

SYLLABUS

Title of Course:	SOLID MODELLING IN CAD SYSTEMS	
Faculty of	Mechanical Engineering	
Study Level	Bachelor	
Semester	Autumn/Spring	
ECTS Credits	4	
Teaching methods	Laboratory	
Course Topics	Acquiring the ability to use methods of creating three-dimensional parametric models of parts and assemblies of mechanical machine elements using different design systems. Creating 2D documentation on the basis of a solid model using different 3D design systems. Analyzing of parts collision, and basic kinematic analysis of moving parts. Skills in data exchange (import / export) between different CAD/CAM applications.	
Grading policy	Positive result of the multiple-choice test	
References	<ol style="list-style-type: none"> 1. Ian Stroud, Hildegard Nagy: Solid Modelling and CAD Systems: How to Survive a CAD System. Springer 2011 (online version) 2. Stasiak Fabian - Autodesk Inventor 11 Zbiór ćwiczeń, ExpertBooks 2006 3. Andrzej Jaskulski - Autodesk Inventor Professional / Fusion 2012PL/2012+ Metodyka projektowania, Wydawnictwo Naukowe PWN 2012 4. Paweł Maciąg - Autodesk Inventor ćwiczenia, Politechnika Radomska, Wydawnictwo 2008 5. Ming C. Leu, Akul Joshi, Krishna C. R. Kolan, NX7 FOR ENGINEERING DESIGN, Department of Mechanical and Aerospace Engineering Missouri University of Science and Technology Rolla, Missouri 65409 6. Marcin Antosiewicz, Dariusz Józwiak, NX Podstawy modelowania Synchronous&Realize Shape, CAMdivision, sp. z o.o. 2015/02 	
Prerequisites	Language: English, CEFR level B1 or higher	
	Other:	Completed courses of: Engineering Graphics, AutoCAD 2D (DoubleCAD, TurboCAD), Fundamentals of Machinery Design
Teacher	Paweł MACIĄG, Ph.D	
	Location:	Krasickiego 54 Street, room 309
	Email:	p.maciag@uthrad.pl
	Phone:	+48 48 361 76 12
Tuition fees	do not apply for EU/EEA citizens or exchange students	

SYLLABUS

Title of Course:	FUNDAMENTALS OF FINITE ELEMENT METHOD	
Faculty of	Mechanical Engineering	
Study Level	Bachelor	
Semester	Autumn/Spring	
ECTS Credits	2	
Teaching methods	Lecture/Laboratory	
Course Topics	Fundamental concepts of the finite element method for linear stress and deformation analysis of mechanical components. Development of truss, beam, frame, elements. Practical modeling techniques and use of general-purpose codes for solving practical stress analysis problems.	
Grading policy	Positive result of the projects	
References	<ol style="list-style-type: none"> 1. Singiresu S. Rao: <i>Finite Element Analysis in Engineering</i>, 4th Edition, 2005 2. O.C. Zienkiewicz, R.L.Taylor, J.Z.Zhu: <i>The Finite Element Method: Its Basis and Fundamentals, Seventh Edition 7th Edition</i> 3. Kazimierz Król: <i>Finite Element Method in structural analysis</i>. Radom 2005 	
Prerequisites	Language: English, CEFR level B1 or higher	
	Other:	Completed courses of: Mathematics from engineering programs, Engineering mechanics, Strength of materials
Teacher	Krzysztof OLEJARCZYK, Ph.D	
	Location:	Krasickiego 54 Street, room 306
	Email:	k.olejarczyki@uthrad.pl
	Phone:	+48 48 361 71 16
Tuition fees	do not apply for EU/EEA citizens or exchange students	

SYLLABUS

Title of Course:	STRENGTH OF MATERIALS	
Faculty of	Mechanical Engineering	
Study Level	Bachelor	
Semester	Autumn/Spring	
ECTS Credits	5	
Teaching methods	Lecture/Laboratory	
Course Topics	Fundamental concepts of strength of material. This course has two specific goals: to introduce students to concepts of stresses and strain; shearing force and bending; as well as torsion and deflection of different structural elements and to develop theoretical and practical skills relevant to the areas mentioned above.	
Grading policy	Positive result of the multiple-choice test	
References	<ol style="list-style-type: none"> 1. Timoshenko S.: <i>Strength of Materials</i>, 3rd edition. Krieger Publishing Company, 1976 2. Hibbeler, R.C.: <i>Statics and Mechanics of Materials</i>, SI Edition. Prentice-Hall, 2004 3. Mott, Robert L.: <i>Applied Strength of Materials</i>, 4th edition. Prentice-Hall, 2002 	
Prerequisites	Language: English, CEFR level B1 or higher	
	Other:	Completed courses of: Mathematics from engineering programs, Engineering mechanics I
Teacher	Krzysztof OLEJARCZYK, Ph.D	
	Location:	Krasickiego 54 Street, room 306
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	Phone:	+48 48 361 71 16
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SYLLABUS

