

**RAMA DEVI WOMEN'S UNIVERSITY
VIDYA VIHAR, BHUBANESWAR**

Proceeding of the meeting of the Board of Studies in Biotechnology held on 24.04.2023 at 3.00 PM in the Dept of Biotechnology, Rama Devi Women's University, Vidya Vihar, Bhoinagar, Bhubaneswar-22.

The following members were present:

1. Prof. Sasmita Mohanty, Internal Member
2. Prof. J. Dandapat, External Member
3. Dr Raj Kumar Joshi, Internal Member
4. Dr. Sujata Mohanty, HOD
5. Dr. Sanjay Kumar Raul, Internal Member
6. Dr. Dillip Kumar Bishi, Internal Member
7. Dr. Monalisa Mohanty, Internal Member

At the outset of the meeting, Prof. Sasmita Mohanty, the senior most faculty member, PG Dept. of Biotechnology, RDWU was formally selected as the Chairperson of the Board of Studies in Biotechnology for the Academic Year 2023-24.

The recommendations of the Board in respect of the Regulations, detailed Syllabus, Text Books and other items are appended in the prescribed form.

Among others, the board made the following recommendations

1. The board recommended the name with contact no. and email IDs for board of conducting examiners, moderation board, examiners and paper setters for the +3 degree (Biotechnology), PG (Biotechnology) and PhD (Biotechnology) for regular and back examinations 2023-24 in the prescribed format.
2. The board recommended that the question papers are to be set unit-wise for regular, back and for onward examinations in 2023-24 for B.Sc Biotechnology and M.Sc Biotechnology courses as well as PhD Biotechnology course work papers.
3. It was unanimously decided by all the members present to recommend the existing CBCS course pattern of B.Sc Biotechnology for the Regular, Back and for onward examinations in 2023-24.
4. For UG course in Biotechnology, the Board unanimously recommended that the second unit (accounting for 25% of the total four units) of each paper should be ear-marked for student's self-study as per Govt. rules. However, for PG course in Biotechnology, the Board recommended that the last unit of each paper should be ear-marked for student's self-study. Nevertheless, the board unanimously agreed that faculty members must ensure the completion of all modules of a paper.

S.Mohanty
24/4/23

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24/4/23

M. Mohanty
24/4/23

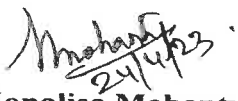
~~Prof. J. Dandapat~~
24/4/23

Dr. Sanjay Kumar Raul
24/4/23

Dr. Dillip Kumar Bishi
24/4/23

5. UG syllabus page 3, Core 13 (Biosafety & Bioethics) is renamed as Environmental Biotechnology and Bioethics to align with the title of the paper in the content. DSI does not have practical experiments. As such, the mark distribution is changed to 80 (end Sem) and 20 (Mid Sem).
6. The Board also authorized the Controller of Examinations, RDWU to take alternative measures as and when required in case of urgency only after consulting with the Head of the department of Biotechnology.

The meeting ended with a vote of thanks to the Chair.


