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 4.7.2022 at 10.00 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**
Mrs.R.Shijitha, Assistant Professor, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	**Member**
Mrs.M.Nila Nandhini, Assistant Professor, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	**Member**

External Members:

Dr.S.Prabakar, Professor & HOD, Department of Bio Medical Engg., Sona College of Technology, Salem - 636 005.	-	**Academician**
Mrs. Saranya Venkatraman, Associate Project Manager, Robert Bosch Engineering and Business Solutions Ltd., CHIL SEZ IT Park, Coimbatore-35.	-	**Industrial Expert**

Invited Members:

Mrs.A.Mahalakshmi,
Assistant Professor,
Department of Biomedical Instrumentation Engineering, School of Engineering.

Mrs.E.Smily Jeya Jothi,
Assistant Professor,
Department of Biomedical Instrumentation Engineering, School of Engineering.

Ms.A.G.Ackshaiyaa,
Assistant Professor,
Department of Biomedical Instrumentation Engineering, School of Engineering.

Invited Member (Student Representative)

Bhavya S 19010UEB05, III B.E Biomedical Instrumentation Engineering

Invited member (Alumni Representative)

Varsha R, 18167UEB42,
Alumni of 2018-2021 batch

Discussions of the Meeting (pertinent to the agenda)

1.a)	Inclusion of **CO-PO mapping** and matrix for 3rd and 4th semester, applicable for **Postgraduate students** admitted from 2021-2022 & onwards. **Discussion:** CO-PO mapping and matrix for M.E. Medical Electronics students admitted from 2021-2022 & onwards have already been implemented.
b)	Inclusion of **CO-PO mapping** and matrix for 3rd to 6th semester, applicable for **Undergraduate students** admitted from 2021-2022 & onwards. **Discussion:** CO-PO mapping and matrix for B.E. Biomedical Instrumentation Engineering students admitted from 2021-2022 & onwards have already been implemented.
2.	Passing the syllabi of Specialisation papers applicable for Ph.D. scholars admitted during January, 2022. **Not Applicable**

3.	List of Subject experts for **BoS, Screening** & **Selection Committee, for Practical Examination, Question Paper Setting** and **Paper Valuation**. **Discussion:** New BoS, Screening, Selection committee members and experts for Practical Examination, Question Paper Setting and Paper Valuation were included. Designation and address changes were incorporated. Revised list of Subject experts for **BoS, Screening & Selection Committee, for Practical Examination, Question Paper Setting** and **Paper Valuation** are enclosed as **Annexure I.**
4.	Implementation of **National Education Policy 2020** - Development of Curriculum Framework for specific Undergraduate programmes to provide access for Implementation of Academic Bank of Credits (ABC) and Credit Transfer. **Discussion:** • The BoS external experts recommended the implementation of ABC and credit transfer after AICTE incorporates it with NEP 2020 under Model Curriculum of UG programmes in Engineering.
5. **a)**	Any other Adoption of dual programme **Discussion:** The BoS external experts recommended incorporation of online PG Diploma programmes in parallel with B.E. and M.E. programmes.
b)	Change of nomenclature (if any) **Discussion:** AICTE's guidelines align with the existing nomenclature of UG and PG programmes as discussed with BoS external experts.
c)	Admission Eligibility for 2022-2023 **Discussion:** Admission eligibility for 2022-2023 & onwards followed as per AICTE Approval Process Handbook 2022-2023, 1.3 (a) Undergraduate Engineering Entry Level qualification 10+2 level; pages 89 & 90; Sr.No.13. Electronics Engineering as there is no specific qualification given for Biomedical Instrumentation Engineering
d)	**Credit transfer for Professional Electives (UG) & Program Elective (PG) through MOOC** Modifications in the Scheme of Instruction and Examination for students admitted in 2021-2022 & onwards to offer MOOCs through SWAYAM - NPTEL for all B.E. degree programmes. **Discussion:** i) **Credit transfer in UG Programme B.E. Biomedical Instrumentation Engineering** ➢ The BoS external experts recommended a maximum of two MOOCs as an alternative to two Professional Electives, through SWAYAM - NPTEL with 3 credits each for B.E Biomedical Instrumentation Engineering. ➢ Two MOOCs to be completed before the end of 7th Semester (during 3/4/5/6/7 semesters) as a means of credit transfer to Professional Electives-Elective V and Elective VI in seventh semester, with 3 credits of 12 weeks duration each. ii) **Additional non-credit transfer MOOC** ➢ The BoS external experts recommended one core or non-core MOOC (8 weeks duration) in addition to 165 credits through SWAYAM-NPTEL to be completed before the end of 7th semester with 2 credits for B.E Biomedical Instrumentation Engineering. It will appear in the eighth semester mark sheet. • The corrected Scheme of Instruction and Examination for B.E. Biomedical Instrumentation Engineering students admitted in 2021-2022 & onwards is enclosed as **Annexure II**.

