MAHENDRA COLLEGE OF ENGINEERING
(Approved by AICTE, Affiliated to Anna University, Chennai-25)
Minnampalli, Salem – 636 106

B.E. BIO-MEDICAL ENGINEERING

Program Outcomes (POs)

Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Design / Development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

The students will demonstrate the abilities to

PSO 1: To enable the graduates to demonstrate their skills in solving challenges in their chosen field through the core foundation and knowledge acquired in engineering and biology.

PSO 2: To enable the graduates to exhibit leadership, make decisions with societal and ethical responsibilities, function and communicate effectively in multidisciplinary settings.

PSO 3: To ensure that graduates will recognize the need for sustaining and expanding their technical competence and engage in learning opportunities throughout their careers.

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OURSE OUTCOME STATEMENTS FOR B.E.BIO-MEDICAL ENGINEERING (2013 REGULATION

SEMESTER 01		
1.Course Code and Name : - HS8151 & COMMUNICATIVE ENGLISH		
	CO Statements	**BLT**
The students should be able		
1	To classify the types of listening and writing skills with acquired knowledge	K2

2	To demonstrate speaking skills in various occasions	K2
3	To compare the formal and informal writing skills by using the mail and blocks	K2
4	To apply the speaking etiquitte to build up communication proficiency	K3
5	To develop presentations with the use of LSRW skills	K3
2.Course Code and Name : MA6151 - MATHEMATICS I		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Solve the Eigen values and Eigen vectors to diagonalise and reduce a matrix to quadratic form	K3
2	Identify the convergences, divergences of infinite series	K3
3	Solve evolutes and envelopes of a given curve by using radius of curvature and center of curvature	K3
4	Identify the maxima and minima value functions of two variables	K3
5	Solve area of plain curves and volume of solid using double and triple integrals	K3
3.Course Code and Name : PH6151 - ENGINEERING PHYSICS I		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Explain the basics of properties of matter and its applications	K2
2	Summarize the concepts of waves and optical devices and their applications in fiber optics	K2
3	Demonstrate the concepts of thermal properties of materials and their applications in expansion joints and heat	K2
4	Outline the concepts of advanced physics quantum theory and its applications in tunneling microscopes	K2
5	Explain the basics of crystals, their structures and different crystal growth techniques	K2
4.Course Code and Name : CY6151 - ENGINEERING CHEMISTRY I		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Classify the polymers and their utility in the industries and explain the techniques of polymerization and properties of	K2
2	Relate various thermodynamic functions such as enthalpy, entropy, free energy and their importance	K2
3	Explain the photo physical processes such as fluorescence and phosphorescence and various components of UV and IR spectrophotometer	K2
4	Illustrate the phase transitions of one component and two component systems and the types of alloys and their	K2
5	Outline the synthesis, characteristics and the applications of nano materials	K2

5.Course Code and Name : GE6151- COMPUTER PROGRAMMING		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Describe the function of a Computer and problem solving techniques.	K2
2	Write simple C programs using basic constructs	K3
3	Implement applications to manage data using arrays and strings	K3
4	Apply functions and pointers for solving problems	K3
5	Develop simple applications using structure and union	K3
6.Course Code and Name : GE6152- ENGINEERING GRAPHICS		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Demonstrate freehand sketching of basic geometrical constructions and multiple views of objects	K2
2	Develop orthographic projections of points, lines and plane surfaces	K3
3	Construct projections of simple solids and truncated solids	K3
4	Develop projection of sectioned solids and utilize development of surfaces	K3
5	Construct isometric and perspective projections of simple solids	K3
7.Course Code and Name : GE6161- COMPUTER PRACTICES LABORATORY		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Apply the usage of office automation tools.	K2
2	Apply good programming design methods for program development.	K3
3	Design and implement C programs for simple applications.	K3
4	Develop recursive programs.	K3
8.Course Code and Name : GE6162 - ENGINEERING PRACTICES LABORATORY		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Construct carpentry components and pipe connections including plumbing works	K2
2	Make use of welding equipments to join the structures	K3
3	Develop models using sheet metal work	K3

4	Illustrate the working of centrifugal pump and air conditioner	K3
5	Demonstrate basic home electrical works, measurement of the electrical quantities and soldering practices	

