



PAAVAI ENGINEERING COLLEGE

(Autonomous)

NH 44, PACHAL, NAMAKKAL-637018

DEPARTMENT OF BIOMEDICAL ENGINEERING

ACTION TAKEN REPORT- STAKEHOLDERS FEEDBACK ON CURRICULUM & SYLLABUS

Academic Year 2022-2023

Date: 04.8.2022

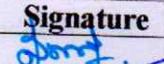

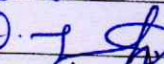
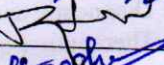
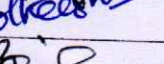
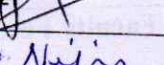
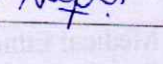
1. Feedback was collected.
2. The feedback was analyzed and reviewed through Internal Committee.
3. The Proposed draft of syllabus was put forth to DAC. The Constructive suggestions were taken from the Stake holder's feedback.
4. After detailed deliberation and discussion, the proposed draft of syllabus with modification was presented to BoS for final Approval.
5. After BoS recommendations, the curriculum and syllabus came into implementation.

Feedback was requested from following Stakeholders


S.No.	Stake Holders	No of feedback form received
1.	Students	59
2.	Teachers	6
3.	Alumni	20
4.	Employer	2

Name of the course	Recommended by	Recommendation	Action Taken
Students Feedback			
Medical Image Processing	Keerthana. M	Need to include biomedical related applications	Forwarded the suggestion for the approval of DAC
Medical Informatics	Kaviyarasan. M	To elaborate with medical codes related to ISO, Indian regulation standards (2017)	Recommendation considered and forwarded to the approval of DAC.
Diagnostic and Therapeutic Equipment	Anandhu. V	Needs Hands on training for advanced therapeutic equipment.	Planned to arrange training.
Faculty Feedback			
Medical Ethics Standards and Safety	Mr. Murugesan. D	IEC60601 basic standards to be included in unit 3.	Planned to add basic standards in unit 3.
Artificial Intelligence for Biomedical Engineering	Dr. Rajasekaran. S	Need to add more algorithms in unit 4.	Planned to add algorithms in unit 4.

Embedded systems and IoT in healthcare	Dr. Jayanthi. N	Healthcare applications and case studies can be included in unit 5.	Forwarded the suggestion for the approval of DAC.
Alumni Feedback			
Machine Learning in Biomedical Engineering	Kavinnilavan. K	Unit 2 is outdated. New contents to be added.	Forwarded the suggestion for the approval of DAC.
Radiological Equipment	Ragul. M	Need local visit of scanning center/ hospital for students to enrich their practical knowledge	Planned to arrange local visits.
Telehealth Technology	Vaishnavi. B. M	Telemedicine topics to be included	Recommendation considered and forwarded to the approval of DAC.
Employer Feedback			
Hospital Internship	Mr.S.Kumar (TMI Systems)	Student feedback about the teaching in hospital must be collected and external evaluation must be needed.	Recommendation considered and forwarded to the approval of DAC.
Wearable Devices and its applications	Boopathi Sakthivel (Prashan Medical Technologies)	Need to include as professional core.	Recommendation considered and forwarded to the approval of DAC.

S.No	Name of the Member	Designation	Role	Signature
1	Dr.T. Arun Kumar	HOD	Chairman/BOS	
2	Mr.D.Murugesan	ASP	Member	
3	Mrs. N. Jayanthi	AP	Member	
4	Dr.S.Rajasekaran	ASP	Member	
5	Mr.S.Jotheeshwaran	AP	Member	
6	Mrs.S.Praveena	AP	Member	
7	Mrs. B. Niranjana Devi	AP	Member	


HOD/BME


PRINCIPAL

PAAVAI ENGINEERING COLLEGE
(Autonomous)
DEPARTMENT OF BIOMEDICAL ENGINEERING

Minutes of Fifth Board of Studies Meeting

Venue: Online mode through Microsoft Teams platform

Date and Time: 04.08.2022, 02.30 p.m

Minutes of Fifth Board of Studies meeting held on August 4th 2022 at 02.00 p.m through online mode using Microsoft Teams platform.

