

ANDHRA UNIVERSITY
AU COLLEGE OF PHARMACEUTICAL SCIENCES



MASTER OF PHARMACY
(2020)

Regulations and Syllabus

Four semester pattern

With effect from 2020-21

M.PHARM (2020) REGULATIONS AND SYLLABUS

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1. Admission, instruction and attendance

The degree of Master of Pharmacy of the Andhra University will be conferred on a candidate who has satisfied the following conditions:

- 1.1 The candidate must have passed the B.Pharm. Degree examination of this University or B.Pharm. Degree examinations of any other University recognized by the Academic Council as equivalent thereto in First or Second class; and must have qualified in any entrance examination, if prescribed.
- 1.2 Every student, selected for admission to PG Pharmacy program in any PCI approved institution should have obtained registration with the State Pharmacy Council or should obtain the same within one month from the date of his/her admission, failing which the admission of the candidate shall be cancelled.
- 1.3 The candidate should have undergone a regular course of study as prescribed hereunder extending over a period of four semesters, ordinarily consecutive, and satisfied the academic requirements as prescribed hereinafter. The course of instruction and periods of study shall be as given in the scheme of instruction and in the syllabus.
- 1.4 The subjects of specializations for Master of Pharmacy Course shall be as follows:
 1. Pharmaceutical Analysis
 2. Pharmaceutical Chemistry
 3. Pharmaceutics
 4. Pharmaceutical Biotechnology
 5. Pharmacology
 6. Pharmacognosy

7. Pharmaceutical Regulatory Affairs
 8. Pharmaceutical Quality Assurance
 9. Industrial Pharmacy
 10. Pharmacy Practice
- 1.5 Instruction and examination in each academic year is spread over two semesters with a minimum of 96 working days in each semester (192 in any given academic year). The odd semesters shall be conducted from the month of July to November and the even semesters shall be conducted from the month of December to April.
 - 1.6 Each period of instruction is of 45 minutes duration. Eight periods of instruction are provided on each day and there are six working days in a week (Monday to Saturday).
 - 1.7 Attendance Requirements: A regular course of study during an academic semester means a minimum of average attendance of 80% of all the courses of the semester computed by totaling the number of periods of lectures and practicals, as the case may be, held in every course. In special cases where sufficient causes were shown, the Vice-Chancellor may on the recommendation of the Principal concerned condone the deficiency in the average attendance to an extent of 9% for reasons such as ill health, if the application for condonation is submitted at the time of actual illness and is supported by certificate of; authorized Medical officer approved by the Principal. However, in the case of students, who participate in activities like N.S.S., N.C.C., Inter-Collegiate tournaments conducted by Andhra University, Inter-University tournaments conducted by Inter-university Board and any such other activities involving the representation of the College/University with the prior approval of the principal, the candidate may be deemed to have attended the college during the period solely for the purpose of the examination.
 - 1.7 A candidate who cannot satisfy the attendance requirements in clause 1.5 because of late admission under special circumstances reasonable and acceptable to the University on the basis of document, shall fulfill the following conditions;
Average attendance: A candidate shall have attended at least a total of 90% of the periods-lectures/practicals as the case may be held from the date of admission and also shall attend at least 50% of the total working days during that academic semester (Late admission means, admissions made after 45 days from date of commencement of the academic semester for the course).

- 1.8 If any candidate fails to satisfy the regulation under 1.5 or 1.6 she/he shall not be allowed for the University Examinations at the end of the semester, and he/she shall not be allowed for promotion to the next higher class of study. He/she shall be required to repeat the regular course of study of that academic semester along with the next regular batch.
- 1.9 A regular record of attendance in theory, practical, seminar, assignment, journal club, discussion with the supervisor, research work presentation and dissertation shall be maintained by the department/teaching staff of respective courses.

2. Examinations - Sessional and Semester-end

- 2.1 Assessment for the award of degree shall consists of (a) internal evaluation for 30 marks in each of the theory and practical courses separately. (b) Semester-end examination as detailed in the scheme of examination for 70 marks in each of the theory and practical.
- 2.2 Regulations concerning sessional examination: (a) There shall be two sessional examinations in each theory course and the average of the two shall be taken; (b) The marks for the internal evaluation for the practical are awarded based on the continuous assessment of the performance of the candidate at the practical classes and the records. (c) The teacher who teaches the subject shall ordinarily to be the internal examiner (d) There shall be no provision for the improvement of the sessional marks. There is no minimum mark prescribed for sessional examination.

2.2.1 Guidelines for Internal assessment

Scheme for awarding internal assessment: Continuous mode

Theory-Criteria	Marks	
Attendance & Student-Teacher Interaction	10	
Total	10	
Practical-Criteria	Practical I	Practical II
Attendance	10	10
Record + DDA (Assignment/Seminars/Viva-Voce etc.,)	5	5
Internal Practical Examination	15	15
Total	30	30

2.2.2 Guidelines for the allotment of marks for attendance

Percentage of Attendance	Theory/Practical
95 -100	10
90-94	8
85-89	6
80-84	4
Less than 80	0

2.3. Regulations concerning M.Pharm I and II semester evaluation pattern:

2.3.1. There shall be one semester end examination in each theory course based on the question paper set by an external paper setter and there shall be single valuation. There shall be one semester end examination in each practical course as per the scheme of examination and valuation shall be done by examiner. The duration of the practical examination is of 6 hours as prescribed.