9.Course Code and Name : GE6163 - PHYSICS AND CHEMISTRY LABORATORY - I		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Make use of spectrometer to find the wavelength of spectral lines, and laser	K3
2	Make use of ultrasonic interferometer and Lee's disc apparatus to find the velocity of sound, compressibility of the liquid and thermal conductivity	K3
3	Demonstrate the estimation of DO content in water sample by Winkler's method and molecular weight of polymer by Ostwald viscometer	K2
4	Experiment with the strength of an acid using pH meter and conductometer	K3
5	Demonstrate the estimation of weak and strong acids in a mixture by conductometer	K2
		K3

SEMESTER 02		
1.Course Code and Name : - HS6251 & TECHNICAL ENGLISH		
	CO Statements	**BLT**
The students should be able		
1	To develop the communication skills with proper grammar usage	K2
2	To summarize the various advanced technical and non-technical english tools	K2
3	To classify the speaking skills and expression through professional english	K2
4	To apply the interview techniques for career development	K3
5	To outline the use of writing skills to express innovatiove ideas	K3
2.Course Code and Name : - MA6251 & ENGINEERING MATHEMATICS-II		
	CO Statements	**BLT**
The students should be able		
1	To apply solenoidal, irrotational vectors and make use of the concepts of Green's, Gauss divergence , Stokes theorem to evaluate single, double and triple integrals	K3
2	To solve simultaneous linear equations and P.I. of Cauchy and Legendre Equation	K3
3	To solve Laplace Transforms of periodic functions and ODE using Inverse Laplace Transform	K3

4	To make use of the properties of analytic functions for verifying C-R equations for determination of Bilinear	K3
5	To develop the functions of two variables as Taylor's and Laurent's series and Contour integrals by using Cauchy's	K3
3.Course Code and Name : PH6253 & PHYSICS FOR ELECTRONICS ENGINEERING		
	CO Statements	**BLT**
The students should be able		
1	To explain the basics, properties and applications of conducting materials	K2
2	To summarize the properties of semiconducting materials and semiconductor devices.	K2
3	To explain the basics, properties and applications of the magnetic materials and super conducting material	K2
4	To illustrate the concepts, mechanisms and applications of dielectric materials	K2
5	To outline the method of synthesis and explain the properties of Nano materials, SMA, Metallic glasses and Ceramics	K2
4.Course Code and Name : BM6251 & ENGINEERING MECHANICS FOR BIOMEDICAL ENGINEERS		
	CO Statements	**BLT**
The students should be able		
1	To develop the vectorial and scalar representation of forces and moments	K3
2	To solve problems pertaining to rigid bodies in equilibrium	K3
3	To identify the properties of surfaces and solids like centriod and moment of inertia etc.	K3
4	To solve problems pertaining to rigid bodies under the effect of dynamic forces	K3
5	To apply the laws of friction for the solution of simple rigid bodies	K3
5.Course Code and Name : - BM6201 & FUNDAMENTALS OF BIO CHEMISTRY		
	CO Statements	**BLT**
The students should be able		
1	To study structural and functional properties of Biomolecules	K1
2	To understand the structural and functional properties of carbohydrates, proteins and lipids	K2
3	To understand the influence of biomolecules on diseases and disorders	K2
4	To understand the role of the biomolecules by providing basic information on specific metabolic diseases and disorders	K2
5	To study the classification and applications of enzymes	K2
6.Course Code and Name : EC6251 - CIRCUIT ANALYSIS		

	CO Statements	BLT
The students should be able		
1	To understand the basic concepts of DC and AC circuits and analyze them	K4
2	To analyze the transient and steady state response of the circuits subjected to step and sinusoidal excitations.	K4
3	To understand different methods of circuit analysis using Network theorems	K4
4	To understand the concepts of duality and topology.	K4
5	To understand and analyze the Two Port networks	K4
7.Course Code and Name : GE6261 & ENGINEERING PRACTICES LABORATORY		
	CO Statements	BLT
The students should be able		
1	To construct carpentry components and pipe connections including plumbing works	K2
2	To make use of welding equipments to join the structures	K3
3	To develop models using sheet metal work	K3
4	To illustrate the working of centrifugal pump and air conditioner	K3
5	To demonstrate basic home electrical works, measurement of the electrical quantities and soldering practices	K3
8.Course Code and Name : BM6211 BIOCHEMISTRY LABORATORY		
	CO Statements	BLT
The students should be able		
1	To estimate and quantify biomolecules	K2
2	To understand separation of macromolecules.	K2
3	To estimate and interprete biochemical parameters	K2
4	To determine the type, amount of alkalinity, hardness in a given water sample and evaluate the amount of copper using	K5
5	To examine the potentiometric redox titration and conductometric precipitation titration	K4
SEMESTER 03		
1.Course Code and Name : MA8352- LINEAR ALGEBRA AND PARTIAL DIFFERENTIAL EQUATIONS		
	CO Statements	BLT
The students should be able		
1	To solve differential equations using Fourier series analysis for engineering applications.	K3