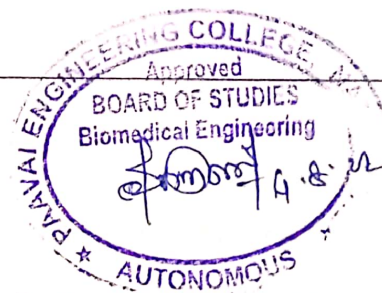
The following members were present

	Name	Designation	Position in committee	College/University/Industry
1	Dr. T. Arunkumar	Professor and Head, Biomedical Engineering	Chairman	Paavai Engineering College
2	Dr. S. Poonguzhali	Professor, Centre for Medical Electronics	University Nominee	College of Engineering, Guindy, Anna University, Chennai.
3	Dr. Judith Justin	Professor & Head, Department of Biomedical Instrumentation Engineering	Academic Expert	Avinashilingam Institute for Home Science and Higher Education for women, Coimbatore.
4	Dr. P. Manimegalai	Associate Professor, Department of Biomedical engineering	Academic Expert	Karunya Institute of Technology and Sciences , Coimbatore.
5	Mr. T. Anbuselvan	General Manager Sales	Industrial Expert	GE Healthcare, Chennai.
6	Ms. B. Niranjana Devi	Assistant Professor/ Biomedical Engineering	Members	Paavai Engineering College
7	Dr. K. Kavitha	Associate Professor/ Biomedical Engineering		
8	Mr. P. Manivannan	Assistant Professor/ Biomedical Engineering		
9	Ms. S. Praveena	Assistant Professor/ Biomedical Engineering		
10.	Ms. F. Sharmila Banu	Assistant Professor/ Biomedical Engineering		

AGENDA

The following agenda are discussed

1. Chairman –BoS introduced the members of the Board of Studies,
2. Chairman –BoS briefed the members about the agenda
3. The Curriculum and syllabus (CBCS) under R2019, 7th and 8th semester for the students admitted in the academic year 2019-2020
4. The Curriculum and syllabus under R2019 (CBCS) 5th, 6th, 7th and 8th semester syllabus for the students admitted in the academic year 2020-2021
5. The list of one credit courses under R 2019



6. Amendments:

- EVS for lateral entry students - VI semesters
- Examination pattern, degree classification and Grading for 2021-2022 admitted students.
- One credit course (soft skills I and II)
- Hospital Internship Training converted to external mode.
- The list of Value added courses under R 2019.
- Panel of examiners as follows,

S.No	Name of The Examiners	College Name
1	Mr.R.Prabu, Department of Biomedical Engineering	Velalar college of engineering and Technology (Autonomus) Erode.
2	Dr. K. Prabakar, Professor and Head, Department of Biomedical Engineering.	Sona College of technology (Autonomus), Salem.
3	Dr. Balasubramaniam.T, Professor, Department of Biomedical Engineering.	Segunthur Engineering college (Autonomus), Erode.
4	Mr. M.Manikandan, Associate Professor, Department of Biomedical Engineering.	Sona College of technology (Autonomus), Salem
5	Prof. MuhammaeduSadhik Raja, Professor and Head, Department of Medical Electronics.	Segunthur Engineering college (Autonomus), Thiruchengode.
6	Dr. Rajalaxmi. S, Associate Professor and Head	Mahendra College of Enginnering, Salem.
7	Dr. Selvam. K, Assistant Professor	Mahendra College of Enginnering, Salem.
8	Dr. M. Prabhu, Associate Professor and Head	Mahendra Institute of Technology (Auonomus), Erode.
9	Ms. R. Santhoshi, Assistant Professor	Mahendra Institute of Technology (Auonomus), Erode.
10	Ms. M. Saranya, Assistant Professor	Mahendra Institute of Technology (Auonomus), Erode.

The following are the suggestions given by the Members of Board of Studies

R 2019 - CURRICULUM & SYLLABUS:

PC - BM19702- MEDICAL IMAGE PROCESSING

- Syllabus have to be reframed completely.
- Arrangement of units must be in sequential manner.
- New edition book 'Gonzalez' is preferred.
- 'S.Esakkirajan' book can be considered as a one of the text books.

