KARNATAKA STATE OPEN UNIVERSITY

Mukthagangotri, Mysuru – 570 006, Karnataka, India

Programme Project Report under revised UGC Regulation-2017

Name of the Programme: | M.Sc. in Mathematics |

| Abstract |

Name of the Programme	Master of Science in Mathematics
Name of the Department	Department of Mathematics
School	School of Science
Duration	2 Years
Scheme	Semester (4)
Credit	72
SLM	Courses: 19 Blocks: 76 Units: 304 1 Block= 4 Units
Instructional delivery	PCP, Counseling, Audio/visuals, Radio, Face to face, Electronic.
Medium of Instruction	English
Eligibility Conditions	12+3 or equivalent degree in concerned subject
Evaluation System	Internal assessments and Term-end examinations.
Teaching Staff	Associate Professor: 1(Post sanctioned, will be recruited) Assistant Professor: 2 (Post sanctioned, will be recruited)
Infrastructure	Lecture halls, Laboratory, Audio-visual centers, Library.
Quality assurance	Students' feedback, Peer review, Editorial committee, Accreditation by agencies.
Expected outcome	Skills, Employability, Quality and Excellence.

(a) Programme's Mission and Objectives:

- **Mission**

  - To empower learners to formulate and solve mathematical and statistical problems and communicate the solutions and their significance.
  - To train a diverse group of problem solvers professionally with well-developed quantitative skills.
  - To promote the success of a diverse group of faculty at all levels, through mentoring, material support and interactions which enhance research and teaching.
  - To impart knowledge and skill to the learners and thereby increase his/her professionalism.
  - To create effective human resources by employing the ICT.
  - To enhance the capacity of the learners to realize their individual, corporate and social responsibility.

- ➢ To impart education such that the learners inculcate moral, civil and ethical values.
- ➢ To provide education at affordable cost to the masses.

- **Objectives**

  - ➢ To impart the learners with a foundation for lifelong learning, critical thinking, and collaborative, technical problem solving in professional and business contexts.
  - ➢ To learn innovative curriculum to be used in the modern world.
  - ➢ To enable learners to gain an appreciation of mathematics, both as a science and as a humanistic study.
  - ➢ To develop interrelations both within mathematics and with human culture and science.
  - ➢ To train learners with latest knowledge, skills and attitude to become experts in the field of mathematics and to get employment.

(b) Relevance of the program with HEI's Mission and Goals:

Mathematics as a subject is key to success in the modern economy. The scope of mathematics is immense due to critical thinking and logical analysis and extend this to serve the society through innovative, interdisciplinary and advanced study in mathematics, holistic education to develop solution provider.

The WTO, international relations between the countries and liberalization, privatization and globalization have created conducive atmosphere in the country to establish numerous industries. At the same time a plethora of job opportunities have been emanated for the formal graduates/post-graduates in the relevant fields.

Mathematics post graduates can also become faculty members in universities, colleges or teachers in schools, etc. Therefore, this program is opened in the distance mode so that all aspired target sections are benefited to gain knowledge, skills and attitudes in mathematics and allied disciplines.

The goal of the program is to enrich learners with knowledge, skills and attitude to become experts in the field of mathematics and to get employment.

(c) Nature of perspective target group of Learners:

1. Candidates who have qualified 12 + 3 equivalent graduate programme with mathematics as one of the major subjects and B.E/B.Tech from recognized University/Institution.
2. Graduates in the concerned subjects who cannot access to the conventional mode of education.
3. Graduates in the core subjects who have economic, socio-cultural and locational disadvantages and other inclusive groups.
4. Graduates in the core subjects working in different sectors.
5. Graduate housewife, senior citizen, prison inmates etc.

(d) Appropriateness of programme to be conducted in ODL mode to acquire specific skills and competence:

The following are the specific skills and competencies expected of a student to acquire during the course of studies.

1. M.Sc. in Mathematics offered by ODL mode is encompassed around the regulations of the UGC.
2. The contents are delivered by self-learning material, lectures and the skills are imparted in the contact classes/counseling classes as per the UGC directions.
3. The course has a well-structured set of self-learning material customized to learner's capacity and aptitude.
4. The course is modulated to assess the learners progress through checks involving assignments and tests. Student seminars, project works, dissertation and field work component are designed at regular stages which will add to the experience of the learners.
5. ICT gadgets will be deployed to acquire professional, presentational, analytical and such other skills relevant for course competence and creates a platform for placement.
6. Audio-visual recording facility will be utilized to record lessons subject experts and will be provided to students.
7. Smart classes with smart board, projector, desktop/laptop computers, speakers along with educational software's will be utilized.
8. The programme has been designed by ODL system as a parallel one to the conventional program.