24/4/23

Dr. Monalisa Mohanty

Internal Member


24/04/23

Dr. Sanjay Kumar Raul

Internal Member


24/4/23

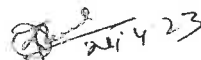
Dr Dillip K Bishi

Internal Member


24/4/23

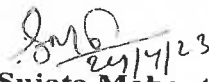
Dr Raj Kumar Joshi

Internal Member


24/4/23

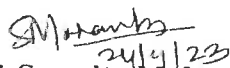
Prof. J. Dandapat

External Member


24/4/23

Dr. Sujata Mohanty

HOD


24/4/23

Prof. Sasmita Mohanty
Chairperson

M.Sc BIOTECHNOLOGY CURRICULUM



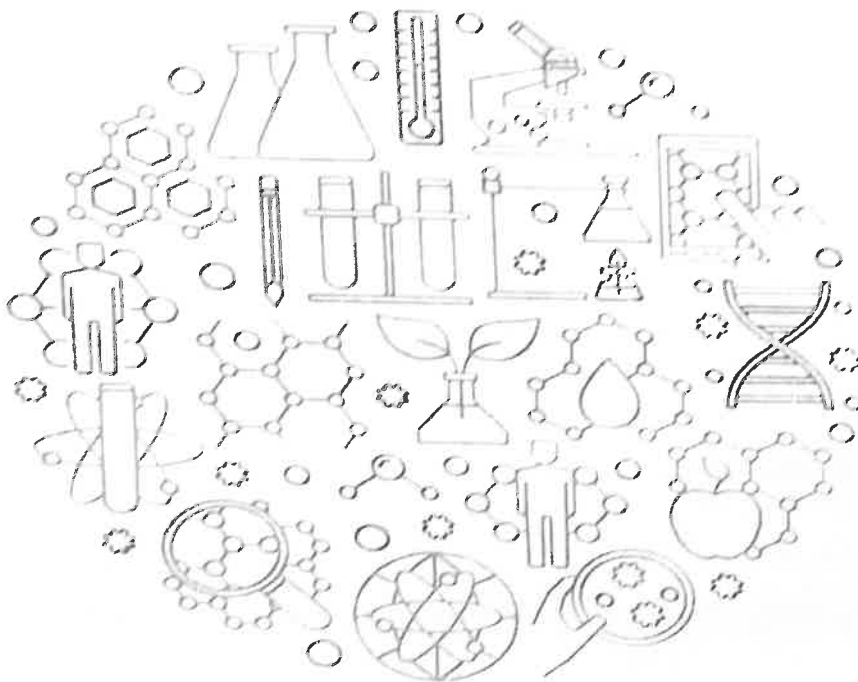
RAMA DEVI UNIVERSITY
Vidya Vihar, Bhubaneswar,
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Ph.D in BIOTECHNOLOGY COURSEWORK CURRICULUM



RAMA DEVI WOMEN'S UNIVERSITY
Vidya Vihar, Bhubaneswar,
ODISHA

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RAMA DEVI WOMEN'S UNIVERSITY
VIDYA VIHAR, BHUBANESWAR

Proceeding of the meeting of the Board of Studies in Biotechnology held on 18.05.2022 at 11 AM in the Board Room of the Examination section, Rama Devi Women's University, Vidya Vihar, Bhoinagar, Bhubaneswar-22.

The following members were present:

1. Dr Raj Kumar Joshi, HOD
2. Prof. J. Dandapat, External Member
3. Prof. Sasmita Mohanty, Internal Member
4. Dr. Sujata Mohanty, Internal Member
5. Dr. Sanjay Kumar Raul, Internal Member
6. Dr. Dillip Kumar Bishi, Internal Member
7. Dr. Monalisa Mohanty, Internal Member
8. Dr. Tilothama Bhotra, Internal Member

At the outset of the meeting, Prof. Sasmita Mohanty, the senior most faculty member, PG Dept. of Biotechnology, RDWU was formally selected as the Chairperson of the Board of Studies in Biotechnology for the Academic Year 2022-23.

The recommendations of the Board in respect of the Regulations, detailed Syllabus, Text Books and other items are appended in the prescribed form.

Among others, the board made the following recommendations

1. The board recommended the name with contact no. and email IDs for board of conducting examiners, moderation board, examiners and paper setters for the +3 degree (Biotechnology), PG (Biotechnology) and PhD (Biotechnology) for regular and back examinations 2022-23 in the prescribed format.
2. The board recommended that the question papers are to be set unit-wise for regular, back and for onward examinations in 2022-23 for B.Sc Biotechnology and M.Sc Biotechnology courses as well as PhD Biotechnology course work papers.
3. It was unanimously decided by all the members present to recommend the existing CBCS course pattern of B.Sc Biotechnology for the Regular, Back and for onward examinations in 2022-23.
4. For UG course in Biotechnology, the Board unanimously recommended that the second unit (accounting for 25% of the total four units) of each paper should be ear-marked for student's self-study as per Govt. rules. However, for PG course in Biotechnology, the Board recommended that the last unit of each paper should be ear-marked for student's

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S.M. Mohanty
18/5/22


self-study. Nevertheless, the board unanimously agreed that faculty members must complete the completion of all modules of a paper.

