

Turbomachinery (ONLINE)

Version	26/10/20
Effective from	18 January 2021
Previous version	-

ECTS Credits	4,0
Teaching hours	50
Workplace learning hours	50
Total hours of student learning	144

Pre-requisites	The course is opened for Russian and foreign Bachelor, Master and PhD students with specialized background in Mechanical Engineering or equivalent skills and knowledge.
Alignment to graduate profiles	This course contributes to achievement of the graduate outcomes of the following qualifications: <ul style="list-style-type: none"> • Bachelor in Mechanical Engineering (Machinery / Thermodynamic / Heat Power) • Graduate Diploma in Mechanical Engineering (Machinery / Thermodynamic / Heat Power) • Diploma in Mechanical Engineering (Machinery / Thermodynamic / Heat Power)
Core transferable skills	This course contributes towards the development of the following core transferable skills categories: Self/Others - Learning to Learn, Specialist skills, Literacy, Numeracy, Digital Literacy. The professional competences, skills, knowledge and skills obtained as a result of the training can be used by bachelors, undergraduates and graduate students in the preparation of the final qualifying work and Ph.D. thesis, in the performance of research work, as well as in further pedagogical activity. Practice-oriented students will be able to bring the acquired competencies, abilities, knowledge and skills into their professional activities.
Course aim	To master the basic provisions on gas turbine technologies (assessment of the current state and look into the future), methods of thermodynamic analysis of turbine plants, steam turbines, wind and microturbines. Get basic design and CFD skills; deep knowledge in thermodynamic, mechanical engineering, technologies, legislation, and innovations in Russian Federation and abroad.
Indicative content	Content may include but is not limited to: <ul style="list-style-type: none"> • Introduction to Turbomachinery • Introduction to Thermodynamics • CFD for Turbomachinery. Introduction • Heat engine cycle • Steam turbines • Guest Speakers Day • Gas turbines • CFD for Turbomachinery • Wind turbines • Wind turbines. Team project • Simulation of thermal schemes of TPP for the application in information systems

LEARNING OUTCOMES

On successful completion of this course students will be able to:	
1	Use knowledge of the theoretical foundations of work processes in power machines, apparatus and installations, methods of computational analysis of objects of professional activity
2	Use knowledge of theoretical and experimental methods of scientific research, principles of organizing research activities
3	Use modern achievements of science and advanced technologies in research work
4	Analyze the advanced Russian and foreign experience in solving the assigned tasks
5	Know gas turbine technology
6	Know areas of application of steam and gas turbines, as well as microturbines
7	Know basic equations of turbomachines

8	Know features of steam turbines for operation on wet steam
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ASSESSMENTS

Basis of assessment	Achievement based assessment		
Methods of assessment	Learning Outcomes	Pass criteria (Minimum)	% Weightings
Summative review	1, 4	40%	40%
Portfolio – summative of practices	2, 3, 5	40%	60%

REQUIREMENTS FOR SUCCESSFUL COURSE COMPLETION

Requirements	<ul style="list-style-type: none"> • Mark of 40% or more in every summative assessment • Gain a course result of C (50%) or higher
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RESULTS

Assessment results	<ul style="list-style-type: none"> • Results for assessments are given in percentage marks
Course results	<ul style="list-style-type: none"> • Individual assessments may cover one or more of the learning outcomes. • Each summative assessment is assigned a percentage weighting. • The overall percentage mark for the course is calculated by adding the weighted results for all summative assessments. • To derive the course result the overall percentage mark is converted into a grade using Course Result Key AC-NMIT-06

LEARNING AND TEACHING

Learning and teaching approaches	Lectures, group discussions, tutorials, learner managed activities, laboratories, presentations, research, projects and case studies.
Learning and teaching resources	Textbooks, journals and Library Learning Centre resources; use of Internet; computer laboratory and specialist software.
Learner managed activities	<ul style="list-style-type: none"> • Completion of course work, set assignments/projects • Reading of course materials • Study group work • Preparation for classes • Homework • Research - (e.g. exploration, location and selection of relevant information, review/evaluation/analysis of information, recording information) • Discussions with colleagues/subject matter experts • Review application of information to course work • Practicing relevant practical and technical skills/methods/techniques • Self-evaluation of course work • Gathering relevant contextual information/ issues/ideas to build knowledge of the subject