

**PRAVARA INSTITUTE OF MEDICAL SCIENCES
(DEEMED UNIVERSITY)**

RULES AND REGULATIONS

**FOR THE BACHELOR AND MASTER OF SCIENCE - INTEGRATED PROGRAM
IN MEDICAL BIOTECHNOLOGY**

1. General:

These rules and regulations are framed as per the directives of UGC and P.I.M.S. – Deemed University.

2. Faculty:

This course will be under the Faculty of Allied Health Sciences.

3. Nomenclature of Degree:

Bachelor and Master of Science - Integrated Degree in Medical Biotechnology (B.Sc + M.Sc)

4. Conditions for admission to the Bachelor and Master of Science - Integrated Degree Program in Medical Biotechnology:

- 4.1 Candidate should have completed 17 years of age at the time of admission or will complete this age on 31st December of the year of admission.
- 4.2 Candidate who have passed 12th standard examination under 10+2 system of Maharashtra State Higher Secondary Board or any equivalent examination of any recognized Board or any statutory University with English, Physics, Chemistry & Biology or Physics, Chemistry and Mathematics or Physics, Chemistry, Biology and Mathematics in one and the same attempt with not less than 40% marks taken together.
- 4.3 Candidates who have appeared for and are expecting their results on or before 31st May of year of admission, of the respective final qualifying examinations.

5. Duration of the Program:

Duration of this program will be five calendar years. Upon successful completion of three years, the candidate will be awarded B.Sc Degree in Biotechnology. Such candidates who acquire the B.Sc Degree in Biotechnology have an option of either continuing their Master's program at P.I.M.S.

6. Selection of Students for the Bachelor and Master of Science - Integrated Degree Program in Medical Biotechnology:

6.1 The selection of the students will be based on the merit of the 12th marks obtained in the examination.

7. Program Objective:

7.1 Candidates will be trained in the basic art of biotechnology and in the skills of self education, critical evaluation, problem recognition and problem solving in science. There is an emphasis on integrating theory with extensive practical training.

7.2 Candidates will have:

1. Excellent skills in the science of medical biotechnology
2. Generic skills including teamwork and oral and written presentation
3. An awareness of the social, economic and ethical aspects of Biotechnology, management

8. Program Structure:

B.Sc (6 semesters)

SEMESTER I - Comprising 18 units				
Subject Code	Subject	Practical hours/wk	Lecture hours/wk	Units
BU 101	Basic Chemistry	3	3	4.5
BU 102	Mathematics for Life Sciences	3	3	4.5
BU 103	Evolutionary Biology	3	3	4.5
BU 104	Introduction to Biotechnology	3	3	4.5
SEMESTER II – Comprising 18 units				
BU 105	Biophysics	2	5	5.25
BU 106	Cell Biology	3	6	6.75
BU 107	Basic Laboratory Methods	1	3	3.0
BU 108	Computational Methods in Biotechnology	1	3	3.0

SEMESTER III – Comprising 18 units				
BU 201	Genetics – A	2	4	4.5
BU 202	Medical Microbiology – A	2	4	4.5
BU 203	Human Biochemistry – A	2	4	4.5
BU 204	Biostatistics	2	4	4.5

SEMESTER IV - Comprising 18 units				
BU 205	Genetics – B	2	4	4.5
BU 206	Medical Microbiology – B	2	4	4.5
BU 207	Human Biochemistry – B	2	4	4.5
BU 208	Enzyme Technology	2	4	4.5

SEMESTER V - Comprising 18 units				
BU 301	Molecular Biology	3	6	6.75
BU 302	Fermentation Technology	3	6	6.75
BU 303	Bioinformatics	3	4	4.5

SEMESTER VI - Comprising 18 units				
BU 304	Ethical issues in biotechnology	2	4	4.5
BU 305	Pharmaceutics	3	6	6.75
BU 306	Basic Immunology	3	6	6.75

M.Sc (4 Semesters)

SEMESTER VII - Comprising 18 units				
Subject Code	Subject	Practical hours/wk	Lecture hours/wk	Units
BP 101	Advance Cell Biology	5	3	6
BP 102	Advance Molecular Biology	5	3	6
BP 103	Bioinformatics	5	3	6

SEMESTER VIII – Comprising 18 units				
BP 104	Genetic Engineering	5	3	6

BP 105	Human Physiology	5	3	6
BP 106	Drug Delivery	5	3	6

SEMESTER IX – Comprising 18 units				
BP 201	Advance Immunology	5	3	6
BP 202	Biopharmaceutical Biotechnology	5	3	6
BP 203	Animal Tissue Culture	5	3	6

SEMESTER X – Comprising 18				
M.Sc. Dissertation Project: Each candidate needs to complete a short dissertation project. Prior to proposing a project, the students must have identified a research topic and a mentor who is familiar with their prospective inquiry and who is willing to provide guidance and oversee the project.				