2.3.2. However the student may apply for revaluation of any subject in theory papers after declaring the results as per University examination guide lines.

2.3.3 Journal Club

In case of Journal Club, based on the research proposal, each student shall collect a minimum of 5 research papers (published in a reputed journal with impact factor of Thomson & Reuters of not less than 1.0) and should discuss in a Programme Committee (consisting of Head of the Department, Research Supervisor and other Senior faculty members) and documented separately for record in a Journal Club Register.

2.3.4 Seminar

A seminar at the end of first and second semesters is separately conducted keeping in view of the enrichment of required communication, presentation and explanatory skills. A minimum of four seminars shall be given during the semester before the Program Committee and other students and documented separately for record in a Semester Seminar Register.

2.3.5 A student shall be eligible to carry forward all the courses of I, II semesters. However, he/she shall not be eligible to attend the courses of IV semester until the candidate clears III semester Midterm Project Review.

2.4. Regulations concerning M. Pharm. III and IV Semester evaluation pattern:

- 2.4.1. Evaluation of the seminar on the objectives and work plan of the proposed project is to be completed within one month from the commencement of the project date with three examiners from the same college consisting of research guide, another teacher in the concerned specialization and third teacher from different specialization. These teachers must fulfill the eligibility criteria laid down in Section 3.
- 2.4.2. Evaluation of the M.Pharm III Semester Mid-term project review and seminar on selected topic will be done by the research guide and external examiner. The seminar on the selected topic shall not be one connected with the topic of the thesis work but should be related to concerned specialization.
- 2.4.3. A candidate shall submit four copies of his/her thesis either printed or typed, embodying the results of research work done by him under direction of an approved research director following the specific guidelines as stipulated under Section 5. All the candidates must submit their thesis within the prescribed date as per the academic calendar.
- 2.4.4. The thesis submitted by the candidate shall be examined by a Board of Examiners consisting of an External Examiner and the research director and shall have to be approved after holding a viva voce examination to test the knowledge of the candidate in the subject. The thesis will be evaluated independently by the external examiner and research director and in case the difference between examiners is more than 20%, the thesis shall be sent to a second external examiner whose award shall be the final. The viva-voce examination will be jointly conducted both by the external examiner and research director. A candidate can re-submit the thesis in a revised form after further work, if required to do so.
- 2.4.5. A candidate desires of improving his/her class shall take either or both of the first two semesters as a whole.
- 2.5. Guidelines for writing the thesis
- The thesis should have the following pages in order:
1. Title page highlighting the title, name of the candidate, reg. no., guide name, college name and month and year of submission.
 2. The inner title page containing the same details on white background.
 3. Certificate from the Head of the institution

4. Certificate from the Research Director
 5. Certificate from the ethical committees for approval of study, if any
 6. Declaration by the student
 7. Acknowledgements
 8. Index highlighting chapter titles and sections titles
 9. Index for tables, figures and plates, if any
 10. Abbreviations and symbols
 11. Materials used in the investigation with their procurement details like name of the company, batch number etc.
 12. Equipment used in the study with the model number and other details
 13. The thesis should contain the following chapters:
 - a) Aim and objectives of the investigation
 - b) Introduction and literature survey
 - c) Description: Methods and Materials, etc.
 - d) Experimental work
 - e) Results and discussion
 - f) Summary and conclusions
 - g) References (The references may be included at the end of each chapter or at the end of the thesis according to the convenience)
- 2.5.1. The thesis should be typed in times new roman in 12 font size with 1.5 line spacing from the beginning of the thesis including titles to the chapters and sections. Bold font may be used wherever necessary. The students are expected to follow scientific grammar for writing *in vivo* etc. which should be in italics.
- 2.5.2. The citation of references should be done carefully by citing the complete reference i.e. name of all the authors. Usage of et al. is not allowed in the citation of reference. The students are expected to give the primary references rather than secondary or higher levels of references. The presentation of reference must be in Vancouver style.
- 2.5.3. No code names or numbers are allowed to be written in the thesis for the materials used in the project.
- 2.5.4. The examiners of thesis evaluation are expected to verify all this and appropriate corrections are to be made before conducting the viva-voce examination.

2.5.5 Project Work/IV Semester Assessment – Division of Marks:

Course 402 -Thesis Evaluation (Max. Marks – 150)

Criteria of Evaluation	Marks
Seminar/Presentation of work	20
Objective(s) of the work done	20
Methodology adopted	40
Results and Discussion	40
Conclusions and Outcomes	30
Total	150

The division of marks shall be clearly indicated for every candidate in the marks statement being sent to the University.

2.6 End Semester examinations

The End Semester examination for each theory, practical and other courses through semesters I to IV shall be conducted by the University except for the subject with asterisk symbol (*) in the tables of the each specialization courses (Non University Examinations) for which examinations shall be conducted by the subject experts at college level and the marks/grades shall be submitted to the University. In case of theory examinations, the question paper of the corresponding subject shall be mailed (Official mail id) to the Controller of Examinations and Chairman, BOS with signature of the Head of the Institute in PDF format within twenty four hours after completion of the examination.