PE – BM19352 –TISSUE ENGINEERING

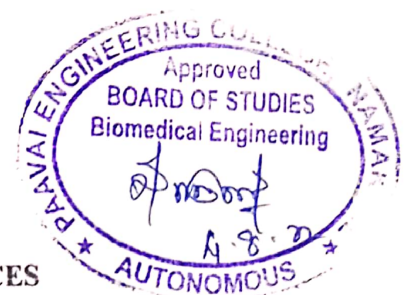
- 'Larry L.Hench and Julian R.Jones' text book have to be included.

PE – BM19353 – TELEHEALTH TECHNOLOGY

- Unit 4 content have to be changed related to telemedicine.
- 'R.S.Khandpur' handbook needed as a reference book.

PE –BM19354- DESIGN AND DEVELOPMENT OF MEDICAL DEVICES

- Syllabus have to be reframed completely.



PE – BM19451– MEDICAL OPTICS AND LASER APPLICATIONS

- Topic repetitions in unit 4 and unit 5 need to be changed.
- In 'Unit 3, Instead of Raman imaging ,change it as Raman spectroscopy & imaging
- In Unit 5, laser safety topic have to be included.

PE –BM19452– MEDICAL ETHICS STANDARDS AND SAFETY

- In Unit 3 IEC60601 basic standard has to be included.
- 'JOHNNA FISHER' text book of bio-medical ethics have to be added.

PE –BM19454– ARTIFICIAL INTELLIGENCE FOR BIOMEDICAL ENGINEERING.

- Course name have to be changed as ARTIFICIAL INTELLIGENCE FOR HEALTH CARE.
- In Unit 4, algorithms need to be added.

OE –BM19903– INTRODUCTION TO DATA SCIENCE

- This course has to be replaced with 'telemedicine health care'instead of 'Introduction to data science'.

OE – BM19904 - WEARABLE DEVICES AND ITS APPLICATION

- The above course has to be included as professional core for bio-medical engineering department.

EE- BM19704- HOSPITAL INTERNSHIP TRAINING

- External evaluation must be needed.
- Students feedback about the teaching in hospital and feedback from staff in the hospital who trained the students needed for NBA.

PC- BM19704- MEDICAL IMAGE PROCESSING LABORATORY

- Image enhancement experiment to be included.
- Instead of 8th experiment, image segmentation to be added.
- 1st experiment topic has to be changed as colour image processing.
- Instead of 11th experiment, wavelet decomposition and reconstruction have to be added.

PC– BM19801 – RADIOLOGICAL EQUIPMENT

- Joseph D.Bronzino,Physics of medical imaging text book need to be included.
- Medical imaging signals and systems Jerry L. Prince have to be included as a text book.

PE – BM19552 – EMBEDDED SYSTEM AND INTERNET OF THINGS IN HEALTH CARE

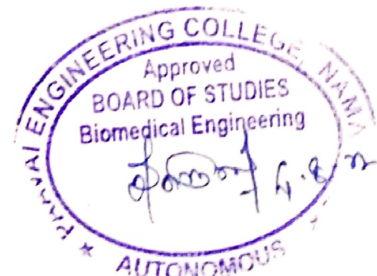
- Unit 3 Arduino have to be removed from title and change the title as processor.

PE – BM19553 – PHYSIOLOGICAL MODELLING

- 'David D Argenio and Michael Khoo' text book have to be included.

PE – BM19652– MACHINE LEARNING IN BIOMEDICAL ENGINEERING

- This course has been replaced with 'Wearable Devices and its Application'.



UG Regulation 2019 (AMENDMENTS)

- For lateral entry students Environmental Science and Engineering will be included in 6th semester of Regulations 2019 for the students admitted in the year 2020-2021 and to include in 4th semester of Regulations 2019 for the students admitted in the year 2021-2022 onwards.

GENERAL DISCUSSIONS:

- In one credit course:
 - In embedded programming, company name arduino has to be removed.
 - In matlab programming, title has to be changed related to medical images and basic clinical application with respect to organs and modality has to be included.
 - Quality assurance in equipment management should be added.
- Value added courses are discussed and approved.
- Discussions regarding R 19 (19-20), R 19 (20-21) are made and clarified.

The list of one credit courses offered to the students during the academic year 2022-2023.

