



PAAVAI ENGINEERING COLLEGE

(Autonomous)

NH 44, PACHAL, NAMAKKAL-637018

DEPARTMENT OF BIOMEDICAL ENGINEERING

STAKE HOLDERS FEED BACK ACTION TAKEN REPORT

Academic Year 2021-2022

Date:31.07.2021

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	84
2.	Teachers	9
3.	Employer	3

Course	Recommended by	Recommendation	Action Taken
Students Feedback			
Healthcare and hospital management	M. Aruna (IIIrd year BME)	In healthcare and hospital management subject, we are requesting to carry more hospitalised based equipments & equipment maintenance management	Forwarded the suggestion for the approval of DAC
Medical Image Processing	Sandra Elizabeth (IIIrd year BME)	If the Image Restoration and Segmentation topic included in this subject it will help to diagnose the medical images	Revised and Forwarded the suggestion for the approval of DAC
Medical Ethics Standards and Safety	M.Ragul (IIIrd year BME)	If the topic that medical devices standards added in our syllabus that help us to know about to attend NABH and NABL	Revised and Forwarded the suggestion for the approval of DAC
Nanotechnology and Applications	Krishnaraj.K (IIInd Year BME)	In introduction nano technology , if the subject as Overview of nanotechnology from medical perceptive, different types of nano	Forwarded the suggestion for the approval of DAC

			biomaterials carries its very usefull to know about future development	
Faculty Feedback				
Medical image processing	Dr.R.Pushpavalli, Dept of BME		If we added this topic Medical Image Analysis and Classification is used for the students to exploration of 3D image datasets of the human body	Forwarded the suggestion for the approval of DAC
Wearable Systems	Ms.A.Ancy Christy, AP, Dept of BME		If we include more new application in this topic Applications of wearable systems, students will know updated technology related to monitoring systems	Forwarded the suggestion for the approval of DAC
Virtual Reality in Medicine	Mr.D.Murugasan, ASP, Dept of BME		In this topic VR programming, students should learn more about 3D Sprites and animated 3D sprites.	Forwarded the suggestion for the approval of DAC
Biometric Systems	Mr.K.Basker, AP, Dept of BME		In Fingerprint Technology, the students gained knowledge about fingerprint sensors using RF imaging techniques	Forwarded the suggestion for the approval of DAC
Human Assist Devices	Mr.S.Jotheeshwaran, AP, Dept of BME		In this topic Prosthetic device, students learn more about artificial organs.	Forwarded the suggestion for the approval of DAC
Employer Feedback				
Hospital training	Boopathi Sakthivel (Prashan medical technologies)		Hands on training on hospitalized equipment those were having a student to explore the knowledge and develop software application related to this field	Forwarded the suggestion for the approval of DAC
Project I & Project II	Boopathi Sakthivel (Prashan medical technologies)		If we keep as a subject Project I & Project II, there is different protocol of student has to submit two projects, but it has changed into	Take it as a suggestion and forwarded for the approval of DAC

	Project phase I and Project phase II students able to continue their project in Research oriented	
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S.No	Name of the Member	Designation	Role	Signature
1	Dr. T. Arun Kumar	HOD	Chairman/BOS	
2	Dr. K. Baskar	ASP	Member	
3	Mrs. N. Jayanthi	AP	Member	
4	Ms. A. Ancy Christy	AP	Member	
5	Ms. R. Deepa Sri	AP	Member	
6	Mrs. F. Sharmila Banu	AP	Member	
7	Ms. M. Prema	AP	Member	


HOD/BME


PRINCIPAL

PAAVAI ENGINEERING COLLEGE (AUTONOMOUS)
DEPARTMENT OF BIOMEDICAL ENGINEERING
MINUTES OF THE FOURTH BOARD OF STUDIES MEETING
(ONLINE MODE)