2	To utilize Dirichlet's condition for finding the Fourier series of a given function	K3
3	To apply Fourier series to solve one dimensional way, one and two dimensional heat equations.	K3
4	To solve Fourier transform for a given function and make use of them to evaluate certain definite Integrals	K3
5	To solve z transforms of standard functions and make use of use them to solve difference equations	K3
2.Course Code and Name : EC8352- SIGNALS AND SYSTEMS		
	CO Statements	**BLT**
The students should be able		
1	To make use of the properties of signals & systems	K3
2	To apply Laplace transform, Fourier transform, Z transform and DTFT in signal analysis	K3
3	To build the continuous time LTI systems using Fourier and Laplace Transforms	K3
4	To build discrete time LTI systems using Z transform and DTFT	K3
5	To apply the transforms in designing the systems	K3
3.Course Code and Name : BM8351 ANATOMY AND HUMAN PHYSIOLOGY		
	CO Statements	**BLT**
The students should be able		
1	To understand the basic structure and functions of cell	K1, K2
2	To learn about the mechanism, types and function of skeletal and respiratory system	K1, K2
3	To understand the interconnect of various systems	K1, K2
4	To learn about the composition of blood and it's function	K1, K2
5	To Learn about the various signal transmission occuring in human body	K1, K2
4.Course Code and Name : BM8301 SENSORS AND MEASUREMENTS		
	CO Statements	**BLT**
The students should be able		
1	To understand the measuring of various electrical parameters with accuracy,precision,resolution.	K2
2	To select appropriate passive or active transducers for measurement of physical phenomenon.	K2
3	To learn selection of appropriate light sensors for measurement of physical phenomenon.	K2
4	To understand AC and DC bridges for relevant parameter measurement.	K2
5	To understand multimeter,CRO and different types of recorders for appropriate measurement.	K2, K3

5.Course Code and Name : EC6201 Electronic Devices and CIRCUITS		
	CO Statements	**BLT**
The students should be able		
1	To understand the structure of basic electronic devices.	K2
2	To get exposed to active and passive circuit elements.	K2
3	To get familiarized with the operation and applications of transistor like BJT and FET.	K2
4	To understand the characteristics of amplifier gain and frequency response.	K2
5	To understand the required functionality of positive and negative feedback systems.	K2
6.Course Code and Name : BM8302 PATHOLOGY AND MICROBIOLOGY		
	CO Statements	**BLT**
The students should be able		
1	To learn the structural and functional aspects of living organisms.	K1, K2
2	To know the etiology and remedy in treating the pathological diseases.	K1, K2
3	To learn the structure of Bacteria and virus and their impact on diseases	K1, K2
4	To learn the different types of microscopes	K1, K2
5	To understand the importance of public health.	K1, K2
7.Course Code and Name : BM8311 PATHOLOGY AND MICROBIOLOGY LABORATORY		
	CO Statements	**BLT**
The students should be able		
1	To use compound microscopes	K2
2	To practice on chemical examinations, Cryoprocessing	K2
3	To learn the different staining techniques	K2
4	To perform experiments on tissue processing	K2
5	To perform experiments on tissue processing histopathological examinations	K2
8.Course Code and Name : BM8312 DEVICES AND CIRCUITS LABORATORY		
	CO Statements	**BLT**
The students should be able		
1	To learn the characteristics of basic electronic devices such as Diode, BJT,FET, SCR	K2
2	To analyse the Common Emitter and Common Base Characteristics	K4

3	To verify the Thevinin & Norton theorem, KVL & KCL, and Super Position Theorems	K5
4	To design RL and RC Circuits	K6
5	To understand the working of clipper and clamper circuits	K2
9.Course Code and Name : BM8313 HUMAN PHYSIOLOGY LABORATORY		
	CO Statements	**BLT**
The students should be able		
1	To learn the estimation and quantification of blood cells	K2
2	To understand the Identification and enumeration of blood cells	K2
3	To learn the Enumeration of haematological parameters	K2
4	To analyse of special sensory organs test	K4
5	To learn the estimation and quantification of blood cells	K2

