Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University Estd. u/s 3 of UGC Act 1956, Category A by MHRD)
Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC
Coimbatore - 641 043, Tamil Nadu, India

Minutes of Board of Studies in Biomedical Instrumentation Engineering held on 26.04.2023 at 09.30 am.

Members List:

Internal Members:

Dr. Judith Justin, Professor & Head, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	**Chairperson**
Dr.R.Vanithamani, Professor, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	**Member**
Dr.R.Shijitha, Assistant Professor, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	**Member**
Mrs. S. Gowri, Assistant Professor, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	**Member**

External Members:

Dr.Mallikarjun S.Holi, Professor & Dean (Academic), Department of Electronics & Instrumentation Engineering., University B.D.T. College of Engineering, Davangere - 577 004. Karnataka.	-	**Academician**
Mrs. Saranya Venkatraman, Associate Project Manager, Robert Bosch Engineering and Business Solutions Ltd., CHIL SEZ IT Park, Coimbatore-35.	-	**Industrial Expert**

Invited Member:

Mrs.M.Nila Nandhini,
Assistant Professor,
Department of Biomedical Instrumentation Engineering, School of Engineering.

Invited Member (Student Representative)

Sri Jayabhatathi S., 21PEM004,
II M.E Medical Electronics

Invited member (Alumni Representative)

Pavithra S., 19PEM005,
Alumni of 2019-2021 batch

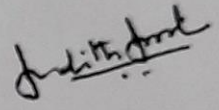
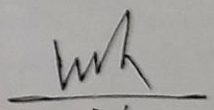
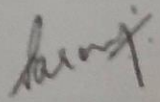
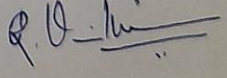
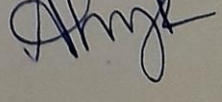
Discussions of the Meeting (pertinent to the agenda)

1.a)	Implementation of **Learning Outcomes based Curriculum Framework (LOCF)** for Undergraduate programmes applicable for students admitted from the academic year 2023 - 2024 & onwards. **Not Applicable**
b)	Passing the syllabi with the inclusion of **CO-PO mapping** and matrix for 1st to 4th semester, applicable for **Undergraduate students** admitted from the academic year 2023 - 2024 & onwards. **Not Applicable**
2.	Revision in the Subject codes & Syllabi (if needed) for **B.Sc. Special Education and Mathematics** and all **B.Voc. programmes** applicable for students admitted from the academic year 2023 - 2024 & onwards. **Not Applicable**
3.	Revision in the syllabi with change in the subject code for **Postgraduate programmes** applicable for students admitted from the academic year 2023 - 2024 and onwards. **Discussion:** M.E. Medical Electronics programme had 70+2 credits which are revised to 73+2 credits for the students admitted from 2023-2024 and onwards. **Revision carried out:** Course Code, Course Learning Objectives (CLOs), Course Outcomes (5 COs), Program Outcomes (POs) and Program Specific Outcomes (PSOs) in M.E. Medical Electronics are revised. The external experts recommended the Scheme of Instruction and Syllabus for M.E. Medical Electronics applicable for the students admitted from academic year 2023-24 & onwards. Enclosed in Annexure - I.
4.a)	Revision in the **Scheme and Syllabi of Papers 1 and 2 of Ph.D. Programmes** applicable for scholars admitted from January, 2023 & onwards. **Discussion:** The Scheme, syllabi, component 1 and 2 were discussed in detail for paper 1 & 2 of Ph.D programme in Biomedical Instrumentation Engineering.