DATE: 31.07.2021

TIME: 10.30 AM – 1.30 PM

MEMBERS PRESENT

S.NO	NAME & DESIGNATION	POSITION IN COMMITTEE	COLLEGE/UNIVERSITY/INDUSTRY
1.	DR. ARUN KUMAR.T PROF/BME	BoS CHAIRMAN	PAAVAI ENGINEERING COLLEGE
2.	DR. POONGUZHALI.S ASP/MDE	UNIVERSITY NOMINEE	COLLEGE OF ENGINEERING-GUINDY, ANNA UNIVERSITY, CHENNAI.
3.	DR. JUDITH JUSTIN PROF/BME	ACADEMIC EXPERT 1	AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN, COIMBATORE.
4.	DR. MANIMEGALAI. P ASP/BME	ACADEMIC EXPERT 2	KARUNYA INSTITUTE OF TECHNOLOGY AND SCIENCES, COIMBATORE.
5.	MR. ANBUSELVAN. T GM SALES	INDUSTRY EXPERT	GE HEALTH CARE, CHENNAI.
6.	MS. ANCY CHRISTY.A AP/BME	MEMBER	PAAVAI ENGINEERING COLLEGE
7.	DR. PUSHPAVALLI.S ASP/MDE	MEMBER	PAAVAI ENGINEERING COLLEGE
8.	MR. BASKAR.K ASP/BME	MEMBER	PAAVAI ENGINEERING COLLEGE
9.	MR. BOOPATHI. D ASP/BME	MEMBER	PAAVAI ENGINEERING COLLEGE
10.	MR. MURUGESAN.D ASP/MDE	MEMBER	PAAVAI ENGINEERING COLLEGE
12.	MR. JOTHEESWARAN.S AP/BME	MEMBER	PAAVAI ENGINEERING COLLEGE
13.	MR. MANIVANNAN.P AP/BME	MEMBER	PAAVAI ENGINEERING COLLEGE
14.	MS. SENTHAMIL.S AP/MDE	MEMBER	PAAVAI ENGINEERING COLLEGE

AGENDA

1. The Curriculum and syllabus for the 7th and 8th semester of Regulations 2016(For the students admitted during the academic year 2016-2017).
2. The Curriculum and syllabus for the 5th and 6th semester of Regulations 2019(For the students admitted during the academic year 2019-2020).
3. The Curriculum and syllabus for the 3rd and 4th semester of Regulations 2019(For the students admitted during the academic year 2020-2021).
4. List of one credit and value-added courses.
5. Panel of examiners.

SUGGESTIONS BY THE MEMBERS

R 2016 - CURRICULUM & SYLLABUS:

PC - BM16701 - HUMAN ASSIST DEVICES

- In Unit 4, Functional Electrical Stimulator topic can be replaced with orthotic devices topics such as hip & knee replacements etc. Based on the the review, orthotic devices topics are included.
- Unit 4 & 5 can be reviewed based on robotics concepts from the book, "Medical devices and Human Engineering" of the author- "Bronzino".
- Based on the review, robotic concepts in unit 4 & 5 are added.

PC - BM16702-MEDICAL IMAGE PROCESSING

- Biomedical applications, case studies should be included in every unit or every 2 units.

PC - BM16703 – BIO CONTROL SYSTEMS

- Controller concepts in unit 2 can be removed. Based on the review, controller concepts are removed.

PC – BM16704 – MEDICAL IMAGE PROCESSING LABORATORY

- Experiments related to wavelets can be included and experiments are suggested to perform under MATLAB and PYTHON software respectively.

PE – BM16351 –TISSUE ENGINEERING

- Case study concepts- artificial skin, artificial blood vessels, artificial pancreas from the book, "Tissue Engineering: Principles and Practices" of the author- "Bronzino" can be included in unit 5. Based on the review, case study concepts are included.

PE – BM16352 – REHABILITATION ENGINEERING

- Unit 2,3 can be revised based on volumetric analysis.
- 3 D biomedical models can be included in unit 4 or 5.
- Based on the review, topics are revised on volumetric analysis in unit 2, 3 and 3 D biomedical models are added in unit 4 or 5.

PE – BM16353 – DESIGN AND DEVELOPMENT OF MEDICAL DEVICES

- Basic topics can be replaced with advanced concepts in units 1 & 2.
- Unit 3 can be reviewed; concepts related to calibration, protocol regulations related to design of the product till reaching the market can be included. Unit 3 is revised based on the review.

PE – BM16354 – MEDICAL ETHICS STANDARDS AND SAFETY

- Units 3 & 4 can be reviewed based on volumetric analysis.
- Based on the review, unit 3, 4 got revised.

PE – BM16451 – BIOMETRIC SYSTEMS

- Reviewed and No changes.