Title of Course:	DATABASES	
Faculty of	Mechanical Engineering	
Study Level	Bachelor	
Semester	Autumn/Spring	
ECTS Credits	5	
Teaching methods	Seminar/Project/Self-study	
Course Topics	Basic concepts of database. Object oriented and entity-relationship model. Relational data model. Introduction to sql. Sql data definition and manipulation language. Developing the database application. Database project.	
Grading policy	Positive result of the multiple-choice test and positive result of project	
References	<ol style="list-style-type: none"> 1. Hektor Garcia-Molina, Jeffrey D. Ullman, Jennifer D. Widom, Database Systems: The Complete Book. Prentice Hall. 2. Narayan Umanath, Richard Scamell, Data Modeling and Database Design. Delmar. 3. Gavin Powell, Beginning Database Design. Wiley. 4. Paul Wilton, John Colby, Beginning SQL. Wiley. 5. Peter Rob, Carlos Coronel, Database Systems: Design, Implementation, and Management, Seventh Edition. Course Technology. 	
Prerequisites	Language:English, CEFR level B1 or higher	
	Other:	Completed courses of: Information Technology
Teacher	Michał PAJĄK, Assistant Professor	
	Location:	Krasickiego54 Street, Room 122
	Email:	m.pajak@uthrad.pl
	Phone:	+48 48 361 7149
Tuition fees	do not apply for EU/EEA citizens or exchange students	

SYLLABUS

Title of Course:	THEORY OF OPERATION AND MAINTENANCE OF TECHNICAL SYSTEMS	
Faculty of	Mechanical Engineering	
Study Level	Bachelor	
Semester	Autumn/Spring	
ECTS Credits	3	
Teaching methods	Seminar/Self-study	
Course Topics	Phases of machine live-cycle. Basis of system theory. Controlled processes of the operation and maintenance phase. Tribological wearing. Non-tribological wearing. operational potential. Operational position of the technical system. Operation and maintenance strategies.	
Grading policy	Positive result of the multiple-choice test	
References	<ol style="list-style-type: none"> 1. Lindley R. Higgins, R. Keith Mobley, Maintenance Engineering Handbook, Seventh Edition. 2. Donella Meadow, Thinking in Systems. Chelsea Green Publishing. 3. http://www.corrosion-doctors.org/modules. 4. Mehadaven B., Operation Management Theory and Practice. Pearson. 	
Prerequisites	Language: English, CEFR level B1 or higher	
	Other:	Completed courses of: Physics
Teacher	Michał PAJAŁ, Assistant Professor	
	Location:	Krasickiego54 Street, Room 122
	Email:	m.pajak@uthrad.pl
	Phone:	+48 48 361 7149
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SYLLABUS

Title of Course:	BIOFUELS FOR INTERNAL COMBUSTION ENGINES	
Faculty of	Mechanical Engineering	
Study Level	Bachelor	
Semester	Autumn/Spring	
ECTS Credits	3	
Teaching methods	Seminar/Laboratory/Self-study	
Course Topics	Fundamentals of combustion process, engine research, fuels physicochemical properties, plant oils, selected ethers and alcohols as a fuel for internal combustion engines, bioethanol, fuel blends, transesterification process of plant oils, advantages and disadvantages of biofuels.	
Grading policy	Positive result of the multiple-choice test	
References	<ol style="list-style-type: none"> 1. http://www.aseanfoundation.org/documents/books/biofuel.pdf 2. http://www.sciencedirect.com/science/article/pii/S0016236112007168 3. http://pubs.acs.org/doi/abs/10.1021/ef4025036 4. ISO EN 14214 Standard 5. ISO EN 590 Standard 	
Prerequisites	Language: English, CEFR level B1 or higher	
	Other:	Completed courses of: Physics, Chemistry
Teacher	Krzysztof GÓRSKI, Associated Professor	
	Location:	Chrobrego 45 Street, Room 50
	Email:	krzysztof.gorski@uthrad.pl
	Phone:	+48 48 361 76 58
Tuition fees	do not apply for EU/EEA citizens or exchange students	

