

MANGALAYATAN UNIVERSITY, ALIGARH

**DIRECTORATE OF DISTANCE AND ONLINE
EDUCATION**



PROGRAMME PROJECT REPORT

**MASTER OF SCIENCE (MATHEMATICS)- ONLINE
2023-24**

M.Sc. (Mathematics)

Introduction

Master of Science in Mathematics (M.Sc. Mathematics) through online mode is a postgraduate program that focuses on advanced mathematical concepts and theories. This program is designed to help students develop a deep understanding of various mathematical principles and their applications in diverse fields such as engineering, physics, computer science, and finance. The curriculum includes topics such as advanced calculus, algebra, topology, number theory, and probability theory, among others. Students pursuing M.Sc. in Mathematics learn how to use mathematical models to solve real-world problems and develop critical thinking and analytical skills. Graduates of this program are well-equipped to pursue careers in academia, research, data analysis, finance, and many other fields that require strong quantitative skills.

M.Sc. Mathematics students are trained to work independently and collaboratively on research projects, helping them to develop valuable teamwork and communication skills. They are exposed to modern mathematical tools and techniques, such as computer simulations and programming languages, which further enhances their problem-solving abilities. This program also encourages students to apply their knowledge in practical settings, allowing them to develop innovative solutions to complex problems. This is a challenging and rewarding program that provides students with a strong foundation in mathematics and prepares them for a wide range of exciting career opportunities.

A. Programme's Mission and Objectives

Mission

- To cater and ensure excellent theoretical and practical training through teaching, counselling, and mentoring with a view to achieve professional and academic excellence.
- To connect with industry and incorporating knowledge for research enhancement.
- To generate, disseminate and preserve knowledge for the benefit and betterment of society.

Objectives

M.Sc. in Mathematics programme through online mode aims to provide students with advanced mathematical skills and knowledge in areas such as algebra, analysis, topology, geometry, and applied mathematics. The programme aims to develop students' skills in mathematical analysis, problem-solving, logical reasoning, and critical thinking. Additionally, it offers advanced coursework in specialized areas of mathematics such as algebra, topology, geometry, number theory, and applied mathematics. The programme also aims to provide students with the skills required to carry out independent research in mathematics, including skills in literature review, mathematical modelling, data analysis, and technical writing. Furthermore, the program prepares students for further studies in mathematics, including Ph.D. programmes or research-based careers in academia, industry, or government. Ultimately, the programme aims to prepare students for a wide range of career opportunities, including roles in academia, research, industry, finance, technology, and government, by providing them with the necessary skills and knowledge to succeed in these fields.

B. Relevance of the Programme with HEI's Mission and Goals

The vision and mission of HEI, Mangalayatan University, Aligarh are:

Vision:

To be an institution where the most formative years of a young mind are spent in the guided pursuit of excellence while developing a spirit of inquisitive questioning, an ability to excel in the pressure of a fast-changing professional world, and a desire to grow into a personality

rather than a person, in an environment that fosters strong moral and ethical values, teamwork, community service and environment consciousness.

Mission:

- To be the enablers of the confluence of academic rigor and professional practicality.
- To bring global best practices to students through widespread use of technology.
- To empower our faculty to constantly develop new skills and excel professionally.
- To provide the best campus environment to students and faculty with all facilities to nurture their interest.

M.Sc. (Mathematics) programme of the University strives to realize its vision and mission by rectifying student centric issues on priority and also to empower local community with the help of various social clubs running in University like NSS, KADAM and Alumni association. The University promotes multidisciplinary and allied research in various fields that supports and harnesses joyful learning environment. The goals of OL program is to provide educational facilities to all qualified and willing persons who are unable to join regular courses due to personal or professional reasons. There are many potential learners who cannot afford to join regular courses due to professional responsibilities and personal commitments. For such cases M.Sc. (Mathematics) through OL mode can be helpful in increasing knowledge base and skill up-gradation.

The program aims to provide alternative path to wider potential learners who are in need of refresher courses to update their skills.

