Załącznik nr 2 do uchwały nr 411 Senatu Politechniki Opolskiej z dnia 29.05.2024 r.

Załącznik nr 11 do Księgi Jakości Kształcenia

KARTA PROGRAMU STUDIÓW

Nazwa programu studiów **Mechanical Engineering**

Specjalności: przedmioty kierunkowe ogólne - KiOg
Machine Design - MD
Manufacturing Technology - MT

Nazwa wydziału **Wydział Mechaniczny**

poziom studiów (I stopnia / II stopnia / jednolite studia magisterskie)	Studia pierwszego stopnia
profil studiów (ogólnoakademicki / praktyczny)	Ogólnoakademicki
forma studiów (stacjonarne / niestacjonarne)	Studia stacjonarne
program studiów obowiązuje od roku akademickiego	2024/2025
data i numer uchwały Senatu ustalającej program studiów	29.05.2024 Uchwała nr 411 Senatu Politechniki Opolskiej
data i numer uchwały Senatu ustalającej kierunkowe efekty uczenia się	29.05.2024 Uchwała nr 411 Senatu Politechniki Opolskiej
dyscyplina wiodąca (w ramach której będzie uzyskiwana ponad połowa efektów uczenia się) – podać udział procentowy	Inżynieria Mechaniczna - 100%
pozostałe dyscypliny – podać udział procentowy	
czas trwania studiów (w semestrach)	7 sem.
łączna liczba punktów ECTS (w tym praktyki)	KiOg - 178 MD - 32 MT - 32 Razem - 210
łączna liczba godzin w planie studiów (w tym praktyki)	KiOg - 2290 MD - 480 MT - 480 Razem - 2770

wymiar (godzinowy) praktyk zawodowych, zasady i forma ich odbywania oraz liczba punktów ECTS, jaką student musi uzyskać w ramach tych praktyk (jeśli program studiów przewiduje praktyki)	KiOg - godziny 160 punkty ECTS 6 Zasady i formę odbywania praktyk określono w karcie opisu przedmiotu oraz w Regulaminie praktyk studenckich w Politechnice Opolskiej.
tytuł zawodowy otrzymywany przez absolwenta	Inżynier
klasyfikacja ISCED	0715
związek z misją i strategią rozwoju Politechniki Opolskiej	Kształcenie na danym kierunku łączy najlepsze tradycje myśli technicznej z zadaniami dnia dzisiejszego i wyzwaniem wobec szybkich przemian technologicznych współczesnego świata. W działalności edukacyjnej i naukowo-badawczej wydziału łączy to potrzebę kształtowania nowoczesnej myśli wobec przemian ekonomicznych i perspektyw gospodarczych kraju z tworzeniem wartości etycznych świata nauki i techniki. Wokół tego posłannictwa skupiają się nauczyciele i studenci, badacze oraz pracownicy administracji, jak również przedstawiciele otoczenia gospodarczego i społecznego szkoły. Do podstawowych składników tak postrzeganej misji należą: kształcenie, badania naukowe oraz służba społeczna. Sprzyja to integracji i rozwojowi nauki, a także stymuluje kreatywność oraz wzmacnia więzi społeczne z regionem.
wymagania wstępne – oczekiwane kompetencje kandydata (szczególnie w przypadku studiów drugiego stopnia)	Zainteresowania techniczne i matematyczne, ścisły umysł, nastawienie na poszukiwanie nowych rozwiązań technicznych i technologicznych. Kandydat powinien również posiadać umiejętność rozwiązywania problemów i być zorientowany na pracę w grupie. Poziom 4 PRK.
zasady rekrutacji (w tym: przedmioty kwalifikacyjne oraz ustalone dla nich współczynniki wagowe)	Podstawę przyjęcia na studia pierwszego stopnia stanowią wybrane wyniki egzaminu maturalnego (dojrzałości). Kryterium decydującym o przyjęciu na studia pierwszego stopnia jest wartość wskaźnika rankingowego obliczanego w oparciu o liczbę punktów uzyskanych za egzaminie maturalnym (dojrzałości), z przedmiotów kwalifikacyjnych wraz z ustalonymi dla nich współczynniki wagowe: chemia (waga:2) fizyka (waga:2) informatyka (waga:2) j. polski (waga:0,5) matematyka (waga:2) j. obcy (waga:0,5)
sposoby weryfikacji zakładanych efektów uczenia się	Wykaz egzaminów oraz zasady oceniania poszczególnych przedmiotów są zawarte w kartach opisu przedmiotów.

sumaryczne wskaźniki charakteryzujące program studiów, a w tym:	łączna liczba punktów ECTS, którą student uzyskuje w ramach zajęć z bezpośrednim udziałem nauczycieli akademickich lub innych osób prowadzących zajęcia	Specj. / ECTS kont. KiOg / 96 MD / 18 MT / 20
	łączna liczba punktów ECTS, którą student uzyskuje w ramach zajęć z zakresu nauk podstawowych, do których odnoszą się efekty uczenia się dla określonego programu studiów, poziomu i profilu studiów	KiOg - 23
	dla profilu praktycznego łączna liczba punktów ECTS przypisanych do zajęć związanych z praktycznym przygotowaniem zawodowym, dla profilu ogólnoakademickiego łączna liczba punktów ECTS przypisanych do zajęć związanych z prowadzonymi w uczelni badaniami naukowymi w dyscyplinie lub dyscyplinach, do których przyporządkowany jest kierunek studiów	KiOg - 86 MD - 24 MT - 26
	liczba punktów ECTS, którą student musi uzyskać w ramach zajęć z dziedziny nauk humanistycznych lub nauk społecznych	KiOg - 5
	w przypadku studiów stacjonarnych I stopnia lub jednolitych magisterskich liczba godzin zajęć z wychowania fizycznego	godziny 60
	liczba punktów ECTS objętych programem studiów uzyskiwana w ramach zajęć do wyboru	KiOg - 34 MD - 32 MT - 32

Program studiów zaopiniowany przez organ samorządu studenckiego.

Sylwetka absolwenta

Mechanical Engineering, Studia pierwszego stopnia, Studia stacjonarne,
Machine Design
Manufacturing Technology

Wiedza:

Absolwent ma pogłębioną wiedzę z matematyki umożliwiającą rozwiązywanie problemów w zakresie projektowania, wytwarzania i eksploatacji maszyn. Ma ugruntowaną wiedzę w zakresie mechaniki analitycznej i drgań. Ma pogłębioną, podbudowaną teoretycznie wiedzę o materiałach inżynierskich stosowanych w budowie maszyn, badaniu ich właściwości, doborze i trendach rozwojowych w tym zakresie. Ma pogłębioną wiedzę w zakresie modelowania i konstruowania maszyn z wykorzystaniem technik komputerowych. Absolwent ma pogłębioną wiedzę w zakresie technik wytwarzania. Ma ugruntowaną i pogłębioną wiedzę związaną z wybranymi zagadnieniami z zakresu funkcjonowania, budowy, obsługi, diagnozowania stanu technicznego, technologii napraw i bezpiecznego użytkowania maszyn i urządzeń. Ma pogłębioną wiedzę o cyklu życia urządzeń mechanicznych. Ma pogłębioną wiedzę niezbędną do rozumienia społecznych, ekonomicznych, prawnych, ekologicznych i innych pozatechnicznych uwarunkowań działalności inżynierskiej. Absolwent ma ugruntowaną wiedzę dotyczącą zarządzania w tym zarządzania jakością, logistyki i prowadzenia działalności gospodarczej. Ma ugruntowaną wiedzę w zakresie ochrony własności intelektualnej. Zna i rozumie w pogłębionym stopniu teorie i terminologię z zakresu języka obcego właściwą dla studiowanego kierunku, umożliwiającą posługiwanie się językiem obcym na poziomie B2 Europejskiego Systemu Opisu Kształcenia Językowego.

Umiejętności:

Absolwent sprawnie pozyskuje informacje z literatury, baz danych i innych źródeł, potrafi integrować uzyskane informacje, dokonywać ich interpretacji, a także wyciągać wnioski oraz formułować i uzasadniać opinie. Sprawnie porozumiewa się przy użyciu różnych technik w środowisku zawodowym oraz w innych środowiskach. Sprawnie posługuje się technikami informacyjno-komunikacyjnymi właściwymi do wykonywania zadań inżynierskich. Absolwent wykorzystuje do formułowania i rozwiązywania zadań inżynierskich, metody analityczne, symulacyjne oraz eksperymentalne. Ma dobre przygotowanie do pracy w środowisku przemysłowym oraz doskonale zna zasady bezpieczeństwa związane z tą pracą. Posiada doświadczenie w wykonywaniu analiz ekonomicznych podejmowanych działań inżynierskich. Absolwent krytycznie analizuje i ocenia sposoby funkcjonowania rozwiązań technicznych: urządzeń, obiektów, systemów, procesów i usług. Identyfikuje i opisuje problemy inżynierskie oraz potrafi je rozwiązywać i ulepszać. Ocenia przydatność i prawidłowo wybiera metody i narzędzia najlepiej nadające się do rozwiązywania zadań inżynierskich. Absolwent projektuje i usprawnia procesy, obiekty lub systemy niezbędne dla wykonywania zadań inżynierskich z uwzględnieniem aspektów pozatechnicznych. Potrafi formułować i testować hipotezy związane z problemami inżynierskimi i prostymi problemami badawczymi w budowie i eksploatacji maszyn. Potrafi ocenić przydatność i możliwość wykorzystania różnych technik i technologii w zakresie projektowania i wytwarzania maszyn i urządzeń. Absolwent ma

umiejętność samokształcenia się. Potrafi posługiwać się językiem obcym na poziomie B2 Europejskiego Systemu Opisu Kształcenia Językowego oraz w wyższym stopniu w zakresie specjalistycznej terminologii. Potrafi kierować grupą, inspirować jej działania oraz współpracować z innymi podmiotami.

Kompetencje społeczne:

Absolwent sprawnie pozyskuje informacje z literatury, baz danych i innych źródeł, potrafi integrować uzyskane informacje, dokonywać ich interpretacji, a także wyciągać wnioski oraz formułować i uzasadniać opinie. Sprawnie porozumiewa się przy użyciu różnych technik w środowisku zawodowym oraz w innych środowiskach. Sprawnie posługuje się technikami informacyjno-komunikacyjnymi właściwymi do wykonywania zadań inżynierskich. Absolwent wykorzystuje do formułowania i rozwiązywania zadań inżynierskich, metody analityczne, symulacyjne oraz eksperymentalne. Ma dobre przygotowanie do pracy w środowisku przemysłowym oraz doskonale zna zasady bezpieczeństwa związane z tą pracą. Posiada doświadczenie w wykonywaniu analiz ekonomicznych podejmowanych działań inżynierskich. Absolwent krytycznie analizuje i ocenia sposoby funkcjonowania rozwiązań technicznych: urządzeń, obiektów, systemów, procesów i usług. Identyfikuje i opisuje problemy inżynierskie oraz potrafi je rozwiązywać i ulepszać. Ocenia przydatność i prawidłowo wybiera metody i narzędzia najlepiej nadające się do rozwiązywania zadań inżynierskich. Absolwent projektuje i usprawnia procesy, obiekty lub systemy niezbędne dla wykonywania zadań inżynierskich z uwzględnieniem aspektów pozatechnicznych. Potrafi formułować i testować hipotezy związane z problemami inżynierskimi i prostymi problemami badawczymi w budowie i eksploatacji maszyn. Potrafi ocenić przydatność i możliwość wykorzystania różnych technik i technologii w zakresie projektowania i wytwarzania maszyn i urządzeń. Absolwent ma umiejętność samokształcenia się. Potrafi posługiwać się językiem obcym na poziomie B2 Europejskiego Systemu Opisu Kształcenia Językowego oraz w wyższym stopniu w zakresie specjalistycznej terminologii. Potrafi kierować grupą, inspirować jej działania oraz współpracować z innymi podmiotami.

Knowledge:

The graduate has in-depth knowledge of mathematics that enables solving problems in the design, manufacture and operation of machines. S/he has solid knowledge of analytical mechanics and vibration. The graduate has in-depth, theoretically underpinned knowledge of the engineering materials used in the construction of machines, testing of their properties, selection and development trends in this field. S/he has in-depth knowledge in the modelling and construction of machines using computer techniques. The graduate has in-depth knowledge of manufacturing techniques, has solid, in-depth knowledge of selected issues in the functioning, construction, maintenance, technical diagnostics, repair technology and safe use of machines and devices. The graduate has in-depth knowledge of the life cycle of mechanical devices. He or she has in-depth knowledge necessary to understand the social, economic, legal, ecological and other non-technical aspects of engineering activity. The graduate has solid knowledge of management, including quality management, logistics and business operations. S/he has solid knowledge of intellectual property protection. The graduate knows and has deep understanding of the foreign language theory and terminology appropriate for their studies, which makes it possible to use the foreign language at the B2

level of the Common European Framework of Reference for Languages.

Skills:

The graduate skilfully obtains information from literature, databases and other sources and integrates the obtained information, interprets it, draws conclusions and formulates and justifies opinions. S/he skilfully communicates using different techniques in professional and other environments. S/he skilfully uses information and communication techniques appropriate for the performance of engineering tasks. The graduate uses analytical, simulation and experimental methods to formulate and solve engineering tasks, is well prepared for work in an industrial environment and has excellent knowledge of the safety rules associated with this work. The graduate has experience in performing economic analyses for undertaken engineering activities. The graduate critically analyses and evaluates the methods of operation of technical solutions, such as devices, facilities, systems, processes and services. S/he identifies and describes engineering issues and is able to solve and improve them. S/he evaluates suitably and appropriately chooses methods and tools that are best-suited to solve engineering tasks. The graduate designs and streamlines the processes, facilities or systems necessary to perform engineering tasks, taking into account non-technical aspects. S/he is able to formulate and test hypotheses related to engineering problems and simple research problems in machine construction and operation. Is able to assess the suitability and possibility of using various techniques and technologies in the design and manufacture of machines and devices. The graduate has self-study skills. The graduate is able to use a foreign language at the B2 level of the Common European Framework of Reference for Languages and at a higher level within the specialist terminology. The graduate is able to lead a group, inspire it and work with other actors.

Social competences:

The graduate is aware of the need to improve their specialist knowledge throughout life and is able to select the appropriate knowledge sources and learning methods for themselves and others. S/he understands the non-technical aspects of the engineer and manager’s activity, including its social consequences and impact on the environment. The graduate is aware of the responsibility for decisions made as part of the engineering and managerial activity, especially in terms of their own and other peoples’ safety and environmental protection. The graduate is aware of the importance of professional conduct, adherence to professional ethics and respecting the diversity of views. S/he is able to demonstrate entrepreneurship and ingenuity in the activity related to the implementation of professional tasks. The graduate understands the social role of an engineer and participates in the provision of reliable information and opinions on the development of technology and related hazards.

Tabela kierunkowych efektów uczenia się

program studiów (kierunek studiów): **Mechanical Engineering** poziom studiów: **Studia pierwszego stopnia** profil studiów: **Ogólnoakademicki**	
symbol kierunkowych efektów uczenia się	efekty uczenia się (treść)
Wiedza: zna i rozumie	
ME_K1_W01	A student has knowledge of mathematics to the extent necessary for modelling and analysis of mechanical systems
ME_K1_W02	A student has knowledge of physics in the area needed to understand, describe and make use of physical phenomena in the design, manufacture and operation of mechanical systems
ME_K1_W03	A student has the knowledge of chemistry needed for the extensive understanding and description of phenomena occurring in the manufacture and operation of machine parts
ME_K1_W04	A student has advanced knowledge of the principles of engineering graphics and tools used in the preparation of technical documentation
ME_K1_W05	A student has specialist knowledge of strength analysis and the principles of design of mechanical structures and machine parts
ME_K1_W06	A student has knowledge of electrical engineering, electronics and automation that is appropriate for their studies
ME_K1_W07	A student has extensive knowledge related to selected issues in the construction, maintenance, technical diagnostics, repair technology and safe use of machinery
ME_K1_W08	A student has systematic knowledge of the manufacture and operation of mechanical machinery and devices
ME_K1_W09	A student has knowledge of metrology in the construction of machinery
ME_K1_W10	A student has advanced knowledge of engineering materials, their testing and development technology
ME_K1_W11	A student has knowledge of the life cycle of mechanical machinery and devices
ME_K1_W12	A student has the knowledge necessary to understand the social, economic, legal, ecological and other non-technical aspects of engineering activity
ME_K1_W13	A student has knowledge of management, logistics and business operation
ME_K1_W14	A student knows and understands the concepts and principles of industrial property protection and copyright law; is able to use patent information resources
ME_K1_W15	A student has knows and understands foreign language theory and terminology enough to use a foreign language at the B2 level of the Common European Framework of Reference for Languages

ME_K1_W16	A students has knows the principles of control systems in mechanical equipment and has knowledge of basic installations in mechanical engineering
Umiejętności: potrafi	
ME_K1_U01	A student is able to obtain information from literature, databases and other sources and integrate the obtained information, interpret it, draw conclusions and formulate and justify opinions
ME_K1_U02	A student has self-study skills
ME_K1_U03	A student is able to use a foreign language at the B2 level of the Common European Framework of Reference for Languages.
ME_K1_U04	A student is able to use information and communication techniques typical of the tasks in the area of design, manufacture and operation of machines
ME_K1_U05	A student is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks
ME_K1_U06	A student has the necessary preparation to work in an industrial environment and knows the safety rules associated with this work
ME_K1_U07	A student is able to conduct a preliminary economic analysis of engineering activities undertaken in the field of machine design, manufacture and operation
ME_K1_U08	A student is able to conduct a critical analysis of functioning and evaluate the existing technical solutions, devices, facilities, systems, processes and services in the field of machine construction, manufacture and operation
ME_K1_U09	A student is able to design and construct a device, facility, system or process typical of the design, manufacture and operation of machinery, using appropriate methods, techniques and tools in accordance with the provided specification
ME_K1_U10	A student is able to communicate using different techniques in professional and other environments
Kompetencje społeczne: jest gotów do	
ME_K1_K01	A student is aware of the need to improve their knowledge throughout life and is able to select the appropriate learning methods for themselves and others
ME_K1_K02	A student understands the non-technical aspects of mechanic engineer’s activity, including its social consequences and impact on the environment
ME_K1_K03	A student is aware of the responsibility for decisions made as part of the engineering activity, especially in terms of their own and other peoples’ safety and environmental protection
ME_K1_K04	A student understands the importance of teamwork and is able to take responsibility for the results of joint activities
ME_K1_K05	A student is aware of the importance of professional conduct, adherence to professional ethics and respecting the diversity of views and cultures
ME_K1_K06	A student demonstrates entrepreneurship and ingenuity in the activity related to the implementation of professional tasks

ME_K1_K07	A student understands the social role of an engineer and participates in the provision of reliable information and opinions on the achievements of technology and its other aspects to the public

Objaśnienia

Symbol efektu tworzą:
- litera K – wyróżnik efektów kierunkowych,
- liczba 1 – studia pierwszego stopnia,
- znak _ (podkreślnik),
- litery W, U lub K – oznaczenie kategorii efektów (W – wiedza, U – umiejętności, K – kompetencje społeczne),
- 01, ... - numer efektu w obrębie danej kategorii, zapisany w postaci dwóch cyfr (numery 1-9 należy poprzedzić cyfrą 0).

Tabela odniesień efektów kierunkowych do charakterystyk drugiego stopnia Polskiej Ramy Kwalifikacji

program studiów (kierunek studiów): **Mechanical Engineering** poziom studiów: **Studia pierwszego stopnia** profil studiów: **Ogólnoakademicki**		
symbol kierunkowych efektów uczenia się	efekty uczenia się (treść)	kod składnika opisu
Wiedza: zna i rozumie		
ME_K1_W01	A student has knowledge of mathematics to the extent necessary for modelling and analysis of mechanical systems	P6S_WG
ME_K1_W02	A student has knowledge of physics in the area needed to understand, describe and make use of physical phenomena in the design, manufacture and operation of mechanical systems	P6S_WG
ME_K1_W03	A student has the knowledge of chemistry needed for the extensive understanding and description of phenomena occurring in the manufacture and operation of machine parts	P6S_WG
ME_K1_W04	A student has advanced knowledge of the principles of engineering graphics and tools used in the preparation of technical documentation	P6S_WG
ME_K1_W05	A student has specialist knowledge of strength analysis and the principles of design of mechanical structures and machine parts	P6S_WG
ME_K1_W06	A student has knowledge of electrical engineering, electronics and automation that is appropriate for their studies	P6S_WG
ME_K1_W07	A student has extensive knowledge related to selected issues in the construction, maintenance, technical diagnostics, repair technology and safe use of machinery	P6S_WG
ME_K1_W08	A student has systematic knowledge of the manufacture and operation of mechanical machinery and devices	P6S_WG
ME_K1_W09	A student has knowledge of metrology in the construction of machinery	P6S_WG
ME_K1_W10	A student has advanced knowledge of engineering materials, their testing and development technology	P6S_WG
ME_K1_W11	A student has knowledge of the life cycle of mechanical machinery and devices	P6S_WG
ME_K1_W12	A student has the knowledge necessary to understand the social, economic, legal, ecological and other non-technical aspects of engineering activity	P6S_WK1 P6S_WK2
ME_K1_W13	A student has knowledge of management, logistics and business operation	P6S_WK2 P6S_WK3
ME_K1_W14	A student knows and understands the concepts and principles of industrial property protection and copyright law; is able to use patent information resources	P6S_WK2

ME_K1_W15	A student has knows and understands foreign language theory and terminology enough to use a foreign language at the B2 level of the Common European Framework of Reference for Languages	P6S_WG
ME_K1_W16	A students has knows the principles of control systems in mechanical equipment and has knowledge of basic installations in mechanical engineering	P6S_WG
Umiejętności: potrafi		
ME_K1_U01	A student is able to obtain information from literature, databases and other sources and integrate the obtained information, interpret it, draw conclusions and formulate and justify opinions	P6S_UK1 P6S_UW
ME_K1_U02	A student has self-study skills	P6S_UU
ME_K1_U03	A student is able to use a foreign language at the B2 level of the Common European Framework of Reference for Languages.	P6S_UK3
ME_K1_U04	A student is able to use information and communication techniques typical of the tasks in the area of design, manufacture and operation of machines	P6S_UK1 P6S_UW
ME_K1_U05	A student is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks	P6S_UW
ME_K1_U06	A student has the necessary preparation to work in an industrial environment and knows the safety rules associated with this work	P6S_UO1 P6S_UW
ME_K1_U07	A student is able to conduct a preliminary economic analysis of engineering activities undertaken in the field of machine design, manufacture and operation	P6S_UW
ME_K1_U08	A student is able to conduct a critical analysis of functioning and evaluate the existing technical solutions, devices, facilities, systems, processes and services in the field of machine construction, manufacture and operation	P6S_UK1 P6S_UW
ME_K1_U09	A student is able to design and construct a device, facility, system or process typical of the design, manufacture and operation of machinery, using appropriate methods, techniques and tools in accordance with the provided specification	P6S_UW
ME_K1_U10	A student is able to communicate using different techniques in professional and other environments	P6S_UK1 P6S_UK2 P6S_UO2
Kompetencje społeczne: jest gotów do		
ME_K1_K01	A student is aware of the need to improve their knowledge throughout life and is able to select the appropriate learning methods for themselves and others	P6S_KK2
ME_K1_K02	A student understands the non-technical aspects of mechanic engineer’s activity, including its social consequences and impact on the environment	P6S_KO1
ME_K1_K03	A student is aware of the responsibility for decisions made as part of the engineering activity, especially in terms of their own and other peoples’ safety and environmental protection	P6S_KK1 P6S_KK2 P6S_KO1

ME_K1_K04	A student understands the importance of teamwork and is able to take responsibility for the results of joint activities	P6S_KR
ME_K1_K05	A student is aware of the importance of professional conduct, adherence to professional ethics and respecting the diversity of views and cultures	P6S_KR
ME_K1_K06	A student demonstrates entrepreneurship and ingenuity in the activity related to the implementation of professional tasks	P6S_KO3
ME_K1_K07	A student understands the social role of an engineer and participates in the provision of reliable information and opinions on the achievements of technology and its other aspects to the public	P6S_KO1 P6S_KO2

Uniwersalne charakterystyki poziomu 6 Polskiej Ramy Kwalifikacji zostały uwzględnione

