

Programme Specifications



Programme: Medicinal Chemistry
Department: Chemistry

Faculty of Science and Humanities
M. S. Ramaiah University of Applied Sciences

University House, New BEL Road, MSR Nagar, Bangalore – 560 054

www.msruas.ac.in

Programme Specifications: M.Sc.(Medicinal Chemistry)

Faculty	Faculty of Science and Humanities (FSH)
Department	Chemistry
Programme	M.Sc. (Medicinal Chemistry)
Dean of Faculty	Prof. M. R. Srinivasan
HOD	Prof. M. R. Srinivasan (I/C)

1. Title of the Award

M.Sc.(Medicinal Chemistry)

2. Modes of StudyFull-Time **3. Awarding Institution /Body**

M S Ramaiah University of Applied Sciences-Bangalore, India

4. Joint Award

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5. Teaching Institution

Faculty of Science and Humanities (FSH)

M S Ramaiah University of Applied Sciences-Bangalore, India

6. Date of h Specifications

August 2014

7. Date of h Approval by the Academic Council of MSRUAS

August 2014

8. Next Review Date

June 2016

9. h Approving Regulatory Body and Date of Approval

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10. h Accrediting Body and Date of Accreditation

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11. Grade Awarded by the Accreditation Body

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12. h Accreditation Validity

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13. h Benchmark

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14. Rationale for the h

A critical element that has opened up career opportunities for medicinal chemists in India is the globalization phenomenon and participation of India in GATT and WTO agreements. Post-1995, a few leading major Indian pharmaceutical companies initiated the game of drug discovery. Since then the demand for medicinal chemists has begun to grow. Post-2005, both multinational and major domestic pharmaceutical companies in India are experiencing a paradigm shift from business-driven research to research-driven business, with an increased R&D thrust focused not only on development of innovative/indigenous processes for known drugs but also on the discovery of new drugs. The increase in medicinal chemistry employment in Asian pharmaceutical companies and Contract Research Organizations collaborating with US and European companies has created a need for chemists to acquire state of the art knowledge of medicinal chemistry.

The Faculty of Science and Humanities of MSRUAS offers the M.Sc.(Medicinal Chemistry) h with an outcome- based curriculum emphasising the Critical, Analytical and Problem Solving skills to equip the students to pursue their scientific and research career with better preparedness and a mature professional outlook. The presence of other allied Faculties of the University provides for a multi-disciplinary approach which is emerging as a key differentiator in the success of modern scientific and engineering endeavors. In the coming years, the government intends to boost up funds for basic sciences. There is an acute shortage of qualified teaching staff. The job prospects for candidates with M.Sc. (Medicinal Chemistry) are good both in industry and academia.

15. h Aim

The aim of the h is to train knowledgeable, skilled, imaginative, and creative individuals who can pursue successful careers in academic/industrial research in medicinal chemistry and allied interdisciplinary subjects.

16. h Objectives

M.Sc. (Medicinal Chemistry) imparts basic competence in general chemistry and in-depth knowledge of medicinal chemistry. The basic competence in general chemistry enables a student to:

1. Impart higher level knowledge and understanding of medicinal chemistry
2. Prepare students to evaluate the soundness of chemical concepts proposed

3. Train students to perform chemical experiments using the standard laboratory equipment/modern instrumentation and gather reliable data
4. Enable students carry out data processing, computation, data analysis and numerical simulations.
5. Teach students proper procedures and regulations for safe handling and use of chemicals.
6. Hone students' skills to pursue chemistry as a teaching and research career
7. Train students in team work and in lifelong learning for continuous professional development

17. Intended Learning Outcomes of the h

The intended learning outcomes are listed under four headings:

1. Knowledge and Understanding, 2. Cognitive Skills 3. Practical Skills and 4. Capability/ Transferable Skills.

17.1 Knowledge and Understanding

After undergoing this , a student will be able to:

- KU1: Identify a family of molecules for a specific drug action
- KU2: Enumerate potential therapeutic targets
- KU3: Describe techniques employed for drug analysis
- KU4: Recognise ethical, regulatory and intellectual property issues in the pharma sector

17.2 Cognitive Skills

After undergoing this , a student will be able to:

