VIGNAN'S

FOUNDATION FOR SCIENCE, TECHNOLOGY & RESEARCH

(Deemed to be University) - Estd. u/s 3 of UGC Act 1956

DEPARTMENT OF BIOMEDICAL ENGINEERING

Date: 28.06.2025

Minutes of Board of Studies Meeting

Board of Studies (BoS) meeting of B.Tech., Biomedical Engineering (BME) programme was conducted on 28th June 2025 (Saturday) at 10:00 AM in blended mode (online participation via Microsoft Teams).

Meeting link:

https://teams.microsoft.com/l/meetupjoin/19%3ameeting_ODViM2Q5NjktZmMzMi00OTJjLWE0MjQtZDNhZGIxNzYzYjBj%40thread.v2/0?context=%7b%22Tid%22%3a%223b0993d8-31db-4db6-b617-64ac193c7ace%22%2c%22Oid%22%3a%2202201331-910a-49b6-a69e-d1c16c6d1f00%22%7d

Agenda of the BoS Meeting:

1. To discuss and finalize the curriculum structure (C25) and detailed syllabus of B.Tech., Biomedical Engineering (BME) Programme for the regulation 2025 (R25).
2. To approve the (R25) curriculum and syllabus of B.Tech., Biomedical Engineering Programme, and recommend to the Academic Council.
3. Approval of seventeen SWAYAM-NPTEL courses to be offered as Honor / Minor / Department elective / Open elective courses.
4. To discuss the Pass Percentage of students for the Academic Year 2024-2025 (Odd Semester) and CO-PO-PSO attainment.
5. Any other points with the permission of the Chairperson.

The following members were present either offline or online.

S.No.	Name and designation of the Member	Position	Signature
1	Dr. T. Pitchaiah, Professor and HoD, Dept. of BME, VFSTR.	Chairperson	
2.	Dr. Renu John, Professor, Dept. of Biomedical Engineering, Chairperson, Centre for Interdisciplinary Programme Head and Board member, Centre for Health Entrepreneurship (CHE), IIT Hyderabad	External Member (Academia)	online
3.	Dr. Arindam Bit, Associate Professor, Dept. of Biomedical Engineering, NIT Raipur	Invited Member (Academia)	online
4.	Mr. Renjith C.V., Electrical Architect, Digital Lead at Philips India Ltd., Pune/Bangalore.	Invited Member (Industry)	online
5.	Dr. B. Usha Kiran, MD., DM, Neurologist, Lalitha Hospital, Kothapet, Guntur - 522 001. Andhra Pradesh	External Member (Hospital)	Absent
6.	Dr. N.Usha Rani, Professor &Dean SEECE, VFSTR	Internal Member	
7.	Dr. Amit Kumar Singh, Professor, Dept. of BME, VFSTR.	Internal Member	
8.	Dr. K. Hima Bindu, Assistant Professor, Dept. of BME, VFSTR.	Internal Membe	
9.	Dr. M. Pachiyanan, Associate Professor, Dept. of ECE, VFSTR.	Nominee (Dean-R&D)	
10.	Ms. Prathiba Jonnala, Assistant Professor, Dept. of BME, VFSTR.	Nominee (Dean-SEECE)	
11.	Dr. Hima Harshan P, Assistant Professor, Dept. of BME, VFSTR.	Member Secretary	
12.	Dr. A. Sateesh Reddy, Assistant Professor, Dept. of BME, VFSTR.	Invited Member (Department)	

The following members have taken leave of absence.

1. Dr. B. Usha Kiran, MD., DM, Neurologist, Lalitha Hospital, Kothapet, Guntur - 522 001. Andhra Pradesh

Chairperson Dr. T. Pitchaiah, Professor and Head, Biomedical Engineering (BME) department, VFSTR, opened the meeting by welcoming and introducing the external members, invitees to the internal members. The Chairperson presented the R25 and C25 curriculum for Biomedical Engineering, which emphasizes creating a learning-centric (continuous learning and continuous assessment model), offering B.Tech.

THE BOS MEMBERS REVIEWED AND DISCUSSED THE FOLLOWING POINTS.

1. The curriculum structure (C25) and detailed syllabus of B.Tech., Biomedical Engineering (BME) Programme for the regulation 2025.
2. Describe the Curriculum structure with credits and credit distribution.
3. The revision of the R22 C24 curriculum to R25 C25 shall include the following changes.
4. The department has introduced the Orientation cum Pre-Semester Program. Basic sciences cover 30 credits.
5. The C25 curriculum carries 160 credits, excluding 10 binary graded credits. The committee has divided Module 2 into three units, and each course defines four to six course outcomes.
6. The course contents are mapped with relevant Sustainable Development Goals (SDGs), ensuring alignment with global sustainability objectives. Additionally, where authenticated information is available, Indian Knowledge System (IKS) topics are incorporated into each course.
7. Industry – Interface (I^2) Courses have been introduced with a 15 Hour duration as a Binary graded course.
8. Two open electives from VFSTR and one from the NPTEL course are required.
9. Major reformation has occurred in the curriculum by offering Honours/Specialization degree or Minor degree through 20 more credits with additional courses.
10. The Biomedical Engineering Department offers on-site training, which involves students visiting industries or hospitals for a month to get exposure..
11. The courses listed in Appendix II that promote entrepreneurship, employability, or skill development are included in the curriculum.

12. Significant changes have been made in the content of all courses; hence, the courses are considered new courses provided in Appendix III.
13. The overall average percentage of the modified syllabus was 30.17% compared to the prior curriculum.
14. Electives and streams/pools.
15. Minor / Honor courses.
16. A discussion over the necessity and curriculum of a course on design thinking.
17. Discussion regarding the training on the professional ethics course.