Tabela pokrycia charakterystyk drugiego stopnia Polskiej Ramy Kwalifikacji przez kierunkowe efekty uczenia się

program studiów (kierunek studiów): **Mechanical Engineering** poziom studiów: **Studia pierwszego stopnia** profil studiów: **Ogólnoakademicki**		
kod składnika opisu	charakterystyki drugiego stopnia Polskiej Ramy Kwalifikacji	symbol kierunkowych efektów uczenia się
Wiedza: zna i rozumie		
P6S_WG	Zna i rozumie w zaawansowanym stopniu – wybrane fakty, obiekty i zjawiska oraz dotyczące ich metody i teorie wyjaśniające złożone zależności między nimi, stanowiące podstawową wiedzę ogólną z zakresu dyscyplin naukowych lub artystycznych tworzących podstawy teoretyczne oraz wybrane zagadnienia z zakresu wiedzy szczegółowej – właściwe dla programu studiów.	ME_K1_W01 ME_K1_W02 ME_K1_W03 ME_K1_W04 ME_K1_W05 ME_K1_W06 ME_K1_W07 ME_K1_W08 ME_K1_W09 ME_K1_W10 ME_K1_W11 ME_K1_W15 ME_K1_W16
P6S_WK1	Zna i rozumie fundamentalne dylematy współczesnej cywilizacji.	ME_K1_W12
P6S_WK2	Zna i rozumie podstawowe ekonomiczne, prawne, etyczne i inne uwarunkowania różnych rodzajów działalności zawodowej związanej z kierunkiem studiów, w tym podstawowe pojęcia i zasady z zakresu ochrony własności przemysłowej i prawa autorskiego.	ME_K1_W12 ME_K1_W13 ME_K1_W14
P6S_WK3	Zna i rozumie podstawowe zasady tworzenia i rozwoju różnych form przedsiębiorczości.	ME_K1_W13
Umiejętności: potrafi		
P6S_UK1	Potrafi komunikować się z otoczeniem z użyciem specjalistycznej terminologii.	ME_K1_U01 ME_K1_U04 ME_K1_U08 ME_K1_U10
P6S_UK2	Potrafi brać udział w debacie – przedstawiać i oceniać różne opinie i stanowiska oraz dyskutować o nich.	ME_K1_U10
P6S_UK3	Potrafi posługiwać się językiem obcym na poziomie B2 Europejskiego Systemu Opisu Kształcenia Językowego.	ME_K1_U03
P6S_UO1	Potrafi planować i organizować pracę indywidualną oraz w zespole.	ME_K1_U06
P6S_UO2	Potrafi współdziałać z innymi osobami w ramach prac zespołowych (także o charakterze interdyscyplinarnym).	ME_K1_U10
P6S_UU	Potrafi samodzielnie planować i realizować własne uczenie się przez całe życie.	ME_K1_U02

P6S_UW	Potrafi wykorzystywać posiadaną wiedzę – formułować i rozwiązywać złożone i nietypowe problemy oraz wykonywać zadania w warunkach nie w pełni przewidywalnych przez: - właściwy dobór źródeł i informacji z nich pochodzących, dokonywanie oceny, krytycznej analizy i syntezy tych informacji, - dobór oraz stosowanie właściwych metod i narzędzi, w tym zaawansowanych technik informacyjno-komunikacyjnych.	ME_K1_U01 ME_K1_U04 ME_K1_U05 ME_K1_U06 ME_K1_U07 ME_K1_U08 ME_K1_U09
Kompetencje społeczne: jest gotów do		
P6S_KK1	Jest gotów do krytycznej oceny posiadanej wiedzy i odbieranych treści.	ME_K1_K03
P6S_KK2	Jest gotów do uznawania znaczenia wiedzy w rozwiązywaniu problemów poznawczych i praktycznych oraz zasięgania opinii ekspertów w przypadku trudności z samodzielnym rozwiązaniem problemu.	ME_K1_K01 ME_K1_K03
P6S_KO1	Jest gotów do wypełniania zobowiązań społecznych, współorganizowania działalności na rzecz środowiska społecznego.	ME_K1_K02 ME_K1_K03 ME_K1_K07
P6S_KO2	Jest gotów do inicjowania działań na rzecz interesu publicznego.	ME_K1_K07
P6S_KO3	Jest gotów do myślenia i działania w sposób przedsiębiorczy.	ME_K1_K06
P6S_KR	Jest gotów do odpowiedzialnego pełnienia ról zawodowych, w tym: - przestrzegania zasad etyki zawodowej i wymagania tego od innych, - dbałości o dorobek i tradycje zawodu.	ME_K1_K04 ME_K1_K05

Tabela odniesień kierunkowych efektów uczenia się do uzyskania kompetencji inżynierskich Polskiej Ramy Kwalifikacji

program studiów (kierunek studiów): **Mechanical Engineering** poziom studiów: **Studia pierwszego stopnia** profil studiów: **Ogólnoakademicki**		
symbol kierunkowych efektów uczenia się	efekty uczenia się (treść)	kod składnika opisu
Wiedza: zna i rozumie		
ME_K1_W01	A student has knowledge of mathematics to the extent necessary for modelling and analysis of mechanical systems	
ME_K1_W02	A student has knowledge of physics in the area needed to understand, describe and make use of physical phenomena in the design, manufacture and operation of mechanical systems	
ME_K1_W03	A student has the knowledge of chemistry needed for the extensive understanding and description of phenomena occurring in the manufacture and operation of machine parts	
ME_K1_W04	A student has advanced knowledge of the principles of engineering graphics and tools used in the preparation of technical documentation	
ME_K1_W05	A student has specialist knowledge of strength analysis and the principles of design of mechanical structures and machine parts	
ME_K1_W06	A student has knowledge of electrical engineering, electronics and automation that is appropriate for their studies	
ME_K1_W07	A student has extensive knowledge related to selected issues in the construction, maintenance, technical diagnostics, repair technology and safe use of machinery	
ME_K1_W08	A student has systematic knowledge of the manufacture and operation of mechanical machinery and devices	
ME_K1_W09	A student has knowledge of metrology in the construction of machinery	
ME_K1_W10	A student has advanced knowledge of engineering materials, their testing and development technology	
ME_K1_W11	A student has knowledge of the life cycle of mechanical machinery and devices	P6S_WG
ME_K1_W12	A student has the knowledge necessary to understand the social, economic, legal, ecological and other non-technical aspects of engineering activity	P6S_WK
ME_K1_W13	A student has knowledge of management, logistics and business operation	
ME_K1_W14	A student knows and understands the concepts and principles of industrial property protection and copyright law; is able to use patent information resources	

ME_K1_W15	A student has knows and understands foreign language theory and terminology enough to use a foreign language at the B2 level of the Common European Framework of Reference for Languages	
ME_K1_W16	A students has knows the principles of control systems in mechanical equipment and has knowledge of basic installations in mechanical engineering	
Umiejętności: potrafi		
ME_K1_U01	A student is able to obtain information from literature, databases and other sources and integrate the obtained information, interpret it, draw conclusions and formulate and justify opinions	
ME_K1_U02	A student has self-study skills	
ME_K1_U03	A student is able to use a foreign language at the B2 level of the Common European Framework of Reference for Languages.	
ME_K1_U04	A student is able to use information and communication techniques typical of the tasks in the area of design, manufacture and operation of machines	
ME_K1_U05	A student is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks	P6S_UW1 P6S_UW2
ME_K1_U06	A student has the necessary preparation to work in an industrial environment and knows the safety rules associated with this work	
ME_K1_U07	A student is able to conduct a preliminary economic analysis of engineering activities undertaken in the field of machine design, manufacture and operation	
ME_K1_U08	A student is able to conduct a critical analysis of functioning and evaluate the existing technical solutions, devices, facilities, systems, processes and services in the field of machine construction, manufacture and operation	P6S_UW3
ME_K1_U09	A student is able to design and construct a device, facility, system or process typical of the design, manufacture and operation of machinery, using appropriate methods, techniques and tools in accordance with the provided specification	P6S_UW4
ME_K1_U10	A student is able to communicate using different techniques in professional and other environments	
Kompetencje społeczne: jest gotów do		
ME_K1_K01	A student is aware of the need to improve their knowledge throughout life and is able to select the appropriate learning methods for themselves and others	
ME_K1_K02	A student understands the non-technical aspects of mechanic engineer’s activity, including its social consequences and impact on the environment	
ME_K1_K03	A student is aware of the responsibility for decisions made as part of the engineering activity, especially in terms of their own and other peoples’ safety and environmental protection	
ME_K1_K04	A student understands the importance of teamwork and is able to take responsibility for the results of joint activities	

ME_K1_K05	A student is aware of the importance of professional conduct, adherence to professional ethics and respecting the diversity of views and cultures	
ME_K1_K06	A student demonstrates entrepreneurship and ingenuity in the activity related to the implementation of professional tasks	
ME_K1_K07	A student understands the social role of an engineer and participates in the provision of reliable information and opinions on the achievements of technology and its other aspects to the public	

Tabela pokrycia kompetencji inżynierskich Polskiej Ramy Kwalifikacji przez kierunkowe efekty uczenia się

program studiów (kierunek studiów): **Mechanical Engineering** poziom studiów: **Studia pierwszego stopnia** profil studiów: **Ogólnoakademicki**		
kod składnika opisu	charakterystyki drugiego stopnia Polskiej Ramy Kwalifikacji	symbol kierunkowych efektów uczenia się
Wiedza: zna i rozumie		
P6S_WG	Zna i rozumie podstawowe procesy zachodzące w cyklu życia urządzeń, obiektów i systemów technicznych.	ME_K1_W11
P6S_WK	Zna i rozumie podstawowe zasady tworzenia i rozwoju różnych form indywidualnej przedsiębiorczości.	ME_K1_W12
Umiejętności: potrafi		
P6S_UW1	Potrafi planować i przeprowadzać eksperymenty, w tym pomiary i symulacje komputerowe, interpretować uzyskane wyniki i wyciągać wnioski.	ME_K1_U05
P6S_UW2	Potrafi przy identyfikacji i formułowaniu specyfikacji zadań inżynierskich oraz ich rozwiązywaniu: - wykorzystywać metody analityczne, symulacyjne i eksperymentalne, - dostrzegać ich aspekty systemowe i pozatechniczne, w tym aspekty etyczne, - dokonywać wstępnej oceny ekonomicznej proponowanych rozwiązań podejmowanych działań inżynierskich.	ME_K1_U05
P6S_UW3	Potrafi dokonywać krytycznej analizy sposobu funkcjonowania istniejących rozwiązań technicznych i oceniać ich rozwiązania.	ME_K1_U08
P6S_UW4	Potrafi projektować - zgodnie z zadaną specyfikacją - oraz wykonywać typowe dla kierunku studiów proste urządzenia, obiekty, systemy lub realizować procesy, używając odpowiednio dobranych metod, technik, narzędzi i materiałów.	ME_K1_U09

WYDZIAŁ MECHANICZNY

POLITECHNIKA OPOLSKA

Plan studiów
Study plan

Kierunek Studiów – Field of study

- MECHANICAL ENGINEERING

- MECHANIKA I BUDOWA MASZYN

Studia stacjonarne
pierwszego stopnia
- wg specjalności

First Cycle Programme – Full-Time Studies

CHARAKTERYSTYKA OGÓLNA

kierunek studiów: Mechanical Engineering

profil: Ogólnoakademicki

nazwa wydziału: Wydział Mechaniczny

plan studiów	uchwała Senatu PO z dnia	nr 411 Senatu PO z dn.29.05.2024r.
	obowiązuje od roku akademickiego	**2024/2025**
forma studiów (stacjonarne / niestacjonarne)		**stacjonarne**
poziom studiów (I stopnia / II stopnia)		**I-go stopnia**
czas trwania (w sem.)		**7**
tytuł zawodowy otrzymywany przez absolwenta		**Inżynier**
liczba punktów ECTS		**210**

PLAN STUDIÓW – STUDY PLAN

POLITECHNIKA OPOLSKA **WYDZIAŁ MECHANICZNY**	**OPOLE UNIVERSITY OF TECHNOLOGY** **FACULTY OF MECHANICAL ENGINEERING**
Kierunek studiów: **MECHANICAL ENGINEERING**	**Field of study:** **MECHANIKA I BUDOWA MASZYN**
Studia Stacjonarne Pierwszego Stopnia – Inżynierskie	
First Cycle Programme - Full-Time Studies *(Engineer's degree)*	

Specjalność – Specialization:
Machine Design - Konstrukcje maszyn
Manufacturing Technology - Technologie wytwarzania

SEMESTR: 1 (1st Semester)		**Liczba godzin zajęć w semestrze; E – egzamin** **Working time (hours) a semester; E – Exam**					**ECTS**	TYP
Nr	**Przedmiot** **Subject unit – semester curricular**	**W** **(Lecture)**	**C** **(Practical classes)**	**L** **(Laboratory classes)**	**P** **(Project)**	**S** **(Seminar)**		
1.1	Humanistic and social subject I Przedmiot humanistyczno-społeczny I	30	0	0	0	0	2.0	W-HS
1.2	Information technology in engineering Technologie informacyjne w inżynierii	30	0	30	0	0	4.0	K
1.3	Ergonomic and industrial safety Ergonomia i bezpieczeństwo pracy	15	0	0	0	0	1.0	K
1.4	Mechanical Engineering Introduction Wprowadzenie do inżynierii mechanicznej	15	0	15	0	0	3.0	K
1.5	Engineering graphics Grafika inżynierska	15	30	0	0	0	3.0	K
1.6	Fundamentals of materials science Podstawy nauki o materiałach	30	0	0	0	0	3.0	K
1.7	Fundamentals of electrical engineering Podstawy elektrotechniki	15	0	15	0	0	3.0	K
1.8	Technical metrology Metrologia techniczna	15E	15	0	0	0	3.0	K
1.9	Protection of invention property Ochrona własności intelektualnej	15	0	0	0	0	1.0	K
1.10	Mathematics I Matematyka I	(E)	60	0	0	0	4.0	P
1.11	Mechanics I Mechanika ogólna I	15E	15	0	0	0	3.0	P
Liczba godzin / ECTS w semestrze (Number of hours / ECTS in a semester)		**195**	**120**	**60**	**0**	**0**	**30**	
Razem godzin w semestrze (Number of hours in a semester)		**375**						

SEMESTR: 2 (2nd Semester)		Liczba godzin zajęć w semestrze; E – egzamin Working time (hours) a semester; E – Exam					ECTS	TYP
Nr	Przedmiot Subject unit – semester curricular	W (Lecture)	C (Practical classes)	L (Laboratory classes)	P (Project)	S (Seminar)		
2.1	Humanistic and social subject II Przedmiot humanistyczno-społeczny II	30	0	0	0	0	3.0	W-HS
2.2	Software engineering and data processing Inżynieria oprogramowania i przetwarzanie danych	15	0	30	0	0	3.0	K
2.3	General science of mechanics Maszynoznawstwo ogólne	30	0	0	0	0	3.0	K
2.4	Technologies and industrial apparatus Technologie i urządzenia przemysłowe	30	0	0	0	0	3.0	K
2.5	Technical drawing in practice Rysunek techniczny w praktyce	15	0	30	0	0	4.0	K
2.6	Material Engineering Inżynieria materiałowa	15E	0	30	0	0	3.0	K
2.7	Selected measuring techniques and systems Wybrane techniki i systemy pomiarowe	30E	0	30	0	0	4.0	K
2.8	Mathematics II Matematyka II	(E)	30	0	0	0	3.0	P
2.9	Mechanics II Mechanika ogólna II	30E	30	0	0	0	4.0	P
Liczba godzin / ECTS w semestrze (Number of hours / ECTS in a semester)		**195**	**60**	**120**	**0**	**0**	**30**	
Razem godzin w semestrze (Number of hours in a semester)		**375**						

SEMESTR: 3 (3rd Semester)		Liczba godzin zajęć w semestrze; E – egzamin Working time (hours) a semester; E – Exam					ECTS	TYP
Nr	Przedmiot Subject unit – semester curricular	W (Lecture)	C (Practical classes)	L (Laboratory classes)	P (Project)	S (Seminar)		
3.1	Differential and integral calculus Rachunek różniczkowy i całkowy	0	30	0	0	0	3.0	K
3.2	Strength of materials Wytrzymałość materiałów	45E	0	0	0	0	4.0	K
3.3	Vehicle and machine propulsion Napędy pojazdów i maszyn	30E	0	30	0	0	5.0	K
3.4	Removal processes I Obróbka ubytkowa I	30E	0	30	0	0	5.0	K
3.5	Technical drawing and CAD I Zapis konstrukcji z wykorzystaniem CAD I	0	0	30	0	0	3.0	K
3.6	Selected chipless technologies Wybrane technologie bezwiórowe	15	0	30	0	0	4.0	K
3.7	Construction documentation Dokumentacja konstrukcyjna	15	0	0	30	0	4.0	K
3.8	Physical education Wychowanie fizyczne	0	30	0	0	0	0.0	W
3.9	Foreign language Język obcy --- Foreign language Język obcy	0	0	30	0	0	2.0	W

Liczba godzin / ECTS w semestrze (Number of hours / ECTS in a semester)		**135**	**60**	**150**	**30**	**0**	**30**	
Razem godzin w semestrze (Number of hours in a semester)		**375**						
SEMESTR: 4 (4th Semester)		**Liczba godzin zajęć w semestrze; E – egzamin Working time (hours) a semester; E – Exam**					**ECTS**	TYP
Nr	**Przedmiot**	**W**	**C**	**L**	**P**	**S**		
	Subject unit – semester curricular	**(Lecture)**	**(Practical classes)**	**(Laboratory classes)**	**(Project)**	**(Seminar)**		
4.1	Engineering statistics Statystyka inżynierska	0	30	0	0	0	2.0	K
4.2	Strength of materials in practice Wytrzymałość materiałów w praktyce	0	0	30	15	0	3.0	K
4.3	Fundamentals of machine design Podstawy konstrukcji maszyn	45E	0	0	0	0	3.0	K
4.4	Technological processes design Projektowanie procesów technologicznych	30E	0	0	30	0	4.0	K
4.5	Technical drawing and CAD II Zapis konstrukcji z wykorzystaniem CAD II	0	0	30	0	0	2.0	K
4.6	Removal processes II Obróbka ubytkowa II	30E	0	30	0	0	4.0	K
4.7	Automatics and robotics Automatyka i robotyka	30	15	15	0	0	4.0	K
4.8	Machinery damage Uszkodzenia maszyn	0	0	30	0	0	2.0	K
4.9	Fluid thermomechanics I Termomechanika płynów I	15	15	30	0	0	4.0	P
4.10	Physical education Wychowanie fizyczne	0	30	0	0	0	0.0	W
4.11	Foreign language Język obcy --- Foreign language Język obcy	0	0	30	0	0	2.0	W
Liczba godzin / ECTS w semestrze (Number of hours / ECTS in a semester)		**150**	**90**	**195**	**45**	**0**	**30**	
Razem godzin w semestrze (Number of hours in a semester)		**480**						
SEMESTR: 5 (5th Semester)		**Liczba godzin zajęć w semestrze; E – egzamin Working time (hours) a semester; E – Exam**					**ECTS**	TYP
Nr	**Przedmiot**	**W**	**C**	**L**	**P**	**S**		
	Subject unit – semester curricular	**(Lecture)**	**(Practical classes)**	**(Laboratory classes)**	**(Project)**	**(Seminar)**		
5.1	Fundamentals of machine design in practice Podstawy konstrukcji maszyn w praktyce	0	0	30	0	0	2.0	K
5.2	Finite element method Metoda elementów skończonych	30E	0	45	0	0	6.0	K
5.3	Technical drawing and CAD III Zapis konstrukcji z wykorzystaniem CAD III	0	0	30	0	0	2.0	K
5.4	Fluid thermomechanics II Termomechanika płynów II	15E	15	30	0	0	5.0	P

5.5	Foreign language Język obcy Foreign language Język obcy	0	0	30	0	0	2.0	W
5.6	Professional practice Praktyka zawodowa	0	0	0	160	0	6.0	W-PR
Liczba godzin / ECTS w semestrze (Number of hours / ECTS in a semester)		**45**	**15**	**165**	**160**	**0**	**23**	
Razem godzin w semestrze (Number of hours in a semester)		**385**						
Specjalność – Specialization: Machine Design - Konstrukcje maszyn								
5.1	Design of molds with the use of CAD Projektowanie form z zastosowaniem CAD	15	0	30	0	0	3.0	W-K
5.2	Machine reliability Niezawodność maszyn	15	0	15	0	0	2.0	W-K
5.3	CAD machine design Projektowanie maszyn CAD	0	0	30	0	0	2.0	W-K
Liczba godzin / ECTS w semestrze (Number of hours / ECTS in a semester)		**30**	**0**	**75**	**0**	**0**	**7**	
Razem godzin w semestrze (Number of hours in a semester)		**105**						
Specjalność – Specialization: Manufacturing Technology - Technologie wytwarzania								
5.1	Individual report - technological work Praca przejściowa - technologiczna	0	0	0	15	0	1.0	W-K
5.2	Tool systems Systemy narzędziowe	15	0	15	15	0	3.0	W-K
5.3	Programming of cnc machines Programowanie obrabiarek CNC	15	0	30	0	0	3.0	W-K
Liczba godzin / ECTS w semestrze (Number of hours / ECTS in a semester)		**30**	**0**	**45**	**30**	**0**	**7**	
Razem godzin w semestrze (Number of hours in a semester)		**105**						

SEMESTR: 6 (6th Semester)		**Liczba godzin zajęć w semestrze; E – egzamin Working time (hours) a semester; E – Exam**					**ECTS**	TYP
Nr	**Przedmiot**	**W**	**C**	**L**	**P**	**S**		
	Subject unit – semester curricular	**(Lecture)**	**(Practical classes)**	**(Laboratory classes)**	**(Project)**	**(Seminar)**		
6.1	Exploitation of vehicles and machinery Eksploatacja pojazdów i maszyn	30E	0	30	0	0	4.0	K
6.2	Techniques of welding Techniki spajania materiałów	30	0	30	0	0	4.0	K
6.3	Diploma seminar I Seminarium dyplomowe I	0	0	0	0	15	1.0	K
6.4	Advanced manufacturing techniques Zaawansowane techniki wytwarzania	30	0	15	0	0	3.0	K
6.5	Individual report - simulation work Praca przejściowa symulacyjna	0	0	0	45	0	3.0	K
6.6	Foreign language Język obcy Foreign language Język obcy	(E)	0	30	0	0	2.0	W
6.7	Diploma work (Engineering project) Praca dyplomowa (projekt inżynierski)	0	0	0	0	0	5.0	W
Liczba godzin / ECTS w semestrze (Number of hours / ECTS in a semester)		**90**	**0**	**105**	**45**	**15**	**22**	
Razem godzin w semestrze (Number of hours in a semester)		**255**						

Specjalność – Specialization: Machine Design - Konstrukcje maszyn								
6.1	Individual report - structural work Praca przejściowa - konstrukcyjna	0	0	0	30	0	2.0	W-K
6.2	Computational engineering Inżynieria obliczeniowa	15	0	30	0	0	3.0	W-K
6.3	CAM process design Projektowanie procesów CAM	15E	0	30	0	0	3.0	W-K
Liczba godzin / ECTS w semestrze (Number of hours / ECTS in a semester)		**30**	**0**	**60**	**30**	**0**	**8**	
Razem godzin w semestrze (Number of hours in a semester)		**120**						
Specjalność – Specialization: Manufacturing Technology - Technologie wytwarzania								
6.1	Technological instrumentation Oprzyrządowanie technologiczne	30E	0	15	15	0	4.0	W-K
6.2	Fundamentals of programming in a CAM system Podstawy programowania w systemie CAM	15	0	0	15	0	2.0	W-K
6.3	Machine control techniques Techniki sterowania maszyn	15	0	0	15	0	2.0	W-K
Liczba godzin / ECTS w semestrze (Number of hours / ECTS in a semester)		**60**	**0**	**15**	**45**	**0**	**8**	
Razem godzin w semestrze (Number of hours in a semester)		**120**						

