Co-funded by the Erasmus+ Programme of the European Union

EUROPEAN UNIVERSITY FOR CUSTOMISED EDUCATION

STUDY GUIDE

COMPRESSOR AERODYNAMICS

Organised by

Brandenburg University of Technology Cottbus-Senftenberg

Co-funded by the Erasmus+ Programme of the European Union

1. IDENTIFYING DATA.	
· Course Name.	Compressor aerodynamics– Event no. 350351
· Coordinating University.	Brandenburg University of Technology Cottbus-Senftenberg
· Partner Universities Involved.	-
· Course Field(s).	Aeroengine, Propulsion, Turbomachinery
· Related Study Programme.	*Mechanical Engineering*
· ISCED Code.	*6, 7*
· SDG.	*4,5,7,9,10,13*
· Study Level.	*M, B*

· Number of ECTS credits allocated.	*3*
· Mode of Delivery.	*Online live AND on-campus*
· Language of Instruction.	*English*
· Course Dates.	*17.10.2023 – 06.02.2024*
· Precise Schedule of the Lectures.	*Bi-weekly (A-weeks/ even weeks 13:45-17:00)*
· Key Words.	*Turbomachinery, Compressor design, performance calculation*
· Catchy Phrase.	

· Prerequisites and co-requisites.	*There are no mandatory requirements for this course.* *A basic knowledge of fluid dynamics and engine thermodynamic cycle is helpful.* *Recommended for Master and bachelor students of mechanical engineering*
· Number of EUNICE students that can attend the Course.	*40*
· Course inscription procedure(s).	

2. CONTACT DETAILS.	
· Department.	*Chair of Aeroengine Design*
· Name of Lecturer.	*Thomas Gietl*
· E-mail.	*majid.asli@b-tu.de*
· Other Lecturers.	*Dr. Majid Asli, Prof. Dr. Klaus Höschler*

3. COURSE CONTENT.

Compressor aerodynamics:
Cycle process requirements, aerodynamic design process, performance maps, important metrics, three-dimensional flow phenomena and blading, compressor operating behaviour, measures to enhance compressor performance, compressor test, compressor life cycle and in-service challenges.

4. LEARNING OUTCOMES.

After participating in the module, the students have in-depth knowledge that is required for the performance analysis of compressors and various aerodynamic phenomena. They can design a compressor for propulsion applications as well as analyse existing ones and use existing methods to modify the compressors for other interdisciplinary applications.

5. OBJECTIVES.

Comprehension of all steps of the aerodynamic design process.
Insight into the operating behaviour of a compressor.
Knowledge of methods to improve compressor performance.
Understanding of important aspects of compressor test.

6. COURSE ORGANISATION.

UNITS

1.	*Introduction: history, cycle process, compressor types, design aspects*
2.	*Aerodynamic design process: 1D / 2D / 3D design*
3.	*Compressor performance: understanding and measures for performance improvement*
4.	*Test and life cycle: important aspects during test, in-service challenges and solutions*

LEARNING RESOURCES AND TOOLS.

PowerPoint slides will be provided prior to the lecture.

PLANNED LEARNING ACTIVITIES AND TEACHING METHODS.

Lecture with the possibility to ask questions.

7. ASSESSMENT METHODS, CRITERIA AND PERIOD.

Written (online) exam, 120 min.

OBSERVATIONS.

8. BIBLIOGRAPHY AND TEACHING MATERIALS.

Recommended literature (not mandatory): N. A. Cumpsty, Compressor Aerodynamics, Krieger Publishing Company, Malabar Florida, reprint edition, 2004, ISBN-13: 978-1575242477