



LIST OF COURSES OFFERED TO INTERNATIONAL STUDENTS
NON-DEGREE PROGRAM
EVEN SEMESTER, ACADEMIC YEAR 2025/2026
Faculty of Engineering - Universitas Indonesia

Course Name: Advanced Calculus

Degree	Bachelor
Department/Study Program	Mechanical Engineering
Type of Class	International
Lecturer Name	Rendi Kurniawan, Ph.D.
Course Structure	Lecture
Course Credits	2
Course Overview	Upon completing this course, students will be able to use concepts from sequences, series, conic sections, and fundamental calculus involving functions of two or three variables to solve applied problems. The material covered in this course includes: Infinite Sequences and Series: Study of infinite sequences and series, including convergence tests for positive and alternating series; Power Series and Operations: Examination of power series and their operations, including Taylor and Maclaurin series; Conic Sections: Analysis of conic sections and their properties; Calculus in Polar Coordinates: Application of calculus concepts in polar coordinates; Differentiation, Limits, and Continuity: Understanding of differentiation, limits, and continuity for functions of multiple variables, including directional derivatives and gradients; Chain Rule: Application of the chain rule for multivariable functions; Tangent Planes and Surface Approximation: Study of tangent planes and surface approximation; Lagrange Multipliers: Use of Lagrange multipliers for optimization problems; Double and Triple Integrals: Computation of double integrals in Cartesian and polar coordinates, and triple integrals in Cartesian, cylindrical, and spherical coordinates; Applications of Multiple Integrals: Application of double and triple integrals to solve real-world problems.
Course Key Words	
Learning Outcome	Students can use the concepts of sequences, series, conic sections, and the basic concepts of calculus which involve the function of two or three variables to solve their applied problems.



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Course Schedule	Infinite sequences and infinite series, Test for convergence of positive series and alternating series, Power series and operation on operations, Taylor and MacLaurin series, Conic sections, Calculus in polar coordinates, Derivatives, limits, and continuity of multivariable functions, Directional derivatives and gradients, Chain Rule, Tangent planes and Approximations, Lagrange multipliers. Double integrals in Cartesian coordinates and polar coordinates, triple integrals in Cartesian coordinates, cylindrical coordinates and spherical coordinates, Applications of double and triple Integral.
Textbooks, References, and Supplementary Materials (Maximum 3)	1. D. Varberg, E. J. Purcell, S.E. Rigdon, Calculus, 9th ed., PEARSON, Prentice Hall, 2007. 2. Thomas, Calculus Thirteenth Edition Volume 2, Erlangga, 2019.
Grading Component	-
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	Students are expected to: - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. - Avoid any form of academic dishonesty (e.g., plagiarism, cheating).



**LIST OF COURSES OFFERED TO INTERNATIONAL STUDENTS
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EVEN SEMESTER, ACADEMIC YEAR 2025/2026
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Course Name: Solid Mechanics 1

Degree	Bachelor
Department/Study Program	Mechanical Engineering
Type of Class	International
Lecturer Name	- Jos Istiyanto, S.T., M.T., Ph.D. - Rendi Kurniawan, Ph.D. - Dr.Eng. Gerry Liston Putra, S.T., M.T.
Course Structure	Lecture
Course Credits	2
Course Overview	Solid Mechanics 1 relates to the loads acting on statically structured systems that represent specific operational conditions. Therefore, the learning outcomes of the statics of structures course are for students to be able to systematically and comprehensively calculate static loads on various types of structures based on fundamental mechanics principles using mathematical approaches. These outcomes include explaining the fundamentals of mechanics, which encompass forces, actions, reactions, and internal forces in various static structures. This involves calculations and diagrams of internal forces and influence lines of specific static structures caused by the movement of loads along the structure. Active learning methods such as small group discussions, cooperative learning, and contextual instruction are employed. Upon completion of this course, students are expected to apply their knowledge of structural statics in mechanical design, design tasks, and experiments for their final research projects.
Course Key Words	
Learning Outcome	Understanding the concepts of force and force equilibrium in various constructions, enabling the calculation and analysis of structural equilibrium based on the principles of force equilibrium in structures, frames, and bar frame constructions.