1 unit = 20 hours

9. Eligibility for Appearing for P.I.M.S. Examination

- 9.1 No students shall be allowed to appear for the Final University Examination unless he/she satisfies the requirement of attendance:
75% Lectures, 100% practical

10. Scheme of Examination

The Examination will be conducted to assess the conceptual Understanding of the candidate of the subject matter that was taught in the corresponding semester. Furthermore, whether the candidate can apply his understanding for practical use.

10.1 The Examination will be conducted at end of each semester.

10.2 The students desirous of appearing for the University examination shall submit the application form duly filled along with the prescribed examination fee. Incomplete application forms or application form submitted without prescribed fee or application form submitted after due date will be rejected and student shall not be allowed to appear for the examination.

10.3 **Theory:** Paper for each subject heading - 100 marks
- 3 hours

Theory Question Paper pattern:

Total of 6 Questions

solve any five questions

Diagrams: color pencils allowed

10.4 **Practical:** One long experiment of 3 hours - 50 marks.

	Two Short experiments, each of 1.5 hours (25 marks each)	– 50 marks
10.5	Viva Voce: based on practical and theory	- 50 marks.
10.6	Internal: Seminar	– 10 marks
	Internal Exam	- 20 marks
	Viva voce	- 10 marks
	Journal	- 10 marks
	(based on timely completion, representation and results)	

11. Rules of Passing

- 11.1 The candidates must secure a minimum of 50% marks in each head of passing in the University Examination and 50% marks in the aggregate; i.e. in the University examination, the candidate should secure 50 marks in the theory paper and 50 marks in the practical.
- 11.2 The gradation will be as follows:
- | | |
|-------------------|--------------------------------|
| 75% marks or more | = pass with distinction or A+ |
| 60% - 74% marks | = pass with first class or A |
| 55% - 59% marks | = pass with second class or B+ |
| 50% marks – 54% | = pass with second class or B |
| less than 50% | = fail. |
- 11.3 The candidate will be distinction if he/she secures 75% more than 75% marks in a examination.
- 11.4 Any candidate who fails in two or more subject headings by end of the two semester in an academic year, will not be permitted to attend the ensuing semester.
- 11.5 The candidate declared fail as per section 11.3 will have to clear the relevant subject headings before he /she is allowed to attend the ensuing semester.

12. Detailed Syllabus

Appended

**PRAVARA INSTITUTE OF MEDICAL SCIENCES
(DEEMED UNIVERSITY)**

RULES AND REGULATIONS

FOR THE INDEPENDENT MASTER OF SCIENCE PROGRAM IN MEDICAL BIOTECHNOLOGY

1. General:

These rules and regulations are framed as per the directives of UGC and P.I.M.S. – Deemed University.

2. Faculty:

This course will be under The Faculty of Allied Health Sciences.

3. Nomenclature of Degree:

Master of Science Degree in Medical Biotechnology (M.Sc)

4. Conditions for admission to the independent Master of Science Program In Medical Biotechnology:

- 4.1 Candidates who have passed the B.Sc. examination with minimum 50% marks in Microbiology/ Biochemistry/ Chemistry/ Zoology/ Botany/ Life Sciences/ Physics with Biophysics specialization from any Statutory University in India or its equivalent.
- 4.2 Candidates who have appeared for and are expecting their results on or before 31st May of year of admission, of the respective final qualifying examinations.

5. Duration of the Program:

Duration of this program will be two calendar year.

6. Selection of Students for the Bachelor and Master of Science - Integrated Degree Program in Medical Biotechnology:

- 6.1 The selection of the students will be based on the merit of the marks obtained in the B.Sc examination from any Statutory University in India or its equivalent.

7. Program Objective:

- 7.1 Candidates will be trained in the advance and current art of biotechnology and in the skills of research methodologies, critical evaluation, problem recognition and problem solving in science.

- 7.2 Candidates will have:
1. Hands-on experience of handling most of the commonly used experimental protocols in molecular biology, genetics, protein and nucleic acid chemistry.
 2. Experience of independently designing, executing, observing and interpreting the results of experiments and build a hypothesis.