3. Eligibility criteria for appointment as examiner for M.Pharm examination

- 3.1. In order to eligible to be appointed as an internal examiner for the semester end examination in the respective specialization, a teacher shall have M. Pharm. or Ph.D. in the respective specialization with at least three years of M.Pharm teaching experience for the course concerned.
- 3.2. The eligibility of a teacher for guiding the M.Pharm III and IV semester project is as follows:
 - 3.2.1. The teacher must have M.Pharm/Ph.D. in the respective specialization with an experience of minimum 3 years of Post Graduate teaching in the respective specialization.

- 3.2.2. The eligibility of such teachers qualified for guiding M.Pharm projects must be ratified by the Board of Studies before commencement of M.Pharm guidance.
- 3.2.3. The recognised M.Pharm guides are not eligible to guide more than **6** students in one academic year including joint guidance.

4. Regulations for pursuing M.Pharm III and IV Semester project

- 4.1. Students desirous of pursuing M.Pharm III and IV semester projects outside college are required to get the approval from the college before one month from the commencement of the project work. The research work can be carried out in a GMP compliant industry (as approved by WHO, USFDA etc.) and Central research laboratories like IICT, CDRI, NIH etc. or DSIR and Drug Control Administration recognized laboratories. A certificate to that effect must be incorporated in the M.Pharm thesis indicating the duration of stay. If the duration of stay is less than nine months the remaining period of stay in the college should be certified by the research supervisor and the Principal.
- 4.2. All the students should present a seminar on the objectives of their work, work plan, etc. within one month from the commencement of the project. The students should attend a mid-term review seminar in the presence of a committee consisting of one external examiner, research director. The suggestions made by the committee are to be taken into consideration for further work and should be presented in the thesis.

5. Declaration of results and classification:

- 5.1. A candidate shall be declared to have passed the examination held at the end of each semester if obtains i) not less than 40% in the each theory and 50% in each practical, seminar, comprehensive viva, thesis and thesis viva-voce at the end of each semester end examination and ii) an aggregate of 50% of all examinations of that semester including sessionals. There are no minimum marks prescribed for sessional examination.
- 5.2. A candidate who has successfully completed the examination in a course by securing not less than 50% of marks shall not be permitted to retake the examination in that course.
- 5.3. A candidate who fails to secure 50% of marks on the aggregate but secures 50% or more in some courses and between 40-49% in the other courses, he/she shall be required to retake the semester and supplementary examination in one or more of

the courses in which he/she secures less than 50% of marks as per his/her choice to satisfy the requirement of 50% aggregate.

5.4 Declaration of class

The classes shall be awarded on the basis of CGPA as follows

- First Class with Distinction = CGPA of 7.50 and above
- First Class = CGPA of 6.00 to 7.49
- Second Class = CGPA of 5.00 to 5.99

6. Grading system:

- 6.1. Appropriate letter grades are awarded in each theory and practical subject to only such candidates who have passed in the university examinations. Internal assessment marks and university examination marks put together will be taken into account for the letter grading system in each subject separately.
- 6.2. A candidate registered for the university examination but fails to appear or fails to score the minimum required 40% marks in the university examination will get a grade ‘F’, indicating failure or grade of incompleteness.
- 6.3. A subject successfully completed cannot be repeated. Final evaluation of each subject (theory and practical separately) will be carried out on a 10- point grading system corresponding to the marks obtained in that subject. Each subject letter grade is converted into a specific grade value associated with the letter grade as given below (Table).
- 6.4. The credits allotted to each course is given in the respective specialization courses tables from 1 to 10.

Table: 10-Point grading system

Percentage of marks	Grade	Grade points
90.00 - 100	O	10.0
80.00 - 89.99	A	9.0
70.00 – 79.99	B	8.0
60.00 – 69.99	C	7.0
50.00 – 59.99	D	6.0
40.00 – 49.99	E	5.0
< 40.00	F(Fail)	0.0
The grade W represents failure due to insufficient attendance in the semester or year	W	0.0
Incomplete (subsequently to be changed into pass or E or O or F grade in the same semester)	I	0.0

6.5 The Semester grade point average (SGPA):

The performance of a student in a semester is indicated by a number called 'Semester Grade Point Average' (SGPA). The SGPA is the weighted average of the grade points obtained in all the courses by the student during the semester. For example, if a student takes five courses (Theory/Practical) in a semester with credits C1, C2, C3 and C4 and the student's grade points in these courses are G1, G2, G3 and G4, respectively, and then students' SGPA is equal to:

$$\text{SGPA} = \frac{C_1G_1 + C_2G_2 + C_3G_3 + C_4G_4}{C_1 + C_2 + C_3 + C_4}$$

The SGPA is calculated to two decimal points. It should be noted that, the SGPA for any semester shall take into consideration the F and AB grade awarded in that semester. For example if a learner has a F or AB grade in course 4, the SGPA shall then be computed as:

$$\text{SGPA} = \frac{C_1G_1 + C_2G_2 + C_3G_3 + C_4 * \text{ZERO}}{C_1 + C_2 + C_3 + C_4}$$

6.6. Cumulative Grade Point Average (CGPA)

The CGPA is calculated with the SGPA of all the IV semesters to two decimal points and is indicated in final grade report card/final transcript showing the grades of all IV semesters and their courses. The CGPA shall reflect the failed status in case of F grade(s), till the course(s) is/are passed. When the course(s) is/ are passed by obtaining a pass grade on subsequent examination(s) the CGPA shall only reflect the new grade and not the fail grades earned earlier. The CGPA is calculated as:

$$\text{CGPA} = \frac{C_1S_1 + C_2S_2 + C_3S_3 + C_4S_4}{C_1 + C_2 + C_3 + C_4}$$

Where C₁,C₂,C₃,...is the total number of credits for semester I, II, III,...and S₁, S₂,

S₃, is the SGPA of semester I, II, III,...