5. The board unanimously recommended the modification in the M.Sc Biotechnology course to be implemented from the academic session 2022-23. Specific objectives and outcomes were incorporated to each paper. Each paper have 5 units with each unit having 3 subunits. Additionally, two new papers- AC-101 (Computer Fundamentals & Applications) in the 1st semester and AC-401 (Women and Society) in the 4th semester was added in the PG syllabus each with 3 credit and 50 marks. The syllabus for this have been designed and approved by separate boards for universal implementation at the University level. BT-305 (Research Methodology and Scientific Communications Skill) was upgraded into a 4 credit paper. Also, BT 402 (Dissertation) was reassigned with 10 credits with a total of 450 marks. Puls
18/5/22
6. The board deliberated on the development of a new skill based certificate course "Molecular Techniques for Integrative Research" to be offered by the dept. of Biotechnology. This course shall have 3 modules for a total of 42 hours. The course will be offered to all PG students of the University during 2nd/3rd semester as a non-credit skill based certificate course. It will have an integrated approach of 21 hours of theory classes and 21 hours of practical sessions. It will be regulated by the rules and regulations for the conduct of skill based certificate courses at Rama Devi Women's University, Bhubaneswar. The board unanimously recommended the course syllabus (Annexure-II) and suggested the implementation of the course from the academic session 2022-23.
7. The board also recommended that additional external experts may be invited to be the members of the BOS in Biotechnology at RDWU.
8. The Board also authorized the Controller of Examinations, RDWU to take alternative measures as and when required in case of urgency only after consulting with the Head of the department of Biotechnology.

The meeting ended with a vote of thanks to the Chair.


Dr. Tilothama Bhotra
Internal Member


Dr. Sujata Mohanty
Internal Member


Dr. Dillip K. Bishoi
Internal Member


Dr. Monalisa Mohanty
Internal Member


Prof. J. Dandapat
External Member


Dr. Sanjay Kumar Raul
Internal Member


Dr. Raj Kumar Joshi
HOD


Prof. Sasmita Mohanty
Chairperson

MODULE 1:

Bioanalytics- Chromatographic & Spectroscopic techniques (3 hours)
Practical demonstration on chromatography and UV-Vis spectroscopy (3 hours)

Microscopic techniques- SEM, TEM, AFM & Confocal microscopy (3 hours)
Practical demonstration on phase-contrast & inverted microscopy (3 hours)

MODULE 2:

Biochemical techniques: Biomolecules estimation methods, protein purification assays, protein sequencing (3 hours)
Practical demonstration on protein estimation & purification (3 hours)

Immunological Techniques: Immunoelectrophoresis, Immunodiffusion, Double Diffusion, Western blotting (3 Hours)
Practical demonstration on Elisa & Immuno-blotting system (3 Hours)

Nano Techniques: Nanoparticles as biosensors, nanomedicine in therapeutics, nanomaterials for tissue engineering (3 Hours)
Practical demonstration on preparation of nanoparticles/nanofibres (3 hours)

MODULE 3:

Recombinant-DNA Techniques: Isolation of DNA & RNA, Electrophoresis & PCR, gene cloning, bacterial transformation (3 hours)
Practical demonstration on isolation of DNA/RNA, PCR and gene cloning (3 Hours)

Bioinformatics: DNA Sequencing, tools for DNA sequence assembly, gene prediction and functional annotation (3 Hours)
Practical demonstration on application of tools for identification, characterization and functional annotation of gene(s) & proteins (3 Hours)

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**RAMA DEVI WOMEN'S UNIVERSITY
VIDYA VIHAR, BHUBANESWAR**

Proceeding of the meeting of the Board of Studies in Biotechnology held on 14.07.2021 at 3 PM in the Dept. of Biotechnology, Rama Devi Women's University, Vidya Vihar, Bhoinagar, Bhubaneswar-22.

The following members were present:

1. Dr Raj Kumar Joshi, HOD
2. Prof. J. Dandapat, External Member
3. Prof. Sasmita Mohanty, Internal Member
4. Dr. Sujata Mohanty, Internal Member
5. Dr. Sanjay Kumar Raul, Internal Member
6. Dr. Monalisa Mohanty, Internal Member
7. Dr. Tilothama Bhotra, Internal Member

Dr. Dillip Kumar Bishi could not attend the meeting as he is on mandatory medical leave after contracting COVID19. Prof. J. Dandapat, external member of the BOS requested to attend the meeting through video conferencing and his request was accepted.