8. Program Structure:

M.Sc (4 semesters)

SEMESTER I - Comprising 18 units				
Subject Code	Subject	Practical hours/wk	Lecture Hour/wk	Units
BP 101	Cell Biology	5	3	4.5
BP 102	Molecular Biology	5	3	4.5
BP 103	Human Biochemistry	5	3	4.5
BP 104	Animal Tissue Culture	5	3	4.5

SEMESTER II – Comprising 18 units				
BP 105	Human Physiology	5	3	4.5
BP 106	Medical Microbiology	5	3	4.5
BP 107	Pharmaceutical Biotechnology	5	3	4.5
BP 108	Bioinformatics	5	3	4.5

SEMESTER III – Comprising 18 units				
BP 201	Genetic Engineering	5	3	4.5
BP 202	Immunology	5	3	4.5
BP 203	Introduction to Biostatistics	5	3	4.5
<u>ELECTIVES</u> BP-EL1	Regulation and Patenting	5	3	4.5
BP-EL2	Drug Delivery and Targeting			

SEMESTER IV – Comprising 18 units	
BP 205	Seminars and Project M.Sc. Dissertation Project: Each candidate needs to complete a short dissertation project. Prior to proposing a project, the students must have identified a research topic and a mentor who is familiar with their prospective inquiry and who is willing to provide guidance and oversee the project.

1 unit = 20 hours

9. Eligibility for Appearing for P.I.M.S. Examination

- 9.1 No students shall be allowed to appear for the Final University Examination unless he / she satisfies the requirement of attendance:
75% Lectures, 100% practical

- 9.2 NO students will be allowed to appear for University examination unless He/she obtains 40% marks in internal assessment for each theory paper & 50% Marks in internal assessment for practical examination.

10. Scheme of Examination

The Examination will be conducted to assess the conceptual understanding of the candidate of the subject matter that was taught in the corresponding semester. Furthermore, whether the candidate can apply his understanding for practical use

- 10.1 The Examination will be conducted at end of each semester.

- 10.2 The students desirous of appearing for the University examination shall submit the application form duly filled along with the prescribed examination fee. Incomplete application forms or application form submitted without prescribed fee or application form submitted after due date will be rejected and student shall not be allowed to appear for the examination.

10.3 Internal Assessment Examination

1. Theory:

Mid term	Max Marks 30	Duration 90 Minutes
Preliminary examination	Max Marks 70	Duration 180 Minutes
Calculate the Marks out of 30		
Any fraction to be converted to the next round figure		

2. Practical:

Mid term	Max Marks 50	Duration 1 day
Preliminary examination	Max Marks 100	Duration 2 days
Calculate the Marks out of 30		

3. a) Seminar Max Marks 10

b) Journal Club

Max Marks 10

4. Viva:

Mid term 20 + Preliminary 40
Converted to out of 10

Calculation for Internal Assessment for Practical sum total of marks obtained

- Out of 30 from **2+** Seminar out of 10 from **3a+** Journal club out of 10 from **3b**
Total out of 50

NO REPEAT TERMINAL OR PRELIMINARY EXAMINATION

FOR INTERNAL MARKS WILL BE CONDUCTED

- Eligibility to appear for university examination – Minimum 40% Marks in Internal examination in each head.
- University examination Theory paper - 70 Marks each

10.4 FOR UNIVERSITY EXAMINATION:

- **Pattern of Theory Question Paper** -
 - Attempt any 5 Question out of 6
 - Each question carrying 14 Marks
 - The question may be sub divided.
 - Duration – 3 hours

*** Practical Exam- 100 Marks**

- **One Long Question – 40 Marks**
- **Three short Question – 60 Marks**

11. Rules of Passing

11.1 The candidates must secure a minimum of 50% marks in each head of passing in the University Examination and 50% marks in the aggregate; i.e. in the University examination, the candidate should secure 50 marks in the theory paper and 50 marks in the practical.

11.2 The gradation will be as follows:

75% marks or more	= pass with distinction or A+
60% - 74% marks	= pass with first class or A
55% - 59% marks	= pass with second class or B+
50% marks – 54%	= pass with second class or B
less than 50%	= fail.

11.3 The candidate will be distinction if he/she secures 75% more than 75% marks in an examination.

11.4 Any candidate who fails in two or more subject headings by end of the two semester in an academic year, will not be permitted to attend the ensuing semester.

11.5 The candidate declared fail as per section 11.3 will have to clear the relevant subject headings before he /she is allowed to attend the ensuing semester.

12. Detailed Syllabus

Appended