# **PROGRAMME STRUCTURE**

Category	Credits
Professional Core Courses	52
Professional Elective Core Courses	15
Online Courses	06
Industrial Training / Mini Project	03
Project	20
Career Orientation Skills (Luminous Club)	00
Total	96

# **SUMMARY**

Semester	No. of Course	Credits
Semester -1	8	25
Semester -2	8	24
Semester -3	9	27
Semester -4	1	20
Total	26	96

# DEPARTMENT OF MARINE BIOTECHNOLOGY M.Sc. Biotechnology 2023-2024 List of Courses for the Program

## <u>SEMESTER - I</u>

S.	Sub Code	Subject Title	с	L	т	Р	М
No.		Subject fille		L .			IVI
1.	PABTC101	Cell and Molecular Biology	4	4	0	0	100
2.	PABTC103	Microbiology and Virology	4	4	0	0	100
3.	PABTC102	Biochemistry and Biophysics	4	4	0	0	100
4.	PABTC104	Developmental Biology and Immunology	4	4	0	0	100
5.		Professional Elective Course - 1	3	3	0	0	100
6.	PABTP101	Molecular Biology and Biochemistry Lab	2	0	0	4	100
7.	PABTP102	Microbiology and Immunology Lab	2	0	0	4	100
8.	PABTO01	MOOC/NPTEL*	2	0	2	0	100
9.	PABTP103	Career Orientation Skills (Luminous Club)**	0	0	1	0	-
			25	19	3	8	
TOTAL: 30 Periods/week							

### Note:

PABTP103: Career Orientation Skills

Through Luminous Club, the activities will be engaged and evaluations will be done by respective mentors. Activities include Organizing events such as debates, quiz, seminars etc. Evaluation will be based on Monthly reports by each student.

\* MOOC credit will be added in the 2<sup>nd</sup> semester mark sheet.

## \*\* Assessment methods

- 1. Each students will be given 6 seminars and has to present one conference participation.
- 2. There will be no internal test.
- 3. Evaluation will be done by Internal Examiners for the maximum marks of 100.

## SEMESTER - II

S.		Subject Title	с		т	Р	м
No.		Subject fille	C		•	F	IVI
1.	PABTC201	Genetic Engineering and Bioinformatics	4	4	0	0	100
2.	PABTC202	Genomics and Proteomics	4	4	0	0	100
3.	PABTC203	Artificial Intelligence and Machine Learning	4	4	0	0	100
4.		Professional Elective Course - 2	3	3	0	0	100
5.		Professional Elective Course - 3	3	3	0	0	100
6.	PABTP201	Genetic Engineering and Bioinformatics Lab	2	0	0	4	100
7.	PABTP202	Genomics, Proteomics, AI and ML Lab	2	0	0	4	100
8.	PABTO02	MOOC/NPTEL*	2	0	2	0	100
9.	PABTP203	Career Orientation Skills (Luminous Club)**	0	0	1	0	100
			24	18	3	8	
TOTAL: 20 Deriede/week							

# TOTAL: 29 Periods/week

### Note:

PABTP103: Career Orientation Skills

Through Luminous Club, the activities will be engaged and evaluations will be done by respective mentors. Activities include Organizing events such as debates, quiz, seminars etc. Evaluation will be based on Monthly reports by each student.

\* MOOC credit will be added in the 3<sup>rd</sup> semester marks sheet.

\*\* Assessment methods

- 1. Each students will be given 6 seminars and has to present one conference participation.
- 2. There will be no internal test.
- 3. Evaluation will be done by Internal Examiners for the maximum marks of 100.