SEMESTER 04		
1.Course Code and Name : MA8391 & PROBABILITY AND STATISTICS		
	CO Statements	**BLT**
The students should be able		
1	To explain the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.	K2
2	To illustrate the basic concepts of one and two dimensional random variables and apply in engineering applications.	K2
3	To apply the concept random processes in engineering disciplines.	K3
4	To apply the concept of correlation and spectral densities.	K3
5	To analyze the response of random inputs to linear time invariant systems.	K4
2.Course Code and Name : BM8401 MEDICAL PHYSICS		
	CO Statements	**BLT**
The students should be able		
1	To explain about non-ionizing radiation, interaction with tissue and its effects.	K2
2	To define and compare intensities of sensory stimuli	K1
3	To summarize ionizing radiation interaction with the human body and to quantify its levels seen in the environment and	K2

4	To explain the fundamentals of radioactivity and radioactive isotopes	K2
5	To Illustrates the methods of detecting and recording the ionizing radiation and its interaction with matte	K2
3.Course Code and Name : EE8452 BASICS OF ELECTRICAL ENGINEERING		
	CO Statements	**BLT**
The students should be able		
1	To design simple electrical circuits and understand through nodal, mesh analysis about constructing series and parallel	K1, K2, K3
2	To understand the basic principles of motors and their different applications	K2
3	To understand power distribution for application of safety principles in biomedical equipments	K2
4	To analyze electromagnetic fields and its effects on different media	K2
5	To understand the basic principles of electric power system and its applications	K2

4.Course Code and Name : EC8453-LINEAR INTEGRATED CIRCUITS		
	CO Statements	**BLT**
The students should be able		
1	To understand the design of linear and non-linear apllications of op-amps.	K2
2	To understand the design applications using Analog multipliers and PLL.	K2
3	To understand designing of ADC and DAC using op-amps.	K2
4	To design waveform Generators using op-amps.	K4
5	To analyze special function ICs.	K4
5.Course Code and Name : EC8393 & FUNDAMENTALS OF DATA STRUCTURES IN C		
	CO Statements	**BLT**
The students should be able		
1	To explain the concepts of Object oriented programming.	K2
2	To develop a simple applications program using C++	K3
3	To discuss the different methods of organizing large amount of data	K6
4	To demonstrate the linear and non-linear data structures	K3
5	To develop a simple applications of linear and non-linear data structures	K2

6.Course Code and Name : EC8392 - Digital Electronics		
	CO Statements	**BLT**

The students should be able		
1	To demonstrate the concept of Boolean algebra and show the correlation between Boolean expressions	K2
2	To construct different methods used for simplification of Boolean expressions	K3
3	To interpret and implement Combinational circuits.	K2
4	To illustrate synchronous and asynchronous sequential circuits	K2
5	To develop a simple HDL codes for the circuits	K2
7.Course Code and Name : EC8381 FUNDAMENTALS OF DATA STRUCTURES IN C LABORATORY		
	CO Statements	**BLT**
The students should be able		
1	To develop and implement C++ programs for manipulating stacks and queues	K2
2	To develop and implement C++ programs for manipulating linked lists, trees, and graphs	K2
3	To apply different data structures in programs	K3
4	To apply good programming design methods for program development.	K3
5	To apply the different data structures for implementing solutions to practical problems	K3

6.Course Code and Name : BM8411 INTEGRATED CIRCUITS LABORATORY		
	CO Statements	**BLT**
The students should be able		
1	To design oscillators and amplifiers using operational amplifiers.	K4
2	To design filters using opamp and perform experiment on frequency response.	K4
3	To analyse the working of PLL and use PLL as frequency mutilplier.	K4
4	To design DC power supply using ICs.	K4
5	To aquire knowledge in using SPICE.	K4

SEMESTER 05		
1.Course Code and Name : BM6501 BIOCONTROL SYSTEMS		
	CO Statements	**BLT**
The students should be able		
1	To understand the modeling of mechanical, rotational and translational systems	K4