At the outset of the meeting, Prof. Sasmita Mohanty, the senior most faculty member, PG Dept. of Biotechnology, RDWU was formally selected as the Chairperson of the Board of Studies in Biotechnology for the Academic Year 2021-22.

The recommendations of the Board in respect of the Regulations, detailed Syllabus, Text Books and other items are appended in the prescribed form.

Among others, the board made the following recommendations

1. The board recommended the name with contact no. and email IDs for board of conducting examiners, moderation board, examiners and paper setters for the +3 degree (Biotechnology), PG (Biotechnology) and PhD (Biotechnology) for regular and back examinations 2020-21 in the prescribed format.
2. The board recommended that the question papers are to be set unit-wise for regular, back and for onward examinations in 2021-22 for B.Sc Biotechnology and M.Sc Biotechnology courses as well as PhD Biotechnology course work papers.
3. It was unanimously decided by all the members present to recommend the existing CBCS course pattern of B.Sc Biotechnology for the Regular, Back and for onward examinations in 2021-22.

4. For UG course in Biotechnology, the Board unanimously recommended that the second unit (accounting for 25% of the total four units) of each paper should be ear-marked for student's self-study as per Govt. rules. However, for PG course in Biotechnology, the Board recommended that the last unit of each paper should be ear-marked for student's self-study. Nevertheless, the board unanimously agreed that faculty members must ensure the completion of all modules of a paper.
5. The board unanimously recommended the existing course syllabus of M.Sc Biotechnology for the Regular, Back and for onward examinations in 2021-22.
6. The board discussed the newly developed course syllabus of PhD Biotechnology. Based on thorough evaluation and necessary feedbacks from the members, the board unanimously recommended the PhD Biotechnology course work syllabus which subject to approval would be applicable for the 2021-22 academic year. The new course work syllabus has been designed as per recommendation of UGC regulations 2016. The course work will have 4 papers of a total of 16 credits including the common paper of Research methodology and Computer application (4 credits) and Research and Publication ethics (4 credits). The details of the modified course is enclosed and may be placed for necessary approval.
7. The Board also authorized the Controller of Examinations, RDWU to take alternative measures as and when required in case of urgency only after consulting with the Head of the department of Biotechnology.

The meeting ended with a vote of thanks to the Chair.

P. Bhatia
14.07.21
Dr. Tilothama Bhotra
Internal Member

Monalisa
14.7.21
Dr. Monalisa Mohanty
Internal Member

Sanjay Kumar Raul
14/07/21
Dr. Sanjay Kumar Raul
Internal Member

S. Mohanty
14.7.21
Dr. Sujata Mohanty
Internal Member

J. Dandapat
14.7.21
Prof. J. Dandapat
External Member

Raj Kumar Joshi
14/07/21
Dr Raj Kumar Joshi
HOD

S. Mohanty
14/7/21
Prof. Sasmita Mohanty
Chairperson

**RAMA DEVI WOMEN'S UNIVERSITY
VIDYA VIHAR, BHUBANESWAR**

Proceeding of the meeting of the Board of Studies for Bachelor of Science (UG) in Biotechnology held on 25.08.2020 at 11 AM in the University Office, Vidya Vihar, Bhoinagar, Bhubaneswar-22.

The following members were present:

- 1. Prof. Sasmita Mohanty, HOD
- 2. Prof. J. Dandapat, External Member
- 3. Dr Raj Kumar Joshi, Internal Member
- 4. Dr. Sujata Mohanty, Internal Member
- 5. Dr. Dillip Kumar Bishi, Internal Member
- 6. Dr. Sanjay Kumar Raul, Internal Member
- 7. Dr. Tilothama Bhotra, Internal Member
- 8. Dr. Monalisa Mohanty, Internal Member

At the outset of the meeting, Prof. Sasmita Mohanty, Professor and Head, PG Dept. of Biotechnology, RDWU was formally selected as the Chairperson of the Board of Studies in Biotechnology for the Academic Year 2020-21.

The recommendations of the Board in respect of the Regulations, Detailed Syllabus, Text Books and other items are appended in the prescribed form.

