

# Innovations / Best practices in Teaching-Learning Process

Department of Medical Electronics

# Statement of goals

- To help students achieve better the Program Educational Objectives of BE-Medical Electronics
- To utilize the online resources and ensure that the students are benefitted with the use of ICT
- To provide exposure to the current technologies to the students
- To help the “Below Average students” to cope up with the academics
- To identify and support the “Bright Students” to enhance their learning abilities

# How do we achieve our goals???

- Allotment of Separate consultation hours to students to clear their doubts and also to help them as and when required
- Availability of laboratory spaces outside the working hours
- Availability of department library facility to help the students
- Inclusion of innovative approaches in teaching-learning process and evaluation methods
- Helping in internships and try to convert the same to Jobs

# Major innovations in Teaching-Learning

- Development of course website
- Video lecture recording for online anytime access
- Supporting online courses from NPTEL
- Guest lectures organized related to the course taught
- Workshops organized about the recent advancements
- Mini projects and projects related to real-time issues
- Plagiarism tool used for project reports
- Industry visits related to Medical equipment technology

# Innovations in Evaluation Process

- Online evaluation using flip-class concept
- Inclusion of seminars related to recent trends
- Group activity for CIE components in theory & lab
- Reducing the usage of inbuilt functions in MATLAB
- Encouraging BRIGHT students
- Supporting weak students



# A FEW SAMPLES

# Development of course websites for various courses

- ML 501 – Biomedical Instrumentation
  - <https://sites.google.com/a/msrit.edu/bmi/>
- ML 601 – Diagnostic & Therapeutic Equipment
  - <https://sites.google.com/a/msrit.edu/d-t/>
- MLL 607 – Diagnostic & Therapeutic Equipment Lab
  - <https://sites.google.com/a/msrit.edu/diagnostic-therapeutic-equipment-lab/>
- ML 701 – Neural Networks & Applications
  - <https://sites.google.com/a/msrit.edu/neural-network/>
- ML 802 - Management & Entrepreneurship
  - <https://sites.google.com/a/msrit.edu/management-entrepreneurship/>

# Availability of Course Videos Online

- ML 46 – 2 – Microcontrollers – MSP 430
  - Available to the students registered for this course through IMPARTUS online lecture capture tool (restricted access)
  - <http://172.1.2.16/impartus/Login.aspx>
- MLL 607 – Diagnostic & Therapeutic Equipment Lab – Experiment Demonstration Videos
  - <https://sites.google.com/a/msrit.edu/diagnostic-therapeutic-equipment-lab/products-services/videos-of-demonstrations>



# NPTEL based online courses

- ML 802 – Management & Entrepreneurship
- NPTEL course – Human Resource Management
  - [https://onlinecourses.nptel.ac.in/noc17\\_mg13/student/mentee](https://onlinecourses.nptel.ac.in/noc17_mg13/student/mentee)

## Course outline

[How to access the portal?](#)[Week 1](#)[Week 2](#)[Week 3](#)[Week 4](#)[Week 5](#)

## Mentee Details

Name ▲	Email	Week 1: Assignment 1	Assignment - 2	Week 2: Assignment 1	Assignment 3 - Week 3	Week 3 : As
AISHWARYA LAKSHMI K	kechiaishu@gmail.com	80		100		
Apurva S Vasana	apu.vasana@gmail.com	100		100		
Arpana n	arpananagesh1@gmail.com	100				
BHAGYA A.R	bhagyaar28@gmail.com					
Basavaraj	Basuganig29@gmail.com	70		40		
Chowtapalle Jayvardhan Chetty	jayvardhan50@gmail.com	70				
K Guna Shekar	guna.s956@gmail.com	50		70		
Kadeeja Tamanna	kadeejatamanna123@gmail.com	80		100		
Leena N	leenanarayan555@gmail.com	80		100		
Madhushree k	madhushreek643@gmail.com					
Mehraj Khanum	famm5099@gmail.com	80		100		
Mithun B S	subbujagat@gmail.com	100		70		
Pancham Bopanna D	1ms13ml026@msrit.edu	60				