7. Guidelines for paper setting and model papers.

7.1. Guidelines for theory paper setting

- 7.1.1. The semester end question paper in each theory course is to be set for a total of 70 marks by an external paper setter as per the general model given below.

7.1.2. Question paper consists of 5 questions each carrying 5 marks out of which 4 questions are to be answered by the candidate and 7 questions each carrying 10 marks out of which 5 questions are to be answered by the candidate for a total of 70 marks. Each main question may contain subsections like a, b, c etc.

7.1.3. The questions given should be spread over the entire syllabus in an even manner covering all the units as per the pattern of the question paper given below.

7.1.4. Model question paper for theory course:

Course No.

Specialization Name:

Title of the course:

Time:3Hrs

Max.Marks:70

Part A

Answer any **four** questions out of five questions

4X5=20

One question has to be set from each unit.

Part B

Answer any **five** questions out of seven questions

5X10=50

Five questions are to be set from five units and the remaining two should cover at least four out of five units. The main questions may contain sub question like 1(a), 1(b) etc.

7.2. Guidelines for practical paper setting

7.2.1 The question paper in each semester end practical examination is to be set jointly by two examiners and evaluated, one external and one internal as per the general model provided below.

7.2.2. Model question paper for practical course:

Course No.

Title of the course

Time: 6 hrs.

1. Synopsis

10 marks

2. Major experiment

30 marks

3. Minor experiment

20 marks

4. Viva voce

10 marks

Total: 70 marks

The subjects of each specialization for M.Pharmacy course are as follows:

Table 1: Pharmaceutical Analysis (MPA) - I, II, III and IV Semesters

Code	Course	A	B	IA	SEE	Total
I SEMESTER						
MPA 101T	Modern Pharmaceutical Analytical	4	4	30	70	100
MPA 102T	Advanced Pharmaceutical Analysis	4	4	30	70	100
MPA 103T	Pharmaceutical Validation	4	4	30	70	100
MPA 104T	Food Analysis	4	4	30	70	100
MPA 105P	Pharmaceutical Analysis Practical I	2	6	30	70	100
MPA 106P	Pharmaceutical Analysis Practical II	2	6	30	70	100
MPA 107	Seminar*	2	4	50	--	50
Total		22	32	--	--	650
II SEMESTER						
MPA 201T	Advanced Instrumental Analysis	4	4	30	70	100
MPA 202T	Modern Bio-Analytical Techniques	4	4	30	70	100
MPA 203T	Quality Control and Quality Assurance	4	4	30	70	100
MPA 204T	Herbal and Cosmetic Analysis	4	4	30	70	100
MPA 205P	Pharmaceutical Analysis Practical III	2	6	30	70	100
MPA 206	Comprehensive Viva	2	--	--	--	50
MPA 207	Seminar*	2	2	50	--	50
Total		22	26	---	---	600
III SEMESTER						
MPA 301T	Research Methodology and Biostatistics*	2	4	30	70	100
MPA 302	Journal Club*	2	2	50	---	50
MPA 303	Discussion /Presentation (Dissertation Title & Project Proposal)*	2	--	50	---	50
MPA 304	Seminar on Selected Topic #	4	4	---	100	100
MPA 305	Research Work Progress (Mid Term	10	20	---	200	100
Total:		20	30	---	---	400
IV SEMESTER						
MPA 401	Journal Club*	2	2	50	---	50
MPA 402	Thesis evaluation	12	20	---	150	150
MPA 403	Thesis viva	4	---	---	50	50
Total:		20	22	---	---	250

A → Credit Points; B → Hrs/wk; IA - Internal Assessment; SEE — Sem End Examn; IA → 10 (DDA) + 20 (average of I & II Mids each 30 M and 2 hr duration). DDA (Day to Day Assessment). * Non-University Examination. Semester End Examination duration for Theory : 3 hrs ; Practical : 6 hrs

Seminar on Selected Topic → To be evaluated by both External and Internal examiners for 100 Marks with 4 credit points.

