

Mahatma Gandhi University
of
Medical Sciences & Technology, Jaipur

Syllabus

M.Sc. Epidemiology

(2 Years Degree Course + 1 Year Internship)

Notice

1. Amendments made by the University in Rules / Regulations of the Courses shall automatically apply.
2. The University reserves the right to make changes in the syllabus/books/ guidelines, fee structure or any other information at any time without prior notice. The decision of the University shall be binding on all.
3. The Jurisdiction of all court cases shall be Jaipur Bench of Hon'ble Rajasthan High Court only.

M.Sc. Epidemiology ()
(2 Years Degree Course + 1 Year Internship)

Rules & Regulations

1. TITLE OF THE COURSE

The title of the course shall be “M.Sc. Epidemiology”.

2. DURATION OF COURSE/TRAINING

The course shall be of two years duration and one year internship from the date of commencement of academic session.

3. MEDIUM OF INSTRUCTION

English shall be the medium of instruction

4. ELIGIBILITY FOR ADMISSION:

Candidate should have passed the Bachelor's Degree in Science (preference shall be given to maths and statistics)

5. CRITERIA FOR ADMISSION

Selection shall be done by an Admission Board of the University strictly on merit. It may consist of two-step process –Written Entrance Examination followed by Counseling/Personal Interview (PI).

6. RESERVATION POLICY

Reservation shall be applicable as per policy of the State Government.

7. ENROLMENT

Every candidate who is admitted to M.Sc. Epidemiology Course in Mahatma Gandhi Medical College & Hospital shall be required to get himself/herself enrolled with the Mahatma Gandhi University of Medical Sciences & Technology after paying the prescribed eligibility and enrolment fees.

A candidate shall deposit enrolment fees along with tuition fees at the time of his/her admission to the course. Such a candidate who fails to submit, through the college Principal, duly filled enrolment form along with original documents including migration certificate required for enrolment within two months of his/her admission or up to November 30 of the year of admission whichever is later, he/she will have to pay late fee prescribed by the University

8. MIGRATION RULES

No student, once admitted to the course and enrolled by the University, will be permitted to migrate to any other Course/ University.

No student will be admitted to the Course on migration from any other Course/ University.

9. ATTENDANCE

Minimum 75% attendance in each year, both for theory and practical classes separately. Student with deficient attendance will not be permitted to appear in University examination.

10. TRAINING:

1. The period of training for M.Sc. shall be of two years from the date of admission.
2. Part – I and Part – II of the course shall be of one-year duration each.
3. The candidate will undertake the post graduate training as a full time post graduate in the department concerned.
4. The students will be required to complete the prescribed period of study and fulfill the requirement of attendance before they are allowed to appear in the University examination.

11. EXAMINATION AND ASSESSMENT

1. The examination of Part I shall consists of three theory papers and internal assessment and practical & viva-voce examination.
2. The examination of Part II shall consist of three theory papers & internal assessment and practical in the opted specialization.
3. A candidate shall be permitted a maximum of 4 years from the year of admission to complete the course and pass the examination failing which, the candidate will have to leave the course.
4. Only those candidates will be allowed to appear at Part II examination, who have passed Part –I examination completely.
5. Degree of M.Sc. Epidemiology will be awarded to a candidate only after his successful completion of one year compulsory internship.

12. CONDUCTION OF THE UNIVERSITY EXAMINATION:

University examination shall be conducted twice in a year; that is Main and Supplementary Examination. Supplementary examination shall be conducted after 2-4 months of the main examination.

13. SCHEME OF EXAMINATION

The Examination in Part I shall consist of:

Paper	Marks
Theory	
Paper I – Epidemiologic Approach to Disease and Intervention	100 Marks
Paper II –Types of epidemiological studies	100 Marks
Paper III – Clinical , environmental and occupational epidemiology	100 Marks
Internal Assessment	100 Marks
Practical & Viva Voce Examination	100 Marks
Total Marks	500 Marks

Notes:

1. Each theory paper shall be of 3 hours duration.
2. Each paper will be set by the External Examiner of the subject concerned and will be assessed by the internal examiner of the subject concerned.