- CS1: Model molecular and supra-molecular properties of these molecules and recognise potential therapeutic targets
- CS2: Design and analyse molecules for a specific drug action
- CS3: Develop a strategy for the discovery and development of medicines for a particular disease
- CS4: Discuss and analyse the emerging problems in the development of innovative medicine

17.3 Practical Skills

After undergoing this , a student will be able to:

- PS1: Synthesise and characterize molecules of pharmaceutical interest
- PS2: Perform drug analysis with spectroscopic and chromatographic instruments
- PS3: Validate analytical methods for drug characterization
- PS4: Simulate molecular modeling and drug action

17.4 Capability /Transferable Skills

After undergoing the _____, a student will be able to

TS1: Manage information, develop technical reports and make presentations

TS2: Build, Manage and Lead a team to successfully complete a project and communicate across teams and organizations to achieve professional objectives

TS3: Work under various constraints to meet project targets

TS4: Adopt to the chosen profession by continuously upgrading his/her knowledge and understanding through Life-long Learning philosophy

18. Structure

The following are the modules a student is required to successfully complete for the award of the degree. The is delivered as per the Time-Table for every batch.

h : M.Sc.(Medicinal Chemistry)			
Module Code	Modules	Credits	Duration Weeks
Department- Common Modules			
CHY501	1. Physical Chemistry	5	5
CHY502	2. Inorganic Chemistry	5	5
CHY503	3. Synthetic Methods in Organic Chemistry	5	5
CHY504	4. Instrumental Methods of Analysis	5	5
CHY505	5. Mathematics for Chemists	5	5
h - Specialization Modules			
MCY501	1. Applied Biomolecular Chemistry	5	5
MCY502	2. Chemical Biology & Chemogenomics	5	5
MCY503	3. Computer Aided Drug Design & Development	5	5
MCY504	4. Modern Methods in Drug Synthesis	5	5
MCY505	5. Modeling & Simulation of Drug Delivery	5	5
Faculty-Common Module			
FSH501	Research Methodology	4	4
FSH502	History of Science and Technology	3	3
FSH503	Soft Skills	3	3
Elective Module			
FSH504	Teaching	5	5
FSH505	Seminar/Internship	5	5
MCY600	Dissertation	25	25
Mandatory Module			
FSH 506	Conference/Journal Publication	5	5
		100	100

Note:

1. The Vacations and other activities shall be as per the Time-Table for the corresponding batch.

19. Module Delivery Structure- Full-Time

A module is delivered from Monday to Friday of the week. The lecture classes will be normally held from 9.30 AM to 1.00 PM with 30 minutes of break. The laboratory classes will be held in the afternoon from 2.00PM to 5.00 PM during the first two weeks of the module.

Module 1 to Module 10				
Week-1	Week-2	Week-3	Week-4	Week-5
Module Delivery	Module Delivery	Study Work	Examination	Assignment submission & Presentation

20. Teaching and Learning Methods

The module delivery comprises of combination of few or all of the following:

1. Face to Face Lectures using Audio-Visuals
2. Workshops, Group Discussions, Debates, Presentations
3. Demonstrations
4. Guest Lectures
5. Laboratory/Field work
6. Industry Visit
7. Seminars/Conferences
8. Group Exercises
9. Project Exhibitions
10. Management Festivals

21. Elective Module

Elective modules are:

FSH504 Teaching

A student can teach a module in his / her area of specialisation in any institute approved by the department. The student must submit the teaching notes and also make a presentation to a team of examiners.

FSH505 Seminar/Internship

Seminar

A student can deliver a seminar of one hour duration of his/her original study on a contemporary topic. Topic of the seminar should be registered at the beginning of the elective module. At the end, seminar must be delivered to a team of examiners and also a word processed report must be submitted for assessment.

Internship

Internship is to be done with a research organization for a period of 5 weeks. The student is required to submit a report for assessment and also make a presentation to a team of examiners. The internship should be related to the h . A student is required to find internship on his/her own but the student placement office may assist in getting internship

FSH506 Conference/Journal Publication

Conference Publication

A student can submit a paper and make a presentation in a conference which is approved by the department. The same paper shall be presented for assessment

and the student is required to make a presentation to a team of examiners.

Journal Publication

A student can publish a paper in an Indian or International journal. The proof of submission to the journal publication and a copy of the paper shall be submitted followed by a presentation for assessment.