SYLLABUS

Title of Course:	VEHICLE DIAGNOSTICS	
Faculty of	Mechanical Engineering	
Study Level	Bachelor	
Semester	Autumn/Spring	
ECTS Credits	3	
Teaching methods	Seminar/Laboratory/Self-study	
Course Topics	European On Board Diagnostic. Gas analysis of the internal combustion engines. Catalytic converter and oxygen sensors. Diagnostics of vehicle brakes and wheel suspension. The wheel geometry measurements. Diagnostic of MAP sensor and Inductive crankshaft position sensor. Fuel and ignition system. Lead – acid battery testing. Common Rail testing. Vehicle safety systems diagnostic.	
Grading policy	Positive result of the multiple-choice test	
References	<ol style="list-style-type: none"> 1. Al Santini: OBD-II: Functions, Monitors and Diagnostic Techniques (online in https://books.google.pl) 2. A. W.M. Bonnick: Vehicle Electric System and fault Diagnosis. (online in https://books.google.pl) 3. C.H. Bartholomew: Catalyst deactivation 1997. (online in https://books.google.pl) 4. K. Reif: Brakes, Brake Control and Driver Assistance Systems. (online in https://books.google.pl) 	
Prerequisites	Language: English, CEFR level B1 or higher	
	Other:	Completed courses of: Physics, Chemistry
Teacher	Krzysztof GÓRSKI, Associated Professor	
	Location:	Chrobrego 45 Street, Room 50
	Email:	krzysztof.gorski@uthrad.pl
	Phone:	+48 48 361 76 58
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Title of Course:	LOGISTICS OF PRODUCTION	
Faculty of	Mechanical Engineering	
Study Level	Bachelor	
Semester	Autumn/Spring	
ECTS Credits	5	
Teaching methods	Lecture/Project	
Course Topics	Fundamentals of logistics. Logistic systems in enterprises. Area and goals of the logistics production. The basic rules of Toyota Production System. Material Requirement Planning (MRP) system. Information flow in production. Kaizen as a philosophy of management. Just-in-time manufacturing. Fundamentals of the Kanban systems.	
Grading policy	Positive result of the examination	
References	<ol style="list-style-type: none"> 1. Bozarth C, Hanfield R.: Introduction to Operations and Supply Chain Management. 4th edition. Published by Pearson Education Inc., New Jersey, 2016 2. Coyle J., Bardi E., Langley C.: The management of business logistics. 7th edition. Published by West Publishing Company, 2003 3. Liker J.: The Toyota Way : 14 Management Principles from the World's Greatest Manufacturer. McGraw Hill Professional, 2003 4. Ohno T.: Toyota Production System. Published by Productivity Press, Portland, Oregon 1988 	
Prerequisites	Language: English, CEFR level B1 or higher	
	Other:	Completed courses of: Basic of logistics
Teacher	Alicja WAŚOWICZ, Ph.D	
	Location:	Chrobrego 45 Street, room 33
	Email:	a.wasowicz@uthrad.pl
	Phone:	+48 48 361 76 65
Tuition fees	do not apply for EU/EEA citizens or exchange students	

SYLLABUS

Title of Course:	LOGISTICS AND SUPPLY CHAIN MANAGEMENT	
Faculty of	Mechanical Engineering	
Study Level	Bachelor	
Semester	Autumn/Spring	
ECTS Credits	5	
Teaching methods	Lecture/Project	
Course Topics	Logistics of supply system. Materials management. Forecasting of demand. Sourcing decisions and the purchasing process. Just in time system /Lean production. Reserves management in supply chain. Analytic Hierarchy Process – AHP method. Pareto method (ABC method, 80/20 rule). Economic value of order.	
Grading policy	Positive result of the multiple-choice test	
References	<ol style="list-style-type: none"> 1. Bozarth C, Hanfield R.: Introduction to Operations and Supply Chain Management. 4th edition. Published by Pearson Education Inc., New Jersey, 2016 2. Coyle J., Bardi E., Langley C.: The management of business logistics. 7th edition. Published by West Publishing Company, 2003 	
Prerequisites	Language: English, CEFR level B1 or higher	
	Other:	Completed courses of: Basic of logistics
Teacher	Alicja WAŚOWICZ, Ph.D	
	Location:	Chrobrego 45 Street, room 33
	Email:	a.wasowicz@uthrad.pl
	Phone:	+48 48 361 76 65
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SYLLABUS

