 4 2018	MNG	917507188738	sirilpatil64@gmail.com	
48	1805096919	35234	JAIN GAYATRI ANIL	M.D. (ANAESTHESIOLOGY)	UR	Apr 2 2018	MNG	919819385996	gayatri.jain@gmail.com	
49	1805060575	60851	ALOK KUMAR SINGH	DIPLOMA IN ANAESTHESIOLOGY	UR	Apr 4 2018	MNG	918130433245	alokhotice_4@rediffmail.com	
50	1805098614	48382	ANSHIKA RAI	M.D. (PATHOLOGY)	UR	Apr 19 2018	MNG	918197643017	11anshikara@gmail.com	

51	1805097076	51601	JYOTSNA SAHAI	M.D. (PATHOLOGY)	UR	Apr 19 2018	MNG	919167305048	jyotisworld@hotmail.com	
52	1805087251	62002	GAIKWAD PRIYANKA NANDKUMAR	M.D. (PATHOLOGY)	UR	Apr 3 2018	MNG	918082019949	priyag061991@gmail.com	
53	1805091188	43188	KARALE SIDDHI RATNAKAR	M.D. (PATHOLOGY)	UR	Apr 3 2018	MNG	919987533901	drsiddhikarale@gmail.com	
54	1805096636	40810	RUCHI KHADAYATE	M.D. (PATHOLOGY)	UR	Apr 4 2018	MNG	917021183208	ruchikhadayate@gmail.com	
55	1805085053	43394	MITI RAVIN GANDHI	M.D. (PHARMACOLOGY)	UR	Apr 19 2018	MNG	919820120572	mitigandhi26@gmail.com	
56	1805106378	27724	KULKARNI NOOPUR SUDHAKAR	M.D. (COMMUNITY MEDICINE)	UR	Apr 21 2018	MNG	917767904363	rahulach1@gmail.com	

Government of India
Ministry of Health & Family Welfare
File No. EC/18/000006
Directorate General of Health Services
Office of Drugs Controller General (India)
Central Drugs Standard Control Organization

FDA Bhawan, Kotla Road,
New Delhi - 110002, India
Dated: 28-Sep-2018

सत्यमेव जयते

To

The Chairman
MGM INSTITUTIONAL ETHICS COMMITTEE NAVI MUMBAI
MGM Medical College, Navi Mumbai
Sector 1, Kamothe Navi Mumbai Panvel Raigad
Maharashtra - 410209 India

Subject: Ethics Committee Registration No. ECR/1133/Inst/MH/2018 issued under Rule 122DD of the Drugs & Cosmetics Rules 1945.

Sir/Madam,

Please refer to your application no. EC/NEW/INST/2017/1645 dated 29-Jan-2018 submitted to this Directorate for the Registration of Ethics Committee.

Based on the documents submitted by you, this office hereby registers the MGM INSTITUTIONAL ETHICS COMMITTEE NAVI MUMBAI situated at MGM Medical College, Navi Mumbai Sector 1, Kamothe Navi Mumbai Panvel Raigad Maharashtra - 410209 with Registration number ECR/1133/Inst/MH/2018 as per the provisions of Rule 122DD of the Drugs and Cosmetics Rules, 1945 subject to the following conditions:

1. This Registration is subject to the conditions specified under Rule 122DD and Appendix VIII of Schedule-Y of Drugs and Cosmetics Act, 1940 and Rules 1945.

2. The Ethics Committee shall review and accord its approval to a clinical trial and also carry ongoing review of the trial at appropriate intervals as specified in Schedule Y and the Good Clinical Practice Guidelines for Clinical Trials in India and other applicable regulatory requirements for safeguarding the rights, safety and well-being of the trial subjects.

3. In the case of any serious adverse event occurring to the clinical trial subjects during the clinical trial, the Ethics Committee shall analyze and forward its opinion as per procedures specified under APPENDIX XII of Schedule Y.

4. The Ethics Committee shall allow inspectors or officials authorized by the Central Drugs Standard Control Organization to enter its premises to inspect any record, data or any document related to clinical trial and provide adequate replies to any query raised by such inspectors or officials, as the case may be, in relation to the conduct of clinical trial.

5. The licensing authority shall be informed in writing in case of any change in the membership or the constitution of the ethics committee takes place.

6. All the records of the ethics committee shall be safely maintained after the completion or termination of the study for not less than five years from the date of completion or termination of the trial (Both in hard and soft copies).

7. If the Ethics Committee fails to comply with any of the conditions of registration, the Licensing Authority may, after giving an opportunity to show cause why such an order should not be passed, by an order in writing stating the reasons therefore, suspend or cancel the registration of the Ethics Committee for such period as considered necessary.