Table 2: Pharmaceutical Chemistry - (MPC) - I, II, III and IV Semesters

Code	Course	A	B	IA	SEE	Total
I SEMESTER						
MPC 101T	Modern Pharmaceutical Analytical	4	4	30	70	100
MPC 102T	Advanced Organic Chemistry I	4	4	30	70	100
MPC 103T	Advanced Medicinal Chemistry	4	4	30	70	100
MPC 104T	Chemistry of Natural Products	4	4	30	70	100
MPC 105P	Pharmaceutical Chemistry Practical I	2	6	30	70	100
MPC 106P	Pharmaceutical Chemistry Practical II	2	6	30	70	100
MPC 107	Seminar*	2	4	50	--	50
Total		22	32	--	--	650
II SEMESTER						
MPC 201T	Advanced Spectral Analysis	4	4	30	70	100
MPC 202T	Advanced Organic Chemistry II	4	4	30	70	100
MPC 203T	Computer Aided Drug Design (CADD)	4	4	30	70	100
MPC 204T	Pharmaceutical Process Chemistry	4	4	30	70	100
MPC 205P	Pharmaceutical Chemistry Practical III	2	6	30	70	100
MPC 206	Comprehensive Viva	2	--	--	--	50
MPC 207	Seminar*	2	2	50	--	50
Total		22	26	---	---	600
III SEMESTER						
MPC 301T	Research Methodology and Biostatistics*	2	4	30	70	100
MPC 302	Journal Club*	2	2	50	---	50
MPC 303	Discussion /Presentation (Dissertation Title & Project Proposal)*	2	--	50	---	50
MPC 304	Seminar on Selected Topic #	4	4	---	100	100
MPC 305	Research Work Progress (Mid Term	10	20	---	200	100
Total:		20	30	---	---	400
IV SEMESTER						
MPC 401	Journal Club*	2	2	50	---	50
MPC 402	Thesis evaluation	12	20	---	150	150
MPC 403	Thesis viva	4	---	---	50	50
Total:		20	22	---	---	250

A → Credit Points; B → Hrs/wk; IA - Internal Assessment; SEE — Sem End Exam; IA → 10 (DDA) + 20 (average of I & II Mids each 30 M and 2 hr duration). DDA (Day to Day Assessment). * Non-University Examination. Semester End Examination duration for Theory : 3 hrs ; Practical : 6 hrs

Seminar on Selected Topic → To be evaluated by both External and Internal examiners for 100 Marks with 4 credit points.

Table 3: Pharmaceutics (MPH) - I, II, III and IV Semesters

Code	Course	A	B	IA	SEE	Total
I SEMESTER						
MPH 101T	Modern Pharmaceutical Analytical	4	4	30	70	100
MPH 102T	Advanced Biopharmaceutics &	4	4	30	70	100
MPH 103T	Modern Pharmaceutics	4	4	30	70	100
MPH 104T	Regulatory Affairs	4	4	30	70	100
MPH 105P	Pharmaceutics Practical I	2	6	30	70	100
MPH 106P	Pharmaceutics Practical II	2	6	30	70	100
MPH 107	Seminar*	2	4	50	--	50
Total		22	32	--	--	650
II SEMESTER						
MPH 201T	Molecular Pharmaceutics (Nano Tech and Targeted DDS)	4	4	30	70	100
MPH 202T	Drug Delivery Systems (DDS)	4	4	30	70	100
MPH 203T	Computer Aided Drug Development (CADD)	4	4	30	70	100
MPH 204T	Pharmaceutical and Cosmetic Product Development	4	4	30	70	100
MPH 205P	Pharmaceutics Practical III	2	6	30	70	100
MPH 206	Comprehensive Viva	2	--	--	--	50
MPH 207	Seminar*	2	2	50	--	50
Total		22	26	---	---	600
III SEMESTER						
MPH301T	Research Methodology and Biostatistics*	2	4	30	70	100
MPH 302	Journal Club*	2	2	50	---	50
MPH 303	Discussion /Presentation (Dissertation Title & Project Proposal)*	2	--	50	---	50
MPH 304	Seminar on Selected Topic #	4	4	---	100	100
MPH 305	Research Work Progress (Mid Term	10	20	---	200	100
Total:		20	30	---	---	400
IV SEMESTER						
MPH 401	Journal Club*	2	2	50	---	50
MPH 402	Thesis evaluation	12	20	---	150	150
MPH 403	Thesis viva	4	---	---	50	50
Total:		20	22	---	---	250

A → Credit Points; B → Hrs/wk; IA - Internal Assessment; SEE — Sem End Examn; IA → 10 (DDA) + 20 (average of I & II Mids each 30 M and 2 hr duration). DDA (Day to Day Assessment). * Non-University Examination. Semester End Examination duration for Theory : 3 hrs ; Practical : 6 hrs

Seminar on Selected Topic → To be evaluated by both External and Internal examiners for 100 Marks with 4 credit points.

Table 4: Pharmaceutical Biotechnology (MPB) - I, II, III and IV Semesters

Code	Course	A	B	IA	SEE	Total
I SEMESTER						
MPB 101T	Modern Pharmaceutical Analytical	4	4	30	70	100
MPB 102T	Microbial Genetics and Cellular Biology	4	4	30	70	100
MPB 103T	Bioprocess Engineering and Technology	4	4	30	70	100
MPB 104T	Advanced Pharmaceutical Biotechnology	4	4	30	70	100
MPB 105P	Pharmaceutical Biotechnology Practical I	2	6	30	70	100
MPB 106P	Pharmaceutical Biotechnology Practical II	2	6	30	70	100
MPB 107	Seminar*	2	4	50	--	50
Total		22	32	--	--	650
II SEMESTER						
MPB 201T	Proteins and Protein Formulation	4	4	30	70	100
MPB 202T	Immunotechnology	4	4	30	70	100
MPB 203T	Bioinformatics and Computer Technology	4	4	30	70	100
MPB 204T	Biological Evaluation of Drug Therapy	4	4	30	70	100
MPB 205P	Pharmaceutical Biotechnology Practical III	2	6	30	70	100
MPB 206	Comprehensive Viva	2	--	--	--	50
MPB 207	Seminar*	2	2	50	--	50
Total		22	26	---	---	600
III SEMESTER						
MPB 301T	Research Methodology and Biostatistics*	2	4	30	70	100
MPB 302	Journal Club*	2	2	50	---	50
MPB 303	Discussion /Presentation (Dissertation Title & Project Proposal)*	2	--	50	---	50
MPB 304	Seminar on Selected Topic #	4	4	---	100	100
MPB 305	Research Work Progress (Mid Term	10	20	---	200	100
Total:		20	30	---	---	400
IV SEMESTER						
MPB 401	Journal Club*	2	2	50	---	50
MPB 402	Thesis evaluation	12	20	---	150	150
MPB 403	Thesis viva	4	---	---	50	50
Total:		20	22	---	---	250

