Topics to be covered

- Biomedical signal processing and applications.
- Classification of Biomedical Signals.
- Modern ECG signal processing.
- Time frequency analysis and estimation of the PSD.
- Time-varying Analysis of Heart-rate Variability.
- Different algorithms for biomedical signal processing and wavelets.
- Analysis of ECG, EEG & PPG signals using MATLAB/Python Data Science Revolution
- Exploratory Data Analysis.
- Preprocessing and analysis of biomedical signal and images.
- Feature Extraction, Classification and Clustering.
- Machine Learning for Biomedical Signals.
- Fundamentals of Deep Learning for biomedical signals.
- National Education Policy (NEP) 2020 implementation.
- Biomedical wearable devices and patches (Case Study).

About the Institute

Shri Sant Gajanan Maharaj College of Engineering, Shegaon (SSGMCE), one of the premier institutes in the field of engineering, was established in 1983 by Shri Gajanan Shikshan Sanstha, Shegaon.

It is affiliated to Sant Gadge Baba Amravati University, Amravati recognized by AICTE, New Delhi and approved by DTE, Mumbai (M.S.). SSGMCE has the recognition of being the re-accredited institute by NAAC, Bangalore and the courses are also accredited by NBA (5 times), AICTE, New Delhi. The Institute offers five undergraduate Engineering courses and five Postgraduate courses. All the laboratories have been recognized as centers for PhD program. It has excellent physical facilities in the form of residential and academic buildings spread over neat and clean 82 acres of campus.

Objectives of the Course

1. Understand the classification and processing techniques for biomedical signals, including ECG, EEG, and PPG, through modern algorithms and time-frequency analysis.
2. Develop skills in MATLAB/Python for exploratory data analysis, preprocessing, feature extraction, and machine learning applications in biomedical signals.
3. Apply deep learning methodologies to biomedical signal processing and explore practical implementations using wearable devices and case studies.
4. Integrate knowledge of the National Education Policy (NEP) 2020 in the context of biomedical signal processing education and its applications.
5. To get acquainted with different technologies for the wearable devices and patches for healthcare systems.

Six Days AICTE (ATAL) Sponsored Faculty Development Programme (FDP)

Biomedical Signal Processing and AI-ML Techniques for Healthcare Systems

16th - 21st December 2024

Jointly organized by

Electronics &Telecommunication Engineering Department, Shri Sant Gajanan Maharaj College of Engineering, Shegaon 444 203 (Maharashtra) & ATAL Academy, AICTE, New Delhi

Brief overview of FDP

The Faculty Development Programme will help to a solid conceptual background in advancements in signal processing techniques and their application to research area focused on Processing of Biomedical signals. This FDP introduces various AI-ML algorithms for signal classification of various biomedical signals and research strategies to be adopted for effective and efficient processing of acquired biomedical signals. This course will give an opportunity to gain exposure in implementing the highly computational and efficient AI-ML algorithms into the research problems of one's area of interest. It illustrates how AI-ML may actually be useful in biomedical signal analysis for development of modules related to health care.

Resource Persons

Eminent speakers from NITs, IIITs, IITs, renowned institutes, etc. will deliver the expert lectures.

Participants will be selected among faculty members, PG students, PhD scholars, researchers, and practicing engineers from Academia, Government and AICTE approved Non-Government Organizations through ATAL Academy portal.

Last Date of Registration

Please visit AICTE ATAL Academy portal:
https://atalacademy.aicte-india.org/signup

Registration Procedure

- **There is no registration fee.**
- Participant needs to apply through AICTE-ATAL portal on or before the last date of registration mentioned in the AICTE ATAL portal.

To complete your registration in ATAL FDP portal, follow the following steps:

1. Visit https://atalacademy.aicte-india.org/signup
2. Register as a participant → Fill your details
3. Select Workshop: Select State →Maharashtra; Select Month → December; Select Thrust Area → Machine Learning; Select Mode → Offline Mode
4. Select Institute→ Shri Sant Gajanan Maharaj College of Engineering, Shegaon (MS).

- Selected participants will be informed in advance through e-mail.
- Numbers of seats are limited and seats will be booked as per ATAL Academy guidelines.

Participation Certificate

- **Minimum 80% attendance and scoring 60% marks in test/quiz** is mandatory to get participation certificate.
- The participation certificate will be issued online through ATAL Academy portal to the eligible participants only.
- A performance evaluation test will be conducted at the end of the FDP.

Organizing Committee

Patron

Hon. Shri Ramkrushna Nilkanth Patil,
Joint Secretory & Chief Executive Director,
Shri Gajanan Shikshan Sanstha, Shegaon (MS)

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