e) Modifications in the Scheme of Instruction and Examination for students admitted in 2021-2022 & onwards to offer MOOC's through SWAYAM - NPTEL for all M.E. degree programmes.

Discussion:

Credit transfer in PG Programme M.E. Medical Electronics

- The BoS external experts recommended one MOOC of 12 weeks duration, through SWAYAM - NPTEL with 3 credits to be completed before the end of 3rd Semester (during 1/2/3 semesters) as an alternative to Program Elective- V in third semester for M.E. Medical Electronics.

Additional non-credit transfer MOOC

- The BoS external experts recommended one core or non-core MOOC (8 weeks duration) in addition to 70 credits through SWAYAM-NPTEL to be completed before the end of 3rd semester with 2 credits for M.E. Medical Electronics. It will appear in the fourth semester mark sheet.
- The corrected Scheme of Instruction and Examination for M.E. Medical Electronics students admitted in 2021-2022 & onwards is enclosed as **Annexure III**.

f) **Credits for MOOC**

- The BoS external experts recommended implementation of credits for MOOC as per NPTEL guidelines. 1 credit for MOOCs of 4 weeks duration, 2 credits for MOOCs of 8 weeks duration and 3 credits for MOOC courses of 12 weeks duration.

g) **Evaluation of MOOC for B.E. and M.E. students admitted in 2021-2022 & onwards**

Discussion:

Evaluation of MOOC for B.E. (Professional Electives)

- A student of B.E Biomedical Instrumentation Engineering has to score a minimum of 50% marks in NPTEL Examination as per university norms even though NPTEL declares 40% as minimum pass. If she fails to score 50% marks and does not complete the course till VII semester or if the results are not announced by NPTEL before the completion of Comprehensive Examination of the Institute, the student may be permitted to appear for an in-house Comprehensive Examination conducted by the institute at the end of VII semester for the course title already enrolled in NPTEL. In case of failure in the in-house examination, she may be permitted to appear for an in-house arrear examination.

Evaluation of MOOC for M.E. (Program Elective)

- A student of M.E. Medical Electronics has to score a minimum of 50% marks in NPTEL Examination as per university norms even though NPTEL declares 40% as minimum pass. If she fails to score 50% marks and does not complete the course till III semester or if the results are not announced by NPTEL before the completion of comprehensive examination of the institute, the student may be permitted to appear for an in-house comprehensive examination conducted by the institute at the end of III semester for the course title already enrolled in NPTEL. In case of failure in the in-house examination, she may be permitted to appear for an in-house arrear examination.

Additional MOOC

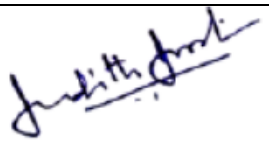
- If a student does not complete the NPTEL certification for the course enrolled till VII semester for B.E. and III semester for M.E to earn the credits required for additional MOOC, in-house examination will be conducted in VII semester for B.E. programme and in III semester for M.E. programme.