Pattern of questions to be set and answered shall be as follows:

Paper	No. of questions to be set	No. of questions to be answered
Paper I	4	4
Paper II	4	4
Paper III	4	4

3. In order to pass the University Examination, the candidate must secure a minimum of 50% marks in each theory paper including internal assessment and 50% marks in practical and viva-voce examination separately.

14. SCHEME OF EXAMINATION

The Examination in Part I shall consist of:

Paper	Marks
Theory	
Paper I –Epidemiologic Approach to Disease and Intervention	100 Marks
Paper II –Types of epidemiological studies	100 Marks
Paper III –Clinical , environmental and occupational epidemiology	100 Marks
Internal Assessment	100 Marks
Practical & Viva Voce Examination	100 Marks
Total Marks	500 Marks

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Pattern of questions to be set and answered shall be as follows:

Paper	No. of questions to be set	No. of questions to be answered
Paper I	4	4
Paper II	4	4
Paper III	4	4

3. In order to pass the University Examination, the candidate must secure a minimum of 50% marks in each theory paper including internal assessment and 50% marks in practical and viva-voce examination separately.
4. A candidate who has failed in one or more theory paper of Part-I Examination must appear in that theory paper in supplementary examination which will be conducted by university within 2 – 4 months.

The Examination in of Part II shall consist of:

Paper	Marks
Theory	
Paper I – Biostatistics	100 Marks
Paper II –Screening and diagnostic tests	100 Marks
Paper III –Applying epidemiology to evaluation and management techniques	100 Marks
Internal Assessment	100 Marks
Practical & Viva Voce Examination	100 Marks
Total Marks	500 Marks

Notes:

1. Each theory paper shall be of 3 hours duration.
2. All papers shall be set by the External Examiners.
3. Paper I will be assessed by the External Examiner and Paper II will be assessed by the Internal Examiner viz. Head of the Department of subject concerned. Paper III will be assessed by Professor / Associate professor / Assistant professor

Pattern of questions to be set and answered shall be as follows:

Paper	No. of questions to be set	No. of questions to be answered
Paper I	4	4
Paper II	4	4
Paper III	4	4

4. Practical examination shall be conducted by one Internal, one External Examiner which will be appointed by the university.
5. In order to pass the examination the candidate must secure a minimum of 50% marks in Theory papers including internal assessment and 50% marks in practical and viva-voce examination separately.
6. In case a student passes either in Theory or in Practical only, the student shall be considered to fail in the whole examination and he will have to appear in both the Theory and Practical in the subsequent examination.

15. APPOINTMENT OF EXAMINER AND PAPER SETTERS

- a. All the examiners, paper setters, theory examination answer books evaluators, Internal and External Examiners for Practical examinations shall be appointed by the President of the University.
- b. Qualification of the Paper setter / Examiner: Assistant Professor and above.
- c. Paper setter can be an examiner

16. GRACE MARKS

No grace marks will be provided in M.Sc. Examination

17. REVALUATION / SCRUTINY

No Revaluation of answer books shall be permitted in M.Sc. Examination. However, the candidate can apply for scrutiny of marks as per University Rules.

Curriculum Outline

Distribution of Teaching hours

1ST Year M.S.c Epidemiology

Course Title	Hours
Introduction, Dynamics of Disease Transmission, Measuring the occurrence of disease, Natural history of disease.	100
Types of study	200
Causation in epidemiology	100
Communicable and non communicable disease epidemiology	100
Clinical epidemiology	100
Epidemiology and prevention	100
Environmental and occupational epidemiology	100
Total Theory Hours	800
Practical	400
Total Hours :	1200

2nd Year MSc Epidemiology

Course Title	Hours
Basic statistics	300
Screening and diagnostic tests	100
Research methodology	100
Epidemiology, health services and health policy	100
Ethical and professional issues in epidemiology	100
Planning and health management	100
Total Theory Hours	800
Practical	400
Total Hours :	1200

SYLLABUS

M.Sc. Epidemiology () (2 Years Degree Course + 1 Year Internship)

Learning Objectives:

1. At the completion of this course, the student should be able to –
2. Explain the principals of disease ,causation with particular emphasis on modifiable enviornmental factors
3. Encouerge the application of epidemiology to the prevention of disease and promotion of health including enviornmental and occupational health.
4. To ensure that health recourses are used to the best possible effect.