SEMESTR: 7 (7th Semester)		**Liczba godzin zajęć w semestrze; E – egzamin Working time (hours) a semester; E – Exam**					**ECTS**	TYP
Nr	**Przedmiot**	**W**	**C**	**L**	**P**	**S**		
	Subject unit – semester curricular	**(Lecture)**	**(Practical classes)**	**(Laboratory classes)**	**(Project)**	**(Seminar)**		
7.1	Exploitation of industrial apparatus Eksploatacja aparatury przemysłowej	0	0	0	30	0	2.0	K
7.2	Diploma seminar II Seminarium dyplomowe II	0	0	0	0	15	1.0	K
7.3	Diploma work (Engineering project) Praca dyplomowa (projekt inżynierski)	(E)	0	0	0	0	10.0	W
Liczba godzin / ECTS w semestrze (Number of hours / ECTS in a semester)		**0**	**0**	**0**	**30**	**15**	**13**	
Razem godzin w semestrze (Number of hours in a semester)		**45**						
Specjalność – Specialization: Machine Design - Konstrukcje maszyn								
7.1	Construction of vehicles and machines Konstrukcje pojazdów i maszyn	30E	0	15	15	0	4.0	W-K
7.2	Rapid Manufacturing Techniques Techniki szybkiego wytwarzania	30	0	0	30	0	4.0	W-K
7.3	Diagnostics of machines and devices Diagnostyka maszyn i urządzeń	30E	0	30	0	0	4.0	W-K
7.4	Hydraulic and pneumatic drives and control Napędy i sterowanie hydrauliczne i pneumatyczne	30	0	30	15	0	5.0	W-K
Liczba godzin / ECTS w semestrze (Number of hours / ECTS in a semester)		**120**	**0**	**75**	**60**	**0**	**17**	
Razem godzin w semestrze (Number of hours in a semester)		**255**						
Specjalność – Specialization: Manufacturing Technology - Technologie wytwarzania								
7.1	Technology machinery and equipment repair Technologia napraw maszyn i urządzeń	30E	15	15	0	0	4.0	W-K
7.2	Bases of quality engineering Podstawy inżynierii jakości	30	0	15	15	0	4.0	W-K
7.3	Rapid prototyping techniques Techniki szybkiego prototypowania	15	0	0	30	0	3.0	W-K
7.4	Design of chipless processes Projektowanie procesów bezwiórowych	15	0	0	30	0	3.0	W-K

7.5	Fundamentals of coordinate metrology Podstawy metrologii współrzędnościowej	15E	0	30	0	0	3.0	W-K
Liczba godzin / ECTS w semestrze (Number of hours / ECTS in a semester)		**105**	**15**	**60**	**75**	**0**	**17**	
Razem godzin w semestrze (Number of hours in a semester)		**255**						

PLAN STUDIÓW RAZEM (TOTAL STUDY PLAN)		
Specjalność (Specialization)	Łącznie godziny kontaktowe Total contact hours	ECTS
Machine Design Konstrukcje maszyn	2770	210
Manufacturing Technology Technologie wytwarzania	2770	210

STATYSTYKA PROGRAMU STUDIÓW			
Typ	Przedmioty - p. ECTS razem	wg. planu	udział
Machine Design Konstrukcje maszyn			
K	Kierunkowy	121	57.62 %
P	Podstawowy	23	10.95 %
W	Wybieralny	23	10.95 %
W-HS	Humanistyczny lub społeczny, wybieralny	5	2.38 %
W-K	Wybieralny kierunkowy	32	15.24 %
W-PR	Praktyka	6	2.86 %
	Łącznie	210	100 %
Manufacturing Technology Technologie wytwarzania			
K	Kierunkowy	121	57.62 %
P	Podstawowy	23	10.95 %
W	Wybieralny	23	10.95 %
W-HS	Humanistyczny lub społeczny, wybieralny	5	2.38 %
W-K	Wybieralny kierunkowy	32	15.24 %
W-PR	Praktyka	6	2.86 %
	Łącznie	210	100 %

Program studiów dostosowany do kierunkowych efektów uczenia się dla kierunku studiów MECHANICAL ENGINEERING (studia pierwszego stopnia)
Plan i program studiów:
– uchwalony przez Senat PO
– zaopiniowany przez samorząd studencki.

Politechnika Opolska
Wydział Mechaniczny
Opole 2024 r.

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Sixth

Course Title	Advanced manufacturing techniques
Nazwa przedmiotu	Zaawansowane techniki wytwarzania

ECTS points	3	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	6.K.4	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	Knows the basics of machine construction and machine parts.
		2	
	Skills	1	Is able to determine the effect of using basic manufacturing techniques.
		2	
	Social Competence	1	Is able to analyze the tasks assigned to be carried out.
		2	Is aware of the responsibility and consequences of decisions made.

Course Goals Providing students with knowledge and gaining practical skills on new, non-classical methods of machining machine elements.

Programme content Processing of the material in the hardened state. Polygonal turning. Practical application of RP in relation to shaping forms and tools. Explosive plating. Shape memory metals. Optimization of tool movement paths. Machine parts manufactured using powder metallurgy.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Has knowledge of unconventional techniques needed to understand and describe phenomena occurring in the production and operation of machine components	ME_K1_W03	W L	C H
	2				
Skills	1	Is able to use analytical, simulation and experimental methods to formulate and solve advanced engineering tasks	ME_K1_U05	W L	C H
	2				
Social Competence	1	Demonstrates entrepreneurship and ingenuity in activities related to the implementation of professional tasks	ME_K1_K06	W L	C H
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr hab. inż. Niesłony Piotr
Calculation class (C)	0	
Laboratory class (L)	15	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	15
Project (P)	0
Seminar (S)	0
Preparation for classes	10
Preparation of a report/paper/ project/presentation	10

Independent study of the course topics	9
Examination or final colloquium	1
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

dr hab. inż. Małecka Joanna
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fourth

Course Title	Automatics and robotics
Nazwa przedmiotu	Automatyka i robotyka

ECTS points	4	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	4.K.7	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	Mathematical analysis (differentiation, integration, continuous and discrete signals; addition, convolution, multiplication of signals, fn modulo)
		2	Mechanics (statics and dynamics - balance of forces, kinematics and dynamics of point movement of the machine mechanism element; its acceleration and speed)
		3	Physics (properties of solids, gases and liquids - resistance to motion in a gaseous and liquid medium), Newton's laws of dynamics, friction, acceleration, speed
		4	Strength of materials (stresses, loads, permissible stresses, properties of Fe, Al alloys, plastics, rubber, allotropic transformations)
		5	Electrical engineering (application of Ohm's law, properties of passive electronic components, bipolar transistor, field-effect transistor, relay)
		6	Basics of machine construction (direct and indirect transmissions, dynamic and kinematic transmission, bearings, clutches, inertia
	Skills	1	Differentiation and integration of continuous and discrete functions, multiplication and addition of signals/functions
		2	Calculation of stresses in the material, determination of permissible stresses, calculation of cross-sections and selection of construction materials. from strength conditions
		3	Preparing a balance of forces for a material point in translational motion. Calculation of a(t) and v(t) for a point in forced motion F(t)
		4	Calculation of voltage drops on passive components for DC systems, knowledge of the characteristics of the PMDC moto
		5	Correct use of supports, bearings, gears and drives in machines and vehicles in accordance with design and operational assumptions.
	Social Competence	1	Ability to work in a team. Clear communication
		2	Formulating concise conclusions Analysis of human-machine interaction

Course Goals To familiarize students with the basics of automation and robotization of production. Discussion of the impact of automation and robotics systems on the design and operational characteristics of machines and devices Explaining the importance of robotic automation in industry in the context of quality, energy consumption, economy and production management.

Programme content Automation and robotics systems - basic functions, structures and operational goals. The role of control and program control for automation and robotics in the design of machines and devices. The impact of automation and robotics - on the quality of production, its energy consumption and economic indicators. The role of automation and robotics in ensuring production flexibility. Integration of systems within the enterprise.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has knowledge related to selected issues in the field of machine construction, operation, and condition diagnosis technical, repair technology and safe use	ME_K1_W06	W C L	A C H
	2	S/he has knowledge of development trends in the design, manufacture, construction and operation of machines	ME_K1_W06	W C L	A C H
Skills	1	S/he is able to use computer methods of mechanics when solving engineering tasks in the field of design, production and operation of machines	ME_K1_U08	L	H
	2				
Social Competence	1	S/he is aware of the responsibility associated with decisions made as part of engineering activities, especially in terms of the safety of oneself and other people	ME_K1_K03	W C L	A C H
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr hab. inż. Brol Sebastian
Calculation class (C)	15	
Laboratory class (L)	15	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	15
Laboratory class (L)	15
Project (P)	0
Seminar (S)	0

Preparation for classes	15
Preparation of a report/paper/ project/presentation	15
Independent study of the course topics	15
Examination or final colloquium	0
Additional contact hours	0
Total student workload	105
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

dr hab. inż. Augustynowicz Andrzej
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Third

Course Title	Construction documentation
Nazwa przedmiotu	Dokumentacja konstrukcyjna

ECTS points	4	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	3.K.7	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	S/he has basic knowledge of technical drawing and metrology
		2	S/he knows the principles of designing machine elements
	Skills	1	S/he has ability to use CAD engineering software
		2	S/he has ability to interpret design assumptions
	Social Competence	1	Correctly identifies dilemmas related to performing the profession
		2	

Course Goals	To familiarize students with geometric dimensioning and tolerancing standards

Programme content	Discussion of geometric tolerances and the principles of their use. Creating technical documentation of selected machine units

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he is able to interpret the markings contained in the technical documentation	ME_K1_W04	W	C
	2				
Skills	1	S/he is able to prepare technical documentation using computer methods	ME_K1_U09	P	K L
	2				
Social Competence	1	S/he is aware of the importance of professional conduct and compliance with the principles of professional ethics	ME_K1_K07	W P	C L
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan

The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr hab. inż. Robak Grzegorz
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	30	
Seminar (S)	0	

Student workload

Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	30
Seminar (S)	0
Preparation for classes	10
Preparation of a report/paper/ project/presentation	30
Independent study of the course topics	15
Examination or final colloquium	0
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Third

Course Title	Differential and integral calculus
Nazwa przedmiotu	Rachunek różniczkowy i całkowy

ECTS points	3	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	3.K.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	S/he has knowledge of basic mathematics issues: linear algebra, analytical geometry, geometry, elements of matrix calculus
		2	
	Skills	1	Ability to analyze and effectively solve tasks in the field of mathematics and physics.
		2	
	Social Competence	1	S/he is aware of the need to supplement specialist knowledge and is able to select appropriate sources of knowledge and teaching methods.
		2	S/he is able to analyze and effectively carry out tasks in the field of mathematics and physics.

Course Goals Familiarization with the differential and integral calculus of functions of one and many variables, familiarization with methods of formulating problems leading to differential equations, with particular emphasis on practical aspects in the area of solving these equations

Programme content Differential and integral calculus of functions of one and many variables, ordinary differential equations - methods of solving

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has general knowledge of differential and integral calculus	ME_K1_W01	C	F G
	2	S/he knows the principles and methods of solving problems leading to the use of derivatives and integrals	ME_K1_W04	C	F G
Skills	1	Can see a mathematical problem and find an adequate method to solve it	ME_K1_U01	C	F G
	2	S/he is able to find solutions to technical problems using mathematical methods	ME_K1_U09	C	F G
Social Competence	1	S/he is able to present calculation results in a public forum.	ME_K1_K06	C	F G
	2	S/he is able to critically verify knowledge using available sources.	ME_K1_K01	C	F G

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan

The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr hab. inż. Lachowicz Cyprian
Calculation class (C)	30	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	30
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	10
Preparation of a report/paper/ project/presentation	20
Independent study of the course topics	15
Examination or final colloquium	0
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Sixth
Course Title	Diploma seminar I

Nazwa przedmiotu	Seminarium dyplomowe I		
ECTS points	1	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit
Course code	6.K.3	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	Knows the basic methods, techniques, tools and materials used to solve engineering problems.
		2	
	Skills	1	Can obtain information from literature and the Internet
		2	Is able to prepare a multimedia presentation
	Social Competence	1	Can think creatively
		2	Is able to use information and communication techniques to carry out typical engineering activities

Course Goals Presentation of the principles of preparing an engineering diploma thesis.

Programme content Analysis of topics and scopes of engineering works. Discussion of the guidelines for preparing an engineering diploma thesis.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Knows the techniques and tools required to solve simple engineering tasks in the field of construction, manufacturing technology and operation of machines	ME_K1_W07	S	N O
	2	Has knowledge of copyright necessary to prepare a diploma thesis	ME_K1_W14	S	N O
Skills	1	Is able to use various communication techniques	ME_K1_U10	S	N O
	2	Is able to obtain and properly use information obtained from various sources	ME_K1_U01	S	N O
Social Competence	1	Is aware of the social role of a graduate - engineer of a technical university	ME_K1_K07	S	N O
	2	Is aware of the importance and understands non-technical aspects and effects of engineering activities	ME_K1_K02	S	N O

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr hab. inż. Robak Grzegorz
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	15	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	0
Seminar (S)	15
Preparation for classes	0
Preparation of a report/paper/ project/presentation	5
Independent study of the course topics	5
Examination or final colloquium	0
Additional contact hours	0
Total student workload	25
Number of contact hours (from the study plan)	15

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Seventh

Course Title	Diploma seminar II		
Nazwa przedmiotu	Seminarium dyplomowe II		
ECTS points	1	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit
Course code	7.K.2	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	S/he has theoretically organized general knowledge of subjects included in the study program
		2	
	Skills	1	S/he is able to obtain information from various sources
		2	
	Social Competence	1	S/he can think creatively
		2	S/he is able to use information and communication techniques to carry out typical engineering activities

Course Goals Familiarizing students with the issues necessary to pass the engineering diploma exam. Preparation for the engineering diploma exam

Programme content Analysis of topics for the diploma exam. Analysis of the course of the engineering diploma examination.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he knows the techniques and tools required to solve simple engineering tasks in the field of construction, manufacturing technology and operation of machines	ME_K1_W07	S	N O
	2	S/he has knowledge of copyright necessary to prepare a diploma thesis	ME_K1_W14	S	N O
Skills	1	S/he is able to use various communication techniques	ME_K1_U10	S	N O
	2	S/he is able to obtain and properly use information obtained from various sources	ME_K1_U01	S	N O
Social Competence	1	S/he is aware of the social role of a graduate - engineer of a technical university	ME_K1_K07	S	N O
	2	S/he is aware of the importance and understands non-technical aspects and effects of engineering activities	ME_K1_K02	S	N O

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr hab. inż. Robak Grzegorz
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	15	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	0
Seminar (S)	15
Preparation for classes	0
Preparation of a report/paper/ project/presentation	5
Independent study of the course topics	5
Examination or final colloquium	0
Additional contact hours	0
Total student workload	25
Number of contact hours (from the study plan)	15

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic

Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Sixth

Course Title	Diploma work (Engineering project)
Nazwa przedmiotu	Praca dyplomowa (projekt inżynierski)

ECTS points	5	Subject type	W
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	6.W.2	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	General knowledge acquired on previously completed subjects
		2	
	Skills	1	General skills acquired in previously completed subjects
		2	
	Social Competence	1	General competences acquired in previously conducted subjects
		2	

Course Goals Course Goals The main purpose of the diploma thesis is to check the degree of obtaining competences during studies. Teaching the student the methodology of searching for source materials and proper use of them. Teaching the student to prepare extensive reports describing the work carried out. Teaching how to edit a technical text, and in particular to present the assumptions, purpose and methodology of reaching a solution to the problem posed in the diploma thesis.

Programme content Analysis of the topic of an engineering diploma thesis. Collecting literature related to the topic of the work. Developing the concept and method of solving the engineering problem posed in the topic of the work, as well as developing a work implementation plan.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	He/She has the knowledge to prepare an engineering project in the field of construction and production technology of mechanical devices	ME_K1_W07	P	K R
	2	He/She has knowledge in the field of intellectual property protection and patent law	ME_K1_W14	P	K R
Skills	1	The graduate is able to analyze the engineering subject of the diploma thesis, as well as search for relevant literature items and subject them to a directional analysis	ME_K1_U01	P	K R
	2	He/She can analyze and evaluate the correctness of the proposed engineering solutions	ME_K1_U08	P	K R
Social Competence	1	The graduate has and understands the need for continuous education	ME_K1_K01	P	K R
	2	He/She is aware of the importance of professional and ethical conduct in professional matters	ME_K1_K05	P	K R

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr hab. inż. Kluger Krzysztof
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	50

Preparation of a report/paper/ project/presentation	9
Independent study of the course topics	65
Examination or final colloquium	1
Additional contact hours	0
Total student workload	125
Number of contact hours (from the study plan)	0

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Seventh

Course Title	Diploma work (Engineering project)
Nazwa przedmiotu	Praca dyplomowa (projekt inżynierski)

ECTS points	10	Subject type	W
Language of lecture	angielski	Mode of completing the course	Examination

Course code	7.W.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	General knowledge acquired on previously completed subjects
		2	
	Skills	1	General skills acquired in previously completed subjects
		2	
	Social Competence	1	General competences acquired in previously conducted subjects
		2	

Course Goals Course Goals The main purpose of the diploma thesis is to check the degree of obtaining competences during studies. Teaching the student the methodology of searching for source materials and proper use of them. Teaching the student to prepare extensive reports describing the work carried out. Teaching how to edit a technical text, and in particular to present the assumptions, purpose and methodology of reaching a solution to the problem posed in the diploma thesis.

Programme content Solving the engineering problem posed in the topic of the diploma thesis and developing the obtained solution results and their critical analysis. Preparation of final conclusions.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	He/ She has the knowledge to carry out the necessary strength calculations for an engineering project	ME_K1_W05	P	K R
	2	He/She uses the necessary knowledge to conduct economic analyzes of an engineering project	ME_K1_W12	P	K R
Skills	1	The graduate student is able to analyze the engineering subject of the diploma thesis, as well as search for relevant literature items and subject them to a directional analysis	ME_K1_U01	P	K R
	2	He/She can take into account economic aspects in the created engineering projects	ME_K1_U07	P	K R
Social Competence	1	The graduate has and understands the need for continuous education.	ME_K1_K01	P	K R
	2	He/She can transfer the acquired knowledge in the field of construction and operation of machines	ME_K1_K07	P	K R

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr hab. inż. Kluger Krzysztof
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload

Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	109
Preparation of a report/paper/ project/presentation	15
Independent study of the course topics	125
Examination or final colloquium	1
Additional contact hours	0
Total student workload	250
Number of contact hours (from the study plan)	0

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	First

Course Title	Engineering graphics
Nazwa przedmiotu	Grafika inżynierska

ECTS points	3	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	1.K.4	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	Has detailed knowledge of projection methods of spatial objects.
		2	Knows the drafting methods of relations between spatial objects.
	Skills	1	Has the ability to graphically solve tasks from stereometry.
		2	Has a practical skill of aesthetic drawing with traditional methods
		3	Can use projections on the plane for the recording and reading of information about a spatial objects.
	Social Competence	1	Understands the need to identify geometric objects
		2	Is able to describe relationships between spatial objects

Course Goals To familiarize students with the correct definition of the position of a point, line and complex shapes in three-dimensional space. Providing students with knowledge regarding the basics of standardization applicable in the engineering construction record. Students master the freehand sketch and the principles of projection according to the European method. Students will acquire the ability to dimension simple and complex engineering structures.

Programme content Types of technical drawings. Types and meaning of drawing lines, sheet formats, normalized drawing scale. Orthogonal projections, arrangement of projections on the drawing plane according to European and American method. Reduction of the number of projections by applying views, cross-sections, local cross-sections, auxiliary projections in engineering graphics. Basic principles of standardization used in technical drawing. Principles of dimensioning of projections of components, arrangement of dimensions. Tolerance of dimensions, shape and position. Determination of surface roughness. Simplifications in drawing of inseparable and disconnectable connections of machines components. Scope and examples of executive, assemblytive and montage drawings. Examples of industrial plant diagrams.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Has knowledge of methods for projecting complex spatial objects.	ME_K1_W04	W C	C F I J P R
	2	Has knowledge of constructing projections of spatial objects on the drawing plane.	ME_K1_W04	W C	C F I J P R
	3	Knows the necessary principles of engineering graphics and traditional tools used in the development of construction documentation	ME_K1_W04	W C	C F I J P R
	4	Knows the scope of standardization and requirements for construction documentation	ME_K1_W09	W C	C F I J P R
Skills	1	Has advanced spatial imagination.	ME_K1_U07	W C	C F I J P R
	2	Has practical ability to draw aesthetically using traditional methods.	ME_K1_U04	W C	C F I J P R
	3	Is able to make a simple technical drawing of a machine element, mechanism and device using the principles of standardization and databases.	ME_K1_U09	W C	C F I J P R
Social Competence	1	Is able to record and transmit information about spatial objects.	ME_K1_K03	W C	C F I J P R
	2	Understands the need to improve spatial imagination.	ME_K1_K01	W C	C F I J P R
	3	Is aware of the importance and responsibility of actions.	ME_K1_K02	W C	C F I J P R
	4	Able to cooperate and work in a group.	ME_K1_K04	W C	C F I J P R

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr inż. Böhm Michał
Calculation class (C)	30	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload

Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	30
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	8
Preparation of a report/paper/ project/presentation	12
Independent study of the course topics	8
Examination or final colloquium	2
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
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dr inż. Wydrych Jacek
Dean of Faculty
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fourth

Course Title	Engineering statistics
Nazwa przedmiotu	Statystyka inżynierska

ECTS points	2	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	4.K.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	knowledge of basic mathematics: algebra
		2	
	Skills	1	Ability to analyze and effectively solve tasks in the field of mathematics and physics.
		2	
	Social Competence	1	Is aware of the need to supplement specialist knowledge and is able to select appropriate sources of knowledge and teaching methods.
		2	Be able to analyze and effectively carry out tasks in the field of mathematics and physics.

Course Goals Familiarization with the basics of probability theory and the use of statistical methods in technology

Programme content Theory of probability. Statistics - building models, reasoning

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Has general knowledge of engineering statistics	ME_K1_W01	C	F G
	2	Knows the principles and methods of solving problems leading to the use of statistical methods	ME_K1_W01	C	F G
Skills	1	Can see a mathematical problem and find an adequate method to solve it	ME_K1_U01	C	F G
	2	Is able to perform statistical analysis of the obtained research results	ME_K1_U09	C	F G
Social Competence	1	Is able to present calculation results in a public forum.	ME_K1_K06	C	F G
	2	Is able to critically verify knowledge using available sources.	ME_K1_K01	C	F G

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname

Lecture (W)	0	dr hab. inż. Lachowicz Cyprian
Calculation class (C)	30	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	30
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	5
Preparation of a report/paper/ project/presentation	10
Independent study of the course topics	5
Examination or final colloquium	0
Additional contact hours	0
Total student workload	50
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
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dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering		
Profile of Education	General Academic		
Level of study	First Cycle Studies		
Specialization			
Form of Study	Full-Time Studies		
Semester	First		
Course Title	Ergonomic and industrial safety		
Nazwa przedmiotu	Ergonomia i bezpieczeństwo pracy		
ECTS points	1	Subject type	K

Language of lecture	angielski	Mode of completing the course	Course credit
Course code	1.K.2	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	No requirements
		2	
	Skills	1	Student is able to analyze the presented issues
		2	Student is able to acquire knowledge in the scope provided by the instructor
	Social Competence	1	Student understands the need to learn and accumulate knowledge
		2	Student contributes to positive interaction with the environment

Course Goals The aim of the classes is to familiarize students with ergonomic solutions in various areas of life

Programme content Auditorium lecture about ergonomics and its application in human life. Includes, among others: ergonomics of living spaces, computer workstations or machining workshops.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Student has knowledge of ergonomics and occupational health and safety at workplaces	ME_K1_W12	W	C
	2				
Skills	1				
	2				
Social Competence	1	Student understands the impact of ergonomic solutions on the work environment	ME_K1_K02	W	C
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname

Lecture (W)	15	dr inż. Łagoda Agnieszka
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	14
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	0
Examination or final colloquium	1
Additional contact hours	0
Total student workload	30
Number of contact hours (from the study plan)	15

* hour (class) means 45 minutes

dr hab. inż. Małecka Joanna
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering		
Profile of Education	General Academic		
Level of study	First Cycle Studies		
Specialization			
Form of Study	Full-Time Studies		
Semester	Seventh		
Course Title	Exploitation of industrial apparatus		
Nazwa przedmiotu	Eksploatacja aparatury przemysłowej		
ECTS points	2	Subject type	K

Language of lecture	angielski	Mode of completing the course	Course credit
Course code	7.K.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	Has knowledge of industrial technology and equipment.
		2	
	Skills	1	Obtains information from literature and other sources related to technical sciences.
		2	
	Social Competence	1	Able to work in a group. Understands the importance of team activities.
		2	

Course Goals Familiarizing students with the construction of industrial equipment and preparing them for its design and operation.