24. Assessment and Grading

A module assessment will have two components:

Component - 1

Assignment 50% weight

Component - 2

Examination 50% weight

(Note: For more details on the break-ups, please refer to the Module Specifications)

A student is required to score a minimum of 40% in each of the components and an overall 40% for successful completion of a module and earning the credits.

Note: Final marks awarded in each of the modules will be confirmed only after SAB/PAB as explained in Academic Regulations of M.Sc. Programme.

25. Failure and Re-registration

If a student fails in a module, he/she is required to re-attend the module when offered next time by re-registering to the module.

26. Attendance

A student is required to have a minimum of 85% attendance to be eligible to write the examination and assignment submission. Less than 85% attendance is considered to be FAIL; such a student is required to follow the same procedure as that of a failed student.

Any condoning of shortfall of the attendance is as per the Academic Regulations for M.Sc. Programme.

27. Award of Class

As per the Academic Regulations for M.Sc. Programme.

28. Student Support for Learning

Students are given the following support:

1. Module Notes
2. Reference Books in the Library
3. Magazines and Journals
4. Internet Facility
5. Computing Facility
6. Laboratory Facility
7. Workshop Facility
8. Staff Support
9. Lounges for Discussions
10. Any other support that enhances their learning

29. Quality Control Measures

The following are the Quality Control Measures:

1. Review of Module Notes
2. Review of Question Papers and Assignment Questions
3. Student Feedback
4. Moderation of Assessed work
5. Opportunities for the students to see their assessed work
6. Review by External Examiners and External Examiners Reports
7. Staff Student Consultative Committee Meetings
8. Student Exit Feedback
9. Subject Assessment Board
10. Programme Assessment Board

30. Curriculum Map

Module Code	Intended Learning Outcomes											
	Knowledge and Understanding				Cognitive (Thinking) Skills (Critical, Analytical, Problem Solving, Innovation)				Practical skills			
	KU1	KU2	KU3	KU4	CS1	CS2	CS3	CS4	PS1	PS2	PS3	PS4
CHY501											X	X
CHY502	X	X		X	X						X	X
CHY503	X	X					X				X	X
CHY504		X							X	X	X	X
CHY505		X			X		X			X		
MCY501	X	X	X	X	X	X	X	X	X			
MCY502	X	X	X	X	X	X		X	X	X	X	X
MCY503	X	X	X	X	X	X	X	X			X	
MCY504	X	X	X		X	X	X	X	X	X	X	
MCY505	X	X	X	X	X	X	X	X	X		X	
FSH501											X	X
FSH502	X	X	X	X	X	X	X	X	X	X	X	X
FSH503	X	X	X	X	X	X	X	X	X	X	X	X
FSH504	X	X	X	X	X	X	X	X	X			
FSH505												
FSH506												
MCY600	X	X	X	X	X	X	X	X	X	X	X	X

31. Capability/ Transferable Skills Map

Module Code	Group work	Self learning	Research Skills	Written Communication Skills	Verbal Communication Skills	Presentation Skills	Behavioral Skills	Information Management	Personal management/ Leadership Skills
CHY501		X	X	X	X	X		X	
CHY502		X	X	X	X	X		X	
CHY503		X	X	X		X		X	
CHY504	X	X	X	X	X	X	X	X	
CHY505		x		x		x		x	
MCY501		X	X	X	X	X		X	
MCY502		X	X	X	X	X		X	
MCY503		X	X	X	X	X		X	
MCY504		X	X	X	X	X		X	
MCY505		X	X	X	X	X		X	
FSH501		X		X	X	X		X	
FSH502		X	X	X	X	X		X	
FSH503		X	X	X	X	X	X	X	X
FSH504	X	X	X	X	X	X	X	X	X
FSH505		x	x	x	x	x		x	
FSH506		x	x	x	x	x		x	
MCY600	X	X	X	X	X	X	X	X	X

32. Co-curricular Activities

Students are encouraged to take part in co-curricular activities like seminars, conferences, symposium, paper writing, attending industry exhibitions, project competitions and related activities for them to enhance their knowledge and network.

33. Cultural and Literary Activities

To remind and ignite the creative endeavors annual cultural festivals are held and the students are made to plan and organise the activities.

34. Sports and Athletics

Students are encouraged to develop a habit of taking part in outdoor and indoor games on daily basis.