A → Credit Points; **B** → Hrs/wk; **IA**-Internal Assessment; **SEE**—Sem End Examn; **IA** → 10 (DDA) + 20 (average of I & II Mids each 30 M and 2 hr duration). DDA (Day to Day Assessment). * Non-University Examination. Semester End Examination duration for Theory : 3 hrs ; Practical : 6 hrs

Seminar on Selected Topic → To be evaluated by both External and Internal examiners for 100 Marks with 4 credit points.

Table 5: Pharmacology (MPL) - I, II, III and IV Semesters

Code	Course	A	B	IA	SEE	Total
I SEMESTER						
MPL 101T	Modern Pharmaceutical Analytical Techniques	4	4	30	70	100
MPL 102T	Advanced Pharmacology-I	4	4	30	70	100
MPL 103T	Pharmacological and Toxicological	4	4	30	70	100
MPL 104T	Cellular and Molecular Pharmacology	4	4	30	70	100
MPL 105P	Pharmacology Practical I	2	6	30	70	100
MPL 106P	Pharmacology Practical II	2	6	30	70	100
MPL 107	Seminar*	2	4	50	--	50
Total		22	32	--	--	650
II SEMESTER						
MPL 201T	Advanced Pharmacology II	4	4	30	70	100
MPL 202T	Pharmacological and Toxicological Screening Methods-II	4	4	30	70	100
MPL 203T	Principles of Drug Discovery	4	4	30	70	100
MPL 204T	Clinical Research and Pharmacovigilance	4	4	30	70	100
MPL 205P	Pharmacology Practical III	2	6	30	70	100
MPL 206	Comprehensive Viva	2	--	--	--	50
MPL 207	Seminar*	2	2	50	--	50
Total		22	26	---	---	600
III SEMESTER						
MPL 301T	Research Methodology and Biostatistics*	2	4	30	70	100
MPL 302	Journal Club*	2	2	50	---	50
MPL 303	Discussion /Presentation (Dissertation Title & Project Proposal)*	2	--	50	---	50
MPL 304	Seminar on Selected Topic #	4	4	---	100	100
MPL 305	Research Work Progress (Mid Term)	10	20	---	200	100
Total:		20	30	---	---	400
IV SEMESTER						
MPL 401	Journal Club*	2	2	50	---	50
MPL 402	Thesis evaluation	12	20	---	150	150
MPL 403	Thesis viva	4	---	---	50	50
Total:		20	22	---	---	250

A → Credit Points; **B** → Hrs/wk; **IA**-Internal Assessment; **SEE**—Sem End Examn; **IA** → 10 (DDA) + 20 (average of I & II Mids each 30 M and 2 hr duration). **DDA** (Day to Day Assessment). * Non-University Examination. Semester End Examination duration for Theory : **3 hrs** ; Practical : **6 hrs**

Seminar on Selected Topic → To be evaluated by both External and Internal examiners for 100 Marks with 4 credit points.

Table 6: Pharmacognosy (MPG) - I, II, III and IV Semesters

Code	Course	A	B	IA	SEE	Total
I SEMESTER						
MPG 101T	Modern Pharmaceutical Analytical	4	4	30	70	100
MPG 102T	Advanced Pharmacognosy I	4	4	30	70	100
MPG 103T	Phytochemistry	4	4	30	70	100
MPG 104T	Industrial Pharmacognostical Technology	4	4	30	70	100
MPG 105P	Pharmacognosy Practical I	2	6	30	70	100
MPG 106P	Pharmacognosy Practical II	2	6	30	70	100
MPG 107	Seminar*	2	4	50	--	50
Total		22	32	--	--	650
II SEMESTER						
MPG 201T	Medicinal Biotechnology	4	4	30	70	100
MPG 202T	Advanced Pharmacognosy II	4	4	30	70	100
MPG 203T	Indian System of Medicine	4	4	30	70	100
MPG 204T	Herbal Cosmetics	4	4	30	70	100
MPG 205P	Pharmacognosy Practical III	2	6	30	70	100
MPG 206	Comprehensive Viva	2	--	--	--	50
MPG 207	Seminar*	2	2	50	--	50
Total		22	26	---	---	600
III SEMESTER						
MPG 301T	Research Methodology and Biostatistics*	2	4	30	70	100
MPG 302	Journal Club*	2	2	50	---	50
MPG 303	Discussion /Presentation (Dissertation Title & Project Proposal)*	2	--	50	---	50
MPG 304	Seminar on Selected Topic #	4	4	---	100	100
MPG 305	Research Work Progress (Mid Term	10	20	---	200	100
Total:		20	30	---	---	400
IV SEMESTER						
MPG 401	Journal Club*	2	2	50	---	50
MPG 402	Thesis evaluation	12	20	---	150	150
MPG 403	Thesis viva	4	---	---	50	50
Total:		20	22	---	---	250

A → Credit Points; *B* → Hrs/wk; *IA* - Internal Assessment; *SEE* — Sem End Examn; *IA* → 10 (DDA) + 20 (average of I & II Mids each 30 M and 2 hr duration). DDA (Day to Day Assessment). * Non-University Examination. Semester End Examination duration for Theory : 3 hrs ; Practical : 6 hrs

Seminar on Selected Topic → To be evaluated by both External and Internal examiners for 100 Marks with 4 credit points.