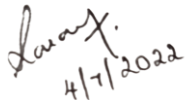
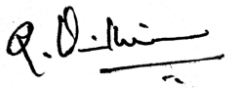
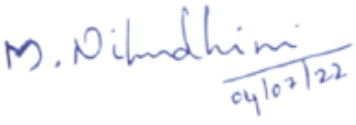
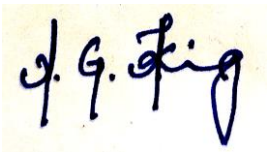
Evaluation and certification of in-house examination

- The question paper pattern for in-house examination **(100% CE paper)** will be:
  - Part A (MCQs, fill in the blanks, true or false) – 25 questions * 1 mark = 25
  - Part B (Descriptive) – 5 questions * 2 marks = 10
  - Part C (Descriptive) – 3 questions * 5 marks = 15

    Total = 50
  - Total 50 marks will be converted to 100 Marks
- Duration of the examination will be 3 hours

	• Questions will be based on the published assignments for the particular course and the course content of NPTEL. • Certificate will be given for the in-house examination by the institute • If the NPTEL results are announced for the course in which the student has enrolled, after conducting the in-house examination by the institute, the score of in-house examination only will be considered.
h)	**Removal of courses from the list of Professional Electives of UG Programme to facilitate MOOC with credit transfer** • Six courses under Professional Elective 1 - Elective V & VI in the seventh semester of B.E Biomedical Instrumentation Engineering have been removed to incorporate MOOC. • Six courses under Professional Elective 2 - Elective V & VI in the seventh semester of B.E Biomedical Instrumentation Engineering have been removed to incorporate MOOC. • The revised list of Professional Electives is enclosed as **Annexure IV**.
i)	**Removal of courses from the list of Program Electives of PG Programme to facilitate MOOC with credit transfer** • Three courses are deleted under Program Elective V in semester III to incorporate MOOC. • The revised list of Program Electives are enclosed as **Annexure V.**
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.)	
	Bhavya S,19010UEB05, IV BMIE, Biomedical Instrumentation Engineering The subjects we are learning are interdisciplinary in nature and include both hardware and software to meet the demands of multi-disciplinary industries. In addition to core biomedical subjects, there are internships in hospitals, which prepare us for placement in hospitals as well as medical equipment manufacturing companies. **Varsha R, 18167UEB42, Alumni** Biomedical Instrumentation Engineering was an all-immersion course that integrated biology, electronics, and computer science. A comprehensive syllabus and course modules were developed to prepare students for foundational and advanced medical and engineering subjects. MOOC courses from SWAYAM - NPTEL, including 'Robotics' and 'Enhancing soft skills and personality', were helpful to deepen my knowledge in the field and to gain a certification useful for internships. **Mr.V.Pragadeeswaran, Founder, Aries Biomedical Technology, Coimbatore.** Syllabus meets industrial needs and bridges the gap between academia and industry. The syllabus adequately covers contemporary topics, and emerging trends in the field of Biomedical Instrumentation Engineering.

Members Present:		**Signature**
Chairperson		
Dr.Judith Justin, Professor & Head, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	

External Members		
Dr.S.Prabakar, Professor & HOD, Department of Bio Medical Engineering, Sona College of Technology, Salem - 636 005.	-	
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.	-	
Mrs.R.Shijitha, Assistant Professor, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	
Mrs.M.Nila Nandhini, Assistant Professor, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	
Invited Members (Staff)		
Mrs. A. Mahalakshmi, Assistant Professor, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	
Mrs.E.Smily Jeya Jothi Assistant Professor, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	
Ms.A.G.Ackshaiyaa Assistant Professor, Department of Biomedical Instrumentation Engineering, School of Engineering.	-	
Invited Member (Student Representative)		
Bhavya S,19010UEB05, III BMIE	-	

Invited member (Alumni Representative)		
Varsha R, 18167UEB42, Alumni, Alumni of 2018-2021 batch	-	

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

***a. Revision of courses without title change* (2020-2021)**

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

***b. Introduction of courses/Revision of Courses with title change* (2021-2022)**

Course code	Course title	Semester	Credits	Type (Specify-New/Title change)	Percentage of revision (if new indicate as new)
-	-	-	-	-	-

2. New Programme (if any) introduced-Nil

3. Part IV Component of UG/ Part II Component of PG (if any): Nil

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)
-	-	-	-	-	-

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

i) B.E. Biomedical Instrumentation Engineering

1. 21BEBE13 – Artificial Intelligence in Healthcare, 21BEBE14 - Machine Learning Techniques, 21BEBE15- Software Design Tools for Sensing and Control specified under Professional Elective 1 - Elective V in the seventh semester of B.E Biomedical Instrumentation Engineering have been removed to incorporate MOOC.