C. Nature of Prospective Target Group of Learners

The Distance and Online Education at Mangalayatan University (MU) shall target the working professionals, executives as well as those who cannot attend a full-time program due to prior occupation or other assignments. The candidates desirous of taking admission in M.Sc. (Mathematics) program shall have to meet the eligibility norms as follows-

To obtain admission in M.Sc. (Mathematics) Programme offered through OL mode, the learner must have completed graduation in science stream (PCM/PCMB).

D. Appropriateness of Programme to be conducted in OL mode to acquire specific skills and competence

The University has identified the following **Programme Outcomes** and **Programme Specific Outcomes** as acquisition of specific skills and competence in M.Sc. (Mathematics) Program.

Programme Outcomes (PO's)

After completing the M.Sc. (Mathematics) programme through OL Mode, students will be able to:

- a. PO1: Knowledge outcomes: Acquire knowledge and ability to develop creative solutions, and better understanding of the future developments of the subject. Also, evolve analytical and logical thinking abilities.
- b. PO2: Skill Outcomes: Learn and understand the new concepts and get prepared for placement by developing scientific skills. Further ability to communicate scientific information in a clear and concise manner.

- c. PO3: General Competence: Be able to understand the role of science in solving real life problems and get an ability to participate in debates and discussions constructively.
- d. PO4: Scientific Aptitude and Innovation: Know the recent developments, future possibilities and able to gather, assess, and make use of new information and applying this knowledge to find creative solutions.

Programme Specific Outcomes:

After completing the M.Sc. (Mathematics) programme through OL Mode, students will be able to:

- a. PSO1: Evaluate hypotheses, theories, methods and evidence within their proper contexts.
- b. PSO2: Select, interpret and critically evaluate information from a range of sources that include books, scientific reports, journals, case studies and the internet.
- c. PSO3: Develop proficiency in the analysis of complex problems and the use of mathematical techniques to solve them.
- d. PSO4: Provide a systematic understanding of the concepts and theories of mathematics and their application in the real world – to an advanced level, and enhance career prospects in a huge array of fields.

E. Instructional Design

The program is divided into foursemestersand minimum credit requirement is 76 to get M.Sc. (Mathematics) degree in OL modefrom Mangalayatan University. Minimum time period for acquiring M.Sc. (Mathematics) degree will be two years and maximum time period to acquire is 4 years.

Evaluation Scheme

Semester-I						
S. No.	Course Code	Course Name	Credit	Continuous Assessment Marks	Term End Exam Marks	Grand Total
				Max. Marks	Max. Marks	
1	MAL-6111	Abstract Algebra	4	30	70	100
2	MAL-6112	Classical Mechanics	4	30	70	100
3	MAL-6113	Partial Differential Equations	4	30	70	100
4	MAL-6114	Real Analysis	4	30	70	100
5	MAL-6115	Computer Graphics	4	30	70	100
6	MAP-6111	Computer Graphics (Practical)	1	0	100	100
Total			21	150	450	600

Semester-II						
S. No.	Course Code	Course Name	Credit	Continuous Assessment Marks	Term End Exam Marks	Grand Total
				Max. Marks	Max. Marks	
1	MAL-6211	Operations Research	4	30	70	100
2	MAL-6212	General Topology	4	30	70	100
3	MAL-6213	Complex Analysis	4	30	70	100
4	MAL-6214	Numerical Methods	4	30	70	100
5	MAL-6215	Programming in C	4	30	70	100
6	MAP-6211	Programming in C (Practical)	1	0	100	100
Total			21	150	450	600

Semester-III						
S.N.	Course Code	Course Name	Credit	Continuous Assessment Marks	Term End Exam Marks	Grand Total
				Max. Marks	Max. Marks	
1	MAL-7111	Research Methodology	4	30	70	100
2	MAL-7112	Axiomatic Set Theory	4	30	70	100
3	MAL-7113	Functional Analysis	4	30	70	100
4	MAL-7114	Integration Theory	4	30	70	100
5	MAL-7115	Measure Theory	4	30	70	100
Total			20	150	350	500