Title of Course:	INTERNAL COMBUSTION ENGINES	
Faculty of	Mechanical Engineering	
Study Level	Bachelor	
Semester	Autumn/Spring	
ECTS Credits	5	
Teaching methods	Laboratory	
Course Topics	<p>Basic parameters and performance of IC engines (power and mechanical efficiency, mean effective pressure and torque, volumetric efficiency, fuel-air ratio, specific fuel consumption, power and mechanical efficiency). Engine characteristics (speed, load and regulation characteristics). Measurement of exhaust emission (HC, methane, non-methane, CO, NO_x, PM). Combustion process examination (cylinder pressure, heat release, thermal efficiency). Heat balance of IC engine. Alternative fuelling of IC engine (dual fuel operation of CI engine).</p>	
Grading policy	Positive result of the multiple-choice test	
References	<ol style="list-style-type: none"> 1. A.J. Martyr and M.A. Plint: Engine Testing(Third Edition) Theory and Practice ISBN: 978-0-7506-8439-2 (http://www.sciencedirect.com/science/book/9780750684392) 2. John B. Heywood: Internal Combustion Engine Fundamentals 3. Günter P. Merker, Christian Schwarz, Gunnar Stiesch, Frank Otto Simulating Combustion Simulation of combustion and pollutant formation for engine-development ISBN 10 3-540-25161-8 Berlin Heidelberg New York 	
Prerequisites	Language: English, CEFR level B1 or higher	
	Other:	Internal Combustion Engines Fundamentals
Teacher	Tomasz SKRZEK, Ph.D	
	Location:	Chrobrego 45 Street, room 216
	Email:	t.skrzek@uthrad.pl
	Phone:	+48 48 361 76 42
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SYLLABUS

Title of Course:	ECO-LOGISTICS	
Faculty of	Mechanical Engineering	
Study Level	Bachelor	
Semester	Winter/summer	
ECTS Credits	3	
Teaching methods	Project	
Course Topics	<p>Essence, aim, definition and functions of eco-logistics. Recycling processes of waste materials in the industry. Collection, transportation, and storage of wastes. Product design optimised for recycling and reuse.</p> <p>Environmental management. Impact of vehicles on the environment – risk and protection. Types of waste and their characteristics. Waste materials in Poland – scale of problem, analysis of statistical data. Eco-logistics during the car service life and dismantling. Reuse of wastes from the automotive market. Safety in logistics. Economic aspects of eco-logistics.</p>	
Grading policy	Positive evaluation of the project	
References	<ol style="list-style-type: none"> 1. Dekker R., Fleischmann M., Inderfurth K., Van Wassenhove L.N.: Reverse logistics. Quantitative models for closed-loop supply chains. Springer-Verlag Berlin Heidelberg 2004 2. Golinska P. (et al.): Environmental issues in automotive industry. Springer-Verlag Berlin Heidelberg 2014. 	
Prerequisites	Language: English	
	Other:	Basics of logistics and environmental protection
Teacher	Małgorzata WOJTYNIAK, Ph.D	
	Location:	Chrobrego 45 Street, room 40
	Email:	m.wojtyniak@uthrad.pl
	Phone:	+48 48 361 76 55
Tuition fees	do not apply for EU/EEA citizens or exchange students	

SYLLABUS

Title of Course:	TRAFFIC ACCIDENT DESCRIPTION AND PHOTOGRAMMETRY	
Faculty of	Mechanical Engineering	
Study Level	Bachelor	
Semester	Winter/summer	
ECTS Credits	2	
Teaching methods	Project	
Course Topics	Basics of photogrammetry. Traffic accident description procedure. Preparing a field sketch of the traffic accident scene. Rules of the correct photographic documentation of a traffic accident. Rules of collecting evidence of the vehicle damage. Photogrammetric markers for traffic accident reconstruction. Photogrammetric methods in traffic accident reconstruction. Application of photogrammetry software in gathering data regarding the accident.	
Grading policy	Positive evaluation of the project	
References	<ol style="list-style-type: none"> McGlone J.C.: Manual of Photogrammetry – 5th edition. American Society for Photogrammetry & Remote Sensing 2004. Praca zbiorowa: Wypadki drogowe. Vademecum biegłego sądowego. WIES Kraków 2003. 	
Prerequisites	Language: English	
	Other:	Principles of photography
Teacher	Małgorzata WOJTYNIAK, Ph.D	
	Location:	Chrobrego 45 Street, room 40
	Email:	m.wojtyniak@uthrad.pl
	Phone:	+48 48 361 76 55
Tuition fees	do not apply for EU/EEA citizens or exchange students	