2. 21BEBE16 - Pattern Recognition and Neural Networks, 21BEBE17 - Internet of Things in Medicine, 21BEBE18 - Foundation Skills in Integrated Product Development specified under Professional Elective 1 – Elective VI in the seventh semester of B.E Biomedical Instrumentation Engineering have been removed to incorporate MOOC.

3. 21BEBE33 - Intellectual Property Rights, 21BEBE34 - Artificial Intelligence in Healthcare, 21BEBE35 - Electronics for Sensor Design, specified under Professional Elective 2 - Elective V in the seventh semester of B.E Biomedical Instrumentation Engineering have been removed to incorporate MOOC.

4. 21BEBE36 - Multimedia Compression and Networks, 21BEBE37- Biostatistics, 21BEBE38 - Foundation Skills in Integrated Product Development specified under Professional Elective 2 – Elective VI in the seventh semester of B.E Biomedical Instrumentation Engineering have been removed to incorporate MOOC.

i) **M.E. Medical Electronics**

21MEME51 - Health Care and Hospital Equipment Management, 21MEME52- Telehealth Technology and 21MEME53 Biological Effects of Ionizing and Non-ionizing Radiations specified under Program Elective V in the third semester have been removed to incorporate MOOC.

5. MOOCs for UG and PG Programmes

The following courses are replaced by MOOCs offered by SWAYAM NPTEL through credit transfer. This is applicable for B.E. Biomedical Instrumentation Engineering students admitted in the academic year 2021-2022 and onwards:

Course code	Course Title	Professional Elective (PE1/PE2)	Semester	Credits	Replaced by
21BEBE13	Artificial Intelligence in Healthcare	Elective – V (PE1)	**VII**	**3**	**21BEBE13 MOOC (12 Weeks course in SWAYAM NPTEL)**
21BEBE14	Machine Learning Techniques				
21BEBE15	Software Design Tools for Sensing and Control				
21BEBE33	Intellectual Property Rights	Elective – V (PE2)	**VII**	**3**	**21BEBE33 MOOC (12 Weeks course in SWAYAM NPTEL)**
21BEBE34	Artificial Intelligence in Healthcare				
21BEBE35	Electronics for Sensor Design				

21BEBE16	Pattern Recognition and Neural Networks	Elective – VI (PE1)	**VII**	**3**	**21BEBE14 MOOC (12 Weeks course in SWAYAM NPTEL)**
21BEBE17	Internet of Things in Medicine				
21BEBE18	Foundation Skills in Integrated Product Development				
21BEBE36	Multimedia Compression and Networks	Elective – VI (PE2)	**VII**	**3**	**21BEBE34 MOOC (12 Weeks course in SWAYAM NPTEL)**
21BEBE37	Biostatistics				
21BEBE38	Foundation Skills in Integrated Product Development				

The following courses are replaced by MOOCs offered by SWAYAM NPTEL through credit transfer. This is applicable for M.E. Medical Electronics students admitted in the academic year 2021-2022 and onwards:

Course code	**Course Title**	**Program Elective**	**Semester**	**Credits**	**Replaced by**
21MEME51	Health Care and Hospital Equipment Management	Program Elective-V	**III**	**3**	**21MEME51 MOOC (12 Weeks course in SWAYAM NPTEL)**
21MEME52	Telehealth Technology				
21MEME53	Biological Effects of Ionizing and Non-ionizing Radiations				

One course from core or non-core MOOC offered by SWAYAM NPTEL is mandated for the B.E Biomedical Instrumentation Engineering students admitted in the academic year 2021-2022 and onwards through non-credit transfer:

Course Code	**Course Title**	**Semester**	**Credits**	**Type**
21BEBMC1	**"Title of the NPTEL course completed by the student"**	**III-VII**	**2**	**MOOC (8 Weeks course in SWAYAM NPTEL)**

One course from core or non-core MOOC offered by SWAYAM NPTEL is mandated for the M.E. Medical Electronics students admitted in the academic year 2021-2022 and onwards through non-credit transfer:

Course Code	Course Title	Semester	Credits	Type
21MEBMC1	**"Title of the NPTEL course completed by the student"**	**I-III**	**2**	**MOO**C **(8 Weeks course in SWAYAM NPTEL)**