WELDING APPLICATION TECHNOLOGY

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IIT Guwahati

TYPE OF COURSE : New | Core | UG/PG
COURSE DURATION : 8 Weeks (23-Aug’ 21 - 15-Oct’ 21)
EXAM DATE : 23 Oct 2021

INTENDED AUDIENCE : Students (UG and PG); Participant from any manufacturing industry

PREREQUISITES : BE/BTECH IN MECHANICAL/PRODUCTION/ MANUFACTURING SCIENCES/POWER PLANNT ENGG/ NAVAL AND ARCITUTURE ENGG

COURSE OUTLINE : The name of the course is Welding Application Technology. As the name implies in this course I will try to cover the fundamental overview of the traditional/ industrial welding technology especially those welding processes which are widely used in manufacturing industries. I will also try to cover the detail concepts of design and analysis of welding joints, heat treatment and weld induced residual stresses & distortions and its measurement. This will help the participants to understand and apply this knowledge of welding in practice for various industrial applications. It will also encourage academic participants to increase the research interest in the field of welding. In this present course the primary focus is on basic fundamental of welding and its importance in industries.

The brief overview of the course content can be stated like; this course will cover the industrial relevance of welding processes. It will give the fundamental knowledge of various important welding processes which includes most of the important fusion welding, solid state welding (i.e. Friction Welding, FSW etc.) and solid-liquid state welding (i.e. Shouldering and Brazing). It will also cover the importance and applications of all these welding techniques. This course will highlight the safety precautions to be followed in different welding techniques.

ABOUT INSTRUCTOR :

I, Dr. Pankaj Biswas, am a Professor in the Dept. of Mechanical Engineering, IIT Guwahati. I am working in the area of welding technology and forming by line heating for the past 15 years. My areas of research are on computational weld mechanics, similar and dissimilar friction stir welding, friction stir welding of steel, hybrid welding technology, Finite Element analysis of weld induced distortion and residual stresses, Analysis of large welding structure, forming by line heating and modelling of welding processes using soft computing techniques. I guided 02 PDF, 7 PhD scholars in the area of welding. Currently I am guiding 01 PDF and 7 PhD students in the welding and line heating areas. I already published about 75 journal articles, 70 conference proceedings, 22 book chapters and 3 patents. I worked in ten sponsored / consultancy projects. I got IEI Young Engineers Award 2013- 2014 in Mechanical Engineering discipline.

COURSE PLAN :

Week 1: Basics of welding residual stresses & distortions and its mitigation
Week 2: Measurement & analysis of welding residual stresses and distortions
Week 3: Measurement of welding residual stresses and distortions
Week 4: Different type of welding methods and its details (PAW, FCAW, RSW)
Week 5: Different type of welding methods and its details (RW, Thermit, FSW)
Week 6: Different type of welding methods & its details (Brazing, Soldering)
Week 7: Design & analysis of butt and fillet welds joints
Week 8: Design & analysis of weld joints for different static loading conditions