	The recommendations of the experts are: a) Component 1 (for 2 credits in addition to 3 credits for Core Paper) should be completed before taking up examination for course work of Paper 1 (23PHBME1 Research Methodology for Engineers). ● Hands on Training in the physical mode for a duration of 5 days or for a split duration of 1 or 2 days totaling not less than 5 days in a reputed research institute / R&D / Centre within India or abroad after getting the necessary approval from the authorities. ● Evaluation will be based on submission of a report (10 marks) and a presentation (10 marks) which will be considered as CIA2, along with the certificate issued by the competent authority. The experts suggested the following research centres for Component 1 1. Sree Chitra Tirunal Institute for Medical Sciences & Technology, Trivandrum. 2. Centre for Bioscience and Nanoscience Research (CBNR), Eachanari, Post, Coimbatore, Tamil Nadu. 3. Defence Bio-Engineering & Electro Medical Laboratory (DEBEL), CV Raman Nagar Bengaluru. 4. Centre for Nano Science and Engineering (CeNSE), Indian Institute of Science, Bangalore. 5. IIT Madras Research Park, Chennai. 6. All India Institute of Speech and Hearing, Mysore. 7. Centre for Incubation, Innovation, Research and Consultancy- CIIRC, Bengaluru 8. Or any other research centre. b) Component 2 (for 2 credits in addition to 3 credits for Core Paper) should be completed before taking up the examination for course work of Paper 2 (23PHBME2 Pattern Recognition Techniques and Applications). ● Online/Offline Course (2 credits) on any tool relevant to the domain of the research scholar, like NPTEL / Coursera / MATLAB certification or other similar courses certified with examination. ● A certificate relevant to the completion of the course should be submitted for evaluation for 20 marks towards CIA 2. The experts recommended the following tools like MATLAB, Python, LabVIEW, AWS or any other relevant ones for Component 2. Online mode / offline mode of study may be permitted. A certificate of PASS is mandatory for evaluation purpose (CIA2). The Scheme of Instruction and Examination for Paper 1 and 2 of Ph.D. programmes for scholars admitted from January 2023 and onwards is enclosed as Annexure II.
b)	Passing the syllabi of **Specialization papers** applicable for **Ph.D. Scholars** admitted during **February, 2023.** **Discussion:** The syllabus of Specialization paper and component 3 were discussed for the Research Scholar admitted in Jan 23 for Ph.D in Biomedical Instrumentation Engineering. **The recommendations of the experts are:** ● a) Component 3 (for 2 credits in addition to 3 credits for the Core Paper) should be completed before taking up examination for course work of the Specialization Paper - 23PHBME3A AI and Machine Learning for the Research Scholar (Blessy Rapheal M, 22PHEBP01), after getting the necessary approval from the authorities.

	• Attending a Workshop / FDP / STTP / Conference for not less than 3 days duration (or 3 one - day, or 1 day and 1 two day) in offline mode, related to the discipline of the research scholar. • A presentation of the contents of the Workshop / FDP / STTP / Conference along with the submission of a copy of the certificate as proof of completion of the course should be submitted for the evaluation. Rubrics may be adopted for the evaluation for 20 marks towards CIA 2. The external experts recommended the syllabus content for 23PHBME3A AI and Machine Learning for the research scholar Mrs.Blessy Rapheal M. admitted in February 2023 is given in Annexure III. The external experts approved the components 1, 2 and 3 and the evaluation process for CIA 2.
5.	Adoption of the following aspects in the Institution from 2023-2024 & onwards: **a. Four year Undergraduate programmes** **b. Dual Programmes** **c. Common University Entrance Test (CUET) for PG programmes Admission** **d. Common University Entrance Test (CUET) for Ph.D. programmes Admission** **Not Applicable**
6.	Any other
a)	**Eligibility norms for admission to B.E. Biomedical Instrumentation Engineering** Candidates seeking admission to the first semester of the eight semesters for **B.E. Biomedical Instrumentation Engineering.** As the curriculum for B.E. Biomedical Instrumentation Engineering is related to medicine, the external experts recommended to admit the students who have passed the Higher Secondary Examination (10+2) with Physics, Chemistry and Biology / Botany / Zoology (Should have obtained at least 45% marks and 40% marks in the case of candidates belonging to the reserved category in the above subjects taken together). The Institute will offer a bridge course for Mathematics for these students. Students can also be admitted with the other eligible subjects (Maths, Physics, Chemistry/Computer Science/Biology/Vocational stream) as per AICTE Approval Process Hand Book 2023-2024 – Page No 5/9 of Appendix -1.
b)	**Eligibility norms for candidates seeking lateral entry admission to the third semester of the eight semesters for B.E. Biomedical Instrumentation Engineering.** The external experts recommended admitting students of B.Voc. Medical Equipment Technology for Lateral Entry as it is a relevant discipline (AICTE Approval Process Hand Book 2023-2024, Page No – 4/9 of Appendix 1).
c)	Revision of subject code for **21BPAI04 Biomedical Instrumentation and Scientific Measurements** for **B.Sc. Physician Assistant** students admitted during 2022-2023 and onwards. **Discussion:** The code is revised for 21BPAI04 Biomedical Instrumentation and Scientific Measurements for B.Sc. Physician Assistant students admitted during 2022-2023 and CO-PO mapping is included. The external experts recommended the revised syllabus for **22BPAD04 Biomedical Instrumentation and Scientific Measurements** for B.Sc. Physician Assistant students admitted during 2022-2023 is enclosed as Annexure-IV.

Suggestions by Students/Alumni/Employers on Curriculum and Syllabus (A workshop in the department to be organized before the BoS and minutes of the same to be placed in the BoS. The action taken on those recommendations to be specified in the minutes of BoS.)	
	Sri Jayabharathi S., 21PEM004, Student Representative The syllabus content made us to achieve excellence in developing technical skills in the field of Medical Electronics. **Pavithra S., 19PEM005, Alumni** The program helped me to do research work and come with publications. **Mr.V.Pragadeeswaran, Founder, Aries Biomedical Technology, Coimbatore.** Syllabus meets industrial needs and bridges the gap between academia and industry. The syllabus adequately covers emerging technologies.