PE – BM16452 – FUNDAMENTALS OF BIOMEDICAL NANOTECHNOLOGY

- Concepts such as protein engineering, nano robotics, tissue engineering can be added in unit 5. Based on the review, upgraded concepts are included in unit 5.

PE – BM16453 – ADVANCED HEALTHCARE SYSTEM DESIGN

- Title of the course can be named as “Digital Health Care”.

PE – BM16454 – ADVANCED MEDICAL IMAGING SYSTEMS

- Recent topics such as PET, SPECT and Proton therapy can be updated in unit 4 & 5.
- Basic topics such as fluoroscopy can be reviewed in unit 2. Based on the review, topics are updated.

PC – BM16705 – HOSPITAL TRAINING

- In Hospital Training Report, observation of equipments from different modality should be covered in terms of ethnic groups.
- Concepts such as biomedical engineer role in a hospital, sanitary guides to be followed in a hospital should be covered.
- SPM Hospital – Er. Sundaram, Head of Biomedical Department can be referred for hospital training.
- “Academic Sector” of GE HEALTH CARE provides online training (5-day program) which can be made accessible for students in pandemic conditions.

PC – BM16706 – PROJECT WORK PHASE I

- Structure of the project phase I shall be revised.

PC – BM16801 – HEALTHCARE AND HOSPITAL MANAGEMENT

- Asset management tools can be included in unit 1 & 2.

PE – BM16551 - ARTIFICIAL ORGANS AND IMPLANTS

- Textbook upgradation must be done.
- Joon B Park’s book named “Biomaterials Science and Engineering” need to be checked for update.

PE – BM16552 - EMBEDDED SYSTEMS AND IOT IN HEALTHCARE

- Coverage of topics in the prescribed textbooks has to be checked and reviewed.

PE – BM16553 - PHYSIOLOGICAL MODELING

- Repetitive concepts in unit 1 can be removed. Based on the review, lung model illustration concept in unit 1 was removed.

PE – BM16554 –ROBOTICS AND AUTOMATION IN MEDICINE

- Recent concepts such as ‘3D visualization of medical organs’ can be updated in unit 4 or 5.
- Unit 5 can be updated with cognitive applications. Based on the review, unit 4 & 5 are reviewed.

PE – BM16651 –VIRTUAL REALITY IN MEDICINE

- Unit 5 can be updated with concepts related to biomedical applications. Based on the review, unit 5 got revised.

PE – BM16652 –WEARABLE SYSTEMS

- Suggested to change the title of the course as “WEARABLE DEVICES”.

PE – BM16653 –QUALITY CONTROL IN BIOMEDICAL ENGINEERING

- In Unit 1, strategic quality planning must be reviewed.
- In Unit 5, regulatory bodies can be included and Equipments under class A & B and ISO regulation 9001 - 13485 shall be included.
- Based on the review, topics are included in unit 5.

PE – BM16654 –MEDICAL RADIATION SAFETY

- Concepts related to radiation monitoring & measurements, nuclear medicine - measuring devices can be updated in unit 4, 5.
- Devices related to radiation monitoring need to be reviewed. Based on the review, unit 4,5 got updated.

PC – BM16802 – PROJECT WORK PHASE II

- Structure of Project phase II shall be revised.

R 19 (19 – 20) - CURRICULUM & SYLLABUS:

PC – BM19505 – DIAGNOSTIC AND THERAPEUTIC EQUIPMENT I


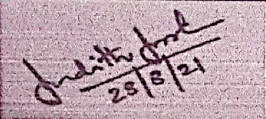
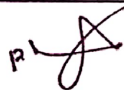

- Content of all the units can be revised. Based on the review, Units 1-5 contents are revised on volumetric aspect.

GENERAL DISCUSSIONS:

- Hospital Training, Project Phase I, Project Phase II, Bio Signal Processing Laboratory and Diagnostic and Therapeutic Equipment Laboratory – course objectives relevant to course outcomes are discussed and got approved respectively.

- Credits allocation has been discussed.
- One credit courses got discussed and approved.
- Value added courses are suggested for inclusion of certification along with grade sheets.
- Discussions regarding R 19 (19-20), R 19 (20-21) are made and clarified.

