

**One Week
Faculty Development Program
on
Machine Learning Applications
in Mechanical Engineering**

Under the banner of
Electronics and ICT academy, NIT Patna

21st - 26th December, 2020



Coordinator
Dr. Vikas Upadhyay

Co-Coordinator
Dr. Saroj Kumar Sarangi

Sponsored by
Meity and Govt. of India

Organized by
Department of Mechanical Engineering,
National Institute of Technology Patna-800005

About NIT Patna

National Institute of Technology Patna is the 18th National Institute of Technology created by the Ministry of H.R.D. Government of India after rechristening the erstwhile Bihar College of Engineering Patna on 28.01.2004. NIT Patna marked its humble beginning in 1886 with the establishment of pleaders survey training school which was subsequently promoted to Bihar College of Engineering Patna in 1924. This made this institute the 6th oldest Engineering Institute of India. The Institute is situated on the south bank of holy river Ganges behind Gandhi Ghat (where the ash of father of the Nation, Mahatma Gandhi was offered in the river Ganges). The campus has a picturesque river view with historic building presenting a spectacle of architecture delight and natural beauty. The Institute imparts high level educational training, research and development in science, engineering, technology and humanities along with high quality education and values at UG, PG and Ph.D. level. At present the Institute offers courses in six major technical disciplines viz. Architecture, Civil Engineering, Computer Science & Engg., Electrical Engg., Electronics & Communication Engg. and Mechanical Engg. It also consists of well-established departments of Physics, Chemistry, Mathematics and Humanities and Social Sciences.

Electronics and ICT Academy

Ministry of Electronics and Information Technology, Government of India has instituted seven Electronics and Information & Communications Technology (ICT) Academies of which, the academy of NIT Patna is one. The Academy at NIT Patna aims to design and organize basic as well as specialized training programs in niche areas of electronics and ICT for the development of required knowledge base, skills and tools to equip the teaching community with better knowledge and understanding.

Overview

The Mechanical industry is undergoing a massive change with newer technologies like intelligent manufacturing, smart materials and structures, IOT, AI, and ML, requiring trained man power to incorporate the changes in the industry. Knowledge of various soft computing techniques such as artificial neural network, Fuzzy systems, and hybrid systems will offer a potential to use new ideas in various mechanical and industrial engineering applications. Optimization of process parameters is also important for

full utilization of available resources. Various evolutionary optimization techniques such as GA, PSO, etc. will also be discussed in this course. So, this program would focus on the basic concept of machine learning and will also demonstrate various commands and coding during interactive sessions to make the participants able to apply and explore them further at their own.

Objectives and Scope

- Primary objective of this program is to provide an exposure of recent trends in machine learning applications in mechanical engineering.
- During this program, focus will be on providing basic knowhow of various machine learning techniques and practical applications through interaction with academicians and industrial experts.
- To provide a comprehensive overview of the methodology needed for various engineering applications.
- To provide a platform to have the concepts of both basics and recent research advances in machine learning applications in mechanical engineering to the teaching and research community.

Course Outcomes

By the end of the program, the participants will be able to:

- Understand the basic terminology and techniques of Machine learning.
- Learn and use evolutionary optimization techniques.
- Apply ML Techniques in design of mechanical systems and condition monitoring.
- Apply ML techniques in manufacturing and Industrial Systems.
- Apply these techniques for solving real life/research problems.

Contents

- Fundamentals of Machine Learning
- Neural Network
- Fuzzy System
- Hybrid Techniques

- Optimization Techniques
- Machine Learning Applications in Industrial Engineering
- Machine Learning Applications in Advanced Machining Systems
- Condition Monitoring using Machine Learning
- Machine Learning Applications in Composite Materials.
- Artificial Intelligence in Mechanical Systems

Resource Persons

Internationally acclaimed faculty members from premier institutions like IITs, NITs, and Central Universities.

One-week FDP includes

- Online theory and interactive query sessions
- Instructor-led online hands-on based learning.
- Soft copy of study material & program code.
- Recorded sessions after completion of training.

Who Can Participate

Faculty members of UGC/AICTE recognized Universities and Engineering colleges all over India, research scholars, students and industry personals, however priority will be given to the faculty members.

Total -100 seats and the selection will be done on first-cum-first-serve basis.

Registration Fee

- ❖ Faculty Member/Research Scholar: Rs 500/-
- ❖ Ph.D/PG/B.Tech Students : Rs 500/-
- ❖ Industry Personnel: Rs 1000/-

Certificate will be given by Electronics & ICT Academy, NIT Patna.

Organizing Committee

Chief Patron

Prof. P. K. Jain
Director, NIT Patna

Patron

Prof. S. K. Verma
Dy. Director, NIT Patna

Convener

Prof. Prakash Chandra, NIT Patna

Coordinator

Dr. Vikas Upadhyay, NIT Patna

Co-Coordinator

Dr. Saroj Kumar Sarangi, NIT Patna

Registration Process

1. Registration fee will be paid though online mode, the account details for this purpose are

Account Name: NIT Patna

Account No.: 50380476798

IFSC Code: ALLA0212286

2. Link for registration:
<https://forms.gle/ijr156bS5L2LGfNz9>

3. The brochure of the program may be downloaded from the Institute website www.nitp.ac.in.

4. Last date of registration: 17.12.2020

PDF file of online filled registration form with proof of registration fee paid will be sent through email to **Dr. Vikas Upadhyay. (E-mail: vikas@nitp.ac.in)**
Contact No.: +91-7061166577

FDP on

Machine Learning Applications in Mechanical Engineering (21st - 26th December, 2020)

REGISTRATION FORM

1. Name (block letter):
2. Gender:
3. Category.....
4. DOB:.....
5. Designation
6. Organization:
7. Address for communication:
-
-
- Pin code: Ph. No.:
- E-mail:
8. Highest Academic Qualification:
9. Specialization:
10. Experience (in years):
(a) Teaching: (b) Industrial:
11. Aadhar No:.....

DECLARATION

I do hereby agree to abide by the rules and regulations of the FDP.

Place:

Date:.....

.....
Signature of the Applicant