Semester-IV						
S.N.	Course Code	Course Name	Credit	Continuous Assessment Marks	Term End Exam Marks	Grand Total
				Max. Marks	Max. Marks	
1	MAL-7211	Mathematical Statistics	4	30	70	100
2	MAL-7212	Graph Theory	4	30	70	100
3	MAD-7211	Project	6	0	100	100
Total			14	60	240	300

MOOCs

The University shall give flexibility in opting for MOOC (Massive Online Open Courses) by the students pertaining to the prescribed curriculum and also the credits earned in the MOOC

courses may be dealt as part of the evaluation scheme as per UGC (Open and Distance Learning Programmes and Online Programmes) Regulations, 2020.

Syllabi and Course Materials

Syllabi, PPR and self-learning materials are developed mostly by experienced faculty members of Mangalayatan University in consultation with contents experts and the same will be forwarded to CIQA and Board of Studies/Academic Council/ Executive Council for further suggestions and approval.

Faculty and Support Staff

The University has identified the requisite faculty and support staff as mandated by the UGC and formally they shall be allocated the required positions from amongst the existing faculty exclusively for OL mode and fresh appointments as per requirement, shall be initiated for which Letter of Intent have been issued to the prospective faculty and staff. The course material prepared by this university will be on par with any open university/Distance education centre in the country.

Delivery Mechanism

The Online Learning (OL) of MU follows a modern ICT (Information & Communication Technology) enabled approach for instruction. The methodology of instruction in OL of MU is different from that of the conventional/regular programs. Our ODL & OL system is more learner-oriented and the learner is an active participant in the teaching-learning process. OL of MU academic delivery system comprises:

The Online learning at Mangalayatan University shall have the four quadrant approach as per the UGC (Credit Framework for Online learning courses through SWAYAM) Regulations, 2016. The University shells provide (1) Video Lectures (2) Specially developed self-learning material in the digital format (e – content), that can be downloaded. (3) Online live discussion for clarifying doubts and (4) Time to time online tests and assignments to test the understanding of the learners.

A. Study Material –

The study material in digital format (e – content) of the programme shall be supplied to the students unit - wise for every course.

B. Video Lectures –

The Video lectures as prescribed by the UGC Regulation shall be made available on the LMS portal of the University.

C. Online Counselling Sessions

The online counselling sessions shall be scheduled beforehand by the Subject Coordinator and informed to the learners. There shall be 6 online counselling sessions / contact classes of 2 hours each for a 4 credit course, held on Saturdays and Sundays. In case of 2 credits course there shall be 4 sessions of 2 hours each and in case of 6 credits course there shall be 8 sessions of 2 hours each.

D. Medium of Instruction

Medium of Course Instruction: English

Medium of Examination: English

Student Support Systems

The university will appoint programme coordinators, course coordinator and course mentors to facilitate the learners in their learning.

Finally, The university has made appropriate arrangements for various support services including online counselling and resource-oriented-services, evaluation methods for both on and off line modes for easy and smooth services to the students' through online mode.

F. Procedure for Admissions, Curriculum, Transaction and Evaluation

Admission Process

Admission to the M.Sc. (Mathematics) Programme will be done on the basis of screening of candidate's eligibility on first come first serve basis. The University will follow the reservation policy as per norms of the Government. Admission shall not be a right to the students and MU, DDOE shall retain the right to cancel any admission at any point of time if any irregularity is found in the admission process, eligibility etc.

Maximum Duration

- A. The maximum duration of the M.Sc. (Mathematics) Programme is four years. Thereafter, students seeking completion of the left-over course(s) will be required to seek fresh admission.
- B. The student can complete his programme within a period of 4 years failing which he/she shall seek fresh admission to complete the programme.

Eligibility

Science (PCM) Graduate from a recognised University is eligible for admission into M.Sc. (Mathematics) programme.