Programme content The acquired knowledge allows for a systemic approach to design to ensure the reliability and safety of devices implementing technological processes and to acquire responsibility for their reliable operation.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Has specialist knowledge in the design of machine parts and mechanical structures required to understand the construction and operation of mechanical devices.	ME_K1_W05	P	K L P
	2				
Skills	1	Can use analytical, simulation and experimental methods in the design process	ME_K1_U05	P	K L P
	2				
Social Competence	1	Can take responsibility for the results of joint activities	ME_K1_K04	P	K L P
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan

The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr hab. inż. Czernek Krystian
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	30	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	30
Seminar (S)	0
Preparation for classes	0
Preparation of a report/paper/ project/presentation	20
Independent study of the course topics	0
Examination or final colloquium	0
Additional contact hours	0
Total student workload	50
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr hab. inż. Hapanowicz Jerzy
Head of the organizational unit
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dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Sixth
Course Title	Exploitation of vehicles and machinery

Nazwa przedmiotu	Eksploatacja pojazdów i maszyn		
ECTS points	4	Subject type	K
Language of lecture	angielski	Mode of completing the course	Examination
Course code	6.K.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	S/he has basic knowledge of chemistry needed to understand and description of phenomena occurring during the operation of machine elements.
		2	
	Skills	1	S/he is able to obtain information from literature, databases and other sources, also in a foreign language; is able to integrate the obtained information and interpret it.
		2	
	Social Competence	1	S/he is able to obtain information from literature, databases and other sources, also in a foreign language, is able to integrate the obtained information and interpret it.
		2	

Course Goals Learning the basic principles in terms of efficiency and operation of machines.

Programme content Basic operational concepts, operational engineering, reliability characteristics of non-renewable and renewable elements, complex systems and reliability models. Principles of maintaining the level of reliability of facilities in the operation process. The impact of element design and the quality of consumables on the durability and reliability of vehicles and machines.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has extended knowledge of the life cycle of machines and mechanical devices.	ME_K1_W07	W L	A I
	2				
Skills	1	S/he is able to integrate the information obtained, interpret it, draw conclusions and formulate and justify opinions.	ME_K1_U08	L	I
	2				
Social Competence	1	S/he understands non-technical aspects of a mechanical engineer's activity, including social consequences and impact on the environment.	ME_K1_K05	L	I
	2				

Methods of verification of learning outcomes: A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr inż. Prażnowski Krzysztof
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	20
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	20
Examination or final colloquium	0
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

dr hab. inż. Augustynowicz Andrzej
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering

Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fifth

Course Title	Finite element method
Nazwa przedmiotu	Metoda elementów skończonych

ECTS points	6	Subject type	K
Language of lecture	angielski	Mode of completing the course	Examination

Course code	5.K.2	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	S/he has knowledge of machine design using computer technology.
		2	
	Skills	1	Proficient in the use of computer methods and programmes useful for the engineering activities undertaken.
		2	
	Social Competence	1	S/he is aware of the need to supplement expertise throughout life and is able to select appropriate sources of knowledge and methods of learning for themselves and others.
		2	

Course Goals	To familiarise students with the technique of carrying out finite element calculations.

Programme content	Finite element calculations of mechanical engineering problems.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has knowledge of structural modelling and calculation using FEM.	ME_K1_W01	W L	A B I
	2				
Skills	1	S/he use computer methods and programmes that are useful for the engineering activities undertaken.	ME_K1_U02	W L	A B I
	2				
Social Competence	1	S/he is able to comprehensively analyse and effectively carry out assigned tasks	ME_K1_K05	W L	A B I
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	prof. dr hab. inż. Niesłony Adam
Calculation class (C)	0	
Laboratory class (L)	45	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	45
Project (P)	0
Seminar (S)	0
Preparation for classes	20
Preparation of a report/paper/ project/presentation	20
Independent study of the course topics	33
Examination or final colloquium	2
Additional contact hours	0

Total student workload	150
Number of contact hours (from the study plan)	75

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fourth

Course Title	Fluid thermomechanics I
Nazwa przedmiotu	Termomechanika płynów I

ECTS points	4	Subject type	P
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	4.P.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	Knowledge of basic laws of physics and mechanics.
		2	Familiarity with the basics of mathematical analysis.
	Skills	1	Ability to balance forces, moments of mass, momentum, and energy.
		2	Ability to solve simple integrals and algebraic equations.
	Social Competence	1	Ability to work both in a team and independently.
		2	Awareness of the significance of engineering actions.

Course Goals Understanding the physical properties of fluids. Learning the elements of fluid statics and dynamics. Acquiring skills in measuring selected thermo-fluid processes. Introduction to the fundamentals of thermodynamic processes.

Programme content Physical properties of fluids. Elements of fluid statics, kinematics, and dynamics. Fundamentals of thermodynamic phenomena. Ideal gas. Heat transfer.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has knowledge in physics focused on concepts necessary for understanding, describing, and utilizing fluid mechanics in the design and manufacturing of various industrial patterns.	ME_K1_W02	W C	C
	2	S/he has knowledge in the field of flow metrology.	ME_K1_W09	L	H P
Skills	1	S/he has the ability for self-education and developing a research toolkit in the field of fluid mechanics.	ME_K1_U02	W C L	C I
	2	S/he can formulate and solve engineering, simulation, and experimental tasks.	ME_K1_U05	L	C H I
Social Competence	1	S/he is aware of the need for lifelong learning and can select appropriate learning methods for himself/herself and others.	ME_K1_K01	W C L	P
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr inż. Borsuk Grzegorz
Calculation class (C)	15	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	15
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	8

Preparation of a report/paper/ project/presentation	15
Independent study of the course topics	15
Examination or final colloquium	2
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

dr hab. inż. Kłosok-Bazan Iwona
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fifth

Course Title	Fluid thermomechanics II
Nazwa przedmiotu	Termomechanika płynów II

ECTS points	5	Subject type	P
Language of lecture	angielski	Mode of completing the course	Examination

Course code	5.P.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	Basic laws of statics, kinematics, fluid dynamics, and thermodynamic issues.
		2	
	Skills	1	Practical use of the laws related to the movement of heat and mass.
		2	
	Social Competence	1	Teamwork skills.
		2	Awareness of the importance of engineering activities.

Course Goals To familiarize students with complex thermal-flow issues: two-phase motion, wear of elements of flow installations. Measurement and modeling of heat and flow issues.

Programme content Subject content regarding complex thermal and flow issues. To familiarize the student with two-phase flows and practical cases of thermal-flow issues related to measurements and modeling.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has knowledge of mathematics, physics, chemistry, and thermodynamics, including knowledge necessary to model and analyze thermal and flow phenomena and systems.	ME_K1_W02	W C L	A H J P R
	2				
Skills	1	The student can obtain information from literature, databases, and other sources, integrate the information obtained, interpret, and draw conclusions, and formulate and justify opinions.	ME_K1_U01	W C L	A C H J P R
	2	S/he can analyze and evaluate existing technical solutions, devices, facilities, systems, and processes related to energy conversion.	ME_K1_U08	W C L	A H J P R
Social Competence	1	S/he understands the role of an engineer as a person who is required to have proper knowledge of technical phenomena.	ME_K1_K07	W C L	A H J P R
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr inż. Wydrych Jacek
Calculation class (C)	15	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	15

Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	10
Preparation of a report/paper/ project/presentation	31
Independent study of the course topics	22
Examination or final colloquium	2
Additional contact hours	0
Total student workload	125
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

dr hab. inż. Kłosok-Bazan Iwona
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Politechnika Opolska
Wydział Mechaniczny
Karta Opisu Przedmiotu

Kierunek studiów	Mechanical Engineering
Profil kształcenia	Ogólnoakademicki
Poziom studiów	Studia pierwszego stopnia
Specjalność	
Forma studiów	Studia stacjonarne
Semestr studiów	Trzeci

Nazwa przedmiotu	Foreign language
Subject Title	Język obcy

Liczba punktów ECTS	2	Typ przedmiotu	W
Język wykładowy	polski	Tryb zaliczenia przedmiotu (E/Z)	Zaliczenie na ocenę

Kod przedmiotu	3.W.2	Przedmiot powiązany z badaniami naukowymi/ prakt. przygot. zawodowym (T/N)	N

Oczekiwania wstępne w zakresie przedmiotu	Wiedza	1	In accordance with the recommendations of PRK level 4.
		2	
	Umiejętności	1	In accordance with the recommendations of PRK level 4.
		2	
	Kompetencje społeczne	1	In accordance with the recommendations of PRK level 4.
		2	

Cele przedmiotu: Development of the four basic language skills (speaking, reading, writing, and listening) as well as communicative skills and competencies at level A of the Common European Framework of Reference for Languages (CEFR).

Treści programowe zapewniające uzyskanie efektów uczenia się dla przedmiotu: The course provides the student with universal linguistic knowledge: vocabulary, phrases, and structures as well as intercultural knowledge necessary for establishing and maintaining communication with target language users according to level A of the Common European Framework of Reference for Languages (CEFR). The student develops the four basic language skills - listening, speaking, reading, and writing, and learns the basic grammar (declensions, conjugations, basic parts of speech, present, past, and future tenses) required at level A according to the CEFR, and acquires the skills of searching, using and selecting information from various sources - including the use of online dictionaries and translators as well as language learning applications.

Efekty uczenia się dla przedmiotu - po zakończonym cyklu studiów			Odniesienie do kierunkowych efektów uczenia się	Formy realizacji (W, C, L, P, S)	Formy weryfikacji efektów uczenia się
Wiedza	1	A student knows and understands foreign language theory and terminology enough to use a foreign language at the B2 level of the Common European Framework of Reference for Languages	ME_K1_W05	L	C E F P
	2				
Umiejętności	1	A student has self-study skills	ME_K1_U02	L	C E F P
	2	A student is able to use a foreign language at the B2 level of the Common European Framework of Reference for Languages.	ME_K1_U03	L	C E F P
Kompetencje społeczne	1	A student is aware of the need to improve their knowledge throughout life and is able to select the appropriate learning methods for themselves and others	ME_K1_K01	L	P
	2	A student understands the importance of teamwork and is able to take responsibility for the results of joint activities	ME_K1_K04	L	P

Formy weryfikacji efektów uczenia się:

A-egzamin pisemny, B-egzamin ustny, C-zaliczenie pisemne, D-zaliczenie ustne, E-na podstawie ocen cząstkowych z odpowiedzi ustnych, F-na podstawie ocen cząstkowych z odpowiedzi pisemnych, G-praca kontrolna, H-ocena ze sprawozdań, I-ocena z przebiegu ćwiczeń, J-ocena z przygotowania do ćwiczeń, K-ocena z przebiegu realizacji projektu, L-ocena pisemnej realizacji projektu, M-ocena z obrony projektu, N-ocena formy prezentacji, O-ocena treści prezentacji, P-obserwacja aktywności na zajęciach, R-obserwacja systematyczności.

Godziny w planie studiów		
Forma zajęć	Liczba godzin zajęć w semestrze	Opiekun (koordynator) przedmiotu (tytuł/stopień naukowy/ tytuł zawodowy, imię i nazwisko)
Wykład	0	dr Świerczewska Beata
Ćwiczenia	0	
Laboratorium	30	
Projekt	0	
Seminarium	0	

Nakład pracy studenta	
Rodzaje zajęć studenta*	Średnia liczba godzin* przeznaczonych na zrealizowane aktywności
Wykład	0
Ćwiczenia	0
Laboratorium	30
Projekt	0
Seminarium	0
Przygotowanie do zajęć	10
Przygotowanie sprawozdania/referatu/ projektu/prezentacji	0
Samodzielne studiowanie tematyki zajęć	10
Egzamin lub kolokwium zaliczeniowe	0
Dodatkowe godziny kontaktowe	0
Łączny nakład pracy studenta	50
Liczba godzin kontaktowych (z planu studiów)	30

* godzina (lekcyjna) oznacza 45 minut

dr Świerczewska Beata
Kierownik jednostki organizacyjnej/bezpośredni przełożony
(pieczęć/podpis)

dr inż. Wydrych Jacek
Dziekan Wydziału
(pieczęć/podpis)

Politechnika Opolska
Wydział Mechaniczny
Karta Opisu Przedmiotu

Kierunek studiów	Mechanical Engineering
Profil kształcenia	Ogólnoakademicki

Poziom studiów	Studia pierwszego stopnia
Specjalność	
Forma studiów	Studia stacjonarne
Semestr studiów	Czwarty

Nazwa przedmiotu	Foreign language
Subject Title	Język obcy

Liczba punktów ECTS	2	Typ przedmiotu	W
Język wykładowy	polski	Tryb zaliczenia przedmiotu (E/Z)	Zaliczenie na ocenę

Kod przedmiotu	4.W.2	Przedmiot powiązany z badaniami naukowymi/ prakt. przygot. zawodowym (T/N)	0

Oczekiwania wstępne w zakresie przedmiotu	Wiedza	1	
		2	
	Umiejętności	1	
		2	
	Kompetencje społeczne	1	
		2	

Cele przedmiotu: Development of the four basic language skills (speaking, reading, writing, and listening) as well as communicative skills and competencies at level A of the Common European Framework of Reference for Languages (CEFR).

Treści programowe zapewniające uzyskanie efektów uczenia się dla przedmiotu: The course provides the student with universal linguistic knowledge: vocabulary, phrases, and structures as well as intercultural knowledge necessary for establishing and maintaining communication with target language users according to level A of the Common European Framework of Reference for Languages (CEFR). The student develops the four basic language skills - listening, speaking, reading, and writing, and learns the basic grammar (declensions, conjugations, basic parts of speech, present, past, and future tenses) required at level A according to the CEFR, and acquires the skills of searching, using and selecting information from various sources - including the use of online dictionaries and translators as well as language learning applications.

Efekty uczenia się dla przedmiotu - po zakończonym cyklu studiów			Odniesienie do kierunkowych efektów uczenia się	Formy realizacji (W, C, L, P, S)	Formy weryfikacji efektów uczenia się
Wiedza	1	A student knows and understands foreign language theory and terminology enough to use a foreign language at the B2 level of the Common European Framework of Reference for Languages	ME_K1_W15	L	C E F P
	2				
Umiejętności	1	A student has self-study skills	ME_K1_U02	L	C E F P
	2	A student is able to use a foreign language at the B2 level of the Common European Framework of Reference for Languages.	ME_K1_U03	L	C E F P
Kompetencje społeczne	1	A student is aware of the need to improve their knowledge throughout life and is able to select the appropriate learning methods for themselves and others	ME_K1_K01	L	P
	2	A student understands the importance of teamwork and is able to take responsibility for the results of joint activities	ME_K1_K04	L	P

Formy weryfikacji efektów uczenia się:
A-egzamin pisemny, B-egzamin ustny, C-zaliczenie pisemne, D-zaliczenie ustne, E-na podstawie ocen cząstkowych z odpowiedzi ustnych, F-na podstawie ocen cząstkowych z odpowiedzi pisemnych, G-praca kontrolna, H-ocena ze sprawozdań, I-ocena z przebiegu ćwiczeń, J-ocena z przygotowania do ćwiczeń, K-ocena z przebiegu realizacji projektu, L-ocena pisemnej realizacji projektu, M-ocena z obrony projektu, N-ocena formy prezentacji, O-ocena treści prezentacji, P-obserwacja aktywności na zajęciach, R-obserwacja systematyczności.

Godziny w planie studiów		
Forma zajęć	Liczba godzin zajęć w semestrze	Opiekun (koordynator) przedmiotu (tytuł/stopień naukowy/ tytuł zawodowy, imię i nazwisko)
Wykład	0	dr Świerczewska Beata
Ćwiczenia	0	
Laboratorium	30	
Projekt	0	
Seminarium	0	

Nakład pracy studenta	
Rodzaje zajęć studenta*	Średnia liczba godzin* przeznaczonych na zrealizowane aktywności
Wykład	0
Ćwiczenia	0
Laboratorium	30
Projekt	0

Seminarium	0
Przygotowanie do zajęć	10
Przygotowanie sprawozdania/referatu/ projektu/prezentacji	0
Samodzielne studiowanie tematyki zajęć	10
Egzamin lub kolokwium zaliczeniowe	0
Dodatkowe godziny kontaktowe	0
Łączny nakład pracy studenta	50
Liczba godzin kontaktowych (z planu studiów)	30

* godzina (lekcyjna) oznacza 45 minut

dr Świerczewska Beata
Kierownik jednostki organizacyjnej/bezpośredni przełożony
(pieczęć/podpis)

dr inż. Wydrych Jacek
Dziekan Wydziału
(pieczęć/podpis)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Third
Course Title	Foreign language
Nazwa przedmiotu	Język obcy

ECTS points	2	Subject type	W
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	3.W.2	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	The student must have grammar and lexical knowledge at B2 level as defined by the Common European Framework of Reference for Languages.
		2	
	Skills	1	The student can use their communication skills in the foreign language at B2 level as defined by the Common European Framework of Reference for Languages.
		2	
	Social Competence	1	The student can collaborate with the group taking different roles.
		2	The student understands the need for self-study.

Course Goals Acquisition of language skills in the fields of science and scientific disciplines relevant to the field of study, in accordance with the requirements set out for level C of the Common European Framework of Reference for Languages.

Programme content In the course students acquire technical vocabulary in the area of Mechanical Engineering as well as the language of work environment (conducting meetings, concluding contracts, negotiations and conversations with partners and clients, giving presentations, solving problems and conflicts, arguing, presenting offers, analyzing job offers, preparing job applications – curriculum vitae, cover letter) . As part of the module, the student acquires real-world knowledge, develops four basic language skills - listening, speaking, reading and writing, and extends the ability to seek, use and select tinformation from different sources .The course is focused on active implementing technical and academic vocabulary with the view of students' future business and scientific careers.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	The student understands foreign language theory and terminology well enough to use the foreign language at C level of the Common European Framework of Reference for Languages	ME_K1_W15	L	C E F P
	2				
Skills	1	The student has self-study skills.	ME_K1_U02	L	C E F P
	2	The student is able to use a foreign language at C evel of the Common European Framework of Reference for Languages.	ME_K1_U03	L	C E F P
Social Competence	1	The student is aware of the need to improve their knowledge throughout life and is able to select the appropriate learning methods for themselves and others	ME_K1_K01	L	P
	2	The student understands the importance of teamwork and is able to take responsibility for the results of joint activities	ME_K1_K04	L	P

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	mgr Kowalczyk Bogusława
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	12
Preparation of a report/paper/ project/presentation	6
Independent study of the course topics	12
Examination or final colloquium	0
Additional contact hours	0
Total student workload	60
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr Świerczewska Beata
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Politechnika Opolska
Wydział Mechaniczny
Karta Opisu Przedmiotu

Kierunek studiów	Mechanical Engineering
Profil kształcenia	Ogólnoakademicki

Poziom studiów	Studia pierwszego stopnia
Specjalność	
Forma studiów	Studia stacjonarne
Semestr studiów	Piąty

Nazwa przedmiotu	Foreign language
Subject Title	Język obcy

Liczba punktów ECTS	2	Typ przedmiotu	W
Język wykładowy	polski	Tryb zaliczenia przedmiotu (E/Z)	Zaliczenie na ocenę

Kod przedmiotu	5.W.1	Przedmiot powiązany z badaniami naukowymi/ prakt. przygot. zawodowym (T/N)	0

Oczekiwania wstępne w zakresie przedmiotu	Wiedza	1	
		2	
	Umiejętności	1	
		2	
	Kompetencje społeczne	1	
		2	

Cele przedmiotu: Development of the four basic language skills (speaking, reading, writing, and listening) as well as communicative skills and competencies at level A of the Common European Framework of Reference for Languages (CEFR).

Treści programowe zapewniające uzyskanie efektów uczenia się dla przedmiotu: The course provides the student with universal linguistic knowledge: vocabulary, phrases, and structures as well as intercultural knowledge necessary for establishing and maintaining communication with target language users according to level A of the Common European Framework of Reference for Languages (CEFR). The student develops the four basic language skills - listening, speaking, reading, and writing, and learns the basic grammar (declensions, conjugations, basic parts of speech, present, past, and future tenses) required at level A according to the CEFR, and acquires the skills of searching, using and selecting information from various sources - including the use of online dictionaries and translators as well as language learning applications.

Efekty uczenia się dla przedmiotu - po zakończonym cyklu studiów			Odniesienie do kierunkowych efektów uczenia się	Formy realizacji (W, C, L, P, S)	Formy weryfikacji efektów uczenia się
Wiedza	1	A student knows and understands foreign language theory and terminology enough to use a foreign language at the B2 level of the Common European Framework of Reference for Languages	ME_K1_W15	L	C E F P
	2				
Umiejętności	1	A student has self-study skills	ME_K1_U02	L	C E F P
	2	A student is able to use a foreign language at the B2 level of the Common European Framework of Reference for Languages.	ME_K1_U03	L	C E F P
Kompetencje społeczne	1	A student is aware of the need to improve their knowledge throughout life and is able to select the appropriate learning methods for themselves and others	ME_K1_K01	L	P
	2	A student understands the importance of teamwork and is able to take responsibility for the results of joint activities	ME_K1_K04	L	P

Formy weryfikacji efektów uczenia się:
A-egzamin pisemny, B-egzamin ustny, C-zaliczenie pisemne, D-zaliczenie ustne, E-na podstawie ocen cząstkowych z odpowiedzi ustnych, F-na podstawie ocen cząstkowych z odpowiedzi pisemnych, G-praca kontrolna, H-ocena ze sprawozdań, I-ocena z przebiegu ćwiczeń, J-ocena z przygotowania do ćwiczeń, K-ocena z przebiegu realizacji projektu, L-ocena pisemnej realizacji projektu, M-ocena z obrony projektu, N-ocena formy prezentacji, O-ocena treści prezentacji, P-obserwacja aktywności na zajęciach, R-obserwacja systematyczności.

Godziny w planie studiów		
Forma zajęć	Liczba godzin zajęć w semestrze	Opiekun (koordynator) przedmiotu (tytuł/stopień naukowy/ tytuł zawodowy, imię i nazwisko)
Wykład	0	dr Świerczewska Beata
Ćwiczenia	0	
Laboratorium	30	
Projekt	0	
Seminarium	0	

Nakład pracy studenta	
Rodzaje zajęć studenta*	Średnia liczba godzin* przeznaczonych na zrealizowane aktywności
Wykład	0
Ćwiczenia	0
Laboratorium	30
Projekt	0

Seminarium	0
Przygotowanie do zajęć	10
Przygotowanie sprawozdania/referatu/ projektu/prezentacji	0
Samodzielne studiowanie tematyki zajęć	10
Egzamin lub kolokwium zaliczeniowe	0
Dodatkowe godziny kontaktowe	0
Łączny nakład pracy studenta	50
Liczba godzin kontaktowych (z planu studiów)	30

* godzina (lekcyjna) oznacza 45 minut

dr Świerczewska Beata
Kierownik jednostki organizacyjnej/bezpośredni przełożony
(pieczęć/podpis)

dr inż. Wydrych Jacek
Dziekan Wydziału
(pieczęć/podpis)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fourth
Course Title	Foreign language
Nazwa przedmiotu	Język obcy

ECTS points	2	Subject type	W
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	4.W.2	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	The student has lexical and grammar knowledge at B2 level according to the Common European Framework of Reference for Languages (CEFR).
		2	
	Skills	1	The student can use the English language at B2 level according to the Common European Framework of Reference for Languages (CEFR).
		2	
	Social Competence	1	The student understands the need for self-study..
		2	The student can cooperate in a group accepting various roles.

