



Course code    Course title  
 METRO 008    Metal Matrix Composites

## Course summary

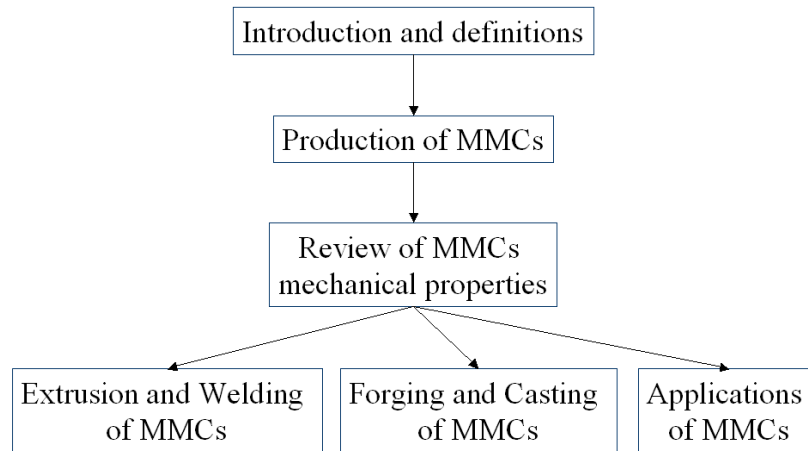
The course gives an introduction to Metal Matrix Composites, in order to understand their peculiarities and potential for engineering applications. After the review of preliminary definitions, the main manufacturing processes are described, as well as the mechanical behaviour of these family of materials. Attention is then devoted to the “secondary” processes (casting, forging, extrusion, welding) suitable for MMCs and finally some significant applications are overviewed.

## Lectures list

n.	Title	Summary	Lecturer	Duration
1	Introduction and definitions	The concept of matrix and reinforcement; main kinds of matrices and reinforcements; long fibers, short fibers, particles	Vedani, Maurizio	30'
2.	Production of MMCs (1)	Classification of MMCs production routes; processes in solid state (diffusion bonding, powder metallurgy)	Bonollo, Franco	25'
3.	Production of MMCs (2)	Processes in liquid state (compcasting, infiltration: spontaneous, in vacuum, under pressure, squeeze, reactive)	Bonollo, Franco	56'
4.	Review of MMCs mechanical properties (1)	Mechanical behaviour of MMCs at room temperature (tensile, fatigue)	Vedani, Maurizio	45'
5.	Review of MMCs mechanical properties (2)	Mechanical behaviour of MMCs at high temperature (tensile, fatigue, creep); hot working of MMCs	Vedani, Maurizio	28'
6.	Extrusion and Welding of MMCs	Main features of the extrusion and welding processes of MMCs, with respect to specific matrix-reinforcement systems	Bonollo, Franco	52'
7.	Forging and Casting of MMCs	Main features of the forging and casting processes of MMCs, with respect to specific matrix-reinforcement systems	Bonollo, Franco	43'
8.	Applications of MMCs	Review of actual and possible industrial applications of MMCs	Vedani, Maurizio	39'
				<b>4h 51'</b>

## Lectures prerequisites chart

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Each arrow means a prerequisite.