

## BACKGROUND AND SCOPE

The field of fluid power technology is assuming increasing importance in every sphere of industry. Two of the most important advantages of fluid power transmission are the ability to multiply force and the flexibility to change direction quickly without damage to the system. The importance of the fundamental knowledge of hydraulic components in various fields like aerospace, production, and system controls has been widely felt.

The latest trend in hydraulic component development is the energy and weight saving technologies for hydraulic drives that are favorable in many industrial applications. With the complexity of today's industrial processes, the early fault identification and diagnosis through electro hydraulic control system is gaining importance. With the advent of electronics integration to hydraulic valves, most of the operations are carried out through proportional and servohydraulics precisely. Similarly, computational tools are applied for analysis and optimization of various parameters in hydraulic system. The latest is the use of MEMS (Micro Electro Mechanical Systems) application in the fluid power technology. Keeping in view the above developments, a one week short term training module is developed for faculty and practicing engineers who wish to have an insight into the components and operation of hydraulic and pneumatic systems. The mathematical content has been kept simple with the aim of making the course good rather than rigorous.

## COURSE OBJECTIVES

The proposed STC is aimed to make the participants aware of the Fluid Power Technology globally prevailing in the area of Industries/Defense in general and multi domain applications in particular.

## COURSE CONTENTS

The course will deal with the fundamentals and diversified industrial /Defense applications. Course would also cover demonstration of the existing know-how and facilities in the lab. The major contents are as follows -

- Enduring trends in Fluid Power Technology-Past and Present
- Introduction to Fluid Power Technology-Components, Application and Basic Laws
- Pumping Theory. Construction and Operational features of Hydraulic pumps and Efficiencies

- Constructional features, selections and Applications of Control Elements - Direction Control, Pressure Control and Flow control Valves
- Construction and Operational features of Fluid Power Actuators and Their Efficiencies
- Design and Analysis of Fluid Power Circuits
- Electro-pneumatics
- Proportional and Servohydraulics
- Modeling of Fluid Power Components
- Accessories- Filters Accumulators, Seals and Maintenance

## DELIVERY MODE

Online through Google Meet. Link will be shared upon acceptance.

## RESOURCE PERSONS

The experts from the R&D Labs, Industry and Faculty from Department of Mechanical Engineering IIT Madras.

## ABOUT THE DEPARTMENT OF MECHANICAL ENGINEERING, IIT Madras

Mechanical Engineering is one of the major activities in the engineering profession and its principles are involved in the design, study, development and construction of nearly all of the physical devices and systems. Continued research and development have led to better machines and processes helping the mankind.

The Department of Mechanical Engineering at IIT Madras is as old as the Institute itself. Its impact on the institute and on society is easily demonstrated by noting the alignment of the department's evolution with key events and technological advances in the India and elsewhere. Today, the department of Mechanical engineering of IIT Madras attracts and features an extraordinary rich diversity and quantity of talented individuals, with nearly 700 undergraduates, 500 graduate students and over 60 faculty members. The impressive array of students makes the department as the largest in the country and one of the largest in Asia.

In addition to teaching undergraduate and graduate students, the faculty of Mechanical Engineering actively pursues research through graduate students. The current graduate students include nearly 150 Master of Technology students (M.Tech), 170 Master of Science (by research) students (M.S.) and 300 students pursuing their doctoral programme (Ph.D).

**AICTE Sponsored**

**Short Term Course (STC) on**

**“Enduring Trends in Hydraulic Control Systems: Past, Present and Future”**

**March 22-27, 2021**

**Registration Form**

1. Name
2. Designation
3. Educational Qualification
4. Department
5. Organization
6. Teaching Experience
7. Favorite Subjects
8. No. of STCs attended so far

At IIT Madras \_\_\_\_ At other places \_\_\_\_ Total \_\_\_\_

9. Mailing Address

10. Telephone

11. E-mail

Date:

Signature of the Applicant

## SPONSORSHIP CERTIFICATE

Certified that Dr/Mr/Mrs \_\_\_\_\_  
\_\_\_\_\_ is being sponsored hereby  
for attending the AICTE Sponsored Short Term Course  
(STC) on "Enduring Trends in Hydraulic Control  
Systems: Past, Present and Future" to be conducted  
at Indian Institute of Technology Madras, Chennai from  
March 22-27, 2021, if selected. Also this is to certify that  
this institute is recognized by AICTE.

Signature and seal of Sponsoring Authority  
(Head of the Institution)

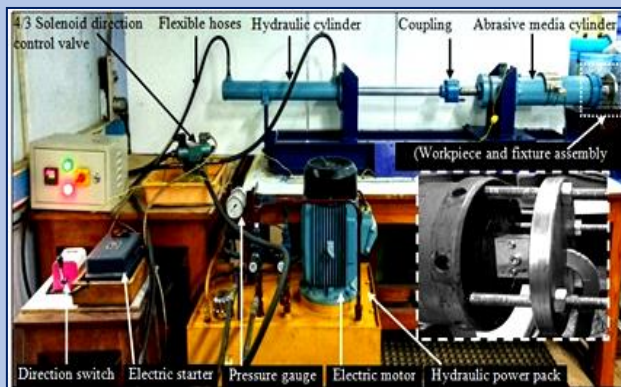
Place:

Date:

PLEASE SEND THE SCANNED SOFT COPIES TO

Mr. Ishwar Bhiradi: me17d025@smail.iitm.ac.in

WhatsApp Contact: 8497040087



## ABOUT THE MANUFACTURING ENGINEERING SECTION

The Manufacturing Engineering Section is spread over three laboratories, one housed in Ranganathan Building, one in the Machine Tool Laboratory and third one Precision Engineering and Instrumentation laboratory in Mechanical Sciences Block. Faculty members, technical staffs and research scholars are focused on the development of next generation advanced manufacturing processes and cutting tools, machining of difficult-to-machine materials, machining and forming at micro and nano scales, friction and laser based surface engineering, microstructural alterations to improve the material properties, infusing smartness into the processes and machines, automation of processes at different levels, high precision measurement and characterization at all length-scales

## ELIGIBILITY & ENTITLEMENT

Faculty of Mechanical, Industrial Production, Mechatronics, Automobile, Ocean Engineering, Aerospace and ECE departments from AICTE recognized Engineering Colleges only are eligible to apply.

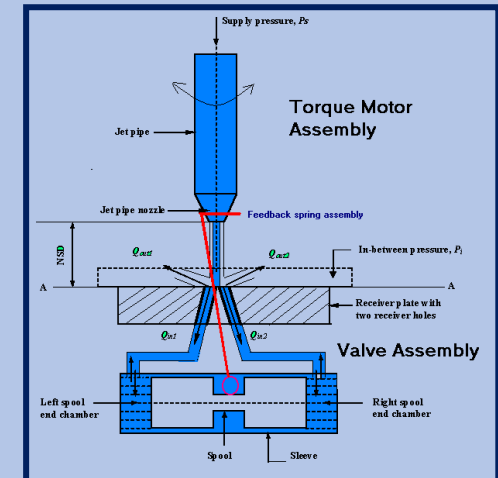
Participation certificate will be issued on successful completion of the course.

## DATES TO REMEMBER

- **Registration Form** duly signed by the Head of the Institution should reach the organizers before **18<sup>th</sup> March 2021**.
- **Notification of Acceptance:** **18<sup>th</sup> March 2021** (through email only).



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Systems: Past, Present and Future  
March 22-27, 2021



Course Coordinator

Dr Somashekhar S Hiremath

Organized by



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