Course Goals To acquire language skills in the field of science and disciplines relevant to studied faculty in accordance with requirements specified for C level of the Common European Framework of Reference for Languages (CEFR)

Programme content In the course students acquire technical vocabulary in the area of Mechanical Engineering as well as the language of work environment (conducting meetings, concluding contracts, negotiations and conversations with partners and clients, giving presentations, solving problems and conflicts, arguing, presenting offers, analyzing job offers, preparing job applications – curriculum vitae, cover letter) . As part of the module, the student acquires real-world knowledge, develops four basic language skills - listening, speaking, reading and writing, and extends the ability to seek, use and select tinformation from different sources .The course is focused on active implementing technical and academic vocabulary with the view of students' future business and scientific careers.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	The student understands foreign language theory and terminology well enough to use the foreign language at C level of the Common European Framework of Reference for Languages	ME_K1_W15	L	C E F P
	2				
Skills	1	The student has self-study skills.	ME_K1_U02	L	C E F P
	2	The student is able to use a foreign language at C level of the Common European Framework of Reference for Languages.	ME_K1_U03	L	C E F P
Social Competence	1	The student is aware of the need to improve their knowledge throughout life and is able to select the appropriate learning methods for themselves and others	ME_K1_K01	L	P
	2	The student understands the importance of teamwork and is able to take responsibility for the results of joint activities	ME_K1_K04	L	P

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	mgr Kowalczyk Bogusława
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	12
Preparation of a report/paper/ project/presentation	6
Independent study of the course topics	12
Examination or final colloquium	0
Additional contact hours	0
Total student workload	60
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr Świerczewska Beata
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Politechnika Opolska
Wydział Mechaniczny
Karta Opisu Przedmiotu

Kierunek studiów	Mechanical Engineering
Profil kształcenia	Ogólnoakademicki

Poziom studiów	Studia pierwszego stopnia
Specjalność	
Forma studiów	Studia stacjonarne
Semestr studiów	Szósty

Nazwa przedmiotu	Foreign language
Subject Title	Język obcy

Liczba punktów ECTS	2	Typ przedmiotu	W
Język wykładowy	polski	Tryb zaliczenia przedmiotu (E/Z)	Egzamin

Kod przedmiotu	6.W.1	Przedmiot powiązany z badaniami naukowymi/ prakt. przygot. zawodowym (T/N)	N

Oczekiwania wstępne w zakresie przedmiotu	Wiedza	1	
		2	
	Umiejętności	1	
		2	
	Kompetencje społeczne	1	
		2	

Cele przedmiotu: Development of the four basic language skills (speaking, reading, writing, and listening) as well as communicative skills and competencies at level A of the Common European Framework of Reference for Languages (CEFR).

Treści programowe zapewniające uzyskanie efektów uczenia się dla przedmiotu: The course provides the student with universal linguistic knowledge: vocabulary, phrases, and structures as well as intercultural knowledge necessary for establishing and maintaining communication with target language users according to level A of the Common European Framework of Reference for Languages (CEFR). The student develops the four basic language skills - listening, speaking, reading, and writing, and learns the basic grammar (declensions, conjugations, basic parts of speech, present, past, and future tenses) required at level A according to the CEFR, and acquires the skills of searching, using and selecting information from various sources - including the use of online dictionaries and translators as well as language learning applications.

Efekty uczenia się dla przedmiotu - po zakończonym cyklu studiów			Odniesienie do kierunkowych efektów uczenia się	Formy realizacji (W, C, L, P, S)	Formy weryfikacji efektów uczenia się
Wiedza	1	A student knows and understands foreign language theory and terminology enough to use a foreign language at the B2 level of the Common European Framework of Reference for Languages	ME_K1_W15	L	A B C E F O P
	2				
Umiejętności	1	A student has self-study skills	ME_K1_U02	L	A B C E F O P
	2	A student is able to use a foreign language at the B2 level of the Common European Framework of Reference for Languages.	ME_K1_U03	L	A B C E F O P
Kompetencje społeczne	1	A student is aware of the need to improve their knowledge throughout life and is able to select the appropriate learning methods for themselves and others	ME_K1_K01	L	P
	2	A student understands the importance of teamwork and is able to take responsibility for the results of joint activities	ME_K1_K04	L	P

Formy weryfikacji efektów uczenia się:
A-egzamin pisemny, B-egzamin ustny, C-zaliczenie pisemne, D-zaliczenie ustne, E-na podstawie ocen cząstkowych z odpowiedzi ustnych, F-na podstawie ocen cząstkowych z odpowiedzi pisemnych, G-praca kontrolna, H-ocena ze sprawozdań, I-ocena z przebiegu ćwiczeń, J-ocena z przygotowania do ćwiczeń, K-ocena z przebiegu realizacji projektu, L-ocena pisemnej realizacji projektu, M-ocena z obrony projektu, N-ocena formy prezentacji, O-ocena treści prezentacji, P-obserwacja aktywności na zajęciach, R-obserwacja systematyczności.

Godziny w planie studiów		
Forma zajęć	Liczba godzin zajęć w semestrze	Opiekun (koordynator) przedmiotu (tytuł/stopień naukowy/ tytuł zawodowy, imię i nazwisko)
Wykład	0	dr Świerczewska Beata
Ćwiczenia	0	
Laboratorium	30	
Projekt	0	
Seminarium	0	

Nakład pracy studenta	
Rodzaje zajęć studenta*	Średnia liczba godzin* przeznaczonych na zrealizowane aktywności
Wykład	0
Ćwiczenia	0
Laboratorium	30
Projekt	0

Seminarium	0
Przygotowanie do zajęć	8
Przygotowanie sprawozdania/referatu/ projektu/prezentacji	2
Samodzielne studiowanie tematyki zajęć	8
Egzamin lub kolokwium zaliczeniowe	2
Dodatkowe godziny kontaktowe	0
Łączny nakład pracy studenta	50
Liczba godzin kontaktowych (z planu studiów)	30

* godzina (lekcyjna) oznacza 45 minut

dr Świerczewska Beata
Kierownik jednostki organizacyjnej/bezpośredni przełożony
(pieczęć/podpis)

dr inż. Wydrych Jacek
Dziekan Wydziału
(pieczęć/podpis)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fifth

Course Title	Foreign language
Nazwa przedmiotu	Język obcy

ECTS points	2	Subject type	W
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	5.W.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	The student has lexical and grammar knowledge at B2 level according to the the Common European Framework of Reference for Languages (CEFR)
		2	
	Skills	1	The student can use the English language at B2 level according to the Common European Framework of Reference for Languages (CEFR)
		2	
	Social Competence	1	The student understands the need for self-study.
		2	The student can collaborate with a group accepting various roles.

Course Goals To acquire language skills in the field of science and disciplines relevant to studied faculty in accordance with requirements specified for C level of the Common European Framework of Reference for Languages (CEFR)

Programme content In the course students acquire technical vocabulary in the area of Mechanical Engineering as well as the language of work environment (conducting meetings, concluding contracts, negotiations and conversations with partners and clients, giving presentations, solving problems and conflicts, arguing, presenting offers, analyzing job offers, preparing job applications – curriculum vitae, cover letter) . As part of the module, the student acquires real-world knowledge, develops four basic language skills - listening, speaking, reading and writing, and extends the ability to seek, use and select tinformation from different sources .The course is focused on active implementing technical and academic vocabulary with the view of students' future business and scientific careers.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	The student understands foreign language theory and terminology well enough to use the foreign language at C level of the Common European Framework of Reference for Languages	ME_K1_W15	L	C E F P
	2				
Skills	1	.The student has self-study skills	ME_K1_U02	L	C E F P
	2	The student is able to use a foreign language at C level of the Common European Framework of Reference for Languages.	ME_K1_U03	L	C E F P
Social Competence	1	A student is aware of the need to improve their knowledge throughout life and is able to select the appropriate learning methods for themselves and others The student is aware of the need to improve their knowledge throughout life and is able to select the appropriate learning methods for themselves and others	ME_K1_K01	L	P
	2	The student understands the importance of teamwork and is able to take responsibility for the results of joint activities	ME_K1_K04	L	P

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	mgr Kowalczyk Bogusława
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0

Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	12
Preparation of a report/paper/ project/presentation	6
Independent study of the course topics	12
Examination or final colloquium	0
Additional contact hours	0
Total student workload	60
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr Świerczewska Beata
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Sixth

Course Title	Foreign language
Nazwa przedmiotu	Język obcy

ECTS points	2	Subject type	W
Language of lecture	angielski	Mode of completing the course	Examination

Course code	6.W.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	The student has lexical and grammar knowledge at B2 level according to European Language Level scale (CEFR) of foreign languages.
		2	
	Skills	1	The student can use a foreign language in a communicative manner at B2 level according to European Language Level scale (CEFR)Językowego.
		2	
	Social Competence	1	The studend understands the need for self-study.
		2	The student can cooperate in a group accepting various roles.

Course Goals To acquire language skills in the field of science and disciplines relevant to studied faculty in accordance with requirements specified for C level of European Language Level scale (CEFR)Europejskiego Systemu Opisu Kształcenia Językowego.

Programme content In the course students acquire technical vocabulary in the area of Mechanical Engineering as well as the language of work environment (conducting meetings, concluding contracts, negotiations and conversations with partners and clients, giving presentations, solving problems and conflicts, arguing, presenting offers, analyzing job offers, preparing job applications – curriculum vitae, cover letter) . As part of the module, the student acquires real-world knowledge, develops four basic language skills - listening, speaking, reading and writing, and extends the ability to seek, use and select tinformation from different sources .The course is focused on active implementing technical and academic vocabulary with the view of students' future business and scientific careers.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	The student understands foreign language theory and terminology well enough to use the foreign language at C level of the Common European Framework of Reference for Languages	ME_K1_W15	L	A B C E F P
	2				
Skills	1	The student has self-study skills	ME_K1_U02	L	A B C E F P
	2	A student is able to use a foreign language at C level of the Common European Framework of Reference for Languages.	ME_K1_U03	L	A B C E F P
Social Competence	1	The student is aware of the need to improve their knowledge throughout life and is able to select the appropriate learning methods for themselves and others	ME_K1_K01	L	P
	2	The student understands the importance of teamwork and is able to take responsibility for the results of joint activities	ME_K1_K04	L	P

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	mgr Kowalczyk Bogusława
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	10
Preparation of a report/paper/ project/presentation	6
Independent study of the course topics	12
Examination or final colloquium	2
Additional contact hours	0
Total student workload	60
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr Świerczewska Beata
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic

Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	First

Course Title	Fundamentals of electrical engineering
Nazwa przedmiotu	Podstawy elektrotechniki

ECTS points	3	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	1.K.6	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	The student knows the fundamental laws of physics electricity and magnetism.
		2	
	Skills	1	The student can solve systems of linear equations.
		2	
	Social Competence	1	Able to work and cooperate in a group
		2	

Course Goals To familiarize the student with the structure, principles of operation, and proper operation of electrical devices. Familiarization with the basic laws of physics related to electricity and methods of measuring selected electrical quantities.

Programme content As part of the course, students learn the basic laws of electrical engineering and how to use them to select electrical components. Methods of calculating the flow of currents and voltages in electrical circuits will be discussed. They learn the structure, materials, and principles of operation of selected electrical devices.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Knows the basics of electrical engineering	ME_K1_W06	W L	C H P
	2	Knows development trends in the field of electrical systems and devices	ME_K1_W06	W L	C H
	3	Knows the use of basic laws of physics and electrical engineering in the construction of machines and devices	ME_K1_W02	W L	C H P R
Skills	1	Can identify and formulate specifications for simple engineering tasks in the field of electrical engineering	ME_K1_U05	L	H P
	2	Can assess the usefulness of routine methods and tools used to solve a simple task engineering for electrical issues	ME_K1_U01	L	H P
Social Competence	1	Understands the need for lifelong learning; can inspire and organize the learning process of other people	ME_K1_K01	W L	C H
	2	Able to cooperate and work in a group, taking on various roles	ME_K1_K04	L	H P

Methods of verification of learning outcomes:
A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr inż. Graba Mariusz
Calculation class (C)	0	
Laboratory class (L)	15	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	15

Project (P)	0
Seminar (S)	0
Preparation for classes	15
Preparation of a report/paper/ project/presentation	20
Independent study of the course topics	15
Examination or final colloquium	0
Additional contact hours	0
Total student workload	80
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr hab. inż. Augustynowicz Andrzej
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fourth
Course Title	Fundamentals of machine design
Nazwa przedmiotu	Podstawy konstrukcji maszyn

ECTS points	3	Subject type	K
Language of lecture	angielski	Mode of completing the course	Examination

Course code	4.K.3	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	The student must have basic knowledge of strength calculations of simple mechanical systems.
		2	The student must have basic knowledge of developing drawing documentation.
	Skills	1	The student must be able to identify burdens.
		2	
	Social Competence	1	Understands the need for lifelong learning.
		2	

Course Goals The aim of the course is to familiarize students with basic knowledge of the design of machines and mechanical devices.

Programme content Knowledge on the design of mechanical connections and the selection of construction elements

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has specialist knowledge in the field of designing basic elements of machine construction	ME_K1_W05	W	A B
	2				
Skills	1				
	2				
Social Competence	1	S/he is aware of responsibility for the elements he designs	ME_K1_K03	W	A B
	2	S/he correctly resolves dilemmas related to the profession	ME_K1_K07	W	A B

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan

The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	45	dr hab. inż. Kluger Krzysztof
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload

Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	45
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	8
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	20
Examination or final colloquium	2
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fifth

Course Title	Fundamentals of machine design in practice
Nazwa przedmiotu	Podstawy konstrukcji maszyn w praktyce

ECTS points	2	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	5.K.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	Knowledge of transferring loads of basic types of connections and their principles of operation
		2	
	Skills	1	Ability to use source materials, such as standards and catalogs, to search for necessary information in the design process
		2	Is able to describe the basic parameters of phenomena occurring during the operation of machine elements
	Social Competence	1	Ability to work in a group
		2	

Course Goals The aim of the course is to familiarize the student with the practical design process using laboratory experiments

Programme content Conducting experiments on the operation of machine elements and structures and designing machine elements and systems using knowledge from experimental research

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has knowledge of methods of strength calculation of machine elements and connections	ME_K1_W05	L	E F H I J
	2	S/he knows how to test inseparable and detachable connections	ME_K1_W08	L	E F H I J
Skills	1	S/he his able to determine the basic mechanical parameters of machines	ME_K1_U05	L	E F H I J
	2	S/he is able to describe the basic parameters of phenomena occurring during the operation of machines	ME_K1_U05	L	E F H I J
Social Competence	1	The student is able to cooperate and work in a group when carrying out laboratory exercises and preparing reports, taking on various roles in the group.	ME_K1_K04	L	E F H I J
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname

Lecture (W)	0	dr hab. inż. Kluger Krzysztof
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	5
Preparation of a report/paper/ project/presentation	10
Independent study of the course topics	5
Examination or final colloquium	0
Additional contact hours	0
Total student workload	50
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering		
Profile of Education	General Academic		
Level of study	First Cycle Studies		
Specialization			
Form of Study	Full-Time Studies		
Semester	First		
Course Title	Fundamentals of materials science		
Nazwa przedmiotu	Podstawy nauki o materiałach		
ECTS points	3	Subject type	K

Language of lecture	angielski	Mode of completing the course	Course credit

Course code	1.K.5	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course			
	Knowledge	1	Basic knowledge of physics and chemistry.
		2	
	Skills	1	Can obtain information from literature.
		2	
	Social Competence	1	Understands the need to learn.
		2	

Course Goals To acquaint students with materials engineering technologies, types of wear and mechanisms of metal destruction,

Programme content Developing concepts, learning regularities and systematizing knowledge in the field of materials science.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he knows the methods of regulating the properties of metals using methods of materials engineering as well as the mechanisms of material wear and methods of preventing wear	ME_K1_W10	W	A
	2				
Skills	1	S/hecan use various sources of information about the consumption of materials and material engineering technologies	ME_K1_U01	W	A
	2				
Social Competence	1	S/he understands the necessity of constant education	ME_K1_K01	W	A
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname

Lecture (W)	30	dr hab. inż. Małecka Joanna
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	20
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	23
Examination or final colloquium	2
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr hab. inż. Małecka Joanna
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dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Second
Course Title	General science of mechanics
Nazwa przedmiotu	Maszynoznawstwo ogólne

ECTS points	3	Subject type	K

Language of lecture	angielski	Mode of completing the course	Course credit
Course code	2.K.3	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	He/She has knowledge of high school in mathematics.
		2	He/She has knowledge of high school in physics and chemistry.
	Skills	1	He/She can read and listen with understanding.
		2	He/She can acquire knowledge from literature and other sources.
		3	He/She can present and analyze the known issues.
	Social Competence	1	He/She understands the need to learn and accumulate knowledge and skills.
		2	He/She understands the importance of the importance of the technical world in human life.
		3	He/She understands the importance and responsibility of the role of an engineer in contemporary society.

Course Goals An introduction to the issues related to the construction and operation of machines, their role in energy conversion and the application of the concept of simple machines functioning in modern structures.

Programme content Lecture in the auditorium with the use of audio-video means and the blackboard. Introduction to the subject of machine science, general machine science, specialized topics, thematic scope, evolution of machines, evolution of manufacturing processes, machine, device, apparatus, equipment, accessories, tool, energy, types of energy, methods of energy conversion, sources of electricity generation in the Polish economy, standardization, simple machines, gears as simple machines - introduction to mechanical drives, press as a simple machine - introduction to hydrostatic hydraulic drives, elements of rotational motion in machine construction, elements that determine the position of moving parts in machine construction, summary and presentation of knowledge by students in the form written.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	He/She knows the attitudes of machine building.	ME_K1_W01	W	C
	2	He/She understands the essence of the operation of machines in the process of energy conversion.	ME_K1_W02	W	C
Skills	1	He/She can gather and work out knowledge from the literature on the subject	ME_K1_U01	W	C
	2	He/She has the ability to self-educate	ME_K1_U05	W	C
Social Competence	1	He/She is aware of completing knowledge throughout life.	ME_K1_K01	W	C
	2	He/She understands the impact of engineering activities on the human environment.	ME_K1_K02	W	C

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr inż. Rosiak Mariusz
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	18
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	25

Examination or final colloquium	2
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr hab. inż. Małecka Joanna
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	First

Course Title	Humanistic and social subject I
Nazwa przedmiotu	Przedmiot humanistyczno-społeczny I

ECTS points	2	Subject type	W-HS
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	1.HSW.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	No requirements.
		2	
	Skills	1	Ability to analyze the topics discussed
		2	
	Social Competence	1	Openness to expanding and deepening your knowledge and skills
		2	

Course Goals The aim of the course is for the student to acquire knowledge of selected humanities or social issues.

Programme content The subject covers selected humanities or social issues A humanities or social sciences subject selected from the faculty or university database.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has knowledge of selected humanities or social issues	ME_K1_W12	W	C D
	2	S/he knows the business operation	ME_K1_W13	W	C D
Skills	1				
	2				
Social Competence	1	S/he becomes a person competent to communicate to his social environment the existence of new, revolutionary changes in the understanding of the universe and the position of man in universe.	ME_K1_K02	W	C D
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr inż. Owsiński Robert
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	5
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	15

Examination or final colloquium	0
Additional contact hours	0
Total student workload	50
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Second

Course Title	Humanistic and social subject II
Nazwa przedmiotu	Przedmiot humanistyczno-społeczny II

ECTS points	3	Subject type	W-HS
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	2.HSW.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	No requirements
		2	
	Skills	1	S/he has ability to analyze the topics discussed
		2	
	Social Competence	1	Openness to expanding and deepening your knowledge and skills
		2	

Course Goals The aim of the course is for the student to acquire knowledge of selected humanities or social issues

Programme content The subject covers selected humanities or social issues A humanities or social sciences subject selected from the faculty or university database.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has knowledge of selected humanities or social issues	ME_K1_W12	W	C D
	2				
Skills	1				
	2				
Social Competence	1	S/he becomes a person competent to communicate to his social environment the existence of new, revolutionary changes in the understanding of the universe and the position of man in universe.	ME_K1_K02	W	C D
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr inż. Owsiński Robert
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	5
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	40
Examination or final colloquium	0

Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
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Dean of Faculty
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Sixth

Course Title	Individual report - simulation work
Nazwa przedmiotu	Praca przejściowa symulacyjna

ECTS points	3	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	6.K.5	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	Statics, kinematics, dynamics of fluid.
		2	Problems of heat transfer.
		3	Mechanical and strength issues of equipment parts.
	Skills	1	Practical use of flow and thermodynamic issues.
		2	Practical use of strength issues.
	Social Competence	1	Awareness of the importance of engineering activities.
		2	

Course Goals To familiarize students with the possibilities of creating computer simulations describing thermal and flow issues, taking into account the strength issues of machine elements.

Programme content Program content related to creating computer simulations describing thermal and flow issues. These issues are complemented by mechanical and strength issues of machine elements and flow equipment.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has knowledge in the field of material strength supplemented with thermal-flow issues occurring in complex flow systems.	ME_K1_W05	P	K L P R
	2				
Skills	1	S/he has ability to create computer models of strength issues supplemented with thermal and flow issues.	ME_K1_U05	P	K L P R
	2				
Social Competence	1	S/he is aware of the need to constantly improve competences.	ME_K1_K01	P	K L P R
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr inż. Wydrych Jacek
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	45	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	45
Seminar (S)	0
Preparation for classes	5
Preparation of a report/paper/ project/presentation	20
Independent study of the course topics	5

Examination or final colloquium	0
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

dr hab. inż. Kłosok-Bazan Iwona
Head of the organizational unit
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dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	First

Course Title	Information technology in engineering
Nazwa przedmiotu	Technologie informacyjne w inżynierii

ECTS points	4	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	1.K.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	Basic computer skills
		2	Familiarity with text editing software
		3	Understanding of graphic editing software
	Skills	1	Teamwork and communication skills
		2	Attention to detail
		3	Analytical thinking
	Social Competence	1	not required
		2	

Course Goals	Preparing students for using information technology

Programme content Introduction to IT Fundamentals: Understanding the basic concepts and principles of Information Technology, including hardware, software, networks, and cybersecurity. Computer Systems and Software Applications: Learning about computer systems architecture, operating systems, and common software applications used in various fields. Data Management and Analysis: Exploring techniques for data organization, storage, retrieval, and analysis using databases and spreadsheet software.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	He/she is familiar with the principles of operation of control systems in mechanical devices and possesses knowledge of basic installations in machine construction.	ME_K1_W16	W L	C E G
	2				
Skills	1	He/she is able to use information and communication techniques appropriate for tasks related to the design, manufacturing, and operation of machines.	ME_K1_U04	L	C E G
	2				
Social Competence	1	He/she is aware of the need for lifelong learning and can choose appropriate learning methods for oneself and others.	ME_K1_K01	W L	C E G
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr inż. Pochwała Sławomir
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0

Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	9
Preparation of a report/paper/ project/presentation	20
Independent study of the course topics	10
Examination or final colloquium	1
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

dr hab. inż. Kłosok-Bazan Iwona
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fourth

Course Title	Machinery damage
Nazwa przedmiotu	Uszkodzenia maszyn

ECTS points	2	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	4.K.8	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	Has expertise in basics of Strength of Materials.
		2	
	Skills	1	Has practical skills in making use of computer methods and programs.
		2	
	Social Competence	1	Knows how to comprehensively analyze and efficiently fulfill the given tasks.
		2	

Course Goals Introduction to evaluation and analysis of failures.

Programme content Analysis on the effects of acting load and verification of damage degree on the basis of operational parameters. Teaching methods: laboratory classes, classes conducted with the use of distance learning methods and techniques.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Has basic knowledge concerning selected issues in the field of operation and durability of machines.	ME_K1_W08	L	I
	2				
Skills	1	Has the ability to critically evaluate the functioning of machine elements.	ME_K1_U08	L	H I
	2				
Social Competence	1	Is able to practically apply the obtained knowledge in order to find the appropriate way of reaching the goal.	ME_K1_K01	L	H I
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan

The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr inż. Blacha Łukasz
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload

Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	15
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	5
Examination or final colloquium	0
Additional contact hours	0
Total student workload	50
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
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dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Second

Course Title	Material Engineering
Nazwa przedmiotu	Inżynieria materiałowa

ECTS points	3	Subject type	K
Language of lecture	angielski	Mode of completing the course	Examination

Course code	2.K.6	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	S/he has basic knowledge of physics and chemistry.
		2	
	Skills	1	S/he can obtain information from literature.
		2	
	Social Competence	1	Understands the need to learn.
		2	

Course Goals To acquaint students with materials engineering technologies, types of wear and mechanisms of metal destruction

Programme content Basic knowledge of understood materials engineering. Construction of materials, methods of shaping and testing their properties.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he knows the methods of regulating the properties of metals using methods of materials engineering as well as the mechanisms of material wear and methods of preventing wear	ME_K1_W10	W L	A C
	2				
Skills	1	S/he can use various sources of information about the consumption of materials and material engineering technologies	ME_K1_U01	W L	A C
	2				
Social Competence	1	S/he understands the necessity of constant education	ME_K1_K01	W L	C
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan

The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr hab. inż. Małecka Joanna
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload

Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	10
Preparation of a report/paper/ project/presentation	10
Independent study of the course topics	8
Examination or final colloquium	2
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

dr hab. inż. Małecka Joanna
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	First

Course Title	Mathematics I
Nazwa przedmiotu	Matematyka I

ECTS points	4	Subject type	P
Language of lecture	angielski	Mode of completing the course	Examination

Course code	1.P.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	Students have knowledge of mathematics at the secondary school level.
		2	
	Skills	1	Students are able to apply basic mathematical tools and techniques.
		2	Students are prepared to acquire knowledge on their own.
	Social Competence	1	Students have ability to use modern tools (calculators, computers, multimedia) and information sources (textbooks, encyclopedias, online resources).
		2	

Course Goals The aim of the course is to familiarize students with the basic concepts of algebra, analytical geometry and mathematical analysis, necessary for further studies.