Fee Structure

Name of the Programme	Degree	Duration	Total Fees (All Inclusive)			Total Fees (All Inclusive)		
			Indian Nationals			Foreign Nationals (\$)		
			Semester	Full Year	Total	Semester	Full Year	Total
Master of Science (Mathematics)	PG	2 to 4 Years	24000	48000	96000	488	975	1950

Activity Schedule

S.NO.	Name of the Activity	Tentative months schedule(specify months) during year			
		From(Month)	To (Month)	From(Month)	To (Month)
1	Admission	Jul	Sep	Jan	Mar
2	Assignment submission (if any)	Sep	Oct	Mar	Apr
3	Evaluation of Assignment	Oct	Nov	Apr	May
4	Examination	Dec	Dec	Jun	Jun
5	Declaration of Result	Jan	Jan	Jul	Jul
6	Re-registration	Jul	Jul	Jan	Jan
7	Distribution of SLM	Jul	Sep	Jan	Mar
8	Contact Programmes (counselling, Practicals.etc.)	Sep	Nov	Mar	May

Credit System

MU, DDOE proposes to follow the 'Credit System' for most of its programs. Each credit amounts to 30 hours of study comprising all learning activities. Thus, a 8 credit course requires 240 hours, 6 credit course requires 180 hours, 4 credit course requires 120 hours and 2 credit course requires 60 hours of study. This helps the student to understand the academic effort to complete a course. Completion of an academic programme requires successful clearing of both, the assignments and the term-end examination of each course in a programme.

Duration of programme	Credits	Name of programme	Level of programme
2 to 4 Yrs.	76	M.Sc. (Mathematics)	Master's Degree

Assignments

Online Education learners have to depend much on self-study. In order to ascertain the writing skill and level of comprehension of the learner, assignment work is compulsory for all learners. Each assignment shall consist of a number of questions, case studies and practical related tasks. The Assignment Question Papers will be uploaded to the website within a scheduled time and the learners shall be required to respond them within a specified period of time. The response of the learner is examined by a faculty member.

Evaluation: The evaluation system of the programme is based on two components:

- A. Continuous Evaluation in the form of assignments (weightage 30%):** This Component carries a weightage of 30%. There will be at least one graded assignment and test per course. These assignments are to be submitted to the Programme Co-ordinator of the DDOE.
- B. Term-end examination (weightage 70%):** Proctored online examination will be held twice every year in the months of June and December. A student will be allowed to appear in the Term-End Examination only after she/he has registered for that course and submitted the assignment. For appearing in the Examination, every student has to submit an Examination form through online (www.mangalayatan.in/) or offline before the due dates as given in the

schedule of operations. If a student misses any term-end examination of a course for any reason, s/he may appear for any of them or all the courses subject to the maximum of 8 courses in the subsequent term-end examinations. This facility will be available until a student secures the minimum pass grade in the courses but up to a maximum period of four semesters, since the date of registration of the course is valid for four semesters. Beyond this period s/he may continue for another four semesters by getting Re-registration by paying fee again. In that case, the score of qualified assignments and/or term-end examination will be retained and the student will be required to complete the left out requirements of such re-registered courses. Minimum requirement for passing a course will be 40% marks.

G. Laboratory Support and Library Resources

The library of Mangalayatan University aims to empower the teaching mission and intellectual culture of the community through availability through an organized collection of information as well as instruction in its access, relevance and evaluation.

The University Library enriches advance learning and discovery by providing access to a broad array of resources for education, research and creative work to ensure the rich interchange of ideas in the pursuit of knowledge.

The Directorate of Distance Education of Mangalayatan University has initiated the process of setting up a dedicated Library for ODL / OL program and acquiring printed books and e-books for this purpose. The required International and National subject journals are also provided. We have a full functioning community radio service on board (90.4 FM). We already have annual journal subscriptions and the capacity can be enlarged at later stages as the University lines up with more online journals.

The collection of the Library is rich and diverse especially in terms of the breadth and depth of coverage. Collection encompasses subjects in Management, Commerce, Information Technology, Computer Applications, and other allied areas. This collection further includes Books, Research Journals, Project Reports/Dissertations and online Journals.

The University has well equipped Computer Laboratories, Lecture Capturing Systems, Audio Video facilities, ICT enabled class rooms, Wi-Fi facilities etc.