The above suggestions were given by the members and approved the syllabi for the 5th and 6th semester of 2019-20 admitted students, 3rd and 4th semester of 2020-2021 admitted students of Regulations 2019(CBCS), one credit courses, value added courses and panel of examiners.

Position in the committee	UNIVERSITY NOMINEE	ACADEMIC EXPERT 1	ACADEMIC EXPERT 2	INDUSTRY EXPERT
Name & Designation	DR. POONGUZHALI.S ASP/MDE	DR. JUDITH JUSTIN PROF/BME	DR. MANIMEGALAI. P ASP/BME	MR. ANBUSELVAN. T GM SALES
e-Signature				

PAAVAI ENGINEERING COLLEGE (AUTONOMOUS)

DEPARTMENT OF BIOMEDICAL ENGINEERING

ACTION TAKEN REPORT

4th BOS Held on 31.7.2021

Date:03.08.2021

Based on the discussion and recommendations held during the Standing Committee meeting dated 02.08.2021

The following suggestions have been implemented in the curriculum and syllabus.

UG - REGULATIONS 2016

S.No	Year	Course code & Name	Suggestions	Implementation
1.	IV	BM16701 - Human assist devices	Unit 4, Functional Electrical Stimulator topic can be replaced with orthotic devices topics.	IMPLEMENTED
2	IV	BM16702 - Medical Image Processing	Case studies may be included.	IMPLEMENTED
3	IV	BM16703 – Biocontrol Systems	Controller concepts in unit 2 can be removed.	IMPLEMENTED
4	IV	BM16351 - Tissue Engineering	Case study concepts- artificial skin, artificial blood vessels topics may be included in unit 5.	IMPLEMENTED
5	IV	BM16352 - Rehabilitation Engineering	Robotics and virtual reality concepts should be included in unit 4.	IMPLEMENTED
6	IV	BM16353 - Design and Development of Medical Devices	Unit 3 can be reviewed; concepts related to calibration, protocol regulations related to design of the product till reaching the market can be included.	IMPLEMENTED
7	IV	BM16354 - Medical Ethics Standards and Safety	Volumetric analysis should be done for all units.	IMPLEMENTED
8	IV	BM16452 - Fundamentals of Biomedical Nanotechnology	Concepts such as protein engineering, nano robotics, tissue engineering can be added in unit 5.	IMPLEMENTED
9	IV	BM16453 - Advanced healthcare system design	Rename the course as “Digital health care”.	IMPLEMENTED
10	IV	BM16454 -	Recent topics such as PET,	IMPLEMENTED

		Advanced Medical Imaging Systems	SPECT and Proton therapy can be updated in unit 5.	
11	IV	BM16704 - Medical Image Processing Laboratory	Experiments related to wavelets can be included and experiments are suggested to perform under MATLAB and PYTHON software respectively.	IMPLEMENTED
12	IV	BM16707 - Project Work Phase I	Structure of the project phase I should be revised.	IMPLEMENTED
13	IV	BM16801 - Healthcare and Hospital Management	Asset management concepts can be included in unit 5.	IMPLEMENTED
14	IV	BM16552 - Embedded Systems and IoT in Health Care	Coverage of topics in the prescribed textbooks has been reviewed.	IMPLEMENTED
15	IV	BM16553 - Physiological Modeling	Lung model illustration concept in unit 1 can be removed.	IMPLEMENTED
16	IV	BM16554 - Robotics and Automation in Medicine	Updation with cognitive applications is done in unit 4 & 5.	IMPLEMENTED
17	IV	BM16651 - Virtual Reality in Medicine	Concepts related to biomedical applications should be included in unit 5.	IMPLEMENTED
18	IV	BM16652 - Wearable systems	Rename the Title as "Wearable Devices"	IMPLEMENTED
19	IV	BM16653 - Quality Control in Biomedical Engineering	Regulatory bodies and ISO regulation 9001 - 13485 shall be implemented.	IMPLEMENTED
20	IV	BM16654 - Medical Radiation Safety	Concepts related to radiation monitoring & measurements, nuclear medicine - measuring devices have been included in unit 5.	IMPLEMENTED
21	IV	BM16802 - Project Work Phase II	Structure of the project phase II has been revised.	IMPLEMENTED

The above implementations are effective from the academic year 2021-2022.


HOD/BME

Head of the Department
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