Programme content Complex numbers, matrix calculus, determinants, systems of linear equations, vector calculus in R3, fundamental one variable functions, with particular emphasis on trigonometric functions, differential calculus of one, two and three variables functions and its applications will be discussed during the classes.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Students are familiar with the concept of a complex numbers.	ME_K1_W01	C	A
	2	Students know the concepts of matrix calculus and basic methods for solving systems of linear equations.	ME_K1_W01	C	A
	3	Students know the operations performed on vectors in R3.	ME_K1_W01	C	A
	4	Students know graphs and properties of elementary functions, the concept of derivative and differential of one variable functions.	ME_K1_W01	C	A
	5	Students know the concepts of partial derivative and total differential.	ME_K1_W01	C	A
Skills	1	Students are able to perform operations on complex numbers.	ME_K1_U05	C	C E P
	2	Students are able to perform operations on matrices, calculate determinants and solve systems of linear equations.	ME_K1_U05	C	C E P
	3	Students can perform operations on vectors and use them to solve geometric problems.	ME_K1_U05	C	C E P
	4	Students can calculate derivatives of functions of one variable and use them to solve geometric, optimization and approximate calculation problems.	ME_K1_U05	C	C E P
	5	Students are able to calculate first- and second-order partial derivatives and use them to solve optimization problems.	ME_K1_U05	C	C E P
Social Competence	1	Students know the limits of their own knowledge and are aware of the need for systematic work and further education.	ME_K1_K01	C	P R
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname

Lecture (W)	0	dr inż. Ścięgosz Hanna
Calculation class (C)	60	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	60
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	30
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	8
Examination or final colloquium	2
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering		
Profile of Education	General Academic		
Level of study	First Cycle Studies		
Specialization			
Form of Study	Full-Time Studies		
Semester	Second		
Course Title	Mathematics II		
Nazwa przedmiotu	Matematyka II		
ECTS points	3	Subject type	P

Language of lecture	angielski	Mode of completing the course	Examination
Course code	2.P.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	Students know the basic concepts of complex numbers.
		2	Students know matrix and vector calculus, hasve knowledge on systems of linear equations.
		3	Students know fundamental functions and their properties.
		4	Students know the differential calculus of one and multivariables functions.
	Skills	1	The ability to abstractional and logical thinking.
		2	The ability to perform basic algebraic calculations.
		3	The ablility to use differential calculus of one and multivariable functions.
	Social Competence	1	The ability to co-work in a group.
		2	Understanding of need for self-education.
		3	Student's responsibility for his own work.

Course Goals Introduction of mathematical foundations necessary to study technical subjects.

Programme content Indefinite integrals and methods of their calculation, definite integrals and their application to solving geometric problems, and improper integrals will be discussed during the classes.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Students have knowledge on indefinite integrals of one variable functions.	ME_K1_W01	C	A
	2	Students have knowledge on definite integrals of one variable functions.	ME_K1_W01	C	A
	3	Students know application of definite integrals.	ME_K1_W01	C	A
Skills	1	Students are able to calculate indefinite integrals of one variable functions.	ME_K1_U05	C	C E F P
	2	Students are able to calculate definite integrals and improper integrals of one variable functions.	ME_K1_U05	C	C E F P
	3	Students are able to apply definite integrals to solve geometric problems.	ME_K1_U05	C	C E F P
Social Competence	1	Students understand to an even greater extent the need for continuous education, especially in the field of modern mathematics methods used in technology.	ME_K1_K01	C	A
	2				

Methods of verification of learning outcomes:
A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr inż. Ścięgosz Hanna
Calculation class (C)	30	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	30
Laboratory class (L)	0
Project (P)	0

Seminar (S)	0
Preparation for classes	35
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	8
Examination or final colloquium	2
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	First
Course Title	Mechanical Engineering Introduction
Nazwa przedmiotu	Wprowadzenie do inżynierii mechanicznej

ECTS points	3	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	1.K.3	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	He/She has basic knowledge of mathematics
		2	
	Skills	1	He/She is able to analyze the presented issues.
		2	
	Social Competence	1	He/She understands the need to learn and accumulate knowledge.
		2	

Course Goals Familiarize students with tools and techniques used in various branches of mechanical engineering.

Programme content The content provided deals with fundamental issues in mechanical engineering. The program includes basic information related to methods, tools, and techniques to support design and manufacturing used by engineers.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	He/She knows mathematics, including the knowledge necessary to model and simulate the kinematics of mechanical systems	ME_K1_W01	W L	C H P R
	2	He/She knows the principles of control systems in mechanical equipment and knows the operation of mechanical systems.	ME_K1_W16	W L	C H P
Skills	1	He/She can obtain information from the literature, use the information received, interpret it, and draw conclusions.	ME_K1_U01	W L	C H P
	2	He/She can use analytical and simulation methods to formulate and solve engineering tasks.	ME_K1_U05	L	H
	3	According to a given specification, one can design a simple virtual device or process, typical of the design and operation process of machinery, using appropriate methods and tools.	ME_K1_U09	L	H P R
Social Competence	1	He/She knows the need to supplement knowledge throughout life and can select appropriate methods of acquiring knowledge.	ME_K1_K01	W L	C P R
	2	He/She demonstrates entrepreneurship and ingenuity in action related to solving problematic professional issues.	ME_K1_K06	W L	C H P R

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname

Lecture (W)	15	dr inż. Owsiński Robert
Calculation class (C)	0	
Laboratory class (L)	15	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	15
Project (P)	0
Seminar (S)	0
Preparation for classes	15
Preparation of a report/paper/ project/presentation	5
Independent study of the course topics	25
Examination or final colloquium	0
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	First
Course Title	Mechanics I
Nazwa przedmiotu	Mechanika ogólna I

ECTS points	3	Subject type	P

Language of lecture	angielski	Mode of completing the course	Examination

Course code	1.P.2	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course			
	Knowledge	1	A student knows the fundamentals of mathematics and vector analysis
		2	Fundamentals of Physics
	Skills	1	A student can apply knowledge of mathematics
		2	
	Social Competence	1	A student recognizes the need for, and an ability to engage in life-long learning
		2	A student is able to think independently.

Course Goals The subject aims to apply the principles of mechanics to practical engineering problems.

Programme content Problems of statics

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	The student is able to define basic concepts in mechanics. Knows the static equilibrium equations and can apply them.	ME_K1_W01	W C	A C
	2				
Skills	1	The student is able to solve typical engineering structures under static loads.	ME_K1_U05	W C	A C
	2				
Social Competence	1	The student is able to independently search for information and analyze it critically.	ME_K1_K01	W C	P
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname

Lecture (W)	15	dr inż. Marciniak Zbigniew
Calculation class (C)	15	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	15
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	15
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	26
Examination or final colloquium	4
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Second
Course Title	Mechanics II
Nazwa przedmiotu	Mechanika ogólna II

ECTS points	4	Subject type	P

Language of lecture	angielski	Mode of completing the course	Examination

Course code	2.P.2	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	A student knows math.
		2	A student knows statics.
	Skills	1	A student is able to apply knowledge of mathematics including multivariable calculus.
		2	A student is able to apply knowledge of differential equations
	Social Competence	1	A student understands the need to learn throughout life.
		2	A student is able to think independently.

Course Goals Knowledge of analytical methods in the application of the principles of kinematics and classical dynamics for typical mechanical systems. Solving technical problems of structures and mechanical systems under dynamic loads.

Programme content Problems of kinematics and dynamics

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	A student is able to define basic concepts in the dynamics of mechanical systems	ME_K1_W01	W C	A C
	2	A student knows the concepts of kinematics and dynamics	ME_K1_W02	W C	A C
	3	A student Knows the principles of dynamics. Knows the equations of motion dynamics	ME_K1_W02	W C	A C
Skills	1	A student is able to calculate velocities and accelerations. Is able to create equations of motion	ME_K1_U05	W C	A C
	2	A student is able to apply the principle of conservation of energy to calculate dynamic quantities	ME_K1_U01	W C	A C
Social Competence	1	A student is able to search for information and is able to critically analyze it	ME_K1_K01	W C	P
	2	A student is able to obey the customs and rules of society	ME_K1_K05	W C	P

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr inż. Marciniak Zbigniew
Calculation class (C)	30	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	30
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	20
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	16
Examination or final colloquium	4
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fourth

Course Title	Physical education		
Nazwa przedmiotu	Wychowanie fizyczne		
ECTS points	0	Subject type	W
Language of lecture	angielski	Mode of completing the course	Credit unrated
Course code	4.W.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	Student has knowledge of individual and team sports.
		2	Student has knowledge about recreational forms of physical activity.
	Skills	1	Student can perform basic elements of the technique of a selected sport.
		2	
	Social Competence	1	Student is capable to co-work in an exercising group
		2	

Course Goals Taking care of health, consolidating active attitudes towards physical culture as well as educating and improving physical skills in the field of a selected sport discipline or various forms of physical recreation.

Programme content The curriculum content includes the concepts of physical activity and sport as well as selected issues in the field of methodology of teaching technical elements in selected team and individual disciplines. They also include the rules of participation in sports disciplines and recreational physical activity, as well as the basics of refereeing.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has the knowledge of professional ethics, necessary to make moral decisions, respecting human rights, taking into account the categories of justice in everyday life, sport and physical recreation.	ME_K1_W12	C	R
	2				
Skills	1	S/he has the ability to understand and analyze interpersonal relationships, including the causes and effects of conflict situations in the workplace, and is able to propose preventive actions.	ME_K1_U10	C	R
	2				
Social Competence	1	S/he understands the need for lifelong learning, broadening knowledge, and knows the possibilities of further education.	ME_K1_K01	C	R
	2	S/he is ready to interact and cooperate in a group, taking on different roles in it.	ME_K1_K04	C	R

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr inż. Tataruch Magdalena
Calculation class (C)	30	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	30
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0

Preparation for classes	0
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	0
Examination or final colloquium	0
Additional contact hours	0
Total student workload	30
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Third

Course Title	Physical education
Nazwa przedmiotu	Wychowanie fizyczne

ECTS points	0	Subject type	W
Language of lecture	angielski	Mode of completing the course	Credit unrated

Course code	3.W.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	Student has knowledge of individual and team sports.
		2	Student has knowledge about recreational forms of physical activity.
	Skills	1	Student can perform basic elements of the technique of a selected sport.
		2	
	Social Competence	1	Student is capable to co-work in an exercising group
		2	

Course Goals Taking care of health, consolidating active attitudes towards physical culture as well as educating and improving physical skills in the field of a selected sport discipline or various forms of physical recreation.

Programme content The curriculum content includes the concepts of physical activity and sport as well as selected issues in the field of methodology of teaching technical elements in selected team and individual disciplines. They also include the rules of participation in sports disciplines and recreational physical activity, as well as the basics of refereeing.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has the knowledge of professional ethics, necessary to make moral decisions, respecting human rights, taking into account the categories of justice in everyday life, sport and physical recreation.	ME_K1_W12	C	R
	2				
Skills	1	S/he has the ability to understand and analyze interpersonal relationships, including the causes and effects of conflict situations in the workplace, and is able to propose preventive actions.	ME_K1_U10	C	R
	2				
Social Competence	1	S/he understands the need for lifelong learning, broadening knowledge, and knows the possibilities of further education.	ME_K1_K01	C	R
	2	S/he is ready to interact and cooperate in a group, taking on different roles in it.	ME_K1_K04	C	R

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr inż. Tataruch Magdalena
Calculation class (C)	30	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload

Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	30
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	0
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	0
Examination or final colloquium	0
Additional contact hours	0
Total student workload	30
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr Woś Barbara
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Dean of Faculty
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fifth

Course Title	Professional practice
Nazwa przedmiotu	Praktyka zawodowa

ECTS points	6	Subject type	W-PR
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	5.W.2	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	
		2	
	Skills	1	
		2	
	Social Competence	1	
		2	

Course Goals The aim of this practice is to get acquainted with the way of functioning and the activity profile of the enterprise (institution) in the field of solving technical problems in the field of designing and manufacturing mechanical devices. The scope of practice includes familiarization with design and construction issues as well as operating conditions of machines and devices in connection with the problems of designing technological systems.

Programme content

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has knowledge of the construction and operation of machines and devices.	ME_K1_W07	P	H R
	2	S/he knows how devices and machines function.	ME_K1_W11	P	H R
Skills	1	S/he can take into account the economic aspect in the design of mechanical systems.	ME_K1_U07	P	H R
	2	S/he uses various communication techniques.	ME_K1_U10	P	H R
Social Competence	1	S/he strives for continuous development and improvement of qualifications.	ME_K1_K01	P	H R
	2	S/he is creative in engineering.	ME_K1_K06	P	H R

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan

The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr inż. Blacha Łukasz
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	160	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	160
Seminar (S)	0
Preparation for classes	0
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	0
Examination or final colloquium	0
Additional contact hours	0
Total student workload	160
Number of contact hours (from the study plan)	160

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
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dr inż. Wydrych Jacek
Dean of Faculty
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	First

Course Title	Protection of invention property
Nazwa przedmiotu	Ochrona własności intelektualnej

ECTS points	1	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	1.K.8	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	none
		2	
	Skills	1	Willingness and ability to study literature
		2	
	Social Competence	1	Communication skills, teamwork.
		2	

Course Goals Providing students with selected issues in the field of copyright and related rights and industrial property law. Moreover, the aim of the course is for students to acquire skills in the use of patent information and legal regulations regarding the protection of invention property.

Programme content The subject provides knowledge on issues related to the protection of intellectual property, both in the field of copyright and industrial property protection. The student acquires knowledge regarding selected elements of the law protecting intellectual property. Is able to use legal acts and information from the Patent Office regarding the registration of items covered by intellectual property protection.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Student knows and understands the concepts and principles of industrial property and copyright protection and is able to use patent information resources	ME_K1_W14	W	C P R
	2				
Skills	1				
	2				
Social Competence	1	Student is aware of the importance of professional conduct and compliance with the principles of professional ethics.	ME_K1_K05	W	C P R
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname

Lecture (W)	15	dr Kuczuk Anna
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	4
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	5
Examination or final colloquium	1
Additional contact hours	0
Total student workload	25
Number of contact hours (from the study plan)	15

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering		
Profile of Education	General Academic		
Level of study	First Cycle Studies		
Specialization			
Form of Study	Full-Time Studies		
Semester	Third		
Course Title	Removal processes I		
Nazwa przedmiotu	Obróbka ubytkowa I		
ECTS points	5	Subject type	K

Language of lecture	angielski	Mode of completing the course	Examination
Course code	3.K.4	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	He/She has knowledge of the basics of machine design.
		2	He/She has knowledge of the basics of metallurgy.
	Skills	1	He/She can analyze the functioning of machines and their components.
		2	He/She can obtain information from the literature.
	Social Competence	1	He/She is aware of the responsibility associated with the decisions made.
		2	He/She is able to analyze the tasks assigned for implementation.

Course Goals Familiarize students with the problems of wide-ranging cavity machining (chip machining - turning, drilling) and machining methods and methods, kinematics of machining processes, machining conditions, technological machines, tools and materials used in the manufacture of cutting tools, machining effects.

Programme content Lecture covering characteristics of technological machines, Structural assemblies and mechanisms of technological machines. Machines for machining (lathes, drills). Drives of conventional machines and with computer control (CNC). Laboratory exercises: construction of machine tools, operations performed on lathes.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	He/She has an expanded knowledge of the classification of technological machines, their construction, manufacture and purpose.	ME_K1_W07	W L	A H I J
	2	He/She has knowledge of the life cycle and proper operation of process machinery.	ME_K1_W11	W L	A H I J
	3	He/She has a structured knowledge of the manufacture and operation of machinery and mechanical equipment.	ME_K1_W08	W L	A H I J
Skills	1	He/She is able to use professional literature, and knows how to analyze, associate and interpret technical information thus acquired.	ME_K1_U01	W L	A H I J R
	2	He/She is able to evaluate the correct functioning of technological machines and determine the conditions for their safe operation.	ME_K1_U08	W L	A H I J R
	3	He/She is able to critically analyze how things work and evaluate existing technical solutions, equipment, facilities, systems, processes and services in the construction, manufacture and operation of machinery.	ME_K1_U08	W L	A H I J
Social Competence	1	He/She is aware that knowledge is constantly changing and that a lifetime of knowledge needs to be supplemented.	ME_K1_K01	W L	A H I J
	2	He/She is aware of the importance and consequences of his decisions, and how they affect the safety of the operator and the machine.	ME_K1_K03	W L	A H I J

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr inż. Chudy Roman
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload

Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	18
Preparation of a report/paper/ project/presentation	20
Independent study of the course topics	25
Examination or final colloquium	2
Additional contact hours	0
Total student workload	125
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fourth

Course Title	Removal processes II
Nazwa przedmiotu	Obróbka ubytkowa II

ECTS points	4	Subject type	K
Language of lecture	angielski	Mode of completing the course	Examination

Course code	4.K.6	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	S/he has knowledge of the basics of machine design
		2	S/he has knowledge of the basics of metallurgy
	Skills	1	S/he can analyze the functioning of machines and their components
		2	S/he is able to obtain information from the literature
	Social Competence	1	S/he is aware of the responsibility associated with the decisions taken
		2	S/he knows how to analyze the tasks assigned

Course Goals Familiarize students with the problems of wide-ranging cavity machining (chip machining - milling, grinding) and machining methods and methods, kinematics of machining processes, machining conditions, technological machines, tools and materials used in the manufacture of cutting tools, machining effects.

Programme content Lecture covering characteristics of technological machines, Structural assemblies and mechanisms of technological machines. Machines for machining (milling machines, grinders). Drives of conventional machines and with computer control (CNC). Laboratory exercises: construction of machine tools, operations performed on milling machines.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has knowledge of metrology in mechanical engineering	ME_K1_W09	W L	A H
	2	S/he has a structured knowledge of the manufacture and operation of machinery and mechanical equipment	ME_K1_W08	W L	A H
Skills	1	S/he is able to obtain information from literature, databases and other sources, is able to integrate obtained information, interpret it, and draw conclusions and formulate and justify opinions	ME_K1_U01	L	H
	2	S/he ie able to critically analyze how things work and evaluate existing technical solutions, equipment, facilities, systems, processes and services in the construction, manufacture and operation of machinery	ME_K1_U08	W L	A H
	3	S/he has the ability to self-educate	ME_K1_U02	W L	A H
Social Competence	1	S/he is aware of the need to supplement knowledge throughout life and is able to choose appropriate methods of teaching for himself and others	ME_K1_K01	W L	A H
	2	S/he is aware of the responsibility associated with decisions, made in the framework of engineering activities, especially in terms of safety of his own and other people and protection of the environment	ME_K1_K03	L	H
	3	S/he understands the social role of the engineer and participates in the communication of reliable information and opinions to the public on the achievements of technology and other aspects of technology	ME_K1_K07	W L	A H

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname

Lecture (W)	30	dr inż. Chudy Roman
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	13
Preparation of a report/paper/ project/presentation	5
Independent study of the course topics	20
Examination or final colloquium	2
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering		
Profile of Education	General Academic		
Level of study	First Cycle Studies		
Specialization			
Form of Study	Full-Time Studies		
Semester	Third		
Course Title	Selected chipless technologies		
Nazwa przedmiotu	Wybrane technologie bezwiórowe		
ECTS points	4	Subject type	K

Language of lecture	angielski	Mode of completing the course	Course credit
Course code	3.K.6	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	They have knowledge of metal structure as well as properties and applications of structural materials.
		2	
	Skills	1	The student is able to use tables, charts, and standards.
		2	
	Social Competence	1	The student is capable of analyzing tasks assigned for completion.
		2	

Course Goals Introducing students to methods of manufacturing structural components in processes such as casting, plastic deformation, heat treatment, and powder metallurgy.

Programme content The course includes an introduction to selected methods of chipless shaping of the structure and properties of structural materials. Participants will gain knowledge about the advantages and limitations of chipless technologies as well as practical applications of these methods in the industry. Laboratory classes involve testing the technological properties of molding materials, non-destructive testing techniques of structural elements manufactured using casting technology, analysis of the influence of mechanical and thermal interactions on the material structure, assessment of the internal structure of compacts before and after plastic deformation, and the possibility of shaping the surface layer structure in structural materials.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	They have knowledge of methods for manufacturing semi-finished products and finished products from metals and their alloys.	ME_K1_W10	W L	C P
	2				
Skills	1	They can use both Polish and foreign literature.	ME_K1_U01	W L	C P
	2				
Social Competence	1	Understands the need for continuous knowledge enhancement.	ME_K1_K01	W L	C
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr hab. Prażmowski Mariusz
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	25
Preparation of a report/paper/ project/presentation	15
Independent study of the course topics	25
Examination or final colloquium	0
Additional contact hours	0
Total student workload	110
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic

Level of study	First Cycle Studies			
Specialization				
Form of Study	Full-Time Studies			
Semester	Second			
Course Title	Selected measuring techniques and systems			
Nazwa przedmiotu	Wybrane techniki i systemy pomiarowe			
ECTS points	4	Subject type		K
Language of lecture	angielski	Mode of completing the course		Examination
Course code	2.K.7	Subject related to scientific research/pract. profess. prepar. (Y/N)		T
Preliminary requirements of the course	Knowledge	1	Mathematics, in algebra, mathematical analysis and probability.	
		2	Physics, in terms of optics.	
		3	Technical metrology - knowledge of the basic concepts and knowledge of general metrology.	
	Skills	1	The ability to solve mathematical and physical problems.	
		2	Self-education skills.	
	Social Competence	1	He is aware of the need to supplement knowledge throughout his life.	
		2	He is aware of the importance of professional conduct and adherence to professional ethics.	
Course Goals	Familiarize students with selected measurement techniques			
Programme content	Auditorium lecture on classification, properties and characteristics of measuring instruments, measuring chains. Practical activities in the laboratory: measurement with a micrometer, caliper, diameter gauge, measurements of angles and cones, measurements of surface roughness, threads, gears.			

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has knowledge of the metrology of geometric quantities, knows the principles of tolerance of dimensions, shape and position, and knows and understands the methods of measurement of basic characterizing quantities for mechanical engineering, knows the calculation methods necessary for the analysis of measurement results.	ME_K1_W09	W L	C
	2	S/he has knowledge of physics, including the fundamentals of mechanics, thermodynamics, optics, electricity and magnetism, nuclear physics, solid state physics and elements of quantum physics, needed to understand, describe and use physical phenomena in the design manufacture and operation of measuring instruments and systems.	ME_K1_W02	W	C
Skills	1	S/he can plan and carry out measurements and interpret the results obtained and draw conclusions.	ME_K1_U08	W L	C
	2	S/he can obtain information from literature, databases and other sources.	ME_K1_U01	W L	C
Social Competence	1	S/he is aware of the need to supplement knowledge throughout life.	ME_K1_K01	W	C
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr inż. Bogdan-Chudy Marta
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30

Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	8
Preparation of a report/paper/ project/presentation	10
Independent study of the course topics	20
Examination or final colloquium	2
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Second
Course Title	Software engineering and data processing
Nazwa przedmiotu	Inżynieria oprogramowania i przetwarzanie danych

ECTS points	3	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	2.K.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	Basic knowledge of the Windows environment and MS Office (or LibreOffice, OpenOffice etc.)
		2	
	Skills	1	Computer skills
		2	Use of Internet services
		3	Working with a spreadsheet
	Social Competence	1	No requirements
		2	

Course Goals Presentation of selected directions of development of modern informatics and the challenges ahead standing. Acquiring the ability to create simple programs and using a spreadsheet to perform scientific and technical calculations.