Among others, the board made the following recommendations

- 1. The Board recommended the name with contact no. and email IDs for Board of conducting examiners, moderation board, examiners and paper setters for the +3 degree (Biotechnology) for regular and back examinations 2020-21 in the prescribed format.
- 2. The Board recommended that the question papers are to be set unit-wise for Regular, Back and for onward examinations in 2020-21 for B.Sc Biotechnology course.
- 3. It was unanimously decided by all the members present to recommend the existing CBCS course pattern of B.Sc Biotechnology for the Regular, Back and for onward examinations in 2020-21.
- 4. For UG course in Biotechnology, the Board unanimously recommended that the second unit (accounting for 25% of the total four units) of each paper should be ear-marked for student's self-study as per Govt. rules.

Sasmita Mohanty
25/8/2020

J. Dandapat
25.8.20

Raj Kumar Joshi
25/8/20

Sanjay Kumar Raul

5. The Board also authorized the Controller of Examinations, RDWU to take alternative measures as and when required in case of urgency only after consulting with the Head of the Department of Biotechnology.

The meeting ended with a vote of thanks to the Chair.

Signature

1. Prof. J. Dandapat, External Member

J. Dandapat
25.8.2020

2. Prof. Sasmita Mohanty, HOD

S. Mohanty
25/8/2020

3. Dr Raj Kumar Joshi, Internal Member

Raj Kumar Joshi
25.8.20

4. Dr. Sujata Mohanty, Internal Member

Sujata Mohanty
25.8.20

5. Dr. Dillip Kumar Bishi, Internal Member

D. K. Bishi
25/8/20

6. Dr. Sanjay Kumar Raul, Internal Member

S. K. Raul

7. Dr. Tilothama Bhotra, Internal Member

T. Bhotra
25.8.2020

8. Dr. Monalisa Mohanty, Internal Member

M. Mohanty
25.8.2020

For 2020 ADB onwards

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M.Sc BIOTECHNOLOGY
CURRICULUM

RAMA DEVI WOMEN'S UNIVERSITY

Vidya Vihar, Bhubaneswar,

ODISHA

Academic Session (2020-2021)

*Prepared by:
 Rajwanti Saha
 25.8.2020*

*Tilakmani Bhoi
 25.8.2020*

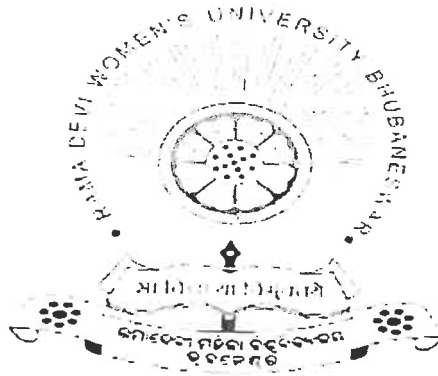
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SYLLABUS FOR UNDER GRADUATE COURSE IN
BIOTECHNOLOGY
(Bachelor of Science Examination)



RAMA DEVI WOMEN'S UNIVERSITY
VIDYA VIHAR, BHUBANESWAR-22

UNDER CHOICE BASED CREDIT SYSTEM

[Handwritten signatures and dates]
27/8/20
Riwd.
25.8.2020
Mustali
25/8/2020
S. Moloy
25.8.20
A. Paul
27/8/20
B. S. Chari
25.08.2020



RAMA DEVI WOMEN'S UNIVERSITY, VIDYA VIHAR
BHUBANESWAR-22

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Proceeding of the meeting of the Board of Studies in Biotechnology
held on 28.08.2019 at 11 A.M / P.M. in the University Office,
Bhoi Nagar, Bhubaneswar-22.

Members Present :

1. Prof. Sarmita Mohanty
2. Dr. Bidyut Prava Dash
3. Dr. Raj Kumar Joshi
4. Dr. Sujala Mohanty
5. Dr. Dilip Kumar Patshi
6. Dr. Sanjay Kumar Raul
7. Dr. Monalisa Mohanty
8. Dr. Tilothama Bhotra

Prof./Dr. Sarmita Mohanty is selected as Chairman of the
Board for the Academic year 2019-20

The recommendations of the Board in respect of the Regulations, Detailed Syllabus, Text
Books and other items are appended the prescribed form.

Signature of the Members :-

Mohanty
28/8/19
CHAIRMAN

1. Raj Kumar Joshi
28.08.19
- 3.
- 4.
- 5.
6. Mohanty
7. Dilip Kumar Patshi
28.08.19
8. Monalisa Mohanty
28/8/19

By Mohanty
28.8.19

Proceedings of the meeting of Board of Studies of PG Dept. of Biotechnology, R.D. Devi Women's University held on 28th August 2019 in the University Office, Bhoinaga Bhubaneswar-22.