2	To understand and analyze time domain response	K4
3	To understand the concepts of stability and learn different stability analysis	K4
4	To understand and analyze frequency domain response	K4
5	To learn the physiological control system and its similarity with Engineering control system	K4
2.Course Code and Name : BM6502 DIAGNOSTIC AND THERAPEUTIC EQUIPMENT I		
	CO Statements	**BLT**
The students should be able to		
1	To understand the different equipment related to cardiology	K2
2	To understand the different equipment related to cardiology	K2
3	To understand the different equipment related to skelatal muscular equipment	K2
4	To learn the basic concepts of biotelemetry and patient monitoring	K2
5	To understand the extra corpeal devices and their applications	K2

3.Course Code and Name : BM6503-BIOMATERIALS AND ARTIFICIAL ORGANS		
	CO Statements	**BLT**
The students should be able		
1	To learn the structure of biomaterials and their bio-compatability	K2
2	To get famialirized with different implant biomaterials	K2
3	To get famialirized with different polymeric implant materials	K2
4	To learn about tissue replacements and their related implants	K2
5	To get familiarized with artificial organs	K2

4.Course Code and Name : BM6504 BIOMEDICAl INSTRUMENTATION		
	CO Statements	**BLT**
The students should be able		
1	To learn about different bio potential electrodes and the related artifacts	K2
2	To learn about different electrode configurations	K2
3	To understand different bio-amplifiers and their applications	K2
4	To understand the measuring of different non-electrical parameters	K2
5	To learn about different bio-chemical parameters	K2

5.Course Code and Name : EC6504 MICROPROCESSOR AND MICROCONTROLLER		
	CO Statements	**BLT**
The students should be able		
1	To learn the features, architecture and instruction set of 8086	K2
2	To understand the 8086 bus structure	K2
3	To understand the different I/O interfacing techniques	K2
4	To learn about 8051 architecture	K2
5	To learn the different I/O interfacing with 8051 microcontroller	K2

6.Course Code and Name : MD6501 HOSPITAL MANAGEMENT		
	CO Statements	**BLT**
The students should be able		
1	To understand the basic priciples of hospital administration	K2
2	To learn about hospital management and human resource	K2
3	To get familiarizedn with marketing and consumer behaviour	K2
4	To understand hospital information systems	K2
5	To understand the quality and safety aspects in hospital	K2

7.Course Code and Name : BM6511 MICROPROCESSORS AND MICROCONTROLLER LABORATORY		
	CO Statements	**BLT**
The students should be able		
1	To write ALP Programmes for fixed and Floating Point and Arithmetic operations	K3
2	To interface different I/Os with processor	K3
3	To generate waveforms using Microprocessors	K3
4	To execute Programs in 8051	K3
5	To explain the difference between simulator and Emulator	K3

8.Course Code and Name : BM6512 & BIOMEDICAL INSTRUMENTATION LABORATORY		
	CO Statements	**BLT**
The students should be able		
1	To design the amplifier for Bio signal measurements	K4
2	To record and analyze bio signals	K4

3	To get training on Measurement of physiological parameters	K4
4	To get training on Measurement of biological parameters	K4
5	To study the characteristics of bio-amplifiers	K4

9.Course Code and Name : GE6674 & COMMUNICATION AND SOFT SKILLS- LABORATORY BASED		
	CO Statements	**BLT**
The students should be able to		
1	To demonstrate reading and writing skills	K2
2	To develop listening and speaking skills	K3
3	To make use of acquired knowledge to take up international examination such as IELTS and TOEFL	K3
4	To apply the interview techniques for career development	K3
5	To illustrate the various aspects of soft skills	K2

SEMESTER 06		
1.Course Code and Name : BM6601 & RADIOLOGICAL EQUIPMENT		
	CO Statements	**BLT**
The students should be able		
1	To understand generation of x-rays and its uses in imaging	K2
2	To learn different types of radio diagnostic techniques	K2
3	To know techniques used for visualizing different sections of the body	K2
4	To learn radiation therapy methodologies and the radiation safety	K2
5	To explain the different radio diagnostic and therapeutic techniques	K2
2.Course Code and Name : BM6602 & BIOMECHANICS		
	CO Statements	**BLT**
The students should be able		
1	To understand the principles of mechanics.	K2
2	To learn the mechanics of physiological systems.	K2
3	To understand the mechanics of joints.	K2

4	To illustrate the mathematical models used in the analysis of biomechanical systems	K2
5	To analyze the biomechanical systems	K4