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

8. This registration shall be in force for a period of three years from the date of issue, unless it is sooner suspended or cancelled. Provided that if the application for re-registration is received by the Licensing Authority within three months before the expiry, the registration shall continue to be in force until orders are passed by the said authority.

a. The Licensing Authority shall be informed in writing in case of any change in the membership or the constitution of the Ethics Committee takes place.

9. Ethics Committee shall consist of not less than seven members and is subject to a maximum of 15. One among its members, who is from outside the institute, shall be appointed as chairman, one member as a Member Secretary and rest of the members shall be from Medical, Scientific, Non-Medical and Non-scientific fields including lay public.

10. The committee shall include at least one member whose primary area of interest or specialization is Non-scientific and at least one member who is independent of the institution, Besides; there should be appropriate gender representation on the Ethics Committee.

11. The Ethics committee can have as its members, individuals from other Institutions or Communities, if required.

12. Members should be conversant with the provisions of clinical trials under this Schedule, Good Clinical Practice Guidelines for clinical trials in India and other regulatory requirements to safeguard the rights, safety and well-being of the trial subjects.

13. For review of each protocol the quorum of Ethics Committee shall be at least five members with the following representations:

I. Basic medical scientist (preferably one pharmacologist)
II. Clinician
III. Legal expert
IV. Social scientist or representative of non-governmental voluntary agency or philosopher or ethicist or theologian or a similar person.
V. Lay person from community

14. The members representing medical scientist and clinicians should have Post graduate qualification and adequate experience in their respective fields and aware of their role and responsibilities as committee members.

15. As far as possible, based on the requirement of research area such as HIV, Genetic disorder, etc., specific patient group may also be represented in the Ethics Committee.

16. There should be no conflict of interest. The members shall voluntarily withdraw from the Ethics Committee meeting while making a decision on an application which evokes a conflict of interest which may be indicated in writing to the Chairman prior to the review and be recorded so in the minutes. All members shall sign a declaration on conflict of interest.

17. Subject experts or other experts may be invited to the meetings for their advice. But no such expert shall have voting rights.

18. This certificate is issued to you on the basis of declaration/submission by you that yours is an Institution and registration is sought for Institutional Ethics Committee.

19. Funding mechanisms for the Ethics Committee to support their operations should be designed to ensure that the committees and their members have no financial incentive to approve or reject particular studies.

20. SOP's for funding of the Ethics committee in order to support their operations must be maintained. The records of income & expenditure of Ethics Committee shall be maintained for review and inspection.

21. The Chairman of Ethics Committee shall enter into MOU with head of institution, that necessary support and facilities and independence will be provided to Ethics Committee and their records will be maintained as long as required.

22. Ethics Committee may undertake the review and monitoring of clinical trial protocols of other investigator(s) and site(s) who do not have their IEC, subject to the condition that the other sites are within the loco-

regional and community settings similar to that of the registered Ethics committee. The approving Ethics Committee must be willing to accept their responsibilities for the study at such trial site(s) and the trial site(s) willing to accept such an arrangement.

23. Ethics Committee shall review and approve the suitability of the investigator and trial site for the proposed trial. The ethics committee shall undertake proper causality assessment of SAE's with the help of subject experts where required, for deciding relatedness and compensation, as per condition no (3) mentioned above.

S ESWARA REDDY

Digitally signed by S ESWARA REDDY
Date: 2018.10.04 10:26:09 IST

(S. Eswara Reddy)
Drugs Controller General (I) &
Licensing Authority

File No. EC/18/000006

Government of India
Ministry of Health & Family Welfare
Directorate General of Health Services
Office of Drugs Controller General (India)
Central Drugs Standard Control Organization

FDA Bhawan, Kotla Road,
New Delhi - 110002, India
Dated: 28-Sep-2018

To

The Chairman
MGM INSTITUTIONAL ETHICS COMMITTEE NAVI MUMBAI
MGM Medical College, Navi Mumbai
Sector 1, Kamothe Navi Mumbai Panvel Raigad
Maharashtra - 410209 India

Subject: Ethics Committee Registration No. ECR/1133/Inst/MH/2018 issued under Rule 122DD of the Drugs & Cosmetics Rules 1945.

Sir/Madam,

Please refer to your application no. EC/NEW/INST/2017/1645 dated 29-Jan-2018 submitted to this Directorate for the Registration of Ethics Committee.

Your Ethics Committee is hereby registered under Rule 122DD vide Registration No.ECR/1133/Inst/MH/2018 with the following composition and all the condition mentioned under the Registration certificate issued to you.