(e) Instructional Design:

Curriculum development plays a very vital role in the development of quality of education. Keeping in view of the norms of UGC, the university took the following measures:

1. **Fully Articulated:** Curriculum articulation has been adopted to avoid conflicts across the different areas. Development of a logical and sequential instructions flow from one year to other is a reality. Curriculum articulation is maintained at all levels of studies reducing and eliminating repetition by establishing sound linkages wherever necessary.
2. **Realistic Contents**:
   - Contents are developed keeping in view the contributions expected of a student in his career.
   - Career role with specific tasks, knowledge, skills, attitudes, and values are considered for development of curriculum.
   - The content of the program is delivered by way of self-learning material which is prepared by the academicians of reputed universities and other institutions.
3. **Evaluation-Conscious:** The curriculum being developed keeping in view of evaluation-consciousness, logic, accuracy and measurability.
4. **Employability:** The curriculum is being developed to bridge the gap between the academic knowledge and job market requirement at various levels.

5. **Duration of the Programme**: Two academic years under semester scheme (four semesters).

6. **Faculty**: The program is administered by-
   Associate Professor-01, (Post sanctioned, will be recruited) Assistant Professor-02 (1 Post vacant, 1 Post sanctioned, will be recruited).

7. **Supporting Staff (Non-teaching and technical staff)**: Clerk/DEO-01, Office Attender-01, Technician-01, Attender-01.

8. **Instructional Delivery Mechanism**: Delivery mechanism is through personal delivery at the time of admission in print media (Prospectus, Student Program Guide, SLM and Practical Manuals), web based services, CD drives and the university also proposed to have virtual class room delivery mode.

9. **Instructional Design**: The instructional design will be made as prescribed by UGC. Curriculum of the program is approved by the bodies viz. Board of Studies, Academic Council and Ordinance. The curriculum is to be revised periodically.

Table 1: Norms for delivery of M.Sc. in Mathematics program through ODL mode					
Semester	**Components**	**No of credits**	**Study hours**	**PCP/Counseling hours**	**No. of Assignments**
I	Theory	15	450	45	10
II	Theory	15	450	45	10
III	Theory	20	600	60	10
IV	Theory	16	420	42	8
	Dissertation	6	180	-	-

*10% of total learning hours of a course are earmarked to deliver lecture in PCP/counseling.

10. **School and Department:** School The program is administered by Department of Mathematics which comes under School of Sciences.

11. **Details of the Syllabi:** The details of Syllabus of M.Sc. in Mathematics Programme is provided in Annexure-1

(f) Procedure for admissions, curriculum transaction and evaluation:

1. **Procedure for Admissions:**

   a. The university has adopted transparent admission policy. All materials relating to admissions, courses, curriculum, evaluation, student support service, etc. is provided in the prospectus and website of the university regularly. The admission norms prescribed by the UGC would be followed in its true spirit.

   The **minimum eligibility** for admission shall be as prescribed under the Ordinances framed under Karnataka State Open University Act-1992. Bachelor's Degree in Science with Mathematics as one of the major subject from a recognised university/Institution or B.E./B.Tech. from recognized university /Institution.

   b. **Program delivery and Activity Planner:** The delivery of the courses is through SLM, Counseling Sessions, Practical classes, Assignments, Contact Programs through web-based learning and print media. The academic calendar of events will be notified well in advance on the website of the University.

c. Financial Assistance:

i. Scholarship for SC/ST students is being awarded.

ii. Muktha Sanjeevini Scheme for meritorious students and rural based students are also awarded.

iii. Women students are exempted from payment of tuition fee @ 25% in case they produce BPL card at the time of their admission.

iv. Merit scholar ships awarded by the Government of India.

2. Curriculum Transaction:

a. Curriculum will be revised and upgraded periodically.
b. Curriculum of the programme is designed on the basis of the proceedings of the workshop.
c. Curriculum matches with the guidelines of regulatory body in terms of credits, blocks and units.
d. Board of Studies, Academic Council and the ordinance strengthens the curriculum design.
e. Students program guide and study material in SLM and E-content.
f. Contract program and counselling enable interactions.

3. Evaluation:

Student is assessed by the Internal Assessment and Term-end examinations.

a. **Internal Assessment:** Internal assessment comprises of various tools such as written assignments, seminars, quiz, field work, group discussions etc. It is a continuous/formative assessment adopted by the university.

b. **Term-end Examinations:** The University conducts term-end examination at the end of each term. It employs all measures suggested by the UGC to conduct transparent examinations at various notified centres of the territory. Besides the evaluation system is same as that of the system suggested by the UGC. Single valuation is relied upon; however the re-valuation, challenge valuation, photocopy of the answer script etc are also adopted to conduct evaluation system transparently and objectively.