### <u>SEMESTER – III</u>

	Subject Title	с	L	т	Р	м
	Subject fille		L	I	P	IVI
PABTC301	Drug Design and Discovery	4	4	0	0	100
PABTC302	Biosafety, Bioethics, and IPR	4	4	0	0	100
PABTC303	Ecotoxicology and Nanobiotechnology	4	4	0	0	100
	Professional Elective Course - 4	3	3	0	0	100
	Professional Elective Course - 5	3	3	0	0	100
PABTP301	Drug Design and Discover Lab	2	0	0	4	100
PABTP302	Ecotoxicology and Nanobiotechnology Lab	2	0	0	4	100
PABTO03	MOOC/NPTEL*	2	0	2	0	100
PABTP303	Career Orientation Skills (Luminous Club)**	0	0	1	0	-
	Industrial Training / Mini Project***	3	0	0	0	-
		27	18	3	8	
	PABTC302 PABTC303 PABTP301 PABTP302 PABTP303 PABTP303	PABTC301Drug Design and DiscoveryPABTC302Biosafety, Bioethics, and IPRPABTC303Ecotoxicology and NanobiotechnologyPABTC303Ecotoxicology and NanobiotechnologyPABTC303Professional Elective Course - 4Professional Elective Course - 5PABTP301Drug Design and Discover LabPABTP302Ecotoxicology and Nanobiotechnology LabPABTP303MOOC/NPTEL*PABTP303Career Orientation Skills (Luminous Club)**Industrial Training / Mini Project***	PABTC301Drug Design and Discovery4PABTC302Biosafety, Bioethics, and IPR4PABTC303Ecotoxicology and Nanobiotechnology4PABTC303Ecotoxicology and Nanobiotechnology4PABTC303Professional Elective Course - 43Professional Elective Course - 53PABTP301Drug Design and Discover Lab2PABTP302Ecotoxicology and Nanobiotechnology Lab2PABTO03MOOC/NPTEL*2PABTP303Career Orientation Skills (Luminous Club)**0Industrial Training / Mini Project***3	PABTC301Drug Design and Discovery44PABTC302Biosafety, Bioethics, and IPR44PABTC303Ecotoxicology and Nanobiotechnology44PABTC303Ecotoxicology and Nanobiotechnology44PABTC303Professional Elective Course - 433PABTP301Drug Design and Discover Lab20PABTP302Ecotoxicology and Nanobiotechnology Lab20PABTP303MOOC/NPTEL*20PABTP303Career Orientation Skills (Luminous Club)**00Industrial Training / Mini Project***30	PABTC301Drug Design and Discovery440PABTC302Biosafety, Bioethics, and IPR440PABTC303Ecotoxicology and Nanobiotechnology440PABTC303Ecotoxicology and Nanobiotechnology440PABTC303Ecotoxicology and Nanobiotechnology440PABTC303Ecotoxicology and Nanobiotechnology440PABTP303Drug Design and Discover 4330PABTP304Drug Design and Discover Lab200PABTP305Ecotoxicology and Nanobiotechnology Lab200PABTO33MOOC/NPTEL*201PABTP303Career Orientation Skills (Luminous Club)**001Industrial Training / Mini Project***30027183	PABTC301Drug Design and Discovery4400PABTC302Biosafety, Bioethics, and IPR4400PABTC303Ecotoxicology and Nanobiotechnology4400PABTC303Ecotoxicology and Nanobiotechnology4400PABTC303Drofessional Elective Course - 43300Professional Elective Course - 53300PABTP301Drug Design and Discover Lab2004PABTP302Ecotoxicology and Nanobiotechnology Lab2004PABT033MOOC/NPTEL*20100PABTP303Career Orientation Skills (Luminous Club)**0010Industrial Training / Mini Project***30038

### TOTAL: 29 Periods/week

#### Note:

PABTP303: Career Orientation Skills

Through Luminous Club, the activities will be engaged and evaluations will be done by respective mentors. Activities include Organizing events such as debates, quiz, seminars etc. Evaluation will be based on Monthly reports by each student.

\* MOOC credit will be added in the 4<sup>th</sup> semester marks sheet.

\*\* Assessment methods

- 1. Each students will be given 6 seminars and has to present one conference participation.
- 2. There will be no internal test.
- 3. Evaluation will be done by Internal Examiners for the maximum marks of 100.

\*\*\* Field / Industry Visits / Internship assessment will be done based on attendance, project work and viva voce.

S. No.	Sub Code	Subject Title	С	L	т	Ρ	М
1.	PABT4PV	Dissertation and Viva Voce	20	0	0	0	100
			20	0	0	0	100

### **SEMESTER - IV**

## **PROFESSIONAL ELECTIVE COURSES**

SI.	SUB CODE	SUBJECT TITLE	С	L	Т	Р	М
No							
List of	Core Elective	Courses for 1 <sup>st</sup> Semester	I	I	1		
1.	PABTE101	Marine Resources and Bioprospecting	3	3	0	0	100
2.	PABTE102	Fish Biotechnology	3	3	0	0	100
List of	Core Elective	Courses for 2 <sup>nd</sup> Semester			1		<u> </u>
3.	PABTE201	Bioprocess & Fermentation Technology	3	3	0	0	100
4.	PABTE202	Research Methods, Statistics & Scientific	3	3	0	0	100
		Communication Skills					
5.	PABTE203	Marine Environmental Biotechnology	3	3	0	0	100
6.	PABTE204	Algae Biotechnology	3	3	0	0	100
List of	Core Elective	Courses for 3 <sup>rd</sup> Semester			1		<u> </u>
7.	PABTE301	Molecular Techniques and Diagnostics	3	3	0	0	100
8.	PABTE302	Stem Cell and Cancer Biology	3	3	0	0	100
9.	PABTE303	Enzyme Technology and Applications	3	3	0	0	100
10.	PABTE304	Biodegradation and Bioremediation	3	3	0	0	100
		Technology					