# Subject related Guest lecture

- ML 601 – Diagnostic & Therapeutic Equipment
- Guest Lectures
  - Advances in ICU based Therapeutic Applications – Defibrillator & ventilator aspects in healthcare
    - Manjunath Ghoghe, Philips Healthcare (04/03/2017)
  - Recent Trends in the Diagnostic aspects of Bioelectric signals in Human Beings – ECG, EEG and EMG based Biomedical analysis
    - Rohit Sharma, Recorders & Medicare India Pvt Ltd, (10/03/2017)

# Workshops organized about recent advancements

- fMRI using SPM tools by Karthik M P, Medtech Pvt Ltd
- ITK/VTK workshop by Nandish S, Manipal University
- SciLab workshop by Dr Mahesh Anand, CTI-Scientific Computing Solutions
- Arduino workshop by Prashanth Pai, Astra Microwave Pvt Ltd

# Project based learning – real-time issues

Sl. No	Project Team	Industry/Hospital/R & D Organization	Faculty Supervisor	Title
1	Aradhana Singh, NamraBalqees Ahmed, Nikhil Rao. M. SatvikaBharadwaj	Mediscan systems	Dr.N.Sriraam	A Computer Aided Diagnostic Screening Tool for Fetal Cardiac Chamber detection using ultrasonic Cine-loop sequences
2	Nikitha D Pratibha A K Priyanka G K Shreya Sridhar	Tiny Chip & Dept. of Physiology, MSRMC	Dr.N.Sriraam	Design and development of PPG based physiological monitoring system
3	ArjunDhingra Ankit Jain Adel	Neurosynaptic	Mr. S J Mahendra	Developing Android App
4	Sneha B Sriravali K	OMYA Healthcare Limited, Whitefield, Bengaluru	Mr.BasavarajHirema	Automated Imaging System for a renal Biopsy

# Plagiarism tools used in projects

- Turnitin tool available in college library for free access
- Viper – free plagiarism tool

# Industry Visits

Sl.No.	Semester	Company & Address	Date	Escort teachers
1	VI	Skaray Healthcare, Mysore	29.04.2016	Mr.Sanjay H S Mr.Basavaraj Hiremath
2	V	TUV Rheinland Electronic city, Bengaluru	01.08.2013	Mrs. Prabhu Ravikala Vittal Mrs. Uma Arun
3	V	Skaray Healthcare, Mysore	02.08.2013	Dr. N.Sriraam Mrs. Prabhu Ravikala Vittal Mrs. Supriya Babu
4	IV	Advanced Electronics System ,Peenya	04.04.2014	Prof.P.G.Kumaravelu, Mrs. Prabhu Ravikala Vittal
5	VI	Skaray Healthcare, Mysore	08.03.2013	Mr.Sanjay H S Mr.Basavaraj Hiremath Ms. Supriya Babu Mr. K S Babu Dr. N Sriraam
6	VII	Hospital training in M.S.Ramaiah Teaching Hospital,	06.12.2013 to 14.12.2013	Mr.Basavaraj Hiremath Mr.S J Mahendra

# Smart Evaluation – Flip class approach

- ML 802 – Management & Entrepreneurship – Case study evaluation using flip-class approach
  - <https://sites.google.com/a/msrit.edu/management-entrepreneurship/other-materials/flip-class-assignment-videos>



# Seminar component related to recent trends

- ML 603 – Biomedical Signal Processing
- ML PE 14 - Biometrics

# Group activities

- ML 304 – Network Analysis
- ML 404 – Communication Systems
- ML 503 – Digital Signal Processing
- ML PE 14 – Biometrics
- MLL 507 – Biomedical Instrumentation Lab
- MLL 607 – Diagnostic & Therapeutic Equipment Lab
- ML 701 – Neural Network and Applications

# Improvements in programming skills

- MLL 608 – Medical Image Processing Laboratory
  - Students are encouraged to develop the programs in MATLAB for MLL 608 lab course without the usage of inbuilt functions

# Encouraging bright students

- ML 601 – Diagnostic & therapeutic Equipment
  - Inclusion of hospital visit based case study analysis
  - <https://sites.google.com/a/msrit.edu/d-t/website-builder>

# Supporting weak students

- Remedial classes
- Counseling and better proctoring
- Online availability of laboratory demonstration videos and course materials for anytime access
- Extra lab slots