Members present:

1. Prof. Sasmita Mohanty
2. Dr. Bidyut Prava Dash
3. Dr. Raj Kumar Joshi
4. Dr. Sujata Mohanty
5. Dr. Dillip Kumar Bishi
6. Dr. Sanjay Kumar Raul
7. Dr. Tilothama Bhotra
8. Dr. Monalisa Mohanty

- At the outset of the meeting, the board unanimously selected Prof. Sasmita Mohanty, Professor of the PG Dept. of Biotechnology, RDWU as the Chairman of the Board.
- The board unanimously recommended the name for Board of conducting examiners, moderation board and paper setters for +3 Biotechnology (CBCS) 1st semester (Reg. & Back for old and new course), 2nd semester (Reg. & Back for old and new course), 3rd semester (Reg. & Back), 4th semester (Reg. & Back), 5th Semester (Reg. & Back), 6th semester (Reg. & Back), 7th semester (Reg. & Back), and 8th semester (Reg. & Back) examination for the academic year 2019-20.
- The board unanimously recommended the name for Board of conducting examiners, moderation board, paper setters and examiners for M. Sc Biotechnology (CBCS) 1st semester (Reg. & Back), 2nd semester (Reg. & Back), 3rd semester (Reg. & Back), and 4th semester (Reg. & Back) examination for the academic year 2019-20.
- The board unanimously recommended the name for Board of conducting examiners, moderation board, paper setters and examiners for M. Phil Biotechnology (CBCS) 1st semester (Reg. & Back), 2nd semester (Reg. & Back) examination for the academic year 2019-20.
- The board recommended that the question papers are to be set unit-wise for Regular and Back for onward examinations in 2019-20 for B.Sc Biotechnology, M.Sc Biotechnology and M.Phil Biotechnology Courses.
- Among other matters, the Board unanimously recommended the modification of existing M.Sc Biotechnology course structure which subject to approval would be applicable from the year 2020-21. The details of the modified course is attached herewith for necessary approval.

Mohanty
28/8/19

P. P. 11.50m
28/8/19

Joshi
28/8/19

S. Mohanty
28/8/19

Prava Dash
28.08.19

Bhotra
28/8/19

BIOTECHNOLOGY**STRUCTURE of CBCS Syllabus for BIOTECHNOLOGY (Honours) from
2019-20****Semester – I**

Sl No	Name of the Course	Paper	CP (Credit Point)	CH (Credit Hour)	Marks
1	Core	C1: Microbiology	6	60	100
2	Core	C2 : Plant Diversity & Physiology	6	60	100
3	GE-A	GE 1A: Paper I from either subject [Zoology / Botany / Chemistry]	6	60	100
4	AECC – I	Environmental Science	4	40	100
Total Paper		4	22	220	400

Semester – II

Sl No	Name of the Course	Paper	CP (Credit Point)	CH (Credit Hour)	Marks
1	Core	C3: Cell Biology and Genetics	6	60	100
2	Core	C4: Animal Diversity & Physiology	6	60	100
3	GE-B	GE 2B: Paper from remaining 02 subjects other than that opted in first semester [Zoology / Botany / Chemistry]	6	60	100
4	AECC - II	MIL Communication (Odia/ Alt English)	4	40	100
Total Paper		4	22	220	400

Semester – III

Sl No	Name of the Course	Paper	CP (Credit Point)	CH (Credit Hour)	Marks
1	Core	C5: Molecular Biology	6	60	100
2	Core	C6: Biochemistry and Metabolism	6	60	100
3	Core	C7: Biostatistics and Computer Applications	6	60	100
4	GE-A	GE 3A: Paper II of the subject opted in first semester [Zoology / Botany / Chemistry]	6	60	100
5	SEC - 1	SEC-1: Communicative English	4	40	100
Total Paper		5	28	280	500