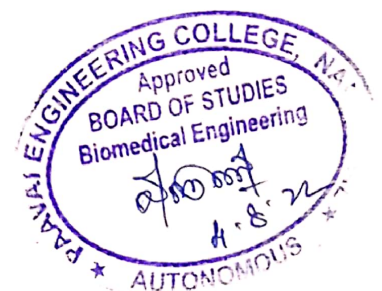
S.NO	Course Code	Course Name
1	BM19951	Embedded Programming
2	BM19952	PC Hardware Assembling and Troubleshooting
3	BM19953	Basic Electronic Circuit Design using Multisim
4	BM19954	Matlab Programming
5	BM19955	Labview Programming
6	BM19956	Open source programming using Linux
7	BM19957	PCB Design using KICAD EDA Tool
8	BM19958	VHDL Programming
9	NPTEL	NPTEL – Swayam – 4 Weeks Course
10	CDL	Soft Skills I and II – Grade equivalence for 2 nd year students

Examination Pattern for relative grading:



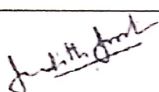


Anna University – Uniform Evaluation Method of students based on Relative Grading – Letter No. 4040/AU/CAC/Relative Grading/2022 dated on 25.6.22 is followed for the students admitted in the year 2021-2022.

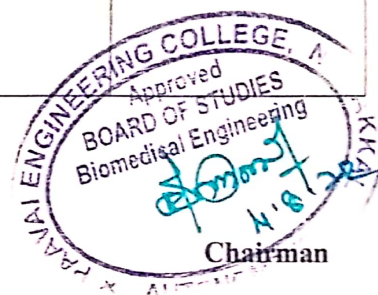
The list of value added courses offered to the students during the academic year 2022-2023

S.NO	Course Name
1	Machine Learning
2	Internet of Things
3	Circuit Design and PCB Fabrication
4	Raspberry Pi
5	Artificial Intelligence using MATLAB
6	Embedded Systems using code composer studio



The above suggestions were given by the members and approved the syllabi for the 7th and 8th semester of 2019-2020 admitted students, 5th, 6th, 7th, 8th semester of 2020-2021 admitted students of regulations 2019(CBCS), value added course and panel of examiners.

Position in the committee	Chairman	University Nominee	Academic Expert 1	Academic Expert 2	Industry Expert
Name & Designation	Dr. T. Arunkumar Professor & Head, BME	Dr. S. Poonguzhali Associate Professor, centre for medical electronics, Anna University, Chennai.	Dr. Judith Justin Professor and Head, Department of Biomedical Instrumentation Engineering	Dr. P. Manimegalai Associate Professor, Department of Biomedical Engineering	Mr. T. Anbuselvan General Manager sales, GE health care, Chennai.
	 				



PAAVAI ENGINEERING COLLEGE
(AUTONOMOUS)
DEPARTMENT OF BIOMEDICAL ENGINEERING
ACTION TAKEN REPORT OF 5TH BOS
BOS SUGGESTIONS AND IMPLEMENTATION
ACADEMIC YEAR 2022-2023

S.No	Semester	Course code & Name	Suggestions	Implementation
1.	VII	PE - BM19353 - Telehealth technology	Suggested to change the content of unit-4	Implemented
2.	VII	PE - BM19354 - Design and development of medical devices	Syllabus have to be reframed completely	Implemented
3.	VII	PE – BM19451-Medical optics and laser applications	Topic repetitions in unit 4 and unit 5 need to be changed. In `Unit 3, Instead of Raman imaging ,change it as Raman spectroscopy & imaging In Unit 5, laser safety topic has to be included.	Implemented
4.	VII	PE- BM- 19454- Artificial intelligence for biomedical engineering	Course name have to be changed as ARTIFICIAL INTELLIGENCE FOR HEALTH CARE.	Implemented
5.	VII	OE–BM-19903–Introduction to data science	Course has to be replaced with ' telemedicine health care ' instead of 'Introduction to data science'.	Implemented
6.	VIII	PE - BM19652 -Machine learning in biomedical engineering	This course has been replaced with ' Wearable Devices and its Application '.	Implemented
7.	VII	PC-BM19702-Medical image processing	Syllabus have to be reframed completely	Implemented

The above implementations were effective from the academic year 2022– 2023.

