



# Programme Specifications

M.Pharm. Programme

Programme:  
Pharmacology

Department:  
Pharmacology

Faculty of Pharmacy  
M.S. Ramaiah University of Applied Sciences

**PROGRAMME SPECIFICATIONS: PHARMACOLOGY**

Faculty	Faculty of Pharmacy (FPH)
Department	Department of Pharmacology
Programme	M. Pharm. in Pharmacology
Dean of Faculty	Dr. V. Madhavan
HOD	Dr. Anita Murali

**1. Title of the Award**

M. Pharm. in Pharmacology

**2. Modes of Study**

Full-Time  Part-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 Pharmacy (FPH)

M.S.Ramaiah University of Applied Sciences – Bangalore, India

**6. Month of Creation of Programme Specifications**

February 2017

**7. Programme Approval Month by the Academic Council of MSRUAS**

April 2017

**8. Next Review**

March 2019

**9. Programme Approving Regulatory Bodies and Date of Approval**

Pharmacy Council of India (PCI), New Delhi

**10. Programme Accrediting Body and Date of Accreditation**

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**11. Grade Awarded by the Accreditation Body**

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**12. Programme Accreditation Validity**

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**13. Programme Benchmark**

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**14. Rationale for the Programme**

Pharmacology is a branch of Pharmaceutical sciences which is considered as the backbone of rational drug therapy. This includes a detailed study of drugs, their sources, mechanism, metabolism, excretion, uses, adverse effects, interactions, and contraindications. Specialization in Pharmacology involves the research, discovery, and characterization of chemicals which show biological effects and the elucidation of their function at organ and cellular levels. A pharmacologist is involved in kinetic and dynamics studies; toxicology, preclinical and clinical studies of new drug molecules.

The M. S. Ramaiah College of Pharmacy, now a constituent of MSRUAS as Faculty of Pharmacy has been in existence for over 2 decades. Over the years, Faculty of Pharmacy of MSRUAS has grown and evolved as one of the Premier Institutions in the state of Karnataka. It has very good infrastructure, noteworthy laboratory facilities including well maintained animal house, experienced and competent staff. During the last two decades it has produced over 1000 graduates and 150 Post graduates. The presence of other Faculties of Applied Sciences of the University will facilitate the students to experience more than the conventional curriculum.

Faculty of Pharmacy of MSRUAS offers M. Pharm Pharmacology degree featured with semester pattern curriculum, featured with critical thinking, analytical and problem solving skills, outcome based curriculum and open electives across various faculties. The curriculum is structured to train students to take independent professional responsibilities and acquire necessary skills to compete with their global counterparts.

**15. Programme Aim**

The aim of the programme is to produce postgraduates with advanced knowledge and understanding of pharmacology; higher order critical, analytical, problem solving and transferable skills; ability to think rigorously and independently to meet higher level expectations of pharmaceutical industry, academics, research or take up entrepreneurial route.

**16. Programme Objectives**

The objectives of the programme are:

1. To uphold all laws, regulations, safety and ethical standards that apply to the experimental procedures in animals and the environment
2. To impart adequate hands-on training in various animal models and determine the effects of drugs using animal models
3. To provide practical inputs in pharmacokinetic studies of various drugs and formulations in animals to establish *in-vitro* and *in-vivo* correlations
4. Acquire practical knowledge in various analytical techniques used in molecular biology
5. To train students in using suitable statistical methods for interpretation of results
6. To prepare the students in teamwork, lifelong learning and continuous improvement

**17. Intended Learning Outcomes of the Programme**

The intended learning outcomes are listed under four headings:

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

**17.1 Knowledge and Understanding**

After undergoing this programme, a student will be able to:

- KU1: Explain the different methods of instrumental analysis
- KU2: Describe the mechanisms involved in signal transduction
- KU3: Explain the rationale for the usage of animal models in drug discovery and Identify alternatives for animal models
- KU4: Select the appropriate drugs for the treatment of a disease

**17.2 Cognitive Skills**

After undergoing this programme, a student will be able to:

- CS1: Design the protocol for the pharmacological evaluation of drugs and analyze and interpret the significance of drug responses
- CS2: Develop novel pharmacological screening methods
- CS3: Interpret the results of instrumental analysis
- CS4: Rationalize drug therapy