Table 7: Pharmaceutical Regulatory Affairs (MRA) - I, II, III and IV Semesters

Code	Course	A	B	IA	SEE	Total
I SEMESTER						
MRA101T	Good Regulatory Practices	4	4	30	70	100
MRA 102T	Documentation and Regulatory	4	4	30	70	100
MRA 103T	Clinical Research Regulations	4	4	30	70	100
MRA 104T	Regulations and Legislation for Drugs & Cosmetics, Medical Devices, Biologicals, Herbals & Food and Nutraceuticals in India	4	4	30	70	100
MRA 105P	Regulatory Affairs Practical I	2	6	30	70	100
MRA 106P	Regulatory Affairs Practical II	2	6	30	70	100
MRA 107	Seminar*	2	4	50	--	50
Total		22	32	--	--	650
II SEMESTER						
MRA 201T	Regulatory Aspects of Drugs & Cosmetics	4	4	30	70	100
MRA 202T	Regulatory Aspects of Herbal &	4	4	30	70	100
MRA 203T	Regulatory Aspects of Medical Devices	4	4	30	70	100
MRA 204T	Regulatory Aspects of Food &	4	4	30	70	100
MRA 205P	Regulatory Affairs Practical III	2	6	30	70	100
MRA 206	Comprehensive Viva	2	--	--	--	50
MRA 207	Seminar*	2	2	50	--	50
Total		22	26	---	---	600
III SEMESTER						
MRA 301T	Research Methodology and Biostatistics*	2	4	30	70	100
MRA 302	Journal Club*	2	2	50	---	50
MRA 303	Discussion /Presentation (Dissertation Title & Project Proposal)*	2	--	50	---	50
MRA 304	Seminar on Selected Topic #	4	4	---	100	100
MRA 305	Research Work Progress (Mid Term	10	20	---	200	100
Total:		20	30	---	---	400
IV SEMESTER						
MRA 401	Journal Club*	2	2	50	---	50
MRA 402	Thesis evaluation	12	20	---	150	150
MRA 403	Thesis viva	4	---	---	50	50
Total:		20	22	---	---	250

A → Credit Points; *B* → Hrs/wk; *IA* - Internal Assessment; *SEE*—Sem End Examn; *IA* → 10 (DDA) + 20 (average of I & II Mids each 30 M and 2 hr duration). DDA (Day to Day Assessment). * Non-University Examination. Semester End Examination duration for Theory : 3 hrs ; Practical : 6 hrs

Seminar on Selected Topic → To be evaluated by both External and Internal examiners for 100 Marks with 4 credit points.

Table 8: Pharmaceutical Quality Assurance (MQA) - I, II, III and IV Semesters

Code	Course	A	B	IA	SEE	Total
I SEMESTER						
MQA 101T	Modern Pharmaceutical Analytical	4	4	30	70	100
MQA 102T	Quality Management System	4	4	30	70	100
MQA 103T	Pharmaceutical Validation	4	4	30	70	100
MQA 104T	Product Development and Technology	4	4	30	70	100
MQA 105P	Pharmaceutical Quality Assurance	2	6	30	70	100
MQA 106P	Pharmaceutical Quality Assurance	2	6	30	70	100
MQA 107	Seminar*	2	4	50	--	50
Total		22	32	--	--	650
II SEMESTER						
MQA 201T	Hazards and Safety Management	4	4	30	70	100
MQA 202T	Audits and Regulatory Compliance	4	4	30	70	100
MQA 203T	Quality Control and Quality Assurance	4	4	30	70	100
MQA 204T	Pharmaceutical Manufacturing Technology	4	4	30	70	100
MQA 205P	Pharmaceutical Quality Assurance	2	6	30	70	100
MQA 206	Comprehensive Viva	2	--	--	--	50
MQA 207	Seminar*	2	2	50	--	50
Total		22	26	---	---	600
III SEMESTER						
MQA 301T	Research Methodology and Biostatistics*	2	4	30	70	100
MQA 302	Journal Club*	2	2	50	---	50
MQA 303	Discussion /Presentation (Dissertation Title & Project Proposal)*	2	--	50	---	50
MQA 304	Seminar on Selected Topic #	4	4	---	100	100
MQA 305	Research Work Progress (Mid Term	10	20	---	200	100
Total:		20	30	---	---	400
IV SEMESTER						
MQA 401	Journal Club*	2	2	50	---	50
MQA 402	Thesis evaluation	12	20	---	150	150
MQA 403	Thesis viva	4	---	---	50	50
Total:		20	22	---	---	250

A → Credit Points; B → Hrs/wk; IA - Internal Assessment; SEE — Sem End Exam; IA → 10 (DDA) + 20 (average of I & II Mids each 30 M and 2 hr duration). DDA (Day to Day Assessment). * Non-University Examination. Semester End Examination duration for Theory : 3 hrs ; Practical : 6 hrs

Seminar on Selected Topic → To be evaluated by both External and Internal examiners for 100 Marks with 4 credit points.