Sr. No.	Name of Member	Qualification	Role/Designation in Ethics Committee
1	Dr. Jaishree Ravindra Ghanekar	MBBS (MD - Medicine)	Clinician
2	Dr. Anant Dattatray Urhekar	MBBS (MD - Pathology & Microbiology)	Basic Medical Scientist
3	Dr. D Bhusare	MBBS (MS - General Surgery)	Clinician
4	Ms. Usha Mohite	10th (Not Applicable)	Lay Person
5	Dr. Pramila Yadav	MBBS (MD-Pharmacology)	Chair Person
6	Dr. Pradeep R Jadhav	MBBS (MD-Pharmacology)	Member Secretary
7	Dr. Ipseeta S Ray	BSc (MSc.,PhD-Pharmacology)	Scientific Member
8	Dr. Ravindra Shriniwas Inamdar	MBBS (MD-Physiology)	Basic Medical Scientist
9	Dr. Rajeev S Chaudhary	MBBS (MD- Forensic Medicine)	Basic Medical Scientist
10	Ms. Rupali V Gujar	BA (MSW)	Social Scientist
11	Ms. Karuna Ramraje Malviya	LLB (LLM)	Legal Expert

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

S ESWARA REDDY
Digitally signed by S ESWARA REDDY
Date: 2018.10.04 10:26:56 +05'30'

(Dr. S. Eswara Reddy)
Drugs Controller General (I) &
Licensing Authority

ECR/1083/MGM-ECRHS/Inst/MH/2014/Re-Registration-2017

सत्यमेव जयते

Government of India
Ministry of Health & Family Welfare
Directorate General of Health Services
Office of Drugs Controller General (India)
Central Drugs Standard Control Organization

FDA Bhawan, Kotla Road,
New Delhi – 110 002, India
Dated: 27/04/2018

To

The Chairman
MGM Ethics Committee for Research on Human Subjects (MGM-ECRHS)
Pharmacology Department, MGM Medical College, N-6, CIDCO
Aurangabad- 431003, Maharashtra
India

Sub:- Ethics Committee Re-Registration No. **ECR/581/Inst/MH/2014/RR-17** issued under Rule 122DD of the Drugs & Cosmetics Rules,1945.

Sir/Madam,

Please refer to your application submitted to this Directorate for the Re-Registration of Ethics Committee.

Based on the documents submitted by you, this office hereby re-registers the **MGM ETHICS COMMITTEE FOR RESEARCH ON HUMAN SUBJECTS (MGM-ECRHS)** situated at **PHARMACOLOGY DEPARTMENT, MGM MEDICAL COLLEGE, N-6, CIDCO, AURANGABAD- 431003, MAHARASHTRA, INDIA** with Re-Registration Number **ECR/581/Inst/MH/2014/RR-17** as per the provisions of Rule 122DD of the Drugs and Cosmetics Rules, 1945 subject to the following conditions:

1. The re-registration shall be in force from 11.09.2017 to 10.09.2020, unless it is sooner suspended or cancelled.
2. This registration is subject to the conditions specified under Rule 122DD and Appendix VIII of Schedule-Y of Drugs and Cosmetics Act, 1940 and Rules 1945.
3. The Ethics Committee shall review and accord its approval to a clinical trial at appropriate intervals as specified in Schedule Y and the Good Clinical Practice Guidelines for Clinical Trials in India and other applicable regulatory requirements for safeguarding the rights, safety and well-being of the trial subjects.
4. In the case of any serious adverse event occurring to the clinical trial subjects during the clinical trial, the Ethics Committee shall analyze and forward its opinion as per procedures specified under APPENDIX XII of Schedule Y.
5. The Ethics Committee shall allow inspectors or officials authorized by the Central Drugs Standard Control Organization to enter its premises to inspect any record, data or any document related to clinical trial and provide adequate replies to any query raised by such inspectors or officials, as the case may be, in relation to the conduct of clinical trial.
6. The licensing authority shall be informed in writing in case of any change in the membership or the constitution of the ethics committee takes place.
7. All the records of the ethics committee shall be safely maintained after the completion or termination of the study for not less than five years from the date of completion or termination of the trial (Both in hard and soft copies).
8. If the Ethics Committee fails to comply with any of the conditions of registration, the Licensing Authority may, after giving an opportunity to show cause why such an order should not be passed, by an order in writing stating the reasons therefore, suspend or cancel the registration of the Ethics Committee for such period as considered necessary.
9. Ethics Committee shall consist of not less than seven members and is subject to a maximum of 15. One among its members, who is from outside the institute, shall be appointed as chairman, one member as a Member

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

Secretary and rest of the members shall be from Medical, Scientific, Non-Medical and Non-scientific fields including lay public.

10. The committee shall include at least one member whose primary area of interest or specialization is Non-scientific and at least one member who is independent of the institution besides; there should be appropriate gender representation on the Ethics Committee.

11. The Ethics committee can have as its members, individuals from other Institutions or Communities, if required.

12. Members should be conversant with the provisions of clinical trials under this Schedule, Good Clinical Practice Guidelines for clinical trials in India and other regulatory requirements to safeguard the rights, safety and well-being of the trial subjects.