**17.3 Practical Skills**

After undergoing this programme, a student will be able to:

- PS1: Handle various equipments for pharmacological research
- PS2: Analyze drugs using various analytical instruments
- PS3: Demonstrate the effects of drugs in animals
- PS4: Estimate biochemical and hematological alterations in biological samples of animals and humans

**17.4 Capability/Transferable Skills**

After undergoing the programme, 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. Programme Structure**

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

<b>SEMESTER – I</b>			
<b>Course Code</b>	<b>Courses</b>	<b>Credits</b>	<b>Hours/Week</b>
<b>DEPARTMENT COMMON COURSE</b>			
<b>MPL101T</b>	1. Modern Pharmaceutical Analytical Techniques	4	4
<b>PROGRAMME SPECIALIZATION COURSES</b>			
<b>MPL102T</b>	1. Advanced Pharmacology-I	4	4
<b>MPL103T</b>	2. Pharmacological and Toxicological Screening Methods-I	4	4
<b>MPL104T</b>	3. Cellular and Molecular Pharmacology	4	4
<b>MPL105P</b>	4. Pharmacology Practical I	6	12
<b>MPL106</b>	5. Seminar/Assignment	4	7
<b>Total</b>		<b>26</b>	<b>35</b>
<b>SEMESTER – II</b>			
<b>PROGRAMME SPECIALIZATION COURSES</b>			
<b>MPL201T</b>	1. Advanced Pharmacology- II	4	4
<b>MPL202T</b>	2. Pharmacological and Toxicological Screening Methods-II	4	4
<b>MPL203T</b>	3. Principles of Drug Discovery	4	4
<b>MPL204T</b>	4. Clinical Research and Pharmacovigilance	4	4
<b>MPL205P</b>	5. Pharmacology Practical II	6	12
<b>MPL206</b>	6. Seminar/Assignment	4	7
<b>Total</b>		<b>26</b>	<b>35</b>
<b>SEMESTER – III</b>			
<b>FACULTY COMMON SPECIALIZATION</b>			
<b>MRM301T</b>	1. Research Methodology and Biostatistics	4	4
<b>MPJ302</b>	2. Journal Club	1	1
<b>MMC301</b>	3. Group project	4	-
<b>MPR301</b>	4. Discussion/synopsis Presentation (Proposal Presentation)	2	2
<b>MPR302</b>	5. Research Work	14	28
<b>Total</b>		<b>25</b>	<b>35</b>
<b>SEMESTER – IV</b>			
<b>PROGRAMME COMMON SPECIALIZATION</b>			
<b>MPJ402</b>	1. Journal Club	1	1
<b>MPR403</b>	2. Research Work	16	31
<b>MPR404</b>	3. Discussion/Interim-Final Presentation	3	3
<b>Total</b>		<b>20</b>	<b>35</b>
<b>MANDATORY COURSE/S</b>			
<b>MMC501</b>	1. Participation/Presentation: National/International Seminar, Conferences, Workshops	1- 3	-
<b>MMC502</b>	2. Publication : National / International Journals		-
<b>MMC503</b>	3. Academic/Research award: State/National/International Agencies		-
<b>Grand Total</b>		<b>Minimum</b>	98
		<b>Maximum</b>	100

**19 Programme Delivery Structure- Full-Time**

The programme is delivered from Monday to Saturday of the week.

Normally from 9 AM to 1PM and 2 PM -5 PM from Monday to Friday and 9AM to 1PM on Saturday.

**20. Teaching and Learning Methods**

The programme delivery comprises of :

1. Face to Face Lectures using Audio-Visuals
2. Group Discussions, Presentations
3. Demonstrations
4. Guest Lectures
5. Laboratory/Field work/Workshops
6. Industry Visit
7. Seminars
8. Project Exhibitions
9. Case studies
10. Concept mapping

**21. Mandatory Courses**

Mandatory course/s can be any one or more of the following –

**MMC501 Participation/Presentation in Research Forum**

A student can participate /submit a paper and make a presentation in a conference, seminar, workshop, training programme or symposium related to the programme specialization which is approved by the department. .

