



Course Syllabus

Department/Faculty: School of Engineering
Graduate Program: Materials Engineering and Nanotechnology
Degree: ☒ Academic Master's ☒ Doctorate (PhD) ☐ Professional Master's
Course Name: Coating Technology
Professor: Prof. Dr. Carlos Roberto Camello Lima
Office hours: 48
Course Overview: The course covers various technologies and processes used for the deposition of surface coatings designed to provide protection in scenarios requiring enhanced performance in wear resistance, corrosion protection, thermal insulation, and other demanding conditions. It discusses the state of the art and a range of applications, particularly those related to Thermal Spraying technology and Welding technology, including hybrid systems involving Cladding and Thermal Spraying. The course also addresses the underlying phenomena, the materials employed, and the outcomes of applying engineering coatings, as well as the tests and evaluations used for characterisation and performance assessment.
Topics outline: 1. Definitions and Basic Concepts 2. Corrosion: Types and Mechanisms 3. Wear: Types and Mechanisms 4. Tribology and Other Degradative Factors 5. Protection Systems: Coatings 6. Main Coating Application Processes 7. Thermal Spraying: Fundamentals 8. Thermal Spraying Methods 9. Coating Applications 10. Key Testing and Evaluation Methods (Lectures)
Letter Grade Assignment Grade A (Excellent) - Grade points between 9 and 10 Grade B (Good) - Grade points between 8 and 8.9 Grade C (Satisfactory) - Grade points between 7 and 7.9 Grade D (Unsatisfactory) - Grade points between 0 and 6.9



Texts, Materials, and supplies

Basic bibliography

- ASM INTERNATIONAL. *ASM Handbook: Corrosion: Fundamentals, Testing, and Protection*. Edited by Stephen D. Cramer; Bernard S. Covino Jr. Materials Park, OH: ASM International, 2003.
 - ASM INTERNATIONAL. *ASM Handbook: Friction, Lubrication, and Wear Technology*. Edited by George E. Totten. Materials Park, OH: ASM International, 2017.
 - DAVIS, J. R. (Ed.). *ASM/TSS Handbook of Thermal Spray Technology*. Materials Park, OH: ASM International – Thermal Spray Society, 2004.
 - GENTIL, Vicente; CARVALHO, L. J. *Corrosão*. 7. ed. Rio de Janeiro: LTC, 2022.
 - KREPSKI, R. P. *Thermal Spray Coating Applications in the Chemical Process Industries*. St. Louis: Materials Technology Institute, Millstone, 1993. 252 p.
 - LIMA, C. R. C.; TREVISAN, R. E. *Aspersão térmica: fundamentos e aplicações*. 2. ed. São Paulo: Artliber, 2007. 152 p.
 - MARQUES, P. V.; MODENESI, P. J.; BRACARENSE, A. Q. *Soldagem: fundamentos e tecnologia*. 3. ed. Belo Horizonte: Editora UFMG, 2009.
 - PAWLOWSKI, L. *The Science and Engineering of Thermal Spray Coatings*. New York: John Wiley & Sons, 1995.
- SOBOLEV, V. V.; GUILMANY, J. M.; NUTTING, J. *High Velocity Oxy-Fuel Spraying: Theory, Structure-Property Relationships and Applications*. London: Maney Publishing, 2004. 397 p.