13. For review of each protocol the quorum of Ethics Committee shall be at least five members with the following representations:

    I. Basic medical scientist (preferably one pharmacologist)
    II. Clinician
    III. Legal expert
    IV. Social scientist or representative of non-governmental voluntary agency or philosopher or ethicist or theologian or a similar person.
    V. Lay person from community

14. The members representing medical scientist and clinicians should have PostGraduate qualification and adequate experience in their respective fields and aware of their role and responsibilities as committee members.

15. As far as possible, based on the requirement of research area such as HIV, Genetic disorder, etc., specific patient group may also be represented in the Ethics Committee.

16. There should be no conflict of interest. The members shall voluntarily withdraw from the Ethics Committee meeting while making a decision on an application which evokes a conflict of interest which may be indicated in writing to the Chairman prior to the review and be recorded so in the minutes. All members shall sign a declaration on conflict of interest.

17. Subject experts or other experts may be invited to the meetings for their advice. But no such expert shall have voting rights.

18. This certificate is issued to you on the basis of declaration/submission by you that yours is an Institution and re-registration is sought for Institutional Ethics Committee.

19. Funding mechanism for the Ethics Committee to support their operations should be designed to ensure that the committee and their members have no financial incentive to approve or reject particular studies.

20. SOP's for funding of the Ethics committee in order to support their operations must be maintained. The records of income & expenditure of Ethics Committee shall be maintained for review and inspection.

21. The Chairman of Ethics Committee shall enter into MOU with head of institution, that necessary support and facilities and independence will be provided to Ethics Committee and their records will be maintained as long as required.

22. Ethics Committee may undertake the review and monitoring of clinical trial protocols of other investigator(s) and site(s) who do not have their IEC, subject to the condition that the other sites are within the loco- regional and community settings similar to that of the registered Ethics committee. The approving ethics committee must be willing to accept their responsibilities for the study at such trial site(s) and the trial site(s) willing to accept such an arrangement.

23. Ethics Committee shall review and approve the suitability of the investigator and trial site for the proposed trial. The ethics committee shall undertake proper causality assessment of SAE's with the help of subject experts where required, for deciding relatedness and compensation, as per condition no (4) mentioned above.

Yours faithfully,

(Dr. S. Eswara Reddy)
Drugs Controller General (I) & Licensing Authority
स्वास्थ्य सेवा महानिदेशालय

MAHATMA GANDHI MISSION
Mahatma Gandhi Mission's
ETHICS COMMITTEE FOR RESEARCH ON HUMAN SUBJECTS
MGM campus, N-6, CIDCO, Aurangabad - 431003
Ph. No.: 0240-6601100, 6601174, Fax No.: +91-0240-2487727
Email: mgmecrhs@gmail.com

Office: Dr. Deepak Bhosle, Prof & Head dept of Pharmacology & MGM-ECRHS, MGM Medical College, Aurangabad-431003.

DATE:-29-03-18

UNDERTAKING BY THE ETHICS COMMITTEE

1. **Full name, address and title of the Chairman:-Dr.Manvendra Sawalaram Kachole,Jawaharlal Nehru engineering College,Aurangabad.**

2. **Name and address of the office of Ethics Committee*MGM Ethics Committee for Research on Human Subjects(MGM-ECRHS),Pharmacology Department,MGM Medical College,Aurangabad-431003,Maharashtra.**

3. **Names, address, qualifications & designation of the other members of the Ethics Committee.***

Sr. No.	Name of the member	Qualification with Specialization	Current Organization	Telephone number/fax number/email ID and mailing address	Designation /Role of member in Ethics Committee	Affiliation of member with institute that has constituted the Ethics Committee
1	Dr.Manvendra Kachole	M.Sc. Ph.D	Jawaharlal Nehru engineering College, Aurangabad.	0240-2323094 mskachole@yahoo.com	Chairman	Professor, Bioinformatics Department, Jawaharlal Nehru engineering College, Aurangabad.
2	Dr.Deepali Jaybhaye Associate Professor	MBBS,MD	MGM Medical College Aurangabad	9423330726 deepalijaybhaye@rediffmail.com	Member Secretary	Associate Professor,Department of Pharmacology,MGM Medical College,Aurangabad.
3	Dr.A.G.Shroff Professor ,Department of Anatomy	MBBS,MD	MGM Medical College Aurangabad	0240-6601100 mgmecrhs@gmail.com	Basic Medical Scientist	Professor & Head Department of Anatomy, MGM Medical College,Aurangabad
4	Dr.S.H.Talib Prof & Head Dept of Medicine	MBBS,MD	MGM Medical College Aurangabad	0240-6601100 sftalib@gmail.com	Clinician	Professor & Head Department of Medicine,MGM Medical College,Aurangabad.
5	Dr.Sonali Bhattu Associate Professor Medicine Department	MBBS,MD	MGM Medical College Aurangabad	9970182314 0240-6601100 sonalibhattu@rediffmail.com	Clinician	Associate Professor Medicine Department, MGM Medical College,Aurangabad.
6	Dr.P.R.Suryawanshi Prof & Head Dept. of Surgery	MBBS,MD	MGM Medical College Aurangabad	0240-6601100 Drspravin22@gmail.com	Clinician	Professor & Head Department of Surgery,MGM Medical College,Aurangabad.
7	Dr.S.M. Mahajan Associate Professor Dept. of PSM	MBBS,MD	MGM Medical College Aurangabad	0240-6601100 Deoswati@yahoo.co.in	Epidemiologist	Associate Professor Department of PSM,MGM Medical College,Aurangabad.