**MMC502 Publication in National/International Journal (Referred & Abstracted)**

A student can publish a review or research paper in a scientific journal. The proof of submission and a copy of the paper shall be submitted to the department.

**MMC503 Academic/Research award from State/National/International Agencies**

A student with extraordinary accomplishment can participate and get academ excellence / research excellence awards from conferences/competitions/recognize affiliated bodies and agencies.

**MMC301 Group Project**

A group project shall have up to 5 interdepartmental students within the faculty. The purpose of group project is that the group should be able to design/develop/evaluate a drug moiety, dosage form, product, data or process in their area of specializations. The students are required to develop a report for assessment and also need to demonstrate the final outcome. The IPR rights of all such work lies with the University only. The students are required to sign an agreement before the commencement of the project. The project should be approved by a committee of examiners before the start of the project. Students can choose a project from the database of projects available with the concerned department. The detailed procedure and evaluation procedure is available in the Operation Manual / i - portal.

22.

**MPL106 & MPL206****Seminar/ Assignment**

**Assignment:** Every candidate shall submit a word processed assignment for individual theory courses in their first and second semester specialization which would be evaluated for a maximum of 25 marks with 50% weightage.

**Seminar:** Every candidate shall present on the submitted assignment topic for individual theory courses in their first and second semester specialization which would be evaluated for a maximum of 25 marks with 50% weightage.

The detailed procedure and evaluation procedure is available in the Operation Manual / i-portal.

23.

**MPJ302 & MPJ 402****Journal Club**

Every student shall critically appraise the research article of their specialization published in reputed journals. Students are trained for inquiry based learning and critical thinking skills. Students shall access journals adopting search engines and made to collect relevant data, analyze and comment on the findings with the submission of the document evidence and present on the same for assessment. The detailed procedure and evaluation procedure is available in the Operation Manual / i- portal.

24.

**MPR302 & MPR403****Dissertation/Research Work**

Every candidate shall carry out work on an assigned research project under the guidance of a recognized Postgraduate teacher in the third and fourth semester, the result of which shall be written up and submitted in the form of a dissertation.

Work for writing the dissertation is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

The dissertation shall be examined by a minimum of two examiners; one internal (Mentor) and one external examiner (outside the University).

25.

**Assessment and Grading****SEMESTER - I**

Course code	Course	Internal Assessment				Semester End Examination		Total Marks
		Continuous Mode	Sessional Examination		Total	Marks	Duration	
			Marks	Duration				
<b>MPH 101T</b>	Modern Pharmaceutical Analytical Techniques	10	15	1h.	25	75	3h.	100
<b>MPL 102T</b>	Advanced Pharmacology-I	10	15	1h.	25	75	3h.	100
<b>MPL 103T</b>	Pharmacological and Toxicological Screening Methods-I	10	15	1h.	25	75	3h.	100
<b>MPL 104T</b>	Cellular and Molecular Pharmacology	10	15	1h.	25	75	3h.	100
<b>MPL 105P</b>	Pharmacology Practical-I	20	30	6h.	50	100	6h.	150
<b>MPL 106</b>	Seminar/ Assignment	-	-	-	-	-	-	100
<b>Total</b>								<b>650</b>



## SEMESTER II

Course Code	Course	Internal Assessment				Semester End Examination		Total Marks
		Continuous Mode	Sessional Examination		Total	Marks	Duration	
			Marks	Duration				
<b>MPL 201T</b>	Advanced Pharmacology- II	10	15	1h.	25	75	3h.	100
<b>MPL 202T</b>	Pharmacological and Toxicological Screening Methods-II	10	15	1h.	25	75	3h.	100
<b>MPL 203T</b>	Principles of Drug Discovery	10	15	1h.	25	75	3h.	100
<b>MPL 204T</b>	Clinical Research and Pharmacovigilance	10	15	1h.	25	75	3h.	100
<b>MPL 205P</b>	Pharmacology Practical- II	20	30	6h.	50	10	6h.	150
<b>MPL 206</b>	Seminar/ Assignment	-	-	-	-	-	-	100
<b>Total</b>								<b>650</b>

