



FUNDAMENTAL OF WELDING SCIENCE AND TECHNOLOGY

PROF. PANKAJ BISWAS

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COURSE OUTLINE :

Prof. Pankaj Biswas going to offer a course on Fundamental of Welding Science and Technology under the MOOCS program of the MHRD. As the name implies in this course he will try to cover the fundamental overview of the traditional/ industrial welding technology especially those welding processes which are widely used in manufacturing industries. 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. Welding is a joining process which is an unavoidable technology in most of the manufacturing sector. It is such a topic in which you will get the taste of most of the science and engineering subjects. Knowledge of almost all science subjects like physics, chemistry, mathematics and engineering subjects like solid mechanics, thermal science, fluid mechanics etc. are highly essential to understand the area welding technology. It is observed that in manufacturing industry over 30 % expenditure is spent on welding. Welding has significant application in various manufacturing sectors like aerospace, automobile, ship building, railway etc. It plays very important and crucial role in service life of the structure. That's why basic fundamental knowledge of welding is highly essential. The brief overview of the course content can be stated like; this course will cover the classification of welding process, classification of welding joints, industrial relevance of welding, welding symbols, characteristics of traditional welding power sources. It will give the fundamental knowledge of principle and physics involve in various welding processes. It will also cover the importance and applications of different traditional welding techniques. This course will highlight safety precautions to be followed in welding. This course will also cover welding defects & inspection and with their remedies to improve the weld quality.

ABOUT INSTRUCTOR :

I, Prof. Pankaj Biswas, am a Professor in the Dept. of Mechanical Engineering, IIT Guwahati. I am working in the area of welding technology, 3-D printing and forming by line heating for the past 17 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 modeling of welding processes using soft computing techniques. I guided 02 PDF, 10 PhD scholars in the area of welding and forming. Currently I am guiding 02 NPDF and 10 PhD students in the welding, 3-D printing and line heating areas. I already published about 104 journal articles, 95 conference proceedings, 28 book chapters and 06 patents. I worked in ten sponsored / consultancy projects. Currently, I am working in another eight sponsored / consultancy projects. I got IEI Young Engineers Award 2013- 2014' in Mechanical Engineering discipline.

COURSE PLAN :

- Week 1:** Introduction and classification of welding
- Week 2:** Nomenclature and symbol of welding joints
- Week 3:** Power source of welding
- Week 4:** Physics and principle of arc welding
- Week 5:** Different type of welding methods and their details
- Week 6:** Different type of welding methods their details
- Week 7:** Different type of welding methods their details
- Week 8:** Welding defects and inspection