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

8	Dr.Prashant Chaudhary Assistant Professor Dept. of Pharmacology	MBBS,MD	MGM Medical College Aurangabad	9405484850,0240-6601100 drprashantmgm@gmail.com	Clinical Pharmacologist	Assistant Professor Dept. of Pharmacology MGM medical College Aurangabad.
9	Dr.Rajesh Dase Associate Professor Dept. of PSM	M.Sc., Ph.D	MGM Medical College Aurangabad	9921100065,0240660 1100 Rdase25@gmail.com	Biostatician	Associate Professor Dept. of PSM, MGM Medical college,Aurangabad.
10	Adv.R.P.Mane Legal Adviser	BA,LLB,DLL, DBM	MGM Medical College Aurangabad	0240-6601100 mgmecrhs@gmail.com	Legal Expert	Legal Adviser, MGM Medical College,Aurangabad
11	Mr.Sewalikar	B.Com	Shivaji Nagar,Aurangabad.	9270983448 sanjaysewalikar@gmail.com	Social Scientist	Social Scientist
12	Mr.Mangesh V. Shinde	M.Ed	46,Samta Nagar ,Kranti Chowk police Station road,Aurangabad	9423393821 Shindemangesh1974@gmail.com	Lay Person	Lay Person Extension officer Panchayat samiti,ZP,Aurangabad.

* Indicate if there is any change in address &composition of the Ethics Committee.

* If yes, provide the complete details i.e. new address and date of change & qualification, experience, and training of the new members as per the requirement of Drugs & Cosmetics Rules.

Commitments:

(i) The Committee shall review and accord its approval to a clinical trial and also carry ongoing review of the trial at appropriate intervals, as specified in Schedule Y and the Good Clinical Practice Guidelines for Clinical Trials in India and other applicable regulatory requirements for safeguarding the rights, safety and well- being of the trial subjects.

(ii) In the case of any serious adverse event occurring to the clinical trial subj ects during the clinical trial, the Committee shall analyse and forward its opinion as per procedures specified under APPENDIX XII of Schedule Y.

(iii) The Committee shall allow inspectors or officials authorised by the Central Drugs Standard Control Organisation to enter its premises to inspect any record, data or any document related to clinical trial and provide adequate replies to any query raised by such inspectors or officials, as the case may be, in relation to the conduct of clinical trial.

(iv) We agree to maintain adequate and accurate records after the completion or termination of the study for not less than five years from the date of completion or termination of the trial (Both in hard and soft copies).

Chairperson
(Signature of the Chairman)
MGM-ECRHS
MGM's Medical College,Aurangabad
Date: 13/2/18

Member Secretary
(Signature of the Member secretary)
MGM-ECRHS
MGM's Medical College,Aurangabad
Date: 13/2/18

Professor & H.O.D.
Department of Pharmacology
MGM's Medical College
Aurangabad.

File No. EC/18/000006

सत्यमेव जयते

Government of India
Ministry of Health & Family Welfare
Directorate General of Health Services
Office of Drugs Controller General (India)
Central Drugs Standard Control Organization

FDA Bhawan, Kotla Road,
New Delhi - 110002, India
Dated: 28-Sep-2018

To

The Chairman
MGM INSTITUTIONAL ETHICS COMMITTEE NAVI MUMBAI
MGM Medical College, Navi Mumbai
Sector 1, Kamothe Navi Mumbai Panvel Raigad
Maharashtra - 410209 India

Subject: Ethics Committee Registration No. ECR/1133/Inst/MH/2018 issued under Rule 122DD of the Drugs & Cosmetics Rules 1945.

Sir/Madam,

Please refer to your application no. EC/NEW/INST/2017/1645 dated 29-Jan-2018 submitted to this Directorate for the Registration of Ethics Committee.

Based on the documents submitted by you, this office hereby registers the MGM INSTITUTIONAL ETHICS COMMITTEE NAVI MUMBAI situated at MGM Medical College, Navi Mumbai Sector 1, Kamothe Navi Mumbai Panvel Raigad Maharashtra - 410209 with Registration number ECR/1133/Inst/MH/2018 as per the provisions of Rule 122DD of the Drugs and Cosmetics Rules, 1945 subject to the following conditions:

1. This Registration is subject to the conditions specified under Rule 122DD and Appendix VIII of Schedule-Y of Drugs and Cosmetics Act, 1940 and Rules 1945.