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Course Schedule	Basic principle of engineering statics/Newton Law; Arrangement and decomposition of force in plane and space; Static equilibrium law; Support and support reaction; Frame construction.
Textbooks, References, and Supplementary Materials (Maximum 3)	1. Beer, Ferdinand P, Mechanics for Engineers: STATICS, Mc GrawHill. 2. Hibbeler RC, Mechanics of Materials, 10th ed., Prentice Hall, 2016. 3. Riley, F William, Engineering mechanics: STATICS, John wiley & sons 4. Hamrock, Fundamental of Machine Element, Mc Graw Hill. 5. Shigley, Joseph Edward, Mechanical Engineering Design, McGrawHill.
Grading Component	-
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	Students are expected to: - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. - Avoid any form of academic dishonesty (e.g., plagiarism, cheating).



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Course Name: Mechanical Modelling and Visualization

Degree	Bachelor
Department/Study Program	Mechanical Engineering
Type of Class	International
Lecturer Name	- Muhammad Agung Santoso, S.T., M.T., Ph.D. - Dr.Eng. Arnas, S.T., M.T.
Course Structure	Lecture
Course Credits	2
Course Overview	After completing this course, students will be able to design machine elements in the form of technical drawings according to applicable engineering drawing standards, using conventional or modern engineering methods, skills, and tools. The learning method predominantly involves synchronous online learning to accommodate interactive discussions between facilitators and students, interactive tutorials, and small group discussions and presentations. Following synchronous lecture sessions, students are assigned individual or group asynchronous tasks to gauge their understanding.
Course Key Words	
Learning Outcome	After completing this course, students will be able to design machine elements in the form of technical drawings according to applicable engineering drawing standards, using conventional or modern engineering methods, skills, and tools.
Course Schedule	Introduction to Graphic Communication in Engineering; Sketching; Visualization; Solid Modelling; Assembly Modelling; Autodesk Inventor
Textbooks, References, and Supplementary Materials (Maximum 3)	1. Dennis Lieu, Sheryl Sorby - Visualization, Modeling, and Graphics for Engineering Design-Delmar Cengage Learning (2008) 2. Curtis Waguespack - Mastering Autodesk Inventor 2015



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	and Autodesk Inventor LT 2015_ Autodesk Official Press Sybex (2014) 3. American Society of Mechanical Engineers - Dimensioning and tolerancing
Grading Component	-
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	Students are expected to: - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. - Avoid any form of academic dishonesty (e.g., plagiarism, cheating).



LIST OF COURSES OFFERED TO INTERNATIONAL STUDENTS
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Course Name: Measurement and Metrology

Degree	Bachelor
Department/Study Program	Mechanical Engineering
Type of Class	International
Lecturer Name	- Agung Shamsuddin Saragih, S.T., M.S.Eng. , Ph.D. - Prof. Sugeng Supriadi, S.T., M.S.Eng. , Ph.D.
Course Structure	Lecture
Course Credits	2
Course Overview	This module covers the concepts of metrology and measurement in industry, as well as the use of metrology and its instruments. The focus of this course is on its relevance to the manufacturing industry. The course will equip students with the ability to understand both the theory and application of metrology and engineering measurement in the field of mechanical engineering.
Course Key Words	
Learning Outcome	• Understanding how to measure, what can be directly measured. • Being able to design methods (approaches) to measure what cannot be directly measured. This involves using measurement techniques that adhere to fundamental principles to maintain quality and achieve maximum benefit from the measurement results.
Course Schedule	Basic Concepts of Measurement and Metrology; Measurement Terminology and Systems; Industrial Measurement Terminology and Systems; Measurement of Temperature, Pressure, Flow, Force, and Stress; Data Acquisition Techniques; Motion Measurement: Position, Speed, Vibration, and Acceleration; Types of Sensors/Transducers; Transfer Function, FFT & Filtering; Uncertainty Analysis; Calibration; Geometric & Dimensional Measurement: Definitions, Spatial Dimensions, Metrology (Length Measurement); Surface Texture; Roughness & Roundness; Flatness & Straightness; Angle Measurement; Basics of CMM (Coordinate Measuring Machines).



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Textbooks, References, and Supplementary Materials (Maximum 3)	1. Raghavendra, N. V., and L. Krishnamurthy., Engineering Metrology and Measurements., 2013. 2. Wahyudin P. Syam., Metrologi Manufaktur: Pengukuran dan analisa dimensi dan geometri., 2017. 3. Wahyudin P. Syam., Toleransi Dimensi dan Geometri: Analisis rantai variasi dalam proses perakitan produk., 2019.
Grading Component	-
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	Students are expected to: - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. - Avoid any form of academic dishonesty (e.g., plagiarism, cheating).



