Academic Council Meeting No. and Date : 03 / February 14, 2022

Agenda Number : 6 Resolution Number : 12 / 5.2

Vidya Prasarak Mandal's
B. N. Bandodkar College of Science (Autonomous), Thane

Certificate Course

in

Techniques in Molecular Biology

(Level 2: Advanced)

With effect from

Academic Year 2022-2023

PREAMBLE

The course focusses on inculcating advanced techniques of molecular biology in attendees. The course would be helpful for all the life science faculties and students having basic hands-on knowhows of molecular biology techniques. It will instigate the advanced practical knowledge right from competent cell preparation in cloning to onerous techniques like extraction of RNA and southern blotting. It would also introduce dry lab technique of 16SrRNA sequencing required for identification of isolate.

Course Objectives:

- To construct a foundation of advanced techniques of molecular biology in the minds of learners, resulting in their chasing of research related to Molecular Biology.
- To make the students updated on intricacies of gene cloning

Course Outcomes:

1. Knowing the minute details of cloning with respect to preparation of competent cells, ligation of target gene with appropriate vector and selection of recombinant cells.

2. Practical grip on southern hybridization.

3. Having knowledge of extraction of total RNA.

4. Identification of isolates from 16SrRNA gene sequencing using bioinformatics tools

VPM's B.N.Bandodkar College of Science (Autonomous), Thane

Structure of Programme

CourseCode	Course Title	No. of lectures	Credits
BNBCCMB2T1	Techniques in Molecular Biology - Advanced	**19**	**3**
BNBCCMB2P1	Practical	**26**	

Syllabus of

Course: Techniques in Molecular Biology (Level 2: Advanced)

Course Code BNBCCMB2T1	Course Title Techniques in Molecular Biology - Advanced	Credits 3	No. of lectures	Practical Duration
Unit I	Extraction of total RNA		4	8
Unit II	Southern hybridization		3	7
Unit III	Cloning			
	• Competent cell preparation using calcium chloride • Transformation of *Escherichia coli* DH5α		3	4
	• Ligation		2	2
	• Blue White Selection Screening bacterial colonies using X-gal and IPTG: α complementation		2	2
Tutorial	16S rRNA gene sequencing		2	3
Assignment	Assignment 1 and 2		3	-
Total			**19**	**26**

EVALUATION SCHEME

THEORY EXAMINATION:
Suggested Format of Question paper
Duration: 2.5 Hours **Total**
Marks: 60 All questions are compulsory

Q. 1	Based on Unit I	15
Q. 2	Based on Unit II	15
Q. 3	Based on Unit III	15
Q. 4	Based on all Units	15

Each question may have following subquestions

Short answer question	7/8 Marks
Short note questions	5 Marks
Objectives	1 Marks

INTERNAL ASSIGNMENTS have to be submitted in the Soft copy/Hard copy format in the department

Total number of assignments: 02 each carrying 20 marks; Total marks: 40

PRACTICAL EXAMINATION: 50 marks (One major technique would be assessed)

Total of Internal Assignments	**40 Marks**
Total of Theory Examination	**60 Marks**
Total of Practical Examination	**50 Marks**
Grand Total	**150 Marks**

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