2. The Ethics Committee shall review and accord its approval to a clinical trial and also carry ongoing review of the trial at appropriate intervals as specified in Schedule Y and the Good Clinical Practice Guidelines for Clinical Trials in India and other applicable regulatory requirements for safeguarding the rights, safety and well-being of the trial subjects.

3. In the case of any serious adverse event occurring to the clinical trial subjects during the clinical trial, the Ethics Committee shall analyze and forward its opinion as per procedures specified under APPENDIX XII of Schedule Y.

4. The Ethics Committee shall allow inspectors or officials authorized by the Central Drugs Standard Control Organization to enter its premises to inspect any record, data or any document related to clinical trial and provide adequate replies to any query raised by such inspectors or officials, as the case may be, in relation to the conduct of clinical trial.

5. The licensing authority shall be informed in writing in case of any change in the membership or the constitution of the ethics committee takes place.

6. All the records of the ethics committee shall be safely maintained after the completion or termination of the study for not less than five years from the date of completion or termination of the trial (Both in hard and soft copies).

7. If the Ethics Committee fails to comply with any of the conditions of registration, the Licensing Authority may, after giving an opportunity to show cause why such an order should not be passed, by an order in writing stating the reasons therefore, suspend or cancel the registration of the Ethics Committee for such period as considered necessary.

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

8. This registration shall be in force for a period of three years from the date of issue, unless it is sooner suspended or cancelled. Provided that if the application for re-registration is received by the Licensing Authority within three months before the expiry, the registration shall continue to be in force until orders are passed by the said authority.

a. The Licensing Authority shall be informed in writing in case of any change in the membership or the constitution of the Ethics Committee takes place.

9. Ethics Committee shall consist of not less than seven members and is subject to a maximum of 15. One among its members, who is from outside the institute, shall be appointed as chairman, one member as a Member Secretary and rest of the members shall be from Medical, Scientific, Non-Medical and Non-scientific fields including lay public.

10. The committee shall include at least one member whose primary area of interest or specialization is Non-scientific and at least one member who is independent of the institution, Besides; there should be appropriate gender representation on the Ethics Committee.

11. The Ethics committee can have as its members, individuals from other Institutions or Communities, if required.

12. Members should be conversant with the provisions of clinical trials under this Schedule, Good Clinical Practice Guidelines for clinical trials in India and other regulatory requirements to safeguard the rights, safety and well-being of the trial subjects.

13. For review of each protocol the quorum of Ethics Committee shall be at least five members with the following representations:

I. Basic medical scientist (preferably one pharmacologist)
II. Clinician
III. Legal expert
IV. Social scientist or representative of non-governmental voluntary agency or philosopher or ethicist or theologian or a similar person.
V. Lay person from community

14. The members representing medical scientist and clinicians should have Post graduate qualification and adequate experience in their respective fields and aware of their role and responsibilities as committee members.

15. As far as possible, based on the requirement of research area such as HIV, Genetic disorder, etc., specific patient group may also be represented in the Ethics Committee.

16. There should be no conflict of interest. The members shall voluntarily withdraw from the Ethics Committee meeting while making a decision on an application which evokes a conflict of interest which may be indicated in writing to the Chairman prior to the review and be recorded so in the minutes. All members shall sign a declaration on conflict of interest.

17. Subject experts or other experts may be invited to the meetings for their advice. But no such expert shall have voting rights.

18. This certificate is issued to you on the basis of declaration/submission by you that yours is an Institution and registration is sought for Institutional Ethics Committee.

19. Funding mechanisms for the Ethics Committee to support their operations should be designed to ensure that the committees and their members have no financial incentive to approve or reject particular studies.

20. SOP's for funding of the Ethics committee in order to support their operations must be maintained. The records of income & expenditure of Ethics Committee shall be maintained for review and inspection.

21. The Chairman of Ethics Committee shall enter into MOU with head of institution, that necessary support and facilities and independence will be provided to Ethics Committee and their records will be maintained as long as required.

22. Ethics Committee may undertake the review and monitoring of clinical trial protocols of other investigator(s) and site(s) who do not have their IEC, subject to the condition that the other sites are within the loco-

regional and community settings similar to that of the registered Ethics committee. The approving Ethics Committee must be willing to accept their responsibilities for the study at such trial site(s) and the trial site(s) willing to accept such an arrangement.

23. Ethics Committee shall review and approve the suitability of the investigator and trial site for the proposed trial. The ethics committee shall undertake proper causality assessment of SAE's with the help of subject experts where required, for deciding relatedness and compensation, as per condition no (3) mentioned above.