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Course Name: Life Science for Engineer

Degree	Bachelor
Department/Study Program	Mechanical Engineering
Type of Class	International
Lecturer Name	- Prof. Dr. Yudan Whulanza, S.T., M.Sc. - Prof. Sugeng Supriadi, S.T., M.S.Eng. , Ph.D.
Course Structure	Lecture
Course Credits	2
Course Overview	This course helps students to understand the basics of life sciences, especially with the arrival of the cybion era: cybernetic-biology-ontology, there are many biological applications that intersect with engineering/engineering sciences. With this foundation, it is also hoped that students will be able to explain biological considerations in mechanical design and the relationship between life sciences and sciences in the scientific discipline of mechanical engineering. The main topics discussed in this course include biological aspects in humans including cell theory and molecular biology, understanding movement systems (neuromusculoskeletal: nervemuscle-bone) and aspects of biological applications in human life, for example biomimetics, bio-inspired design, biomaterials, biomechanics and basic principles of medical device design.
Course Key Words	
Learning Outcome	• Students can explain basic biological definitions, types and anatomy of cell theory and the basics of molecular biology. • Students can provide illustrations of the relationships between networks in a human body function system (locomotor function). • Students can apply various life science phenomena in various aspects of mechanical engineering design products.
Course Schedule	Introduction to cell, chemical aspect in biology: acid, carbohydrate, lipid, protein, nucleate acid; bioenergy and metabolism: aerobic and anaerobic respiration, photosynthesis; animal control system, thermoregulation and homeostasis; biomechanics, animal



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	locomotion, scale effect; food and farm; environmental conservation, air, water, life science consideration in mechanical design.
Textbooks, References, and Supplementary Materials (Maximum 3)	1. Alexander, R. McNeill. Principles of animal locomotion. Princeton University Press, 2003. 2. Karp, G. Cell and Molecular Biology, 5th ed., John Wiley and Sons, Inc. 3. Berger, S. et al. Introduction to Bioengineering, Oxford University Press 4. Cunningham, William P., and Mary Ann Cunningham. Principles of environmental science: inquiry & applications. McGraw-Hill, 2011. 5. Cosentino, Carlo, and Declan Bates. Feedback control in systems biology. CRC Press, 2011.
Grading Component	-
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	Students are expected to: - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. - Avoid any form of academic dishonesty (e.g., plagiarism, cheating).



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Course Name: Kinematics and Dynamics

Degree	Bachelor
Department/Study Program	Mechanical Engineering
Type of Class	International
Lecturer Name	- Dr.Eng. Radon Dhelika, B.Eng., M.Eng. - Prof. Dr. Ir. Wahyu Nirbito, MSME
Course Structure	Lecture
Course Credits	4
Course Overview	The Kinematics and Dynamics course is a course that provides the foundation for understanding aspects of motion and energy of moving mechanical systems. It is hoped that after taking this course, students will apply the concepts of kinematics and dynamics and apply them to problems involving moving mechanical systems. The discussion in this course is through two approaches, namely the concepts of kinematics and dynamics in particles and in rigid bodies.
Course Key Words	
Learning Outcome	Students can understand the key concept of kinematics and dynamics of mechanical system and are capable to analyze the movement, velocity, acceleration force and equilibrium.
Course Schedule	Vector velocity analysis, free body diagram, linier motion, velocity polygon, 2D motion, rectangular coordinates, N-T and pole, relative motion and velocity of 2 coincide/relate point, Coriolis acceleration and stiff body kinematics, Inertia Force, Statics, particle system, works, energy, impulses, linear-angular.
Textbooks, References, and Supplementary Materials (Maximum 3)	1. Meriam & Kraige, Engineering Mechanics. 7th ed, Wiley New York. 2012. 2. Holowenko, Dynamics of Machinery, John Wiley, 1995. 3. Beer & Johnston, Mechanics for Engineer, Dynamics, 11th ed. Dynamics, Mc Graw-Hill, 2015.
Grading Component	-
Other	Students are expected to:



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(i.e. Expectations on Classroom Conduct and Decorum etc.)	- Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. - Avoid any form of academic dishonesty (e.g., plagiarism, cheating).
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Faculty of Engineering - Universitas Indonesia