Semester – IV

Sl No	Name of the Course	Paper	CP (Credit Point)	CH (Credit Hour)	Marks
1	Core	C8: Immunology	6	60	100
2	Core	C9: Plant Biotechnology	6	60	100
3	Core	C10: Animal Biotechnology	6	60	100
4	GE-B	GE 4B, Paper II of the subject opted in second semester Zoology / Botany / Chemistry	6	60	100
5	SEC – 2	SEC–2: Enzymology / Basics of Forensic Science / Mushroom culture/Sericulture	4	40	100
Total Paper		5	28	280	500

Semester – V

Sl No	Name of the Course	Paper	CP (Credit Point)	CH (Credit Hour)	Marks
1	Core	C 11: Genetic Engineering	6	60	100
2	Core	C 12: Genomics and Proteomics	6	60	100
3	DSE 1	DSE 1: Biotechniques	6	60	100
4	DSE 2	DSE 2: Bioinformatics	6	60	100
Total Paper		4	24	240	400

Semester – VI

Sl No	Name of the Course	Paper	CP (Credit Point)	CH (Credit Hour)	Marks
1	Core	C 13: Bioethics and Biosafety	6	60	100
2	Core	C 14: Bioprocess Engineering and Technology	6	60	100
3	DSE 3	DSE 3: Bioenterpreurship	6	60	100

4	DSE 4	DSE 4: Medical Microbiology (to be opted by students securing below 60%) / Project Report & Seminar* *- for students securing $\geq 60\%$	6	NA	100
Total Paper		4	24	180	400
Grand Total		26	148	1480	2600

(Project 80 + 20 Viva)

* AECC – Ability Enhancement Compulsory Course * SEC – Skill Enhancement Course

* DSE – Discipline Specific Elective * GE – Generic Elective

*Hons students has to opt two Generic Elective Subjects. *Subjects A & B (containing 2 Papers) from subjects available other than Core (Hons.) Subject. Subject - A for Semester 1 & 3 another subject B for Semester 2 & 4.

*** GE – Generic Elective [To be opted by +3, Biotechnology (Hons.)]**

Two subjects among three subjects viz., Zoology / Botany / Chemistry to be chosen (02 papers/ Subject i.e. Total 04 papers/ 02 subjects) other than Core as **Generic Elective**.

Subject	Generic Elective Papers	
	GE Paper-I	GE Paper-II
Zoology	Animal Diversity (Non-Chordate), Physiology and Endocrinology	Animal Diversity (Protochordata and Chordata), Developmental Biology and Immunology
Botany	Industrial and Environmental Microbiology	Botany and Plant Biotechnology
Chemistry	Atomic Structure Bonding, General Organic Chemistry & Aliphatic Hydrocarbons	Chemical Energetic & Equilibria and Functional Organic Chemistry

Any two subjects among three subjects and each Subject contains two papers (**Subject-A** with two papers at Semester I & III [GE-1A & GE-3A] and another **Subject B** with two papers for Semester II & IV [GE-2B & GE-4B] is to be opted.

* GE – Generic Elective [To be opted by +3, Science (Hons.) other than Biotechnology]

Subject	Generic Elective Papers	
	Paper-I	Paper-II
Biotechnology	Biochemistry and Molecular Biology	Recombinant DNA Technology
	Paper-III	Paper-IV
	Environmental Biotechnology and Bioethics	Bioprocess Technology & Entrepreneurship

BIOTECHNOLOGY Papers for HONOURS Students

Core course – 14 papers, Discipline Specific Elective – 4 papers

Generic Elective for Non-Biotechnology students – 4 papers. In case University offers 2 subjects as GE, then papers 1 and 2 will be the GE paper.

Marks per paper - Midterm: 15 marks, Practical: 25 marks, End term: 60 marks, Total: 100 marks, Credit per paper – 6: Theory-4, Practical-2, Teaching hours per paper – 40 hours theory classes+ 20 hours practical classes

C 1: MICROBIOLOGY

Course outcome:

On successful completion of the course, the student will be able to

- Apply fundamental principles governing classification schemes to categorize microorganisms.
- Explain the concepts of microbial diversity, taxonomy, and systematics and methods employed for replication, adaptations, and interaction with the host and environment.
- Describe the morphology, mechanism of infection and multiplication, and therapy of viruses that are significant to medicine.