3.Course Code and Name : BM6603 DIAGNOSTIC AND THERUPATICE EQUIPMENT II		
	CO Statements	**BLT**
The students should be able		
1	To understand the various equipment used in ICU and applications of telemetry.	K2
2	To explain the types of diathermy and its applications.	K2
3	To express the basics of ultrasound and its application in medicine	K2
4	To learn the various extracorporeal and special diagnostic devices used in hospitals	K2
5	To outline the importance of patient safety against electrical hazard	K2

4.Course Code and Name : EC6502 & PRINCIPLE OF DIGITAL SIGNA PROCESSING		
	CO Statements	**BLT**
The students should be able		
1	To interpret the transformation of discrete data between time and frequency domains and also apply mathematical tool for accelerating calculations in signal processing applications	K2
2	To construct IIR filtering for undesired signal and learn the frequency response characteristics of IIR filter	K3
3	To construct FIR filtering for undesired signal and know the linear phase response characteristics of FIR filter	K3
4	To classify the concept of quantization and also analyze how its affect in digital filters	K2
5	To explain various approach for changing the sampling rate of a digital signal is to convert it back into analog and then to re-digitize it at the new rate	K2

5.Course Code and Name : GE6351 & ENVIRONMENTAL SCIENCE AND ENGINEERING		
	CO Statements	**BLT**
The students should be able		
1	To iIllustrate the concepts of an ecosystem , energy flow and conservation of biodiversity.	K2
2	To explain the causes, effects and control of various types of pollution.	K2
3	To outline the conservation of natural resources.	K2
4	To summarize the social issues of environment and legislative guidelines for disaster management.	K2
5	To relate population growth and its impact on environment and human health.	K2

6.Course Code and Name : BM6002 & BIOMETRIC SYSTEMS		
	CO Statements	**BLT**
The students should be able		
1	To understand the technologies of fingerprint, iris, face and speech recognition	K2
2	To understand the general principles of design of biometric systems and the underlying trade-offs	K2
3	To recognize personal privacy and security implications of biometrics based identification technology	K2
4	To identify issues in the realistic evaluation of biometrics based systems	K2
5	To demonstrate knowledge engineering principles underlying biometric systems	K2

7.Course Code and Name : BM6611 & DIGITAL SIGNAL PROCESSING LABORATORY		
	CO Statements	**BLT**
The students should be able		
1	To develop various types of continuous signal and discrete signal.	K3
2	To demonstrate their abilities towards DSP processor based implementation of DSP system.	K2
3	To analyze a continuous and discrete signals using FFT algorithm.	K4
4	To analyze Finite word length effect on DSP systems.	K4
5	To construct an adaptive filters for various applications of DSP.	K3

8.Course Code and Name : BM6612 & DIAGNOSTIC AND THERUPATIC EQUIPMENT LABORATORY		
	CO Statements	**BLT**
The students should be able		
1	To be practiced on recording and analysis of different Bio potentials	K4
2	To study the function of different Therapeutic equipments	K4
3	To analyze the Bio medical signals	K4
4	To check the safety of any medical equipments	K4
5	To develop knowledge about therapeutic equipments	K4
SEMESTER 07		

1.Course Code and Name :BM6701 Pattern Recognition and Neural Networks		
	CO Statements	**BLT**
The students should be able		
1	To understand the fundamentals of pattern recognition and its application.	K2
2	To learn about the computational methods such as linear discriminant functions and nearest neighbor rule	K2
3	To understand the basic neural network architectures and learning algorithms for applications in pattern recognition	K2
4	To analyse the back propagation and associative memory of neural network	K4
5	To design and apply different pattern recognition techniques to the applications of interest.	K5
2.Course Code and Name : BM6702 MEDICAL INFORMATICS		
	CO Statements	**BLT**
The students should be able		
1	To learn about the health informatics and different ICT applications in medicine	K2
2	To understand the various medical standards	K2
3	To study the function of Hospital Information Systems	K2
4	To understand the data storage and automation process of medical data	K2
5	To analyse the recent trends in medical informatics	K4

3.Course Code and Name :BM6703 MEDICAL OPTICS		
	CO Statements	**BLT**
The students should be able		
1	To understand the fundamentals of optical properties of tissues	K2
2	To learn about the photonics	K2
3	To learn the surgical applications of laser	K2
4	To understand about the diagnostic application	K2
5	To understand about the therapeutic application	K2