Course Name: Numerical Method

Degree	Bachelor
Department/Study Program	Mechanical Engineering
Type of Class	International
Lecturer Name	- Dr.Eng. Sholahudin, S.T., M.Sc. - Prof. Dr. Ir. Engkos Achmad Kosasih, M.T.
Course Structure	Lecture
Course Credits	3
Course Overview	Numerical methods are a branch of applied mathematics that studies various methods and techniques in solving mathematical problems formulated so they can be solved using arithmetic operations. Solving mathematical problems with arithmetic operations can be solved effectively by using a computer as a calculating tool. Therefore, learning Numerical Methods is closely related to programming calculation algorithms on computers to complete arithmetic calculations quickly and efficiently. After attending this lecture, students will be able to solve various mathematical problems, especially problems that are difficult to solve using analytical methods, by applying numerical methods and techniques implemented in computer programming. The learning process applied is an active learning process. Students will also go straight. The achievement of this course is to produce technical experts who can produce cheap and efficient analysis and design results as a substitute/complement to experimental studies and physical modeling.
Course Key Words	
Learning Outcome	The objective of this course is that the student can understand and able to apply the process and method (algorithm) of engineering numerical method in computer-based computation and to understand the parameters that influence the speed and accuracy of calculation.



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Course Schedule	Introduction to numerical method and programming: simple mathematical modeling, programming and software, structural programming, modular programming, iterative method; Function: function and function value, Taylor and Maclaurin series, approximation and error; Root of equation: graphical method, Bisection method, False-Position method, Newton – Raphson method, Secant method, Bairstow method; Linear algebra equation system: Gauss elimination, Gauss-Jordan elimination, Decomposition and transformed matrices; Curve – Fitting: Least – Square regression, Interpolation; Numerical Integral: Trapezoid method, Simpson method, Double Integral; Differential equation: Finite Divided Difference, Euler method, Runge – Kutta method; Ordinary Differential Equation System.
Textbooks, References, and Supplementary Materials (Maximum 3)	1. Chapra, Steven C. and Canale, Raymond P. Numerical Methods for Engineers 6th edition. New York: McGraw-Hill, 2010. 2. Kreyszig, Erwin. Advanced Engineering Mathematics 10th edition. Danvers: John Wiley & Sons, 2011. 3. Sedgewick R., Phillippe F, An Introduction to the Analysis of Algorithms, Addison Wesley. 4. Cheney W., Kincaid D., Numerical Mathematics and Computing, Cole Publishing.
Grading Component	-
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	Students are expected to: - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. - Avoid any form of academic dishonesty (e.g., plagiarism, cheating).



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Course Name: Basic Fluid Mechanics

Degree	Bachelor
Department/Study Program	Mechanical Engineering
Type of Class	International
Lecturer Name	- Prof. Dr. Ir. Harinaldi, M.Eng. - Dr.-Ing. Ridho Irwansyah, S.T., M.T.
Course Structure	Lecture
Course Credits	4
Course Overview	Fluid mechanics are one of the applied mechanical science branches that will be used to investigate, analyze, and learn the nature and the behavior of fluids. Fluid that will be explored could be a moving or stationary fluid. Fluid Mechanics course intends to complement the ability of a student to be able to apply the basic laws of fluid mechanics in practical engineering calculations of fluid mechanics and be able to analyze the behavior of the fluid and developing knowledge in the field of fluid mechanics.
Course Key Words	
Learning Outcome	After completing this course students understand the physical properties of fluids, are able to apply the laws and concepts of fluid mechanics in calculating practical fluid mechanics designs and are able to analyze fluid behavior.
Course Schedule	Fluid and its nature, fluid statics, the relative balance, concept and basic equations of fluid flow, dynamic of flow, the equation of fluid motion (Newton, Euler, Navier stokes), Basic Equation of Fluid Dynamics (Continuity, Energy and momentum), dimensional analysis and hydraulic similarity, ideal fluid flow, viscous flow, viscous flow: transition from laminar into turbulent flow, fully developed turbulent flow, flow around submerged objects, general characteristic of outside flow, concept and characteristic of layer in closed flow, measurement and visualization of flow, pressure measurement concept, flow and capacity, flow measurement devices (Pitot tube, Venturi, orifice, Nozzle, HWA, LDV), Flow visualization method.