Table 2: Details of Credits and Examination

FIRST SEMESTER					
Course code	Credits	Theory		IA	Aggregate for Pass
		Max Marks	Min Marks		
Math 1.1	4	80	32	20	
Math 1.2	4	80	32	20	
Math 1.3	4	80	32	20	40%
Math 1.4	3	80	32	20	
Math 1.5	3	80	32	20	
Total	18	400	-	100	200

SECOND SEMESTER					
Course code	Credits	Theory		IA	Aggregate for Pass
		Max Marks	Min Marks		
Math 2.1	4	80	32	20	
Math 2.2	4	80	32	20	
Math 2.3	4	80	32	20	40%
Math 2.4	3	80	32	20	
Math 2.5	3	40	32	20	
Total	18	400	-	100	200

THIRD SEMESTER					
Course code	Credits	Theory		IA	Aggregate for Pass
		Max Marks	Min Marks		
Math 3.1	4	80	32	20	
Math 3.2	4	80	32	20	
Math 3.3	4	80	32	20	40%
Math 3.4	3	80	32	20	
Math 3.5	3	80	32	20	
Total	18	400	-	100	200

FOURTH SEMESTER					
Course code	Credits	Theory		IA	Aggregate for Pass
		Max Marks	Min Marks		
Math 4.1	4	80	32	20	
Math 4.2	4	80	32	20	
Math 4.3	3	80	32	20	40%
Math 4.4	3	80	32	20	
Math 4.5	4	80	32	20	
Total	18	400	-	110	200

g. **Notification**: The University would notify its admission policy, financial assistance, delivery of the programme, academic planning and other details on the website of the University for the Information of the learners once the programme is approved by UGC.

(g) Requirement of the Laboratory Support and Library Resources:

i. Laboratory Support: The University will provide the requisite skill by conducting the computer practical classes. For this purpose, the compatible computer lab and trained personals will be in place at the centers notified by the university. This infrastructure may be its own or through periodical MOU's with collaborations executed with reputed government institutions.

ii. Library Resources: The University provides library facility both traditional and digital at the learner center with proper security. Further, state of the art library is in place in the headquarters.

h. Cost estimate of the programme and the provisions:

The approximate cost estimate of the programme is Rs. 90,00,000/- per annum.

(i) Quality Assurance and Expected Programme Outcomes:

The quality will be ensured by taking the following measures:
- Student's formal feedback-students give feedback in the prescribed format on the content of the SLM at the term end. Students also give feedback on the lectures/practical classes delivered at the contact programme/counseling. Their suggestions are employed for improvement.
- Academic peers, the senior faculty members in the concerned subject also review the study material and the practical manuals. Periodic workshops on the curriculum help enhancing the quality.
- Academic audit promotes quality and standards.
- Feedback of the industrialists, employers, professionals also step up the quality and standard of the programme.
- The editorial committee ensures the quality of the SLMs.
- Assessment and accreditation by agency.

Expected Programme Outcomes:

- To acquire, update, refresh, relearn and enrich the existing knowledge so as to produce outcomes of comparable quality with on-campus programs.
- To produce human resources in the field of mathematics and allied subjects with classical and corporate responsibility.
- To empower multiple competencies and adding quality dimension to learner's knowledge.
- To compete successfully for internship and employment positions in government, industry, and non-profit organizations.
- To develop a predisposition toward application areas such as physical sciences, financial services, and social sciences and have the knowledge, experience, and motivation to bring the tools of mathematics and statistics to bear on real-world problems.

Benchmark System:

- Employability and placement of students.
- Creation of data base of learners and alumni association.
- Achieving quality and excellence in the field.
- Corporate level services.
- Community development, networking and collaborations.
- Furtherance of research and development.

ANNEXURE-I

SYLLABUS

M.Sc. in Mathematics

I Semester	**Title**
Course 1	Algebra
Course 2	Real Analysis - I
Course 3	Complex Analysis - I
Course 4	Discrete Mathematics
Course 5	Differential Equations

II Semester	
Course 1	Linear Algebra
Course 2	Real Analysis - II
Course 3	Complex Analysis - II
Course 4	Numerical Analysis
Course 5	Operation Research

III Semester	
Course 1	Topology
Course 2	Measure and Integration
Course 3	Functional Analysis
Course 4	Mathematical Modelling
Course 5	Computer Programing

IV Semester	
Course 1	Number Theory
Course 2	Graph Theory and Algorithms
Course 3	Fluid Mechanics
Course 4	Mathematical Statistics
Course 5	Dissertation