S ESWARA REDDY

Digitally signed by S ESWARA REDDY
Date: 2018.10.04 10:26:09

(S. Eswara Reddy)
Drugs Controller General (I) &
Licensing Authority

CDSCO CDSCO

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

File No. EC/18/000006

सत्यमेव जयते

Government of India
Ministry of Health & Family Welfare
Directorate General of Health Services
Office of Drugs Controller General (India)
Central Drugs Standard Control Organization

FDA Bhawan, Kotla Road,
New Delhi - 110002, India
Dated: 28-Sep-2018

To

The Chairman
MGM INSTITUTIONAL ETHICS COMMITTEE NAVI MUMBAI
MGM Medical College, Navi Mumbai
Sector 1, Kamothe Navi Mumbai Panvel Raigad
Maharashtra - 410209 India

Subject: Ethics Committee Registration No. ECR/1133/Inst/MH/2018 issued under Rule 122DD of the Drugs & Cosmetics Rules 1945.

Sir/Madam,

Please refer to your application no. EC/NEW/INST/2017/1645 dated 29-Jan-2018 submitted to this Directorate for the Registration of Ethics Committee.

Your Ethics Committee is hereby registered under Rule 122DD vide Registration No.ECR/1133/Inst/MH/2018 with the following composition and all the condition mentioned under the Registration certificate issued to you.

Sr. No.	Name of Member	Qualification	Role/Designation in Ethics Committee
1	Dr. Jaishree Ravindra Ghanekar	MBBS (MD - Medicine)	Clinician
2	Dr. Anant Dattatray Urhekar	MBBS (MD - Pathology & Microbiology)	Basic Medical Scientist
3	Dr. D Bhusare	MBBS (MS - General Surgery)	Clinician
4	Ms. Usha Mohite	10th (Not Applicable)	Lay Person
5	Dr. Pramila Yadav	MBBS (MD-Pharmacology)	Chair Person
6	Dr. Pradeep R Jadhav	MBBS (MD-Pharmacology)	Member Secretary
7	Dr. Ipseeta S Ray	BSc (MSc.,PhD-Pharmacology)	Scientific Member
8	Dr. Ravindra Shriniwas Inamdar	MBBS (MD-Physiology)	Basic Medical Scientist
9	Dr. Rajeev S Chaudhary	MBBS (MD- Forensic Medicine)	Basic Medical Scientist
10	Ms. Rupali V Gujar	BA (MSW)	Social Scientist
11	Ms. Karuna Ramraje Malviya	LLB (LLM)	Legal Expert

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

S ESWARA REDDY

Digitally signed by S ESWARA REDDY
Date: 2018.10.04 10:05:30 +05'30'

(Dr. S. Eswara Reddy)
Drugs Controller General (I) &
Licensing Authority

भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
पशु कल्याण प्रभाग
पशुओं पर परीक्षण के नियंत्रण एवं पर्यवेक्षण के प्रयोजनार्थ समिति (सीपीसीएसईए)
Government of India
Ministry of Environment, Forest and Climate Change
Animal Welfare Division
Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA)

F. No. 25/127/2010-AWD
02/05/2018

To

Dr. Savita Shahani, Chairperson IAEC,
Mahatma Gandhi Mission's Medical College,
Sector - 18, Kamothe, Navi Mumbai - 410209, Maharashtra,
Mobile: 9819277578
E-mail: drshahanirediffmail@yahoo.co.in

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

Subject: Revision of Institutional Animals Ethics Committee (IAEC) – regarding

Madam,

Kindly refer to your application on the above subject. CPCSEA hereby accords approval to your request for revision of IAEC.

2. Accordingly, the revised IAEC is as under:

S.No.	Name of IAEC Members	Designation in IAEC
1.	**Dr. Savita Shahani**	**Biological Scientist(Chairperson)**
2.	Dr. Ipseeta Ray	Scientist from different biological discipline(Member Secretary)
3.	Dr. R S Inamdar	Scientist from different biological discipline
4.	Dr. G S Narshetty	Scientist Incharge of Animal House Facility
5.	Dr. Mohan Latkar	Veterinarian
6.	Dr. Uddhav Kalu Chaudhari	Main Nominee
7.	Dr. Vikas D. Dighe	Link Nominee
8.	Dr. Dhanjit Kumar Das	Scientist from outside the Institute
9.	Prof. Vishnu N. Thakare	Socially Aware Nominee

Contd..

3. It is stated that only above approved IAEC members shall sign, with date, on the attendance sheet of the IAEC mettings, and decisions will be taken only in meetings where quorum is complete. The quorum for holding IAEC meeting is six(6), and CPCSEA Nominees must be present in such meetings. Link Nominee can attend in case main nominee conveys his unavailablity in writing to the chairman IAEC. Socially aware member's presence is compulsory in cases referred to CPCSEA and at least in one meeting in a Calendar year. Any decision taken in the meetings of IAEC without quorum shall be considered invalid.

