Theme of Course:

This FDP equips educators with skills, tools and expertise necessary to effectively use artificial intelligence for the solution of problems in the emerging areas of electrical engineering. This FDP covers the interactive seasons by various experts to enrich the participants' knowledge in artificial intelligence and its application to electrical engineering. This program empowers the faculty to impart practical insights and knowledge to their students in the area of application of AI to electrical engineering.

Significance of Course

This course will provide more insight to participants for use of Artificial Intelligence in Electrical Engineering. It will bridge the gap between theoretical understanding and real world applications, enabling educators to impart practical skills to students.

Topics to be Covered

1. Introduction to Machine Learning & Deep Learning
2. Applications of AI in Wind Power Generation, Load Forecasting, Adaptive Strategies in Power System Protection, System Identification, Autonomous Vehicle Control, Fault Diagnosis of Transmission Network.
3. Artificial Intelligence based forecast models for Predicting Solar Power

PATRONS

Mr. Amol Chavan (Member, Admin Council)

Dr. Uday A. Dabade (I/C Director, WCE Sangli)

ADVISOR

Dr. Sandeep Anand (IIT Bombay)

Dr. Deepak Ronanki (IIT Madras)

Dr. Yogesh Hote (IIT Rorkee)

Dr. Ganesh Kumbhar (IIT Rorkee)

COURSE COORDINATOR

Dr. D. S. More

CO-COORDINATOR

Dr. V. P. Mohale

ORGANISING TEAM

Mr. A. B. Patil, Mr. N. V. Patel

Mrs. S. L. Shaikh, Dr. R. P. Hasabe

Mrs. S. P. Diwan, Mr. S. S. Karvekar

CONTCAT DETAILS

For any further information

Dr. D. S. More
M. : 9892261135

Dr. V. P. Mohale
M : 9421837331

E-mail: hod.electrical@walchandsangli.ac.in

AICTE Training and Learning (ATAL) Academy Sponsored

One Week
Faculty Development Program on

Applications of Artificial Intelligence to Electrical Engineering

(11th - 16th December 2023)

Walchand College of Engineering, Sangli
Electrical Engineering Department

Resource Persons

Programme faculty includes experts from IITs, NITs and reputed Technical/engineering Institutes and experts from industries.

Who May Be Benefitted

The faculty members of the AICTE approved institutions, research scholars, PG Scholars, participants from Government and Industry (Bureaucrats/Technicians/ Participants from Industry etc.) would be benefitted from the course. The course is focused on Smart Energy Application using IoT as a tool which is going to impact future energy sector in a massive way.

How to Apply

The eligible participants are requested to register through the following registration link:

https://atalacademy.aicte-india.org/login

The last date for Registration : 01th December 2023

There is no registration fees.

Certificate

The certificate shall be issued by AICTE Training and Learning (ATAL) academy to those participants who have attended the program with 80% attendance and scored minimum 60% marks in the test conducted at the end of online FDP.

About ATAL Academy

AICTE Training and Learning (ATAL) Academy is established with the vision "To empower faculty to achieve goals of Higher Education such as access, equity and quality". ATAL academy is conducting a series of workshops in thrust areas identified by AICTE.

About WCE, Sangli

Walchand College of Engineering Sangli (WCE), established in 1947 and aided by the Govt. of Maharashtra, is one of the oldest and premier engineering institutions in India. With a rich history of 75 years and a beautiful campus of over 90-acres, WCE Sangli, is providing transformational learning experience in various disciplines of engineering. WCE offers 6 UG programs in Civil, Electrical, Mechanical, Electronics, Computer Science and Engineering and Information Technology and 10 PG programs. It also offers PhD programs under Shivaji University, National Doctoral Fellowship of AICTE and under Quality Improvement Program (QIP) scheme of Ministry of Human Resource Development (MHRD). Walchand College of Engineering is affiliated to Shivaji University Kolhapur and is approved by AICTE, New Delhi. The institute is also given autonomous status by University Grants Commission since 2007. The students of WCE get placed in reputed Multinational and Indian Companies such as Google, Microsoft, LinkedIn, Amazon, John Deere, Rakuten, P&G, Mahindra, TCS, Infosys and many other companies

About Electrical Engineering Department

Through its long existence since 1955, Electrical Engineering Department of Walchand College of Engineering, Sangli has earned a great reputation and has become well known not only in our country, but also in the world through his alumni spread across the length and breadth of the globe. The Department was the second to be established in 1955 after Civil Engineering in 1947. Consequent to inception of the department, PG courses in two specializations, namely, Power System Engineering and Control System Engineering were started in the year 1971.

The Department offers a four-year course leading to the Bachelor's Degree in Electrical Engineering (B. Tech.) and a two-year course leading to Master's degree (M. Tech.) in Power System Engineering and Control System Engineering. The curriculum contains mandatory as well as elective courses and has various tracks and a choice-based credit system with balanced theory, laboratory and project-oriented courses.