Assessment:

The examination to the first/second year shall be open to a student who:

Has remained on the rolls of the course concerned for full on academic year preceding the examination and having attended not less than 75% of the full course of lectures and 75% practical separately held for the purpose in each year.

SYLLABUS

Part-I : Paper I

Epidemiologic Approach to Disease and Intervention

- Introduction, history/evolution of epidemiology.
- Dynamics of disease transmission.
- Measuring the occurrence of disease- Mortality/ Morbidity, proportion, standardization, rates and ratios.
- Natural history of disease.
- Types of study with examples and illustration of classical case studies.

Part-I : Paper-II

Using epidemiology to the cause of disease

- Association and causation
- Descriptive epidemiology
- Case control study
- Cohort study

Part-I : Paper-III

Applying Epidemiology to Evaluation and Policy

- Basic Biostatistics.
- Data, probability, sampling, collection, compilation, analysis.
- Screening / Diagnostic tests.
- Research Methodology.
- Epidemiology, health services and health policy.
- Ethical and professional issues in Epidemiology.
- Planning
- Health management.

PRACTICAL :

1. Study design
2. Epidemiological exercise
3. Statistical Exercise
4. Screening test
5. Planning a research project
6. Epidemiological investigation

Part-II : Paper I Biostatistics

- Data
- Type of data
- Graphical representation of data
- Normal distribution Curve
- Measures of central tendency
- Measures of dispersion

Part-II : Paper-II

Screening and diagnostic tests

- Screening
- Screening test and diagnostic test
- Sensitivity, specificity
- Positive predictive value
- Negative predictive value

Part-II : Paper-III

Applying Epidemiology to Evaluation and Management

- Operational research
- Role of Epidemiology in evaluation of health services
- Management techniques: PERT, CPM and other management techniques
- Cost benefit analysis, cost effective analysis
- Health insurance
- Planning cycle

PRACTICAL :

- Study design
- Epidemiological exercise
- Statistical Exercise
- Screening test
- Planning a research project
- Epidemiological investigation

MODEL PAPER

M.Sc.epi.–

Short Name

M.Sc. Epidemiology

Part-I (Main) Examination month year

Paper I

Epidemiologic Approach to Disease and Intervention

Time: Three Hours

Maximum Marks: 100

Students shall be allowed to take only one supplementary copy long with one main answer book. All the parts of one question should be answered at one place. Different parts of one question should not be answer at different places in the answer book

Attempt all Questions.

- Q.1 Define epidemiology. What are the various types of epidemiological studies?
Discuss in detail case control study. 25
- Q.2 What is the concept of screening? Write briefly the types of screening.
Discuss the measures to evaluate a screening test. 25
- Q.3 Long answer Type
- a) Write in detail natural history of disease. 12½
- b) Describe RCT in detail. 12½
- Q.4 Short Notes 5x5=25
- a) Epidemiological triad.
- b) Iceberg phenomenon.
- c) Modes of transmission of disease.
- d) Opportunistic screening.
- e) Dynamics of disease transmission.

MODEL PAPER

M.Sc.epi.–

Short Name

M.Sc. Epidemiology

Part-I (Main) Examination (month year)

Paper-II

Using Epidemiology to the cause of Disease

Time: Three Hours

Maximum Marks: 100

Students shall be allowed to take only one supplementary copy long with one main answer book. All the parts of one question should be answered at one place. Different parts of one question should not be answer at different places in the answer book

Attempt all Questions.

- | | | |
|-----|-----------------------------------------------------------------------------------------|--------|
| Q.1 | What is association and causation? Describe with an example. | 25 |
| Q.2 | Identify the role of genetic and environmental factors in disease causation. | 25 |
| Q.3 | Long answers Type | |
| | a) Compare between case control and cohort study. | 12½ |
| | b) Describe various types of bias in case control study and measures to eliminate them. | 12½ |
| Q.4 | Short Notes | 5x5=25 |
| | a) Confounding factor. | |
| | b) Risk ratio | |
| | c) Odds ratio | |
| | d) Uses of descriptive epidemiology | |

MODEL PAPER

M.Sc. epi.–

Short Name

M.Sc. Epidemiology

Part-I (Main) Examination month year

Paper-III

Applying Epidemiology to Evaluation and Policy

Time: Three Hours

Maximum Marks: 100

Students shall be allowed to take only one supplementary copy long with one main answer book. All the parts of one question should be answered at one place. Different parts of one question should not be answer at different places in the answer book

Attempt all Questions.