Programme content What is computer science? Main directions of development of computer science. Computer programming - paradigms, programming languages, tools. From problem to solution: problem - algorithm - program. Spreadsheet programming. Scientific computing environment such as MATLAB or other - e.g. SCILAB, OCTAVE.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Student knows the typical applications of computers in engineering practice.	ME_K1_W06	W	C P
	2	Student knows the basics of computer programming, useful in the preparation of technical documentation.	ME_K1_W04	W L	C P
	3	Student knows the applications of the software discussed in the course in engineering practice.	ME_K1_W01	W L	C P
Skills	1	Student is able to create simple computer programs.	ME_K1_U09	L	C H P
	2	Student knows how to make calculations using a spreadsheet, using the programming language built into the spreadsheet.	ME_K1_U04	L	C H P
	3	Student is able to choose the most effective tool to solve an engineering task.	ME_K1_U05	L	C H P
Social Competence	1	Student understands the need for further training and enhancing professional competence.	ME_K1_K01	W L	C P
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan

The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr inż. Spyra Andrzej
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	10
Preparation of a report/paper/ project/presentation	10
Independent study of the course topics	25
Examination or final colloquium	0
Additional contact hours	0
Total student workload	90
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Third
Course Title	Strength of materials

Nazwa przedmiotu	Wytrzymałość materiałów		
ECTS points	4	Subject type	K
Language of lecture	angielski	Mode of completing the course	Examination
Course code	3.K.2	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	Basic knowledge of mathematics and physics
		2	Basic knowledge of general mechanics
	Skills	1	Is able to determine reactions in a statically determinate beam
		2	Can solve a system of linear equations
		3	Can solve a quadratic equation
	Social Competence	1	Understands the need to learn
		2	Can think independently

Course Goals Preparing students to assess the strength of structural elements

Programme content Analysis of typical strength cases: tension - compression, shear, torsion, bending. Stress and strain state analysis, Mohr's circle. Strength hypotheses. Complex state of stress.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	The student knows methods of strength analysis of basic elements of mechanical systems.	ME_K1_W05	W	A B
	2	The student is able to discuss various strength cases	ME_K1_W05	W	A B
	3	The student is able to define the centers of gravity and moments of inertia of plane figures	ME_K1_W05	W	A B
Skills	1				
	2				
Social Competence	1	Is able to discuss the solution to an engineering problem	ME_K1_K01	W	A B
	2	Understands the need for lifelong learning	ME_K1_K01	W	A B

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	45	dr hab. inż. Kurek Marta
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	45
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	25
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	26
Examination or final colloquium	4
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

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dr inż. Wydrych Jacek
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fourth

Course Title	Strength of materials in practice			
Nazwa przedmiotu	Wytrzymałość materiałów w praktyce			
ECTS points	3	Subject type		K
Language of lecture	angielski	Mode of completing the course		Course credit
Course code	4.K.2	Subject related to scientific research/pract. profess. prepar. (Y/N)		T

Preliminary requirements of the course	Knowledge	1	The student knows methods of strength analysis of basic elements of mechanical systems.
		2	The student is able to discuss various strength cases
		3	The student is able to define the centers of gravity and moments of inertia of plane figures
	Skills	1	The student is able to perform strength calculations in various load states
		2	The student is able to select the dimensions of the element, the mechanical properties of the material or the permissible loads for each case of simple strength (tension, compression, shear, torsion, bending), taking into account safety conditions and the required stiffness.
		3	The student is able to draw Mohr's circle for various strength cases
	Social Competence	1	Understands the need to learn
		2	Can think independently

Course Goals Preparing students to assess the strength of structural elements

Programme content Testing the mechanical properties of metals: static tensile test, impact test, torsion test, shear test, compression test. Analysis of plastic deformation in bending test. Determination of stresses in the crane and strain gauge measurements.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Knowledge of planning and implementation experiments related to machine design	ME_K1_W05	L P	C F K P
	2				
Skills	1	The student is able to carry out experiments and laboratory tests	ME_K1_U05	L P	C F K P
	2	The student is able to measure and analyze the obtained results	ME_K1_U05	L P	C F K P
	3	The student is able to design a selected structural element	ME_K1_U09	L P	C F K P
Social Competence	1	The student is aware of the need for education and deepening knowledge	ME_K1_K01	L P	C F K P
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr hab. inż. Kurek Marta
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	15	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	15
Seminar (S)	0
Preparation for classes	10
Preparation of a report/paper/ project/presentation	10

Independent study of the course topics	15
Examination or final colloquium	2
Additional contact hours	0
Total student workload	82
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Third

Course Title	Technical drawing and CAD I
Nazwa przedmiotu	Zapis konstrukcji z wykorzystaniem CAD I

ECTS points	3	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	3.K.5	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	Knows modeling geometric objects and simple machine elements.
		2	S/he knows the rules and standards of technical drawing.
	Skills	1	S/he can interpret the markings contained in the technical drawing.
		2	S/he can operate computer engineering software
	Social Competence	1	S/he can cooperate in a group.
		2	S/he correctly formulates questions regarding the discussed issue
		3	S/he can logically solve a given problem

Course Goals Preparing students to use primary engineering applications for technical documentation. To familiarize students with work in engineering programs for creating documentation and creating 2D and 3D representations of machine and device elements

Programme content During the classes, students will familiarize themselves with the methodology of designing in a CAD environment. The classes will focus on creating single-body models and assemblies, their editing methods, and engineering tools and methods enabling the realization of spatial models of machine parts and their assemblies.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he knows the rules of recording the structure using CAD software.	ME_K1_W04	L	G I P R
	2				
Skills	1	S/he can recreate the technical documentation of the structure with the use of tools supporting computer CAD design.	ME_K1_U04	L	G I P R
	2				
Social Competence	1	The course includes content from selected humanities or social issues.	ME_K1_K06	L	G I P R
	2	S/he is aware of the importance of professional conduct	ME_K1_K07	L	G I P R

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr inż. Owsiński Robert
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	30

Project (P)	0
Seminar (S)	0
Preparation for classes	15
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	30
Examination or final colloquium	0
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fourth
Course Title	Technical drawing and CAD II
Nazwa przedmiotu	Zapis konstrukcji z wykorzystaniem CAD II

ECTS points	2	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	4.K.5	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	S/he has knowledge of modeling geometric objects and simple machine elements.
		2	S/he he knows the rules and standards of technical drawing.
	Skills	1	S/he can interpret the markings contained in the technical drawing.
		2	S/he can operate computer engineering software.
		3	S/he can identify typical machine components.
	Social Competence	1	S/he can cooperate in a group.
		2	S/he correctly formulates questions regarding the discussed issue.
		3	S/he can logically solve a given problem.

Course Goals Preparing students to use basic engineering applications for the preparation of technical documentation. To familiarize students with work in engineering programs for creating documentation and creating 2D and 3D representations of machine and device elements

Programme content During the classes, students will familiarize themselves with the methodology of designing in a CAD environment. The classes will focus on creating complex models and assemblies, their editing methods, and engineering tools and methods enabling the realization of spatial models of machine parts and their assemblies, including special functionalities related to sheet metal constructions and modeling of welded joints.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Student knows the rules of recording the structure using CAD software.	ME_K1_W04	L	G I P R
	2	Student knows the principle of operation of advanced tools CAD software to speed up your work.	ME_K1_W04	L	G I P R
Skills	1	Student can recreate the technical documentation of the structure with the use of tools supporting computer CAD design.	ME_K1_U04	L	G I P R
	2	Student can reproduce a spatial model of a single machine part and the entire machine assembly in a CAD environment.	ME_K1_U08	L	G I P R
Social Competence	1	Student can organize work on a project in accordance with the design logic and the possibilities of tools.	ME_K1_K06	L	G I P R
	2	Student is aware of the importance of professional conduct	ME_K1_K07	L	G I P R

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr inż. Owsiński Robert
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	10
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	10
Examination or final colloquium	0
Additional contact hours	0
Total student workload	50
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic

Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fifth

Course Title	Technical drawing and CAD III
Nazwa przedmiotu	Zapis konstrukcji z wykorzystaniem CAD III

ECTS points	2	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	5.K.3	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	S/he has knowledge of modeling geometric objects and simple machine elements.
		2	S/he knows the rules and standards of technical drawing.
		3	S/he has basic knowledge of part modeling in a 2D environment and basic knowledge of modeling in a 3D environment
	Skills	1	S/he can interpret the markings contained in the technical drawing.
		2	S/he can operate computer engineering software.
		3	S/he can identify typical machine components.
		4	S/he can create spatial models of machine parts
	Social Competence	1	S/he can cooperate in a group.
		2	S/he correctly formulates questions regarding the discussed issue.
		3	S/he can logically solve a given problem.

Course Goals Preparing students to use basic engineering applications for the preparation of technical documentation. To familiarize students with work in engineering programs for creating documentation and creating 2D and 3D representations of machine and device elements

Programme content During the classes, students will become acquainted with the methodology of designing in a CAD environment. The sessions will focus on utilizing advanced engineering modules in CAD software to conduct design processes for machine parts (shafts, gears), as well as methods for strength verification of parts and creating drawing documentation. Discussion on parametric modeling in CAD will also be covered.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he knows the rules of recording the structure using CAD software.	ME_K1_W04	L	G I P R
	2	S/he knows the principle of operation of advanced CAD software tools in order to speed up the work.	ME_K1_W04	L	G I P R
	3	S/he knows the methodology of creating spatial models in software supporting engineering design.	ME_K1_W04	L	G I P R
Skills	1	S/he can recreate the technical documentation of the structure with the use of tools supporting computer CAD design.	ME_K1_U04	L	G I P R
	2	S/he can reproduce a spatial model of a single machine part and the entire machine assembly in a CAD environment.	ME_K1_U08	L	G I P R
	3	S/he can develop technical documentation in the form of executive and assembly drawings	ME_K1_U10	L	G I P R
Social Competence	1	S/he can organize work on a project in accordance with the design logic and the possibilities of tools.	ME_K1_K06	L	G I P R
	2	S/he is aware of the importance of professional conduct	ME_K1_K07	L	G I P R

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr inż. Owsiński Robert
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	30

Project (P)	0
Seminar (S)	0
Preparation for classes	5
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	15
Examination or final colloquium	0
Additional contact hours	0
Total student workload	50
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Second
Course Title	Technical drawing in practice
Nazwa przedmiotu	Rysunek techniczny w praktyce

ECTS points	4	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	2.K.5	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	S/he has detailed knowledge in the field of projection methods for complex spatial objects.
		2	S/he has knowledge in constructing projections of spatial objects onto the drawing plane.
		3	S/he is familiar with methods for determining relationships between spatial objects.
	Skills	1	S/he has the ability to solve problems in solid geometry.
		2	Has practical ability to solve problems in solid geometry regarding recording of design features of objects.
	Social Competence	1	Correctly identifies and resolves relationships between complex spatial objects.
		2	Correctly identifies and resolves relationships between complex spatial objects.
		3	Can think and act entrepreneurially.

Course Goals Acquainting students with parametric modeling methods using 3D CAD software and the creation of drawing documentation. Introducing students to so-called "best practices" related to the process of creating virtual representations of designed machines and devices.

Programme content Includes an introduction to using CAD software in practice. Modeling of solids and assemblies using "best practices" and maintaining the proper structure of assemblies. Utilization of standardized element libraries in the modeling process. Creation of drawing documentation in accordance with applicable standards.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he is familiar with the principles of engineering graphics as well as traditional tools used in developing design documentation.	ME_K1_W04	W L	C F G I P R
	2	S/he is familiar with the basic scope of standardization and requirements placed on design documentation.	ME_K1_W04	W L	C F G I P R
Skills	1	S/he can create a simple technical drawing of a machine element, mechanism, or device using the principles of standardization and databases.	ME_K1_U01	L	C F G I P R
	2	S/he can formulate specifications for practical engineering tasks.	ME_K1_U01	L	C F G I P R
	3	S/he can interpret technical drawings.	ME_K1_U10	L	C F G I P R
	4	Can communicate using graphical techniques in a professional environment.	ME_K1_U10	L	C F G I P R
Social Competence	1	S/he is aware of the importance and responsibility of an engineer's actions.	ME_K1_K05	W L	C F G I P R
	2				

Methods of verification of learning outcomes: A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr inż. Kowalski Mateusz
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	25
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	28
Examination or final colloquium	2
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering

Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	First

Course Title	Technical metrology
Nazwa przedmiotu	Metrologia techniczna

ECTS points	3	Subject type	K
Language of lecture	angielski	Mode of completing the course	Examination

Course code	1.K.7	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	Mathematics, in algebra, mathematical analysis and probability.
		2	Physics, in terms of optics.
		3	Elementary knowledge in technical drawing.
	Skills	1	Can obtain information from literature, databases and other sources.
		2	Has the ability to self-educate.
	Social Competence	1	Is aware of the need to supplement knowledge throughout life.
		2	Is able to cooperate and act in a group, assuming various roles in it.

Course Goals Familiarize students with measurement methods

Programme content Auditorium lecture on basic concepts of measurement, units of measurement, methods of measurement, operation of measuring instruments, evaluation of measurement accuracy. Calculation of tolerances and fits, analysis of measurement errors and uncertainties. Development and presentation of measurement results.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has knowledge of technical metrology.	ME_K1_W09	W C	C
	2	S/he knows the methods of measuring the basic quantities characteristic of mechanical engineering dla budowy maszyn.	ME_K1_W09	W C	C
	3	S/he knows the computational methods necessary to analyze the measurement results.	ME_K1_W09	W C	C
Skills	1	S/he is able to apply methods of estimating measurement errors.	ME_K1_U01	C	C
	2				
Social Competence	1	Is aware of the need to supplement knowledge throughout life.	ME_K1_K01	W C	C
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr inż. Bogdan-Chudy Marta
Calculation class (C)	15	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	15
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	15
Preparation of a report/paper/ project/presentation	0

Independent study of the course topics	28
Examination or final colloquium	2
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr hab. inż. Małecka Joanna
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Sixth

Course Title	Techniques of welding
Nazwa przedmiotu	Techniki spajania materiałów

ECTS points	4	Subject type	K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	6.K.2	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	They have knowledge in the field of properties and applications of metallic structural materials.
		2	They have knowledge of the transformations occurring in steels during heating and cooling treatments.
	Skills	1	They have knowledge of the transformations occurring in steels during heating and cooling treatments.
		2	
	Social Competence	1	They are capable of collaborating and working within a group.
		2	

Course Goals	Introducing students to the technologies of bonding inseparable

Programme content As part of the course, students acquire theoretical and practical knowledge about various metal joining techniques, such as MIG/MAG welding, TIG welding, shielded metal arc welding, thermit welding, submerged arc welding, brazing, and soldering. They learn about the structure and properties of welded joints, methods of their evaluation, application areas, as well as safety and standards-related issues. Upon completion of the course, students possess essential knowledge in selecting welding techniques across various industries and manufacturing sectors.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	They have knowledge in the field of joining metals and alloys through non-destructive methods, as well as testing techniques.	ME_K1_W08	W L	C
	2				
Skills	1	S/he is capable of using standards, professional literature, catalogs of welding materials, and online sources.	ME_K1_U01	W L	C
	2				
Social Competence	1	S/he understands the necessity of self-education and knowledge enhancement.	ME_K1_K01	W L	C
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr hab. Prażmowski Mariusz
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	30

Project (P)	0
Seminar (S)	0
Preparation for classes	20
Preparation of a report/paper/ project/presentation	10
Independent study of the course topics	20
Examination or final colloquium	0
Additional contact hours	0
Total student workload	110
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Fourth
Course Title	Technological processes design
Nazwa przedmiotu	Projektowanie procesów technologicznych

ECTS points	4	Subject type	K
Language of lecture	angielski	Mode of completing the course	Examination

Course code	4.K.4	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	Knows the principles of engineering graphics
		2	
	Skills	1	Is able to choose the appropriate production method.
		2	
	Social Competence	1	Is able to analyze engineering tasks.
		2	

Course Goals Preparing students to design machine elements based on typical production processes.

Programme content Structural diagram of the technological process. Types of semi-finished products and their selection. Machining allowances. Input data for designing the technological process. Technological documentation. Technology of construction. Processes of technological parts class shaft, disc, sleeve.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Knows the principles of engineering graphics and tools used in preparing technical documentation	ME_K1_W04	W	A B
	2	Has knowledge of engineering materials, their research and shaping technologies	ME_K1_W10	W	A B
	3	Has knowledge of the production and operation of machines and mechanical devices	ME_K1_W08	W	A B
Skills	1	Is able to use information and communication techniques appropriate to carry out tasks in the field of design, production and operation of machines	ME_K1_U04	P	K
	2	Is able - in accordance with a given specification - to design and implement a simple device, object, system or process, typical for the process of designing, manufacturing and operating machines, using appropriate methods, techniques and tools	ME_K1_U09	W P	B K
	3	Has the necessary preparation to work in an industrial environment and knows the safety rules related to this work	ME_K1_U06	P	K
Social Competence	1	Is aware of the need to supplement knowledge throughout life and is able to select appropriate learning methods for themselves and other people	ME_K1_K01	W P	A B K
	2	Is aware of the responsibility related to decisions made as part of engineering activities, especially in terms of own and other people's safety and environmental protection	ME_K1_K03	W P	A B

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname

Lecture (W)	30	dr hab. inż. Niesłony Piotr
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	30	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	30
Seminar (S)	0
Preparation for classes	15
Preparation of a report/paper/ project/presentation	15
Independent study of the course topics	8
Examination or final colloquium	2
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

dr hab. inż. Małecka Joanna
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering		
Profile of Education	General Academic		
Level of study	First Cycle Studies		
Specialization			
Form of Study	Full-Time Studies		
Semester	Second		
Course Title	Technologies and industrial apparatus		
Nazwa przedmiotu	Technologie i urządzenia przemysłowe		
ECTS points	3	Subject type	K

Language of lecture	angielski	Mode of completing the course	Course credit
Course code	2.K.4	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	Mechanics, Fluid mechanics, Strength of materials strength
		2	
	Skills	1	The student has knowledge of the basics of mechanics, fluid mechanics and strength of materials to understand the principles of operation and construction equipment.
		2	
	Social Competence	1	Student acquires information from literature and other sources related to technical sciences.
		2	

Course Goals The aim of the course is to prepare students for the use of modern technology and industrial equipment.

Programme content The course provides knowledge on issues related to preparing students to use modern technologies and industrial equipment. The acquired knowledge allows for a systemic approach to design to ensure the reliability and safety of devices implementing technological processes and to acquire responsibility for their reliable operation.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	A student has extensive knowledge related to selected issues in the construction, maintenance, technical diagnostics, repair technology and safe use of machinery.	ME_K1_W07	W	C P
	2				
Skills	1				
	2				
Social Competence	1	A student is aware of the need to improve their knowledge throughout life and is able to select the appropriate learning methods for themselves and others.	ME_K1_K01	W	C P
	2	A student is aware of the importance of professional conduct, adherence to professional ethics and respecting the diversity of views and cultures	ME_K1_K05	W	C P

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr hab. inż. Czernek Krystian
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	0
Seminar (S)	0
Preparation for classes	23
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	20
Examination or final colloquium	2
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr hab. inż. Hapanowicz Jerzy
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic

Level of study	First Cycle Studies
Specialization	
Form of Study	Full-Time Studies
Semester	Third

Course Title	Vehicle and machine propulsion
Nazwa przedmiotu	Napędy pojazdów i maszyn

ECTS points	5	Subject type	K
Language of lecture	angielski	Mode of completing the course	Examination

Course code	3.K.3	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	has well-established and extended knowledge related to selected issues in the field of operation and construction of vehicles
		2	
	Skills	1	critically analyzes and evaluates the functioning of technical solutions of vehicle drive systems in the field of the specialty pursued
		2	
	Social Competence	1	understands the non-technical aspects of the activity of a mechanical engineer and manager, including its social consequences and impact on the environment
		2	

Course Goals Preparing students to achieve theoretical and practical knowledge in the field of general machine science.

Programme content The subject is intended to enable students to acquire knowledge of modern drive systems of vehicles and machines as well as skills in their operation. An important issue is that students learn to work in a team during service activities.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has knowledge related to the structure and operation of drive systems	ME_K1_W08	W L	A B E H P
	2				
Skills	1	S/he is able to critically analyze functioning selected elements of machine drives	ME_K1_U08	W L	B I J P
	2				
Social Competence	1	S/he understands the non-technical aspects of a mechanical engineer's activity, in particular the impact on the environment various aspects of the operation of machine drives	ME_K1_K02	W L	B I J P
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	prof. dr hab. inż. Mamala Jarosław
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	23
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	40

Examination or final colloquium	2
Additional contact hours	0
Total student workload	125
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

dr hab. inż. Augustynowicz Andrzej
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Machine Design
Form of Study	Full-Time Studies
Semester	Fifth

Course Title	CAD machine design
Nazwa przedmiotu	Projektowanie maszyn CAD

ECTS points	2	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	5.WK.3	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	S/he has knowledge of material strength and calculations for simple mechanical systems.
		2	S/he has knowledge in modeling and developing drawing documentation using CAD software.
	Skills	1	S/he has the ability to model individual parts as well as assemblies using CAD software.
		2	Has the ability to identify loads.
	Social Competence	1	S/he understands the need for lifelong learning.
		2	

Course Goals Introducing students to methods of designing basic machine elements using computational tools and CAD software.

Programme content Utilization of CAD software in parametrization of machine systems based on strength criteria. Techniques for supporting modeling and calculations of basic connection groups used in machine constructi

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has specialized knowledge in utilizing CAD software for the needs of structural components of machines and mechanical constructions.	ME_K1_W05	L	I J K L M P R
	2				
Skills	1	S/he is able to operate software appropriate for tasks related to the design, manufacturing, and operation of machines.	ME_K1_U04	L	I J K L M P R
	2				
Social Competence	1	S/he is aware of the responsibility associated with decisions made within engineering activities, particularly in terms of personal safety, the safety of others, and environmental protection.	ME_K1_K03	L	I J K L M P R
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr inż. Kowalski Mateusz
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	10
Preparation of a report/paper/ project/presentation	0

Independent study of the course topics	10
Examination or final colloquium	0
Additional contact hours	0
Total student workload	50
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Machine Design
Form of Study	Full-Time Studies
Semester	Sixth

Course Title	CAM process design
Nazwa przedmiotu	Projektowanie procesów CAM

ECTS points	3	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Examination

Course code	6.WK.3	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	He/She has knowledge of the basics of cavity machining and process machinery.
		2	He/She has knowledge of integrated manufacturing systems.
		3	He/She knows the principles of design using CAD programs.
	Skills	1	He/She is able to prepare the technological process of simple machine components. .
		2	He/She can interpret the markings on the technical drawing.
		3	He/She can determine the effect of basic manufacturing techniques.
	Social Competence	1	He/She is aware of supplementing and expanding his knowledge in the field of design.
		2	He/She is able to analyze the tasks assigned for implementation.
		3	He/She is aware of the responsibilities and consequences associated with his decisions.

Course Goals To enable the acquisition of basic knowledge of computer-aided manufacturing systems and prepare students for their practical use.

Programme content Lecture on process design for CNC machine tools. Introduction to computer aided manufacturing (CAM) systems. CAX techniques in manufacturing. Automatic programming using CAM systems. Methodology of programming on the example of a selected CAD/CAM system. Design exercises in the computer lab: development of technology and machining program for CNC machine tool. Programming 2-axis turning and 3-axis milling.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	He/She has knowledge of computer-aided manufacturing using CAM computer techniques.	ME_K1_W01	W L	H I J
	2				
Skills	1	He/She proficiently uses information and communication techniques appropriate for engineering tasks.	ME_K1_U05	L	A H I J
	2	He/She appropriately selects manufacturing technology to shape the form, structure and properties of components.	ME_K1_U01	W L	A H I J
	3	He/She develops computer programs to assist in solving a variety of technical issues and uses selected CAM computer programs.	ME_K1_U03	L	H I J
Social Competence	1	He/She is aware of the need to supplement specialized knowledge throughout his life and is able to select appropriate sources of knowledge and methods of learning for himself and others.	ME_K1_K04	W L	A H I J
	2	He/She recognizes the importance of knowledge in solving cognitive problems and practical engineering problems in the field of mechanics and mechanical engineering.	ME_K1_K01	W	A H I J
	3	He/She is ready to consult experts when having difficulty solving a problem on their own.	ME_K1_K02	L	H I J

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr inż. Chudy Roman
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities

Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	8
Preparation of a report/paper/ project/presentation	10
Independent study of the course topics	10
Examination or final colloquium	2
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

dr hab. inż. Małecka Joanna
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Dean of Faculty
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Machine Design
Form of Study	Full-Time Studies
Semester	Sixth
Course Title	Computational engineering
Nazwa przedmiotu	Inżynieria obliczeniowa

ECTS points	3	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	6.WK.2	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	S/he has a basic knowledge of computer science and design.
		2	
	Skills	1	S/he is able to operate 3D modelling software and proficient in the use of computer techniques.
		2	
	Social Competence	1	S/he is aware of the need to supplement expertise throughout life and is able to select appropriate sources of knowledge and methods of learning for themselves and others.
		2	

Course Goals To prepare students for the application of modern computational techniques in engineering work.