4.Course Code and Name : IT6005 DIGITAL IMAGE PROCESSING		
	CO Statements	**BLT**
The students should be able		
1	To understand about digital image fundamentals.	K2
2	To apply image enhancement techniques.	K3

3	To apply image restoration techniques.	K3
4	To use image compression and segmentation Techniques.	K4
5	To use image representation	K4

5.Course Code and Name : MD6010 Telehealth Technology		
	CO Statements	**BLT**
The students should be able		
1	To learn the key principles for telemedicine and health	K2
2	To understand telemedical technology	K2
3	To know telemedical standards, mobile telemedicine and it applications	K2
4	To apply multimedia technologies in telemedicine	K5
5	To apply telehealth in healthcare	K5

6.Course Code and Name : CS6551 Computer Networks		
	CO Statements	**BLT**
The students should be able		
1	To describe the basic layers and its functions in Computer Network.	K2
2	To describe the basics of data flows in a network.	K2
3	To analyze and design various routing algorithms.	K3
4	To apply TCP and UDP protocols for various functions.	K3
5	To describe various protocols for application layer.	K2

7.Course Code and Name : BM6712 DIGITAL IMAGE PROCESSING LABORATORY		
	CO Statements	**BLT**
The students should be able		
1	To perform filtering operations in the image	K4
2	To use transforms and analyse the characteristics of the image	K4
3	To write program to analyse the texture of the image	K4
4	To implement project on simple image processing applications	K5
5	To Apply image processing technique to solve real world problems	K5

8.Course Code and Name : BM6711 HOSPITAL TRAINING		
	CO Statements	**BLT**
The students should be able		
1	To advocate a patient-centred approach in healthcare	K2
2	To communicate with other health professionals in a respectful and responsible manner	K2
3	To recognize the importance of inter-professional collaboration in healthcare.	K2
4	To propose a patient-centred inter-professional health improvement plan based upon the patient‘s perceived needs	K2
5	To use the knowledge of one‘s own role and those of other professions to address the healthcare needs of populations and patients served.	K2

SEMESTER 08		
1.Course Code and Name : BM6801 & REHABILATION ENGINEERING		
	CO Statements	**BLT**
The students should be able		
1	To study the principles of rehabilitation	K2
2	To know new rehabilitation concepts for future development and applications	K2
3	To learn therapeutic Exercise Techniques	K2
4	To understand orthopedic prosthetics and orthotics in rehabilitation	K2
5	To explore the principles of management in rehabilitation	K2
2.Course Code and Name:BM6010 & ASSIST DEVICES		
	CO Statements	**BLT**
The students should be able		
1	To study various mechanical techniques that will help failing heart.	K2
2	To learn the functioning of the unit which does the clearance of urea from the blood	K2
3	To understand the tests to assess the hearing loss and development of electronic devices to compensate for the loss	K2
4	To know the various orthodic devices and prosthetic devices to overcome orthopaedic problems	K2
5	To understand electrical stimulation techniques used in clinical applications	K2

3.Course Code and Name : GE6075 & PROFESSIONAL ETHICS IN ENGINEERING		
	CO Statements	**BLT**
The students should be able		
1	To enable the students to create an awareness on Engineering Ethics and Human Values	K2
2	To instill Moral and Social Values and Loyalty	K2
3	To appreciate the rights of others	K2
4	To make aware of global issues	K2
5	To understand the social responsibilities and rights	K2

4.Course Code and Name : BM6012 & WERABLE SYSTEMS		
	CO Statements	**BLT**
The students should be able		
1	To study about sensors and its application in wearable systems	K2
2	To learn about applications of wearable systems	K2
3	To learn the energy harvesting for wearable systems	K2
4	To get familiarized with wireless wearable systems	K2
5	To understand the applications of wearable systems	K2

5.Course Code and Name : BM6811 & PROJECT WORK		
	CO Statements	**BLT**
The students should be able		
1	To demonstrate a sound technical knowledge of their selected project topic.	K2
2	To estimate the problem identification, formulation and solution.	K6
3	To design engineering solutions to complex problems and Conduct an engineering project	K6
4	To construct a group Communicate with engineers and the community at large in written an oral forms.	K6
5	To demonstrate the knowledge, skills and attitudes of a professional engineer.	K2

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