H. Cost Estimate of the Programme and the Provisions

Initial expenses have been done by the University in terms of provision of infrastructure, manpower, printing of self-study material and other. The University intends to allocate expenses out of the total fee collection as per following details:

a) SLM Development and Distribution	:	20%
b) Postal Expense	:	10%
c) Salary and other Administrative expenses	:	60%
d) Future development	:	10%

Once programmes are operational, fee receipt from the programme's budget to be planed as per the guidelines of University Grants Commission.

I. Quality Assurance

The University has established the Centre for Internal Quality Assurance (CIQA) in the University campus. The CIQA will monitor and maintain the quality of the ODL programmes. It has the following objectives in making the compliances of quality implementations.

Objectives

The objective of Centre for Internal Quality Assurance is to develop and put in place a comprehensive and dynamic internal quality assurance system to ensure that programme of higher education in the Open and Distance Learning mode and Online mode being implemented by the Higher Educational Institution are of acceptable quality and further improved on continuous basis.

Functions of CIQA

The functions of Centre for Internal Quality Assurance would be following

- 1) To maintain quality in the services provided to the learners.
- 2) To undertake self-evaluative and reflective exercises for continual quality improvement in all the systems and processes of the Higher Educational Institution.
- 3) To contribute in the identification of the key areas in which Higher Educational Institution should maintain quality.
- 4) To devise mechanism to ensure that the quality of Open and Distance Learning programmes and Online programmes matches with the quality of relevant programmes in conventional mode.
- 5) To devise mechanisms for interaction with and obtaining feedback from all stakeholders namely, learners, teachers, staff, parents, society, employers, and Government for quality improvement.
- 6) To suggest measures to the authorities of Higher Educational Institution for qualitative improvement.
- 7) To facilitate the implementation of its recommendations through periodic reviews.
- 8) To organize workshops/ seminars/ symposium on quality related themes, ensure participation of all stakeholders, and disseminate the reports of such activities among all the stakeholders in Higher Educational Institution.
- 9) To develop and collate best practices in all areas leading to quality enhancement in services to the learners and disseminate the same all concerned in Higher Educational Institution.
- 10) To collect, collate and disseminate accurate, complete and reliable statistics about the quality of the programme (s).
- 11) To ensure that Programme Project Report for each programme is according to the norms and guidelines prescribed by the Commission and wherever necessary by the appropriate regulatory authority having control over the programme.
- 12) To put in place a mechanism to ensure the proper implementation of Programme Project Reports.
- 13) To maintain are cord of Annual Plans and Annual Reports of Higher Educational Institution, review them periodically and generate actionable reports.
- 14) To provide inputs to the Higher Educational Institution for restructuring of programmes in order to make them relevant to the job market.
- 15) To facilitate system based research on ways of creating learner centric environment and to bring about qualitative change in the entire system.

- 16) To act as a nodal coordinating unit for seeking assessment and accreditation from a designated body for accreditation such as NAAC etc.
- 17) To adopt measures to ensure internalization and institutionalization of quality enhancement practices through periodic accreditation and audit.
- 18) To coordinate between Higher Educational Institution and the Commission for various qualities related initiatives or guidelines.
- 19) To obtain information from other Higher Educational Institutions on various quality benchmarks or parameters and best practices.
- 20) To record activities undertaken on quality assurance in the form of an annual report of Centre for Internal Quality Assurance.
- 21) It will be mandatory for Centre for Internal Quality Assurance to submit Annual Reports to the Statutory Authorities or Bodies of the Higher Educational Institution about its activities at the end of each academic session. A copy of report in the format as specified by the Commission, duly approved by the statutory authorities of the Higher Educational Institution shall be submitted annually to the Commission.

After enrolling in M.Sc. (Mathematics) programme of Mangalayatan University in OL mode, student will exhibit knowledge, skill and general competence with scientific aptitude and innovation. After completion of M.Sc. (Mathematics) programme, student will pursue further studies in mathematics for roles in academia, research, industry, finance, technology and government.