

Vivekanand Education Society's College of Arts, Science & Commerce (Autonomous)

Minutes of the 1st Meeting of the Board of Studies (2025 -2028) in Microbiology

Date: 28th March 2025

Time: 11:00 AM - 1:00 PM

Mode: Online

Google Meeting Link and ID: <https://meet.google.com/vxn-puzi-nkx>

Agenda for the Meeting:

1. Welcome and Introduction of all the BOS members
2. Review of the FYBSc and SYBSc Microbiology syllabus
3. Discussion and approval of the T.Y.B.Sc. Semester 5 Microbiology syllabus and scheme of course evaluation
4. Approval of the paper titles of the T.Y.B.Sc. Semester 6 Microbiology syllabus
5. Discussion of innovative Teaching and Evaluation Techniques, especially concerning Continuous Internal Evaluation
6. Any Other Business (A.O.B)

Members Present:

- Dr. Dona Joseph (Chairperson & HOD)
- Dr. Malay Shah, Dr. Shweta Patil, Mr. Suman Ganger, Dr. Mugdha Apte, Dr. Sumana Sannigrahi, Ms. Malavika Pillai (Members, Faculty at the Department of Microbiology, VESASC)
- Dr. Anup Padmanabhan (External Subject Expert Member)
- Dr. Deepti Gupta (External Subject Expert Member)
- Professor Dr. Lolly Jain (University Nominee)
- Mr. Kumaraswami Sivan (External Subject Expert Member - Industry Representative)
- Dr. Subhojit Sen (PG Alumnus)

All members were present

Agenda 1: Welcome and Introduction of all the BOS members

Dr. Dona Joseph welcomed the members to the 1st meeting of the 2nd BOS committee constituted by the Microbiology Department of VESASC. She briefed the members about the composition of the new BOS and called out each member to introduce themselves. The term, frequency of meetings, functions and responsibilities of the BOS were read out.

Agenda 2: Review of the FYBSc and SYBSc Microbiology Major syllabus

Since this was a new BOS, the FYBSc and SYBSc Microbiology Major syllabus were presented for the members to review.

Mr. Suman Ganger provided an overview of the FYBSc Major papers for both semesters. He informed the BOS about the minor changes that were planned in the theory syllabus. He also explained that the department plans to reduce the number of practicals since we had realized, from our experience, that they were too numerous to complete within the available time. Some of the practicals were shuffled between the two semesters, with the aim of making them more relevant and engaging.

Dr. Deepti suggested including isolation of all extremophiles (psychrophiles, halophiles, thermophiles) in food microbiology, rather than restricting them to thermophiles. She also suggested that isolation of yeasts and molds be carried out from different food samples rather than specifying a single food source.

Ms. Malavika Pillai presented the Major SYBSc syllabus. She explained the changes planned in Paper I and Paper II, noting that some topics were reshuffled and additional topics such as Transposable elements (Paper 1) and inflammation (Paper 2) were added. Dr. Deepti Gupta raised concerns regarding the allotment of just 5 lectures for “History of Genetics”. Dr. Dona Joseph explained that the topic could not be covered in detail, since the number of credits allotted to the Major subject has been drastically reduced in the NEP scheme. Dr. Deepti and Dr. Subhojit suggested reading the books DNA by Watson, and 8th Day of Creation to get an interesting overview of the history of genetics. Dr. Anup suggested that we include “regulation of lytic and lysogenic cycle in lambda phage” in Virology. Dr. Dona Joseph explained that the topic will have to be shifted to M.Sc due to paucity of lectures in B.Sc.

Dr. Subhojit Sen suggested inviting experts from the industry to conduct guest lectures for the VSC paper (Bioanalytical Techniques) since it was entirely theory-based. Dr. Malay Shah explained that we do conduct guest lectures and workshops on the subject in higher classes. At the SY level, the students needed basic explanations that could be best provided by the teachers.

For the SY practicals, Dr. Deepti suggested keeping general titles without specifying samples etc. Dr. Anup was apprehensive about using onion as the source for DNA isolation instead of a microorganism. Dr. Subhojit seconded this. Dr. Dona clarified that the paper on Genetics was not restricted to bacteria or microorganisms, but covered all living organisms. Onion was selected as the source of DNA because of convenience.

After the presentation of medical related practicals, Dr. Subhojit suggested we introduce strip tests for biochemical tests rather than tube tests. Dr. Dona explained that for understanding the principles, tube tests are better. Mr. Sivan explained about the cost involved and suggested that the students could be taken to a lab or we could get used strips from any path lab to show to the students. Sharing of the strips between colleges was also suggested by Dr. Subhojit. Dr. Shweta Patil mentioned that the strips have been ordered for Ph.D. students and hence can be shown to the UG students too.