COURSE STRUCTURE

M.Sc. BIOTECHNOLOGY

Semester-I							
Sl. No.	Course Code	Paper Title	Units	Credits	Marks		
					Internal	End - Sem	Total
1	BT-101	Biochemistry	5	4	20 + 10	40	70
2	BT-102	Cell Biology and Genetics	5	4	20 + 10	40	70
3	BT-103	Microbiology	5	4	20 + 10	40	70
4	BT-104	Molecular Biology	5	4	20 + 10	40	70
5	BT-105	LAB-I (Biochem and Analytical Techniques)	-	4	10 + 10	40	60
6	BT-106	LAB-II (Microbio and Mol BioTechniques)	-	4	10 + 10	40	60
7	BT-107	Fundamentals of Physical Sciences/Biological Sciences	-	-	-	-	-
8	AC-101	Fundamentals of Computer application	3	3	10 + 10	30	50
Total				27	180	270	450

Semester-II							
Sl. No.	Course Code	Paper Title	Units	Credits	Marks		
					Internal	End - Sem.	Total
1	BT-201	Genetic Engineering	5	4	20 + 10	40	70
2	BT-202	Immunobiology and Immunotechnology	5	4	20 + 10	40	70
3	BT-203	Biostatistics and Bioinformatics	5	4	20 + 10	40	70
4	BT-204	Physiology and Developmental Biology	5	4	20 + 10	40	70

5	BT-205	LABORATORY-III (Genetic Engg. & Bioinformatics)	-	4	10 + 10	40	
6	BT-206	LABORATORY-IV (Immunology and Diagnostics)	-	4	10 + 10	40	6
7	BT-207	Summer Internship Report	-	3	-	50	50
	Total			27	160	290	450

Semester-III

Sl. No.	Course Code	Paper Title	Units	Credits	Marks		
					Internal	End - Sem.	Total
1	BT-301	Plant and Animal Biotechnology	5	4	20 + 10	40	70
2	BT-302	Bioprocess Engineering and Industrial Biotechnology	5	4	20 + 10	40	70
3	BT-303	Genomics, Proteomics and Molecular Diagnostics	5	4	20 + 10	40	70
4	BT-304	IPR, Biosafety and Bioentrepreneurship	5	4	20 + 10	40	70
5	BT-305	Research Methodology and Scientific Communications Skill	5	4	20 + 10	40	70
6	BT-306	LAB-V (Plant-Animal Biotech & Genomics)	-	4	10 + 10	40	60
7	BT-307	LABORATORY-VI (Bioprocess Engg, and Technology)	-	4	10 + 10	40	60
8	BT-308	Seminar	-	1	10	-	10
Total				29	200	280	480

Semester-IV

Sl. No.	Course Code	Paper Title	Units	Credits	Marks		
					Internal	End - Sem.	Total
1	BT-401	Elective-I (A) Environmental Biotechnology/Ecology & Evolution / Nano biotechnology	5	4	20 + 10	40	70
2	BT-402	Dissertation	-	10	-	450	450
3	BT-403	Documentation & Presentation	-	3	-	50	50
4	AC-401	Women & Society	3	3	10 + 10	30	50
Total				20	50	570	620

OUTLINE OF THE COURSE STRUCTURE

Sl. No	Paper code	Course Title	Credit	Marks	Pass Mark
1	BT01	Research Methodology & Computer Application	4	100	55%
2	BT02	Advances in Biotechnology	4	100	55%
3	BT03	Presentation of Review Literature	4	100	55%
4	BT04	Research & Publication Ethics	4	100	55%
TOTAL			16	400	

Biotech

OUTLINE OF COURSE STRUCTURE

SEMESTER-I

Sl. No	Paper code	Paper	Name of Paper	Mark	Credit
1	MBT1	Paper-I	Research Methodology	100	6
2	MBT2	Paper-II	Advances in Biotechnology-I	100	6
3	MBT3	Paper-III	Advances in Biotechnology-II	100	4
			Total	300	16

SEMESTER-II

Sl. No	Paper code	Paper	Name of Paper	Mark	Credit
1	MBT4	Paper-IV	Review of Literature <i>[Writing (50) + Power point presentation (50)]</i>	100	4
2	MBT5	Paper-V	Preparation and Presentation of seminar <i>[Synopsis presentation (50) + Pre-thesis submission seminar (50)]</i>	100	4
3	MBT6	Paper-VI	Dissertation	100	6
			Total	300	14