Members Present:		**Signature**
Chairperson		
Dr.Judith Justin, Professor & Head, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	
External Members		
Dr.Mallikarjun S.Holi, Professor & Dean (Academic) Department of Electronics & Instrumentation Engineering., University B.D.T. College of Engineering, Davangere - 577 004, Karnataka.	-	
Mrs. Saranya Venkatraman, Associate Project Manager, Robert Bosch Engineering and Business Solutions Ltd. CHIL SEZ IT Park, Coimbatore-35.	-	
Internal Members		
Dr.R.Vanithamani, Professor, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	
Dr.R.Shijitha, Assistant Professor, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	

Mrs. S. Gowri, Assistant Professor, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	
Invited Member (Staff)		
Mrs.M.Nila Nandhini, Assistant Professor, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	
Invited Member (Student Representative)		
Sri Jayabharathi S., 21PEM004, II M.E Medical Electronics	-	
Invited member (Alumni Representative)		
Pavithara S., 19PEM005, Alumni of 2019-2021 batch	-	

1. Revision of Courses in already existing Programme (if any)

a. Revision of courses without title change **(2023-2024)**

Course code	Course title	Semester	Credits	Percentage of revision
23MEMC02	Diagnostic and Therapeutic Equipment	I	3	50
23MEMC03	Biomedical Instrumentation Practicals	I	1.5	10
23MEMC04	Biomedical Signal Processing Practicals	I	1.5	60
23MEMC05	Research Methodology and IPR	I	3	10
23MEMC07	Medical Image Processing	II	3	20
23MEMC08	Medical Image Processing Practicals	II	1.5	50
23MEMC09	Physiological Modeling Practicals	II	1.5	10
23MEME21	Rehabilitation Engineering	I Program Elective II	3	40
23MEME31	Pattern Recognition and its Applications	II Program Elective III	3	30

	Ph.D BMIE			
23PHBME1	Research Methodology for Engineers		3+ 2*	
23PHBME2	Pattern RecognitionTechniques and Applications		3+ 2**	30

b. Introduction of courses/Revision of Courses with title change **(2023-2024)**

Course code	Course title	Semester	Credits	Type (Specify-New/Title change)	Percentage of revision (if new indicate as new)
23MEMC06	Physiological Modeling	II	3	New	New
23MEME12	Medical Imaging Systems and Radio Therapy	I Program Elective I	3	New	New
23MEME13	Human Anatomy and Physiology	I Program Elective I	3	New	New
23MEME33	AI and Machine Learning	II Program Elective III	3	New	New
23MEME41	Telehealth Technology	II Program Elective IV	3	New	New
23MEME43	Embedded Systems and Internet of Things for Medical Application	II Program Elective IV	3	New	New

2. New Programme (if any) introduced-Nil

3. ~~Part IV Component of UG~~/ Part II Component of PG (if any): Professional Certification with 2 credits is moved from Part I to Part II in M.E. Medical Electronics

a. Revision of courses in Part IV Component of UG/ Part II Component of PG without title change

Course code	Course title	Semester	Credits	Percentage of revision
-	-	-	-	-

b. Introduction of courses/Revision of Courses in Part IV Component of UG/ Part II Component of PG with title change

Course code	Course title	Semester	Credits	Type (Specify-New/Title change)	Percentage of revision (if new indicate as new)
23MEMC12	Internship/Training	3	2	Title Change	New

4. Deletion or removal of courses to be specified in detail (if any):

i. M.E. Medical Electronics programme

1. 21MEMC06-Biological Control Systems in the second semester of M.E. Medical Electronics programme have been removed and 23MEMC06-Physiological Modeling has been introduced.

2. 21MEME12-Medical Imaging Techniques specified under Program Elective-I in the first semester of M.E. Medical Electronics programme have been removed and 23MEME12-Medical Imaging Systems and Radio Therapy has been introduced.

3. 21MEME13-Anatomy and Physiology specified under Program Elective-I in the first semester of M.E. Medical Electronics programme have been removed and 23MEME13-Human Anatomy and Physiology has been introduced.

4. 21MEME33-Brain Computer Interfaces specified under Program Elective-III in the second semester of M.E. Medical Electronics programme have been removed and 23MEME33-AI and Machine Learning has been introduced.

5. 21MEME41-Biostatistics specified under Program Elective-III in the second semester of M.E. Medical Electronics programme have been removed and 23MEME41-Telehealth Technology has been introduced.

6. 21MEME43-Real Time Embedded Systems specified under Program Elective-III in the second semester of M.E. Medical Electronics programme have been removed and 23MEME43-Embedded Systems and Internet of Things for Medical Application has been introduced.