4. The above composition of IAEC is valid upto the renewed period of registration i.e. 18.01.2022.

Yours faithfully,

(S. P. Singh)
Under Secretary (CPCSEA)

Copy for information to Nominees of CPCSEA:

1. Dr. Uddhav Kalu Chaudhari- Main Nominee
2. Dr. Vikas D. Dighe- Link Nominee
3. Dr. Dhanjit Kumar Das- Scientist from outside the Institute
4. Prof. Vishnu N. Thakare- Socially Aware Nominee

Print

F. No. 25/30/2014-CPCSEA

Government of India
Ministry of Environment, Forest & Climate Change
Animal Welfare Division
O/o Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA)
******

5th Floor, Vayu Block, Indira Paryavaran Bhawan,
Jor Bagh Road, New Delhi - 110003
28/08/2017

To

Dr. Jyoti Bobde, Chairperson, IAEC
MGM Medical College
N-6, CIDCO, Aurangabad - 431003, Maharashtra
Email:jyobobde@gmail.com
Mobile:9423781558

Subject: Renewal of Registration and Reconstitution of Institutional Animals Ethics Committee (IAEC)-regarding

Madam,

The registration of Animal House Facility of your establishment with CPCSEA has been renewed **for a period of five years from the date of issue of this letter.**

- The new registration number of Animal House Facility of your establishment is ***1777/PO/Re/S/14/CPCSEA for Research for Education purpose of small animals***. Henceforth, the new registration number may kindly be quoted in all your future correspondence with this office.
- The CPCSEA has accepted the following members recommended by the establishment:

S.No.	Name of the IAEC Members	Designation in IAEC
1	Dr. Sangita Phatale	Scientist from different discipline, Member Secretary
2	Dr. Vishvesh Bansal	Scientist from different discipline
3	Dr. Rajendra survavanshi	Veterinarian

4	Dr. Sambhaji Shinde	Biological Scientist
5	Dr. Jyoti Bobde	Scientist Incharge of Animal House Facility, Chairperson

- CPCSEA hereby nominates the following members to the Institutional Animals Ethics Committee (IAEC) of your establishment:

S.No.	Name	Nominated as
1	**Dr. Shrikant B. Satale** Flat No. 2, Sairaj Apartment, Plot 15, Sandesh Nagar, Garkheda, Aurangabad, Maharashtra - 431009 Contact No :09730459199 Email :drshrikantsatale@gmail.com	Main Nominee
2	**Dr. Aman B. Upaganlawar** Associate Professor, Deptt of Pharmacology, SNJB's SSDJ College of Pharmacy, Jain Gurukul, Neminagar, Chandwad – 423 101, Nashik, MS Contact No :0956033551 Email :amanrx@yahoo.com	Link Nominee
3	**Dr. Chandrashekhar Upasani** Row House NO. 7, 'Tejas', Kashika Nagar, Bhujbal Farm, Mumbai-Agra Road, Nashik - 423009, Maharashtra Contact No :9822112007 Email :cdupasani@rediffmail.com	Scientist from outside the Institute
4	**Dr. Jaykumar S. Satav** Shree Bhagirathi Residency, Flat No. B-1, Near Zambad Estate, Shahanoormiya Darga, Railway Gate, Aurangabad Contact No :9423124827 Email :jaykumarsatav@gmail.com	Socially Aware Nominee

(Please note that any change in IAEC members can be made only with prior approval of CPCSEA.)

- The IAEC is valid for a period of five years and is coterminous with renewed period of registration. IAEC is required to be reconstituted at the time of renewal of registration as per CPCSEA guidelines.

- You are requested to convene the meeting of the re-constituted IAEC within a period of 30 days and upload the same on the website of the CPCSEA.
- **It is stated that only above approved IAEC members shall sign, with date, on the attendance sheet of the IAEC meetings, and decisions will be taken only in meetings where quorum is complete. The quorum for holding IAEC meeting is six (6), and CPCSEA Nominees must be present in such meetings .Link Nominee can attend in case main nominee conveys his unavailability in writing to the chairman IAEC.Socially aware member's presence is compulsory in cases referred to CPCSEA and atleast in one meeting in a calendar year.Any decision taken in the meetings of IAEC without quorum shall be considered invalid.**
- It is also to inform you that before commencing any research on large animals you are required to send research protocols with due recommendation of IAEC to CPCSEA for further approval (procedure for submission of Research Protocols is available on the website of CPCSEA).

Yours faithfully,

(S. Gowri Shankar)

Deputy Secretary (AW) & Member Secretary (CPCSEA)

Copy for necessary action to: Nominees of CPCSEA.

The Main Nominee is requested to ensure that the IAEC meetings are held regularly as stipulated in the SOP of CPCSEA and submit the Annual Inspection Reports of the Animal House Facility regularly on the Website of CPCSEA.

The Main Nominee is requested to conduct the Inspection of Animal House Facility within a period of 30 days and submit the Inspection Report on the Website of CPCSEA.

Tentative
21/22 Apl