Walchand College of Engineering, Sangli

Time Table

One Week FDP on Applications of Artificial Intelligence to Electrical Engineering

11th Dec 2023	12th Dec 2023	13th Dec 2023	14th Dec 2023	15th Dec 2023	16th Dec 2023
9:00- 9:30 Inauguration					
9:30-12:00 Session 1	9:30-12:00 Session 3	9:30-12:00 Session 5	9:30-12:00 Session 7	9:30-1:00 Industrial Visit	9:30-12:00 Session 10
12:00-1:00 Article 1 Discussion	12:00-1:00 Article 2 Discussion	12:00-1:00 Article 3 Discussion	12:00-1:00 Article 4 Discussion		12:00-1:00 Reflection Journal
1:00-2:00 Lunch	1:00-2:00 Lunch	1:00-2:00 Lunch	1:00-2:00 Lunch	1:00-2:00 Lunch	1:00-2:00 Lunch
2:00-4:30 Session 2	2:00-4:30 Session 4	2:00-4:30 Session 6	2:00-4:30 Session 8	2:00-4:30 Session 9	2:00-4:00 MCQ, Feedback & Interaction
4:30-5:30 Practical Session /Labs1	4:30-5:30 Practical Session/Labs2	4:30-5:30 Practical Session/Labs3	4:30-5:30 Practical Session/Labs4	4:30-5:30 Practical Session/Labs5	4:00-5:00 Valedictory Session

Session Details

Session No.	Topic	Resource Person
1	Introduction to Machine Learning & Deep Learning Part- I	Dr. Dinesh B. Kulkarni Professor, IT Department, WCE, Sangli
2	Introduction to Machine Learning & Deep Learning Part- II	Dr. Dinesh B. Kulkarni Professor, IT Department, WCE, Sangli
3	Advanced AI based Controller for Wind Turbine Pitch Control	Dr. B. B. Pimple Associate Professor, Department of Electrical Engineering, SPCOE, Andheri (W)
4	Load forecasting using Artificial Intelligence Techniques	Dr. N. W. Kinhekar Professor, Electrical Engineering, SPCOE, Mumbai
5	Artificial Intelligence based forecast models for Predicting Solar Power	Mr. Chandrakant J. More Associate Director, Deloitte, Pune
6	Artificial Intelligence based Controller for Power Electronic Converters	Dr. Deepak B. Kulkarni HOD, Electrical Engineering, GIT, Belgavi
7	System Identification using Artificial Intelligence	Dr. Yogesh Hote Professor, IIT, Roorkee
8	Adaptive Strategies in Power System Protection using Artificial Intelligence Techniques	Dr. P. M. Joshi Ex HOD, Electrical Engineering, GCE, Karad
9	Application of AI in Autonomous Vehicle Control	Dr. A. B. Raju HOD, Electrical Engineering, BVBM, Hubli
10	Artificial Intelligence Technology in Fault Diagnosis of Transmission Network	Mr. Pradip Survase Application Engg Lead Siemens Ltd Mumbai

Article Discussion

Article 1:

S. Zhao, F. Blaabjerg and H. Wang, "An Overview of Artificial Intelligence Applications for Power Electronics," in IEEE Transactions on Power Electronics, vol. 36, no. 4, pp. 4633-4658, April 2021, doi: 10.1109/TPEL.2020.3024914.

Article 2:

S. Stock, D. Babazadeh and C. Becker, "Applications of Artificial Intelligence in Distribution Power System Operation," in IEEE Access, vol. 9, pp. 150098-150119, 2021, doi: 10.1109/ACCESS.2021.3125102.

Article 3:

Z. Sičanica, S. Sučić and B. Milašinović, "Architecture of an Artificial Intelligence Model Manager for Event-Driven Component-Based SCADA Systems," in IEEE Access, vol. 10, pp. 30414-30426, 2022, doi: 10.1109/ACCESS.2022.3159715.

Article 4:

K. Y. Yap, C. R. Sarimuthu and J. M. -Y. Lim, "Artificial Intelligence Based MPPT Techniques for Solar Power System: A review," in Journal of Modern Power Systems and Clean Energy, vol. 8, no. 6, pp. 1043-1059, November 2020, doi: 10.35833/MPCE.2020.000159.

Practical Sessions

Practical Session 1

Introduction to Power Electronic Converters & Control Strategies for Power Converters:

- Overview of different types of power electronic converters used in wind power systems (rectifiers, inverters, converters).
- Introduction to AI techniques (e.g., machine learning, neural networks) applicable to power electronics control.
- Implement basic control techniques for power electronic converters (e.g., voltage control, current control). Introduction to AI-based control strategies and their advantages.

Practical Session 2

Simulating Wind Power Generation:

- Simulate a wind power generation system using software like MATLAB/Simulink.
- Implement wind turbine characteristics and power curves.
- Integrate a simple power electronic converter for energy extraction.

Practical Session 3

Maximum Power Point Tracking (MPPT) for Solar Power Plant:

- Implement MPPT algorithms using AI techniques to optimize energy extraction from varying wind conditions.
- Compare AI-based MPPT with traditional control techniques.

Practical Session 4

Load Flow Analysis using AI:

- Implement load flow analysis using traditional methods (e.g., Gauss-Seidel) and compare with AI-based methods (e.g., neural networks, genetic algorithms).
- Study the accuracy and convergence of AI-based load flow solutions.

Practical Session 5

Microgrid Modeling and Simulation:

- Simulate a microgrid using software like MATLAB/Simulink.
- Implement various distributed energy resources (DERs) such as solar panels, wind turbines, and energy storage.
- Integrate AI models to control DERs and manage microgrid operation.