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Textbooks, References, and Supplementary Materials (Maximum 3)	1. Munson, B.R., Fundamentals of Fluid Mechanics 7th Ed, John Wiley & Sons, Inc. 2012 2. Smits, A.J., A, Physical Introduction to Fluid Mechanics, John Wiley & Sons, Inc. 2000. 3. Kumar, SCPL.L., Engineering Fluid Mechanics, Eurasia Publishing House Ltd., 2010.
Grading Component	-
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	Students are expected to: - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. - Avoid any form of academic dishonesty (e.g., plagiarism, cheating).



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Course Name: Mechanical Design

Degree	Bachelor
Department/Study Program	Mechanical Engineering
Type of Class	International
Lecturer Name	- Jos Istiyanto, S.T., M.T., Ph.D. - Prof. Sugeng Supriadi, S.T., M.S.Eng. , Ph.D.
Course Structure	Lecture
Course Credits	4
Course Overview	This course gives an understanding of the application of engineering mechanic science and material strength in machine elements. After completion in this course, the students have the basic competence to design the machine element.
Course Key Words	
Learning Outcome	After completing this course, students are able to decide, and study the design theory of various machine elements, as well as carry out calculations and analyzes regarding phenomena that occur in various machine elements, and can choose machine elements that are suitable for use.
Course Schedule	Basic mechanical design review, design of joint: welding, solder, adhesive bonding, rivet, pin, bolt, nut, thread, axel, shaft, hub, roller & ball bearing, lubrication, wear and friction, spring, break, fixed and unfixed clutch, chain, belt, basic of gear, straight & tilt bearing, Final Assignment: Design process consist of the understanding of purpose, load and calculation of machine element.
Textbooks, References, and Supplementary Materials (Maximum 3)	1. Hamrock, Fundamental of Machine Element, 3rd ed, CRC Press, 2013. 2. Shigley, Joseph Edward, Mechanical Engineering Design, 10th ed, McGraw-Hill., 2014. 3. Sularso, Dasar Perencanaan & Pemilihan Elemen Mesin, Pradnya Paramita, 1994. 4. Hibbeler RC, Mechanics of Materials, 10th ed., Prentice Hall, 2016. 5. Riley, F William, Engineering Mechanics: STATICS, John



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Grading Component	-
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	Students are expected to: - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. - Avoid any form of academic dishonesty (e.g., plagiarism, cheating).



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Course Name: Heat and Mass Transfer

Degree	Bachelor
Department/Study Program	Mechanical Engineering
Type of Class	International
Lecturer Name	- Prof. Dr. Ir. Imansyah Ibnu Hakim, M.Eng. - Prof. Dr. -Ing. Ir Nandy Setiadi Djaya Putra
Course Structure	Lecture
Course Credits	4
Course Overview	This course studies the mechanisms of heat and mass transfer in a control volume due to temperature differences and is closely related to basic thermodynamics. The goal of this course is for students to understand various mechanisms of energy, heat, and mass transfer between two systems when there is a temperature difference and to be able to calculate the rate of heat transfer. Students should also be able to solve various heat and mass transfer problems using dimensionless parameters.
Course Key Words	
Learning Outcome	• Students can understand several heat and mass transfer mechanisms between two systems. • Students can calculate the heat transfer rate if the temperature gradient occurs. • Students can solve various heat and mass transfer problems using dimensionless parameters.
Course Schedule	Fundamental of heat transfer, conduction heat transfer (1 dimensional and 2 dimensional), numerical analysis in conduction heat transfer/unsteady state, forced convection heat transfer, free convection heat transfer, boiling and condensation, heat exchanger, radiation, fundamental of mass transfer, steady state molecule diffusion, unsteady state molecular diffusion, convection mass transfer, convection mass transfer correlation, mass transfer apparatus.
Textbooks, References, and Supplementary Materials	1. Frank P Incropera, David P De Witt, Fundamental heat and mass transfer, 7th Ed., Wiley, 2011, New York.



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(Maximum 3)	2. Holman JP, Heat Transfer, 10th ed, Mc Graw-Hill, 2009. 3. Welty R James, Wicks Charless, Wilson Robert, Fundamentals of Momentum, Heat, and Mass Transfer, 6th Ed. Wiley, 2014. 4. Cengel, Yunus, Heat Transfer a Practical Approach, 2nd Ed. Mc Graw Hill, 2003, Singapore. 5. Kreith Frank, Bohn Mark, Principles of Heat Transfer, 7th Ed. CL Engineering, 2010.
Grading Component	-
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	Students are expected to: - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. - Avoid any form of academic dishonesty (e.g., plagiarism, cheating).