- Q.1 Write in detail about the various steps of investigation of an epidemic. 25
- Q.2 What is the role of epidemiology to evaluate various health services. 25
- Q.3 Long answers Type
- a) What are various ethical and professional issues involved in epidemiology. 13
- b) What are various types of sampling? Write in detail about cluster sampling. 12
- Q.4 Short Notes 5x5=25
- a) Steps of planning a research project.
- b) Planning cycle
- c) Measures of dispersion
- d) Various graphical representation of data
- e) Types of data

MODEL PAPER

M.Sc.epi.–

Short Name

M.Sc. Epidemiology

Part II - (Main) Examination (month year)

Paper I

Biostatistics

Time: Three Hours

Maximum Marks: 100

Students shall be allowed to take only one supplementary copy long with one main answer book. All the parts of one question should be answered at one place. Different parts of one question should not be answer at different places in the answer book

Attempt all Questions.

- Q.1 Give an account of frequency distribution. 25
- Q.2 Give an account of the method of graphic presentation of data. 25
- Q.3 Long answer Type
- a) Give an account of measures of central tendency. 13
- b) Find out the coefficient of correlation from the following data

X	65	66	67	67	68	69	71	73
Y	67	68	64	68	72	70	69	70

- 12
- Q.4 Short Type 5x5=25
- a) Calculate the geometric mean of the following :—
50, 72, 54, 82 and 93.
- b) What is normal curve ? Explain.
- c) What do you mean by null hypothesis ?
- d) What is dependent variable ?
- e) Give an account of the procedure for testing of hypothesis.

MODEL PAPER

M.Sc.epi.–

Short Name

M.Sc. Epidemiology

Part-II (Main) Examination month year

Paper -II

Screening and diagnostic tests

Time: Three Hours

Maximum Marks: 100

Students shall be allowed to take only one supplementary copy long with one main answer book. All the parts of one question should be answered at one place. Different parts of one question should not be answer at different places in the answer book

Attempt all Questions.

Q.1 In what way do sensitivity and specificity differ from the false-positive and false-negative rates? 25

Q.2 What is the concept of screening? Write briefly the types of screening.
Discuss the measures to evaluate a screening test. 25

Q.3 Long answer Type

a) A screening test was done for a disease. The results are as follows-

Screening test	Diagnosis		Total
	Diseased	Not Diseased	
Result			
Positive	40	20	60
Negative	100	9840	
Total	140	9860	

- o Calculate - Sensitivity of the test & Specificity of the test
predictive value of positive test & Predictive value of negative test

13

b) Comment on predictive value of a positive test and predictive value of a negative test.

12

Q.4 Short Notes 5x5=25

- Types of screening
- Positive predictive value
- Sensitivity of a test
- Specificity of a test
- False positive rate

MODEL PAPER

M.Sc. epi.–

Short Name

M.Sc. Epidemiology

Part-II (Main) Examination month year

Paper-III

Applying Epidemiology to Evaluation and Management

Time: Three Hours

Maximum Marks: 100

Students shall be allowed to take only one supplementary copy long with one main answer book. All the parts of one question should be answered at one place. Different parts of one question should not be answer at different places in the answer book

Attempt all Questions.

- Q.1 Define operational Research. Explain the limitation of operation research. 25
- Q.2 What is the role of epidemiology to evaluate various health services. 25
- Q.3 Long answers Type
- a) Programme Evaluation and Review Technique (PERT) 13
- b) Describe the application of management principles in maintaining the overall operations of a hospital. 12
- Q.4 Short Notes 5x5=25
- a) Steps of planning a research project.
- b) Planning cycle
- c) Cost benefit analysis
- d) Health insurance
- e) Cost effective analysis