Agenda 3: Discussion and Approval of the T.Y.B.Sc. Semester 5 Microbiology syllabus and Scheme of Course Evaluation

Dr. Dona Joseph presented an overview of the T.Y.B.Sc. Semester 5 syllabus. The syllabus for each paper was then discussed in detail

Paper I: The flow of genetic information

Dr. Dona Joseph discussed the detailed syllabus of Paper 1. Dr. Anup Padmanabhan suggested linking the process of translation to antibiotics that target the process. Dr. Dona Joseph explained that the mechanisms of antibiotics would be covered in Paper 2.

Paper II: Medical Microbiology

Dr. Malay Shah enlisted the various pathogens that would be studied in Paper 2. Dr. Anup mentioned that selected diseases can be assigned for discussion/ presentations to students. Dr. Lolly recommended that the topics to be covered with respect to fungal, viral and protozoal pathogens should be spelled out (Morphology and cultural characteristics, pathogenesis & clinical features, laboratory diagnosis, treatment and prevention)

Paper III: Biochemistry

Dr. Mugdha Apte explained the Paper 3 syllabus. She noted that, due to time constraints, some topics would be taught schematically or diagrammatically. Dr. Lolly Jain emphasized that the paper was too heavy and needed substantial trimming. Her opinion was shared by Dr. Deepti and Mr. Sivan. They gave the following suggestions for the paper:

- Unit I could cover Nutrient transport and Unit II could cover ETC and ATP synthesis
- Unit II (fermentative pathways) could be shifted to M.Sc or next semester

Dr. Deepti said that names of books should not be mentioned along with sub-topics in the syllabus, giving the impression that a single reference book was to be used for the topic. She also added that phrases such as “diagrammatically only/explain only” should be avoided in the syllabus. The syllabus should not be restrictive, but broad and general.

Major Practicals:

Major practicals were presented by Dr. Dona. She mentioned that certain Biochemistry experiments such as glucose transport were newly added and the protocols for the same were not yet finalized. Dr. Anup was apprehensive about whether the college had the facilities to handle pathogenic cultures in Medical practicals, but Dr. Dona clarified that only lab cultures were

being used for the practicals. It was also suggested that in-silico cloning and APE software tools could be used for conducting practicals.

VSC: Techniques in Molecular Biology

Mr. Suman presented the syllabus of the Vocational Skill Course, which is planned to be taken as a theory paper on Techniques in Molecular Biology. He emphasized the importance of the topics covered in the paper for entrance exams that would be attempted by the students.

Elective papers:

Mr. Suman Ganger explained that the department would offer three elective courses (2 credits theory + 2 credits practical), out of which one would be selected by the students in each semester. Dr. Subhojit asked about how the choice of elective would be made, and Dr. Malay replied that it would be based on the preference of the majority

Elective 1: Applications of Biotechnology

Mr. Suman Ganger presented the theory and practical syllabus of the first elective course titled “Applications of Biotechnology”.

Elective 2: Industrial Microbiology: Principles And Applications

Dr. Malay presented the second elective course titled “Industrial Microbiology: Principles And Applications”. Dr. Anup suggested including kinetics in the paper but all the department members disagreed saying that it was beyond the capacity of students at the T.Y. level and hence would be included in the M.Sc. syllabus. Dr. Anup also proposed taking the students for industrial visits, which Dr. Malay confirmed.

Dr. Lolly proposed shifting Downstream processing to a separate unit and revising the fermentation topics. Dr. Deepti noted that the objectives and outcomes need alignment. Practical details were also discussed. Dr. Lolly asked whether the experiment involving production, extraction and detection of antibiotics from unknown cultures would work. Dr. Anup suggested using *Streptomyces* or a known culture for study of antibiotic producers.

Elective 3: Bioinformatics and Biostatistics

Mr. Suman presented the syllabus of the third Elective course “Bioinformatics and Biostatistics”. He expressed his doubt over whether students would opt for the paper, as the topics are perceived to be difficult. Dr. Lolly pointed out that students who do not opt for this elective would miss out on the topic entirely. Mr. Suman clarified that some of the Biostatistics content overlaps with the Maths Statistics course offered as SEC, while others would be covered by conducting workshops under the PM USHA scheme.