Table 9: Industrial Pharmacy (MIP) - I, II, III and IV Semesters

Code	Course	A	B	IA	SEE	Total
I SEMESTER						
MIP 101T	Modern Pharmaceutical Analytical	4	4	30	70	100
MIP 102T	Advanced Biopharmaceutics &	4	4	30	70	100
MIP 103T	Novel Drug Delivery Systems	4	4	30	70	100
MIP 104T	Intellectual Property Rights	4	4	30	70	100
MIP 105P	Industrial Pharmacy Practical I	2	6	30	70	100
MIP 106P	Industrial Pharmacy Practical II	2	6	30	70	100
MIP 107	Seminar*	2	4	50	--	50
Total		22	32	--	--	650
II SEMESTER						
MIP 201T	Scale Up and Technology Transfer	4	4	30	70	100
MIP 202T	Pharmaceutical Production Technology	4	4	30	70	100
MIP 203T	Entrepreneurship Management	4	4	30	70	100
MIP 204T	Pharmaceutical Formulation Development	4	4	30	70	100
MIP 205P	Industrial Pharmacy Practical III	2	6	30	70	100
MIP 206	Comprehensive Viva	2	--	--	--	50
MIP 207	Seminar*	2	2	50	--	50
Total		22	26	---	---	600
III SEMESTER						
MIP 301T	Research Methodology and Biostatistics*	2	4	30	70	100
MIP 302	Journal Club*	2	2	50	---	50
MIP 303	Discussion /Presentation (Dissertation Title & Project Proposal)*	2	--	50	---	50
MIP 304	Seminar on Selected Topic #	4	4	---	100	100
MIP 305	Research Work Progress (Mid Term	10	20	---	200	100
Total:		20	30	---	---	400
IV SEMESTER						
MIP 401	Journal Club*	2	2	50	---	50
MIP 402	Thesis evaluation	12	20	---	150	150
MIP 403	Thesis viva	4	---	---	50	50
Total:		20	22	---	---	250

A → Credit Points; B → Hrs/wk; IA - Internal Assessment; SEE — Sem End Examn; IA → 10 (DDA) + 20 (average of I & II Mids each 30 M and 2 hr duration). DDA (Day to Day Assessment). * Non-University Examination. Semester End Examination duration for Theory : 3 hrs ; Practical : 6 hrs

Seminar on Selected Topic → To be evaluated by both External and Internal examiners for 100 Marks with 4 credit points.

Table 10: Pharmacy Practice - I, II, III and IV Semesters

Code	Course	A	B	IA	SEE	Total
I SEMESTER						
MPP 101T	Clinical Pharmacy Practice	4	4	30	70	100
MPP 102T	Pharmacotherapeutics I	4	4	30	70	100
MPP 103T	Hospital & Community Pharmacy	4	4	30	70	100
MPP 104T	Clinical Research	4	4	30	70	100
MPP 105P	Pharmacy Practice Practical I	2	6	30	70	100
MPP 106P	Pharmacy Practice Practical II	2	6	30	70	100
MPP 107	Seminar*	2	4	50	--	50
Total		22	32	--	--	650
II SEMESTER						
MPP 201T	Principles of Quality Use of Medicines	4	4	30	70	100
MPP 202T	Pharmacotherapeutics II	4	4	30	70	100
MPP 203T	Clinical Pharmacokinetics and Therapeutic Drug Monitoring	4	4	30	70	100
MPP 204T	Pharmacoepidemiology & Pharmacoeconomics	4	4	30	70	100
MPP 205P	Pharmacy Practice Practical III	2	6	30	70	100
MPP 206	Comprehensive Viva	2	--	--	--	50
MPP 207	Seminar*	2	2	50	--	50
Total		22	26	---	---	600
III SEMESTER						
MPP 301T	Research Methodology and Biostatistics*	2	4	30	70	100
MPP 302	Journal Club*	2	2	50	---	50
MPP 303	Discussion /Presentation (Dissertation Title & Project Proposal)*	2	--	50	---	50
MPP 304	Seminar on Selected Topic #	4	4	---	100	100
MPP 305	Research Work Progress (Mid Term	10	20	---	200	100
Total:		20	30	---	---	400
IV SEMESTER						
MPP 401	Journal Club*	2	2	50	---	50
MPP 402	Thesis evaluation	12	20	---	150	150
MPP 403	Thesis viva	4	---	---	50	50
Total:		20	22	---	---	250

A → Credit Points; **B** → Hrs/wk; **IA** - Internal Assessment; **SEE** — Sem End Examn; **IA** → **10 (DDA) + 20 (average of I & II Mids each 30 M and 2 hr duration)**. **DDA** (Day to Day Assessment). * Non-University Examination. Semester End Examination duration for Theory : **3 hrs** ; Practical : **6 hrs**

Seminar on Selected Topic → To be evaluated by both External and Internal examiners for 100 Marks with 4 credit points