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Course Name: Business, Entrepreneurship, and Project Management

Degree	Bachelor
Department/Study Program	Mechanical Engineering
Type of Class	International
Lecturer Name	- Agung Shamsuddin Saragih, S.T., M.S.Eng. , Ph.D. - Ir. Ardiyansyah, S.T., M.Eng., Ph.D.
Course Structure	Lecture
Course Credits	4
Course Overview	This course is designed to provide students with the knowledge and skills needed to launch and manage successful entrepreneurial ventures. It covers the entire entrepreneurial process, from identifying opportunities and developing business plans to securing financing and managing growth. Students will engage with real-world case studies, participate in interactive discussions, and develop their own business ideas.
Course Key Words	
Learning Outcome	Upon successful completion of this course, students will be able to create viable business plans, understand market dynamics, secure funding, and manage entrepreneurial ventures effectively.
Course Schedule	Introduction to entrepreneurship; opportunity recognition and idea generation; business models and value proposition; market research and analysis; business plan development; funding and financial management; marketing and sales strategies; growth and scalability; leadership and team dynamics; legal and ethical issues in entrepreneurship.
Textbooks, References, and Supplementary Materials (Maximum 3)	1. Eric Ries, "The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses". 2. Peter Thiel and Blake Masters, "Zero to one: Notes on startups, or how to build the future".
Grading Component	-
Other (i.e. Expectations on Classroom	Students are expected to: - Attend all classes regularly and on time.



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Conduct and Decorum etc.)	- Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. - Avoid any form of academic dishonesty (e.g., plagiarism, cheating).
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Course Name: Sustainable Energy Conversion System

Degree	Bachelor
Department/Study Program	Mechanical Engineering
Type of Class	International
Lecturer Name	- Prof. Dr. Ir. Ahmad Indra Siswantara - Ir. Ardiyansyah, S.T., M.Eng., Ph.D.
Course Structure	Lecture
Course Credits	4
Course Overview	The course Sustainable Energy Conversion Systems covers energy sources, types and classifications of energy, energy conversion, energy consumption, basic concepts of energy conversion systems, resources and classifications of energy conversion machines, including practical sessions on the performance of energy conversion machines. The goal of the course is for students to understand energy resources, classify various types of energy conversion machines, grasp the basic concepts of energy conversion, energy systems, and energy conservation, as well as perform basic calculations of the performance of various types of energy conversion machines and make critical considerations regarding energy conservation.
Course Key Words	
Learning Outcome	• The ability to design, plan, execute, and evaluate tasks in energy conversion systems. • The ability to analyze components, systems, and/ or thermo-fluid processes and mechanical systems to meet expected needs within realistic constraints, such as legal, economic, environmental, social, political, health and safety, and sustainability considerations, as well as recognizing and/or leveraging the potential of local and national resources with a global perspective. • The ability to conduct experiments, gather information, analyze data, and report experimental results by applying statistical principles in practical sessions, including



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	observations of compressors, Pelton turbines, heat pumps, refrigeration training units, diesel engines, Otto engines, and centrifugal pumps.
Course Schedule	Definition of energy and energy resources, type and energy classification; law and equation in energy conversion; energy profile (resources, reserves and the world's and Indonesia's energy needs); basic concept of energy conversion system; power resources and classification of energy conversion engine; fuel in energy conversion; renewable energy; non-renewable energy; classification of combustion engine; calculation for internal combustion engine performance; steam power plant; fluid machinery; cooling engine classification; thermodynamics cycle of cooling engine; energy conversion method in vehicle; industry and building.
Textbooks, References, and Supplementary Materials (Maximum 3)	1. Kreith, F, Goswami, DY, Energy Conversion (Mechanical Engineering), CNC Press, 2007 2. Kreith, F, Goswami, DY, Energy management and Conservation Handbook, CNC Press, 2007 3. Patrick, D.R., et.al, Energy Conservation Guidebook, 3rd ed. Fairmont Press 2014 4. Dincer, I., Rosen, Thermal Energy Storage: Systems and Applications 2nd ed, Wiley, 2010.
Grading Component	-
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	Students are expected to: - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. - Avoid any form of academic dishonesty (e.g., plagiarism, cheating).

*** Note: Please add additional sheets for the next course**

