Course Title	**Surface Engineering**				
Course Code	**MME 553**				
Course Type	**Compulsory**				
Level	Graduate				
Year / Semester	Fall Semester				
Teacher's Name	Claus Rebholz				
ECTS	8	Lectures / week	2X1.5 hrs	Laboratories / week	1
Course Purpose and Objectives	The purpose of this course is to (a) cover practical surface treatments and deposition of thin films and functional coatings for multiple applications, and (b) support students when faced with a multitude of options to select and specify a treatment to engineer the surface of a component.				
Learning Outcomes	• Develop the fundamental knowledge of physical processes and interactions in materials and surfaces that affect the performance of engineering systems. • Understand the significance of engineered surfaces in materials technology. • Discuss and understand how coating technologies are embedded within all engineering disciplines. • Recognise various surface coating technologies and their applications. • Describe standard methods of testing of modified surfaces. • Understand the role that surfaces play in materials behaviour of thin film and coating systems. • Review concepts of surface engineering for multiple applications and how it may be used to optimise industrial component performance.				
Prerequisites	NO	Required	NO		
Course Content	This course covers surface treatments and deposition of thin films and functional coatings for multiple applications such as mechanical, biomedical, catalytic, etc. using a large variety of methods. The processes involved range from traditional, well established techniques (e.g. painting, electroplating and galvanising), to more technologically demanding coating technologies and surface treatments (e.g. physical and chemical vapour deposition, ion implantation and laser treatment) which have benefited from recent innovations. Integrating both theory with lab practice in this course ensures a greater understanding and appreciation of the concepts for application.				

Teaching Methodology	Class and laboratory lectures; power point presentations Communicative, Collaborative During the first week of the semester, the Syllabus of the course is given by the teacher, which includes information on the course content, expected learning outcomes, assessment and office hours
Bibliography	• P.A Dearnley, *Introduction to Surface Engineering*, 2017. ISBN-13: 978-0521401685 • Michel Cartier, *Handbook of Surface Treatments and Coatings*, 2003. ISBN: 0791801950 • *Surface Engineering* (ASM Handbook, Vol 5), 1994. ISBN: 087170384X • Milton Ohring. *Materials Science of Thin Films*, 1991. ISBN: 0125249756 • Lecture notes; selected articles
Assessment	Midterm exam (35%), final exam (35%), homework, lab reports/presentation (30%)
Language	English