## SEMESTER III

Course Code	Course	Internal Assessment				Semester End Examination		Total Marks
		Continuous Mode	Sessional Examination		Total	Marks	Duration	
			Marks	Duration				
<b>MRM301T</b>	Research Methodology and Biostatistics	10	15	1h.	25	75	3 h.	100
<b>MPJ302</b>	Journal Club	-	-	-	25	-	-	25
<b>MPR301</b>	Discussion / Synopsis Presentation	-	-	-	50	-	-	50
<b>MPR302</b>	Research Work	-	-	-	-	350	1h.	350
<b>Total</b>								<b>525</b>

## SEMESTER IV

Course Code	Course	Internal Assessment			Semester End Examination		Total Marks		
		Continuous Mode	Sessional Examination		Total	Marks		Duration	
			Marks	Duration					
MPJ402	Journal Club	-	-	-	25	-	-	25	
MPR403	Research Work	-	-	-	-	400	-	400	
MPR404	Discussion / Interim - Final Presentation	-	-	-	75	-	1h.	75	
<b>Total</b>									<b>500</b>

**Theory: 100 Marks****(Component -1: 25 Marks + Component-2: 75 Marks)****Component - 1: 25 Marks**

It has two sub-components (Part A &amp; B)

**Part – A: Continuous Evaluation: 10 Marks**

The marks allocated for Continuous mode of internal assessment shall be awarded as per the scheme given below:

**\*Guidelines for allotment of marks for attendance**

Percentage of Attendance	Theory
95-100	8
90-94	6
85-89	4
80-84	2
Less than 80	0

**Scheme for awarding Continuous Evaluation -Theory**

Criteria	Maximum marks
Attendance*	8
Student–Teacher Interaction**	2
Total	10

\*\* student will be continuously assessed during theory and practical sessions

**Part – B: Sessional Examination: 15 Marks**

Two sessional examinations (each for 15 Marks with one hour duration) will be conducted. Average marks of the two sessionals will be computed for sessional examination marks.

**Component - 2 Semester End Theory Examination: 75 Marks**

**Theory Examination:** A theory exam shall be conducted for maximum marks 75 Marks with three hours of duration

**Practical: 150 Marks****(Component - 1: 50 Marks + Component - 2: 100 Marks)****Component - 1: 50 Marks**

It has two sub-components (Part A & B)

**Part – A: Continuous Evaluation: 20 Marks**

The marks allocated for Continuous mode of internal assessment shall be awarded as per the scheme given below:

**Scheme for awarding Continuous Evaluation -Theory**

Criteria	Maximum marks
Attendance*	10
Practical Records, Regular viva-voce	10
Total	20

**Guidelines for allotment of marks for attendance\***

Percentage of Attendance	Practical
95-100	10
90-94	7.5
85-89	5
80-84	2.5
Less than 80	0

**Part – B: Sessional Examination: 30 Marks**

Two sessional examinations (each for 30 Marks with six hour duration) will be conducted. Average marks of the two sessionals will be computed for sessional examination marks.

**Component -2 Semester End Practical Examination : 100 Marks**

**Practical Examination:** 100 Marks with six hours of duration. Practical examination shall also consist of a Viva –voce (Oral) examination.

The assessment questions are set to test the learning outcomes. In each component a certain learning outcome is assessed.

Note: For more details on the break-ups, please refer to the Course Specifications

A student is required to score an overall 50% for successful completion of a course and earn the credits.

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

**Assignment & Seminar**

The detailed procedure and evaluation procedure is available in the Operation Manual / Student Handbook/Academic Regulations

**Journal Club**

The detailed procedure and evaluation procedure is available in the Operation Manual / Student Handbook/Academic Regulations.

**Group Project**

The detailed procedure and evaluation procedure is available in the Operation Manual / Student Handbook/Academic Regulations

**Mandatory Courses**

The credit points assigned for extracurricular and/co-curricular activities shall be given by the Dean of the Faculty and the same shall be submitted to the University.