Dr. Deepti suggested offering weeklong courses for topics such as Bioinformatics and Biostatistics and prioritizing practicals over theory, focusing on phylogenetic analysis, protein visualization, and genomics. Dr. Anup agreed that theoretical learning is dull and recommended linking statistics to students' experiments, such as colony counting. Prediction models can be integrated into the syllabus.

Agenda 4: Approval of Paper Titles of the T.Y.B.Sc. Semester 6 Microbiology syllabus

Dr. Dona Joseph gave a brief overview of the upcoming syllabus for Semester 6. She informed the members that a detailed syllabus approval meeting would be held later.

Approval of the changes in the syllabus of Minor (Sem II to Sem V)

Dr. Sumana presented the Minor syllabus from Semester 2 to Semester 4. Noting the heaviness of the current syllabus for minor students, deletions of some topics and rearrangement of others were proposed. Topics such as Recent Advances in Microbiology, and Microbiology in the 21st century were removed from Unit 1 of semester 2. Topics like Beginning of Industrial Microbiology, Microbial Ecology, Genetics and Molecular Biology from Unit 1 were integrated with the existing topics of Unit 2 in semester 2. Topics detailing the taxonomy and different types of microorganisms, were shifted to unit 1 for a better understanding of microorganisms. Moreover, 15 lectures were allotted to the application of microbiology, to cover it in a detailed manner and create interest among students towards Microbiology. The headings of unit 1 (Past and Present - Microbiology) and unit 2 (Group of Microbes and their role) were modified to Foundation of Microbiology and Applications of Microbiology respectively.

As there was some inconsistency between the practical and theory syllabus of semester 3 and semester 4, cultivation of microorganisms (unit 1, semester 4) was shifted as unit 2 of semester 3. Similarly unit 2 (Study of Microorganisms in different Environments) of semester 4 was redesignated as unit 1. Also, unit 2 (Control of Microbes) of semester 3 was shifted as unit 2 in semester 4. Some of the topics in practicals for semester 3 (Streaking Spot inoculation, Isolation on plates, Use of Enriched media, Differential media and selective media) and semester 4 (Omnipresence of Microorganism, working of a colorimeter, Effect of UV, Chlorination on bacteria, common surface disinfectants, alcohol, bacteria proof filters, Oligodynamic action of heavy metals, Antibacterial activity of dyes and antibiotics by disc diffusion method) were reshuffled for better understanding by the students.

Semester 5 Minor syllabus was presented by Mr. Suman, who explained the challenges faced in teaching Minor students. He said that many students who come from vernacular backgrounds find the subject too challenging. Besides, there is rampant absenteeism as some students coming from economically challenged backgrounds need to earn while they are learning, while others are not motivated enough to attend the classes regularly. He explained that we were introducing “Biomolecules” in Semester 5 with the hope that the students might find it interesting as they are all majoring in Chemistry. Dr. Anup inquired whether Biochemistry was already covered in Chemistry Major, and Mr. Suman confirmed that it was not covered. Dr. Subhojit suggested incorporating bioinformatics to spark interest, which Mr. Suman agreed could be included in practicals.

Overall Evaluation pattern

Mr. Suman outlined the common evaluation pattern, with internal and external assessments. Dr. Anup asked about how students are marked for field project evaluation, to which Mr. Suman replied that the academic council has given departments the freedom to evaluate FP. The IQAC of VESASC has framed certain suggestive guidelines for the departments. At the Microbiology department, a group of 3-4 students is given one project and the evaluation is divided into three parts: 1) Pre-presentation of the idea and objectives of the project as a powerpoint presentation, 2) Actual field work which includes surveys, collection of samples and its analysis in lab, environment monitoring etc, 3) Final presentation of the project.

For the Community Engagement Program, the Outreach Cell of the College has framed certain guidelines and students are encouraged to associate themselves with a known and active NGO. Students can also do community service on their own and keep records of the same for their mentors to verify.

Regarding On Job Training (OJT) , the IQAC of VESASC has released draft guidelines and will soon finalize and circulate them for the information of staff and students. OJT can be done by the students right after their Sem IV exams, thus utilizing the summer vacations between SY and TY. They can also complete the OJT in parts utilizing their other vacations and complete the same by January of the academic term.

Dr. Subhojit suggested that students can explore varied pedagogical techniques to spread awareness about Microbiology in the community, which was well received by the department.

Dr. Mugdha Apte gave a vote of thanks and stated that the department would integrate the suggestions provided from both research and industrial perspectives. She noted that the minutes of the meeting would be circulated and the revised syllabus would be mailed to all the members. The meeting concluded on a positive note, with all members contributing valuable insights.

Dr. Dona Joseph

Chairperson & HOD

BOS (Microbiology)