1. Dr. Renu John, Professor, Dept. of Biomedical Engineering, IIT Hyderabad

Execution Focus – The major challenge is designing the curriculum and ensuring its effective execution and implementation.

Interdisciplinary Nature – Biomedical Engineering must integrate core sciences, core engineering, and clinical sciences, especially after the foundational first year.

Basket System for Electives – Introduce breadth and depth through elective baskets (streams) to allow students to specialize while retaining interdisciplinary flexibility.

Proposed Elective Baskets – Suggested baskets include Computer Science & AI/ML for Healthcare, Electronics, Instrumentation & Signal/Image Processing, Biomechanics & Rehabilitation, Biomaterials, Regenerative Medicine & 3D Bio-printing, Neurosciences & Neuroethology

Computer Science Basket – Include fundamentals of Machine Learning, AI, Probability & Statistics, Pattern Recognition, and Medical Data Analytics, with a strong focus on applications in bioinformatics and healthcare.

Electronics & Instrumentation Basket – Streamline basic electronics into fewer modules and add advanced practical content (signal processing, imaging, hands-on labs, programming for devices).

Biomechanics Basket – Cover introductory biomechanics, rehabilitation engineering, sports medicine, computational modelling, systems biology, MEMS/microfluidics for mechanical-flavor integration.

Biomaterials Basket – Include prosthetics, advanced biomaterials, implants, stem cells, tissue engineering, regenerative medicine, and 3D printing/bio printing with scope for future faculty/course expansion.

Clinical Integration – Strengthen anatomy, physiology, and clinical immersion programs where students shadow clinicians to gain real-world biomedical problem perspectives.

Minors & Open Electives – For BME students: Provide focused minors in allied fields like AI/ML through negotiation with other departments.

For other department students: Ensure BME open electives are rigorous and at par with departmental electives, adding value for external students.

2. Dr. Arindam Bit, Associate Professor, Dept. of Biomedical Engineering, NIT Raipur

1. The curriculum lacks a fundamental biomechanics course at the professional core.
2. Only biofluid dynamics appears under honours, but biomechanics is missing.
3. The fundamentals of anatomy, physiology, and basic clinical science need to be differentiated.
4. Observed issue: overlap between physiology and basic clinical science in some institutes (e.g., NIT Raipur).
5. Suggestion: merge physiology and basic clinical science to create space for biomechanics.
6. The curriculum includes basic electronics, digital logic circuits, electrical circuit theory, and analogue electronics.
7. Concerns were raised about content duplication in basic electronics and analogue electronics.
8. Question: What additional topics are taught in basic electronics beyond the fundamentals of analog electronics?
9. Students already cover physics in Class 12, raising concerns about redundancy.
10. Suggests streamlining electronics courses to avoid overlap and optimize curriculum slots.

3. Mr. Renjith C.V., Electrical Architect, Digital Lead at Philips India Ltd., Pune/Bangalore.

1. Add Medical Device Regulatory Standards (focusing on risk management) as a department elective to align with industry needs.
2. Shift Image Processing into department electives, as it is highly relevant for biomedical students.
3. Introduce FPGA as an open elective for students interested in hardware design or embedded systems.
4. Biomedical students should be able to take electives from Electronics & Communication Engineering (ECE).
5. Suggested electives from ECE: FPGA and Digital Signal Processor (DSP) architecture.
6. The current syllabus lacks coverage of processor architectures, which are crucial for applications like ECG signal processing.
7. Providing cross-departmental elective choices (e.g., FPGA, DSP) would benefit students aiming for hardware and signal processing careers.

4. <u>Suggestions from internal members</u>

1. Image Processing Should not be a standalone subject. It can be included as one unit in Biomedical Instrumentation. If more depth is required, conduct a Value-Added Course (1-credit).
2. A more industry-oriented approach is needed. The current content is mostly software descriptions that lack technical depth. Hardware is limited to plug-and-play units, offering less real skill-building. Course Content Overlapped.
3. Current title and content overlap significantly with Biosensors and Biomaterials Instrumentation. Need to refine and differentiate the course structure.
4. Minor courses may not attract biotechnology/biomedical students, but could attract electronics, computer science, and electrical students. Courses should be hierarchical and connected, moving from basics to advanced:
5. Structure the program so non-biomedical students (ECE, CSE, EE, etc.) can also benefit. Ensure progression from basics → processing → imaging → learning.

The above recommendations and comments emerged while developing the C24 BME course content. Changes are made in accordance with the suggestions. The external BoS members approve modifications via e-mail correspondence and then present to the academic council with the agreement of the BoS chair.

The following resolutions were made after the discussion:

1. BoS members approved the revised R-25 C25 curriculum structure and syllabus for the B.Tech., Biomedical Engineering programme. Curriculum structure is provided in Appendix I. On average, 42 % of the syllabus has been revised shown in Appendix III.
2. A minor restructuring has occurred in the C25 curriculum, oriented towards continuous learning and assessment based on module structure.
3. The curriculum encompasses the courses that enable employability, entrepreneurship, or skill development, as Appendix II provides.
4. The significant changes have been made in the content of all courses, as suggested by external and internal members; hence, the courses are considered new courses listed in Appendix III.
5. The average proportion of syllabus revisions was compared to the prior curriculum.

Based on the feedback from various stakeholders and suggestions from the members, the Chairperson of BoS stated that those fruitful suggestions would be incorporated appropriately in the C25 curriculum and syllabi of the regulation R25, which will be recommended to the Academic Council of VFSTR for approval. Without further discussion points, the Chairperson

thanked all the external, internal, and invited members and announced that the meeting was adjourned.

Member Secretary

Chairperson