<b>Name of the activity</b>	<b>Maximum credit points Eligible/Activity</b>
Participation in National Level Seminar/Conference/Workshop/Symposium/ Training	01
Participation in International Level outside India Seminar/Conference/Workshop/Symposium/ Training Programs (related to the specialization of the student)	02
Academic Award/Research Award from State Level/National Agencies	01
Academic Award/Research Award from International Agencies	02
Research / Review Publication in National Journals (Indexed in Scopus / Web of Science)	01

**Dissertation/Research Work**

1. Every candidate shall carry out work on an assigned research project under the guidance of a recognized Postgraduate Teacher, the result of which shall be written up and submitted in the form of a dissertation.
2. Work for writing the Dissertation is aimed at contributing to the development of spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in pharmaceutical/medical sciences and the manner of identifying and consulting available literature. Dissertation shall be submitted as per the notified time schedule mentioned in the Academic calendar / student hand book.
3. The Dissertation and viva-voce shall be evaluated by two examiners, one Internal and one External examiner appointed by the University.

**Scheme of Evaluation of Dissertation book:**

Objective(s) of the work done	: 50 Marks
Methodology adopted	: 150 Marks
Results and Discussions	: 250 Marks
Conclusions and Outcomes	: 50 Marks

**Total : 500 Marks**

**Scheme of Evaluation of Presentation:**

Presentation of work	: 100 Marks
Communication skills	: 50 Marks
Question and answer skills	: 100 Marks

**Total : 250 Marks**

A student is required to score a minimum of 50% overall for successful completion of Dissertation and earn the corresponding credits.

**Supplementary/Re-registration examination and improvement of sessional marks**

The eligibility criteria and procedures for supplementary examination and improvement of sessional marks are as per the Pharmacy Council of India (PCI) norms and are indicated in the Academic Regulations governing this programme.

**26. Attendance**

A student is required to have a minimum of 85% attendance to be eligible to appear for the examination. Any condoning is as per the Academic regulations of M. Pharm. programme.

**27. Award of Class**

As per the Academic Regulations for M. Pharm. Programme

**28. Student Support for Learning**

Students are given the following support:

1. Course 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 Course Notes
2. Review of Question Papers and Assignment
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

Course 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
MPL101T								X				
MPL102T		X		X				X				
MPL103T			X									
MPL104T	X	X					X	X				
MPL105P					X	X	X		X	X	X	X
MPL106	X	X	X	X	X		X	X				
MPL201T				X				X				
MPL202T			X		X	X	X					
MPL203T	X											
MPL204T				X								
MPL205P					X	X	X		X	X	X	X
MPL206	X	X	X	X	X		X	X				
MRM301T					X							
MPJ302	X	X	X	X	X		X					
MMC301		X	X		X				X	X	X	
MPR301							X					
MPR302							X		X	X		X
MPJ402										X		
MPR403							X		X	X		X
MPR404								X				
MMC501												
MMC502												
MMC503												



**30. 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
MPL101T	X	X	X	X	X	X	X	X	X
MPL102T	X	X	X	X	X	X	X	X	X
MPL103T	X	X	X	X	X	X	X	X	X
MPL104T	X	X	X	X	X	X	X	X	X
MPL105P	X	X	X	X	X	X	X	X	X
MPL106		X		X	X	X	X	X	X
MPL201T	X	X	X	X	X	X	X	X	X
MPL202T	X	X	X	X	X	X	X	X	X
MPL203T	X	X	X	X	X	X	X	X	X
MPL204T	X	X	X	X	X	X	X	X	X
MPL205P	X	X	X	X	X	X	X	X	X
MPL206		X		X	X	X	X	X	X
MRM301T	X	X	X	X	X	X	X	X	X
MPJ302		X	X	X	X	X	X	X	X
MMC301	X	X	X	X	X	X	X	X	X
MPR301		X	X	X	X	X	X	X	X
MPR302		X	X	X	X	X	X	X	X
MPJ402		X	X	X	X	X	X	X	X
MPR403		X	X	X	X	X	X	X	X
MPR404		X	X	X	X	X	X	X	X
MMC501		X	X	X	X	X	X	X	X
MMC502		X	X	X	X	X	X	X	X
MMC503		X	X	X	X	X	X	X	X

**31. 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 to enhance their knowledge and network.

**32. Cultural and Literary Activities**

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

**33. Sports and Athletics**

Students are encouraged to develop a habit of playing games on daily basis and also take part in annual sports and athletic events.