Programme content Learning about computer platforms and tools to support the engineering design process.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he knows and understands the main development trends relevant to the mechanical engineering education programme	ME_K1_W01	W L	A B I
	2				
Skills	1	S/he is able to develop and use research results and carry out analyses using computer techniques	ME_K1_U05	W L	A B I
	2				
Social Competence	1	S/he is prepared to think and act effectively and lead to constructive conclusions.	ME_K1_K03	W L	A B I
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname

Lecture (W)	15	prof. dr hab. inż. Niesłony Adam
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	20
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	20
Examination or final colloquium	0
Additional contact hours	0
Total student workload	85
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering		
Profile of Education	General Academic		
Level of study	First Cycle Studies		
Specialization	Machine Design		
Form of Study	Full-Time Studies		
Semester	Seventh		
Course Title	Construction of vehicles and machines		
Nazwa przedmiotu	Konstrukcje pojazdów i maszyn		
ECTS points	4	Subject type	W-K

Language of lecture	angielski	Mode of completing the course	Examination

Course code	7.WK.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	S/he has elementary knowledge of the principles of designing machine parts and mechanical structures.
		2	
	Skills	1	S/he is able to identify and formulate specifications for simple engineering tasks of a practical nature in the field of design.
		2	
	Social Competence	1	S/he understands non-technical aspects of the activity of a mechanical engineer, including its social consequences and impact on the state environment
		2	

Course Goals Systematization of knowledge in the field of vehicle construction. Discussion of design solutions and technologies used in vehicles.

Programme content Discussion of the technical characteristics and technical and legal limitations of vehicle and machine structures. Basic loads and operating conditions of vehicles and machines. Body construction and cabin equipment for special and commercial vehicles.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has specialist knowledge in the construction and principles of designing machine parts and mechanical structures used in vehicles.	ME_K1_W05	W L P	C H K
	2				
Skills	1	S/he is able to critically analyze the functioning and evaluate existing technical solutions, devices, facilities, systems, processes and services in the field of construction, production and operation of vehicles.	ME_K1_U08	L P	H I K
	2				
Social Competence	1	S/he understands non-technical aspects of the activity of a mechanical engineer, including its social consequences and impact on the environment.	ME_K1_K02	L	H
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr inż. Prażnowski Krzysztof
Calculation class (C)	0	
Laboratory class (L)	15	
Project (P)	15	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	15
Project (P)	15
Seminar (S)	0
Preparation for classes	20
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	18
Examination or final colloquium	2
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

dr hab. inż. Augustynowicz Andrzej
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic

Level of study	First Cycle Studies
Specialization	Machine Design
Form of Study	Full-Time Studies
Semester	Fifth

Course Title	Design of molds with the use of CAD
Nazwa przedmiotu	Projektowanie form z zastosowaniem CAD

ECTS points	3	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	5.WK.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	Student is familiar with the current state of technology and development trends regarding tools for producing elements from non-ferrous construction materials
		2	
	Skills	1	Possess the ability to use engineering tools to assist in design
		2	
	Social Competence	1	The student is aware of the importance of professionalism in the work of an engineer and adherence to professional ethics.
		2	

Course Goals To gain knowledge of the construction and operation of tools for plastics processing, To familiarize students with the knowledge of design and construction of tools for manufacturing using CAD

Programme content The course includes content related to methods of computer-aided design of injection molds. The construction and design principles of injection molds

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Knows the use of CAD tools in the design process and manufacturing of structural components	ME_K1_W04	W L	G I P R
	2	Knows the principles of designing injection molds using CAD	ME_K1_W08	W L	G I P R
	3	Knows the design of tools for manufacturing structural components using CAD tools	ME_K1_W10	W L	G I P R
Skills	1	Can create a 3D model of the designed structural component and create a mold for its manufacturing	ME_K1_U04	W L	G I P R
	2	Can design using CAD techniques and appropriate tooling for injection molding manufacturing	ME_K1_U09	W L	G I P R
	3	Can create, based on the spatial model, the corresponding complete drawing documentation	ME_K1_U10	W L	G I P R
Social Competence	1	Is aware of the importance of professional conduct	ME_K1_K05	W L	G I P R
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr inż. Owsiński Robert
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	15

Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	30
Examination or final colloquium	0
Additional contact hours	0
Total student workload	90
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
Head of the organizational unit
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dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Machine Design
Form of Study	Full-Time Studies
Semester	Seventh
Course Title	Diagnostics of machines and devices
Nazwa przedmiotu	Diagnostyka maszyn i urządzeń

ECTS points	4	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Examination

Course code	7.WK.3	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	Knows physics, including the basics of mechanics, thermodynamics, electricity, and magnetism, including knowledge needed to understand the description and use of physical phenomena in the operation of mechanical systems
		2	
	Skills	1	Can use measuring equipment and estimation methods measurement errors
		2	
	Social Competence	1	Is aware of supplementing knowledge throughout life and can select appropriate learning methods for themselves and other people
		2	

Course Goals To familiarize the student with methods of diagnostics of machines and devices

Programme content As part of the course, students learn selected methods of diagnostics of machines and devices. They will be introduced to modern systems supporting the diagnostics of selected machines and devices and will learn how to interpret the obtained results of a diagnostic experiment.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Knows metrology and measurement systems used in the construction of machines and devices	ME_K1_W09	W L	C I P
	2	Knows related to selected issues in the field of machine construction, operation, and diagnosis of the technical condition of machines and devices	ME_K1_W07	W L	C I P
Skills	1	Can obtain information from literature, databases, and other sources on the construction and diagnosis of devices, can integrate the information obtained, interpret it, draw conclusions, and formulate and justify opinions	ME_K1_U01	L	H P
	2	Can critically analyze the functioning and evaluate existing technical solutions, devices, facilities, systems, and processes in the field of construction, production, operation, and diagnostics of machines and devices	ME_K1_U08	L	H P
Social Competence	1	Demonstrates entrepreneurship and ingenuity in activities related to the diagnostics of machines and devices	ME_K1_K06	W L	A H P
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr inż. Graba Mariusz
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	10
Preparation of a report/paper/ project/presentation	20
Independent study of the course topics	15
Examination or final colloquium	2
Additional contact hours	0
Total student workload	107
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

dr hab. inż. Augustynowicz Andrzej
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Dean of Faculty
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic

Level of study	First Cycle Studies
Specialization	Machine Design
Form of Study	Full-Time Studies
Semester	Seventh

Course Title	Hydraulic and pneumatic drives and control
Nazwa przedmiotu	Napędy i sterowanie hydrauliczne i pneumatyczne

ECTS points	5	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	7.WK.4	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	Basic knowledge of the laws of physics and mechanics
		2	
	Skills	1	Problem-solving skills using mathematical analysis
		2	
	Social Competence	1	Awareness of the significance of engineering actions
		2	

Course Goals Understanding the construction, operation, calculation, and design of components of hydraulic and pneumatic systems

Programme content Construction, operation, experimental research, calculation, and design of components of hydraulic and pneumatic systems considering the techniques of their control and interaction within pneumatic and hydraulic systems

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Has expanded knowledge related to selected issues in machine construction, particularly in the construction and operation of hydraulic and pneumatic systems	ME_K1_W07	W L	C H
	2				
Skills	1	Capable of critically analyzing the operation and evaluating existing technical solutions in the construction and operation of hydraulic and pneumatic systems	ME_K1_U08	W L	C H
	2	Capable of designing a simple hydraulic or pneumatic system according to a given specification using appropriate methods, techniques, and tools	ME_K1_U09	P	K
Social Competence	1	Aware of the responsibility associated with decisions made in engineering activities, particularly in terms of personal safety, safety of others, and environmental protection related to hydraulic and pneumatic systems	ME_K1_K03	W L P	C H K
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr inż. Bieniek Andrzej
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	15	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	15

Seminar (S)	0
Preparation for classes	10
Preparation of a report/paper/ project/presentation	30
Independent study of the course topics	10
Examination or final colloquium	0
Additional contact hours	0
Total student workload	125
Number of contact hours (from the study plan)	75

* hour (class) means 45 minutes

dr hab. inż. Augustynowicz Andrzej
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dr inż. Wydrych Jacek
Dean of Faculty
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Machine Design
Form of Study	Full-Time Studies
Semester	Sixth
Course Title	Individual report - structural work
Nazwa przedmiotu	Praca przejściowa - konstrukcyjna

ECTS points	2	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	6.WK.1	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	The student must have knowledge of the basics of constructing machines and devices and developing drawing documentation
		2	
	Skills	1	Ability to correctly identify element loads, strength calculations and material selection
		2	Has the ability to use a CAD program
		3	Is able to independently search for interesting information in available databases
	Social Competence	1	Is able to properly determine the priorities of the designer's work
		2	

Course Goals The aim of the course is to acquire the ability to independently perform simple construction projects

Programme content The program content concerns the construction of selected machine units or machine elements along with the development of digital drawing documentation.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Knows how to search for and implement ready-made available components into the structure	ME_K1_W07	P	K L P R
	2	Knows how to design using basic construction evaluation criteria	ME_K1_W05	P	K L P R
Skills	1	Is able to independently make machine structures	ME_K1_U09	P	K L P R
	2	Is able to obtain information from literature, databases regarding typical elements and design methods	ME_K1_U01	P	K L P R
	3	Is able to present the designer's problems in an understandable way	ME_K1_U04	P	K L P R
Social Competence	1	Is aware of the need for lifelong learning	ME_K1_K01	P	K L P R
	2	Is able to gain knowledge from others	ME_K1_K01	P	K L P R
	3	Is aware of the importance of professional conduct	ME_K1_K05	P	K L P R

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan

The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr hab. inż. Kluger Krzysztof
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	30	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	30
Seminar (S)	0
Preparation for classes	2
Preparation of a report/paper/ project/presentation	25
Independent study of the course topics	2
Examination or final colloquium	1
Additional contact hours	0
Total student workload	60
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
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Dean of Faculty
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Machine Design
Form of Study	Full-Time Studies
Semester	Fifth
Course Title	Machine reliability

Nazwa przedmiotu	Niezawodność maszyn		
ECTS points	2	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Course credit
Course code	5.WK.2	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course			
	Knowledge	1	Student has basic knowledge in statistics.
		2	Has the overall knowledge about the relations between components used in industrial machines.
	Skills	1	Student can analyze the way of functioning of technical objects.
		2	
	Social Competence	1	Student can appropriately determine the priorities for the realization of one's own or other tasks.
		2	

Course Goals The course is aimed on introduction to the typical issues of technical reliability.

Programme content Generation and analysis of functional and measure characteristics of technical reliability. Teaching methods: auditory lectures, laboratory classes, classes conducted with the use of distance learning methods and techniques.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Student has basic knowledge about the life cycle of devices, objects and technical systems.	ME_K1_W11	W	C D
	2				
Skills	1	Student can formulate and solve reliability analysis with the application of analytical methods and mathematical apparatus.	ME_K1_U05	W L	C D H I P
	2				
Social Competence	1	Student is aware of the importance and understanding of nontechnical aspects of the proper functioning of technical objects.	ME_K1_K02	W L	C D H I P
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr inż. Blacha Łukasz
Calculation class (C)	0	
Laboratory class (L)	15	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	15
Project (P)	0
Seminar (S)	0
Preparation for classes	15
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	15
Examination or final colloquium	0
Additional contact hours	0
Total student workload	60
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Machine Design
Form of Study	Full-Time Studies
Semester	Seventh

Course Title	Rapid Manufacturing Techniques		
Nazwa przedmiotu	Techniki szybkiego wytwarzania		
ECTS points	4	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Course credit
Course code	7.WK.2	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	has knowledge of CAD design
		2	has knowledge of selected topics in machine design
	Skills	1	is capable of using CAD software in the design process of complex components
		2	is able to acquire knowledge from literature
	Social Competence	1	is able to appropriately determine priorities for accomplishing a task defined by themselves or others
		2	

Course Goals The aim of the course is to familiarize students with the rapidly developing branch of industry that is rapid prototyping and additive technologies, and to indicate areas of their application depending on the type of material used.

Programme content The course focuses on the principles and practical application of rapid manufacturing techniques, including a deep understanding of 3D printing processes such as FDM (Fused Deposition Modeling). Students learn to design and implement projects using modern 3D printing technologies, while also becoming familiar with potential problems and ways to solve them.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Has knowledge in the field of strength assessment of components manufactured using additive methods	ME_K1_W05	W P	C P
	2	Has knowledge in the application of additive methods in the manufacturing process of machine parts and devices	ME_K1_W08	W P	C P
Skills	1	Is able to identify and operate software suitable for a given additive technology in order to manufacture a machine component with its help	ME_K1_U04	W P	P
	2	Is capable of designing and manufacturing a simple device component in accordance with the received specifications	ME_K1_U09	P	M P
Social Competence	1	Is aware of the importance and understands the non-technical aspects of the safety of technical objects	ME_K1_K02	W P	C P
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr inż. Kurek Andrzej
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	30	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	30
Seminar (S)	0

Preparation for classes	15
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	25
Examination or final colloquium	0
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

dr hab. inż. Kluger Krzysztof
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Manufacturing Technology
Form of Study	Full-Time Studies
Semester	Seventh

Course Title	Bases of quality engineering
Nazwa przedmiotu	Podstawy inżynierii jakości

ECTS points	4	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	7.WK.T2	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	Student has knowledge about basic techniques and tools required for solving simple engineering tasks
		2	
	Skills	1	Student is able to obtain information from literature, databases and other sources
		2	
	Social Competence	1	Student is aware of the need to improve knowledge throughout life
		2	

Course Goals This course teaches Quality Engineering concepts and tools, information about quality systems, auditing, product and process control and design, quality methods and tools, applied statistics, SPC, and Design of Experiments

Programme content Knowledge of basic concepts and issues regarding methods and techniques of control and quality management in a manufacturing company. Ability to describe the control process, develop a control plan for a selected operation, and use selected quality tools to solve engineering problems.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Student has knowledge of the life cycle of mechanical machinery	ME_K1_W11	W L P	C H I K M N O P R
	2	Student has knowledge about quality management and the use of quality engineering instruments to improve the quality of processes and products	ME_K1_W12	W L P	C H I J K M N O P R
Skills	1	Student is able to assess the suitability of routine quality engineering methods and tools	ME_K1_U07	W L P	C H I J K M N O P R
	2	Student is able to plan and carry out computer simulations and measurements	ME_K1_U05	L P	C H I J K M N O P R
Social Competence	1	Student is aware of the responsibility for decisions made as part of the engineering activity	ME_K1_K03	W L P	C H I J K M N O P R
	2	Student is able to cooperate and act in a group	ME_K1_K04	L P	C H I J K M N O P R

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan

The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr hab. inż. Małecka Joanna
Calculation class (C)	0	
Laboratory class (L)	15	
Project (P)	15	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	15
Project (P)	15
Seminar (S)	0
Preparation for classes	10
Preparation of a report/paper/ project/presentation	15
Independent study of the course topics	13
Examination or final colloquium	2
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

dr hab. inż. Małecka Joanna
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Manufacturing Technology
Form of Study	Full-Time Studies
Semester	Seventh
Course Title	Design of chipless processes

Nazwa przedmiotu	Projektowanie procesów bezwiórowych		
ECTS points	3	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Course credit
Course code	7.WK.T4	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	The student possesses knowledge in the field of material forming technologies.
		2	The student has basic knowledge of the properties and applications of engineering materials.
	Skills	1	The student has the ability to gather information from literature, integrate the obtained information, and draw conclusions.
		2	
	Social Competence	1	The student is capable of working in a team as an inspiring individual.
		2	

Course Goals Preparing the student for designing technological processes in foundry engineering.

Programme content As part of the course, students will become acquainted with the technology of mold casting and the design of casting processes for parts or components in this technology. Lectures and practical design sessions will involve analyzing the properties of materials used in casting process design, designing casting molds, and optimizing the casting process for quality and efficiency. Students will gain theoretical and practical knowledge in the application of standards and technical requirements, as well as in preparing technical documentation in casting processes.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	The student has knowledge of the possibilities of applying computer simulation in the development of manufacturing technologies.	ME_K1_W08	W P	C L
	2				
Skills	1	The student is able to utilize computer software to develop manufacturing technologies for simple machine components.	ME_K1_U09	W P	C L
	2				
Social Competence	1	The student can independently solve technical problems.	ME_K1_K01	W P	C L
	2				

Methods of verification of learning outcomes:
A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr hab. Prażmowski Mariusz
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	30	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	30
Seminar (S)	0
Preparation for classes	15
Preparation of a report/paper/ project/presentation	15
Independent study of the course topics	0
Examination or final colloquium	0
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

dr hab. inż. Małecka Joanna
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dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering

Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Manufacturing Technology
Form of Study	Full-Time Studies
Semester	Seventh

Course Title	Fundamentals of coordinate metrology
Nazwa przedmiotu	Podstawy metrologii współrzędnościowej

ECTS points	3	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Examination

Course code	7.WK.T5	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	Mathematics, in algebra, mathematical analysis and probability.
		2	Physics, in terms of optics.
		3	Technical metrology - knowledge of the basic concepts and knowledge of general metrology.
	Skills	1	The ability to solve mathematical and physical problems.
		2	Self-education skills.
	Social Competence	1	He/She is aware of the need to supplement knowledge throughout his life.
		2	He/She is aware of the importance of professional conduct and adherence to professional ethics.

Course Goals Familiarize students with selected measurement techniques.

Programme content Auditorium lecture covering issues related to the construction and operating principle of coordinate measuring machines including optical measuring machines, heads, tracers, measuring arms. As part of exercises in the computer laboratory, developing measurement strategies and plans based on documentation, creating a measurement report. As part of practical classes, making measurements on the coordinate measuring machine, multisensor machine.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	He/She has knowledge of the metrology of geometric quantities, knows the principles of tolerance of dimensions, shape and position, and knows and understands the methods of measurement of basic characterizing quantities for mechanical engineering, knows the calculation methods necessary for the analysis of measurement results.	ME_K1_W09	W L	C H I
	2	He/She has knowledge in physics, including the fundamentals of mechanics, thermodynamics, optics, electricity and magnetism, nuclear physics, solid state physics and elements of quantum physics, needed to understand, describe and use physical phenomena in the design manufacture and operation of measuring instruments and systems.	ME_K1_W02	W L	C H I
Skills	1	He/She can plan and carry out measurements and interpret the the obtained results and draw conclusions.	ME_K1_U08	W L	C H I
	2	He/She can obtain information from literature, databases and other sources.	ME_K1_U01	W L	C H I
Social Competence	1	He/She is aware of the need to supplement knowledge throughout life.	ME_K1_K01	W L	C H I
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr inż. Bogdan-Chudy Marta
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload

Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	5
Preparation of a report/paper/ project/presentation	10
Independent study of the course topics	10
Examination or final colloquium	5
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

dr hab. inż. Małecka Joanna
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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Manufacturing Technology
Form of Study	Full-Time Studies
Semester	Sixth

Course Title	Fundamentals of programming in a CAM system
Nazwa przedmiotu	Podstawy programowania w systemie CAM

ECTS points	2	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	6.WK.T2	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	S/he has knowledge of the basics of cavity machining and process machinery.
		2	S/he has knowledge of integrated manufacturing systems.
		3	S/he he knows the principles of design using CAD programs.
	Skills	1	Can prepare the technological process of simple machine components. .
		2	Can interpret the markings on the technical drawing.
		3	Can determine the effect of basic manufacturing techniques.
	Social Competence	1	S/he is aware of supplementing and expanding his knowledge in the field of design.
		2	S/he is able to analyze the tasks assigned for implementation.
		3	S/he is aware of the responsibilities and consequences associated with his decisions.

Course Goals To enable the acquisition of basic knowledge of computer-aided manufacturing systems and prepare students for their practical use.

Programme content Lecture on process design for CNC machine tools. Introduction to computer aided manufacturing (CAM) systems. CAX techniques in manufacturing. Automatic programming using CAM systems. Methodology of programming on the example of a selected CAD/CAM system. Design exercises in the computer lab: development of technology and machining program for CNC machine tool. Programming 2-axis turning and 3-axis milling.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has technical knowledge of the operation of kinematics and dynamics of mechanisms.	ME_K1_W01	W P	C D L M
	2				
Skills	1	S/he can use analytical methods to solve tasks.	ME_K1_U05	W P	C D L M R
	2	S/he can interpret the results obtained and draw conclusions about the kinematics and dynamics of mechanisms.	ME_K1_U01	P	K L M R
Social Competence	1	S/he is able to interact and work in a group.	ME_K1_K04	P	K L M R
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr inż. Chudy Roman
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	15	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	15
Seminar (S)	0
Preparation for classes	5
Preparation of a report/paper/ project/presentation	5
Independent study of the course topics	5
Examination or final colloquium	5
Additional contact hours	0
Total student workload	50
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Manufacturing Technology
Form of Study	Full-Time Studies
Semester	Fifth

Course Title	Individual report - technological work			
Nazwa przedmiotu	Praca przejściowa - technologiczna			
ECTS points	1	Subject type		W-K
Language of lecture	angielski	Mode of completing the course		Course credit
Course code	5.WK.T1	Subject related to scientific research/pract. profess. prepar. (Y/N)		N

Preliminary requirements of the course	Knowledge	1	S/he knows the basics of process design.
		2	S/he knows the basic methods of machine manufacturing technology.
	Skills	1	S/he can prepare a study of engineering tasks.
		2	S/he is able to obtain information from the literature, integrate the information obtained and draw conclusions.
		3	S/he knows how to analyze engineering tasks.
	Social Competence	1	S/he is aware of the need to supplement knowledge throughout life.
		2	S/he is aware of the responsibilities and consequences associated with his decisions.

Course Goals Prepare students to design technological processes for CNC machine tools including the selection of machine tools, tools and tooling.

Programme content The design of the technological process of a selected part in the conditions of mass production. Framework technological process. Selection of semi-finished product, selection of intermediate allowances. Technological documentation including selection of machine tools, tooling, tools and machining parameters. Norming of work time. Machining program for CNC machine tools.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	He/She has knowledge of the manufacturing processes of machine and equipment components.	ME_K1_W08	P	K L M
	2	He/She has knowledge of tooling and fixture selection and CNC machine tool programming.	ME_K1_W05	P	K L M
Skills	1	He/She is able to develop a technological framework process of selected machine parts and complete technological documentation of machining for CNC machine tools.	ME_K1_U09	P	K L M
	2	He/She can obtain information from professional literature, databases and other sources.	ME_K1_U01	P	K L
Social Competence	1	He/She is aware of the need to supplement knowledge throughout his life.	ME_K1_K01	P	K L M
	2	He/She is aware of the responsibility associated with decisions made in engineering activities, with particular emphasis on the consequences of these decisions.	ME_K1_K03	P	K L M

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	0	dr inż. Bogdan-Chudy Marta
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	15	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	0
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	15
Seminar (S)	0

Preparation for classes	0
Preparation of a report/paper/ project/presentation	5
Independent study of the course topics	5
Examination or final colloquium	0
Additional contact hours	0
Total student workload	25
Number of contact hours (from the study plan)	15

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Manufacturing Technology
Form of Study	Full-Time Studies
Semester	Sixth

Course Title	Machine control techniques
Nazwa przedmiotu	Techniki sterowania maszyn

ECTS points	2	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	6.WK.T3	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	The student has knowledge of the basics of electrical engineering, computer science, automation and control theory.
		2	
	Skills	1	The student has the ability to design technological machining processes.
		2	
	Social Competence	1	Creative thinking and action.
		2	Ability to work in a group.

Course Goals To familiarize students with control systems of machines and devices and the basics of mathematical modeling of such systems.

Programme content A review of basic issues of automation. Development of control systems. Symbols and markings on diagrams. Control systems for hydraulic, pneumatic, electric, electro-hydraulic and electro-pneumatic drives. Digital control of objects. Programmable controllers in industrial devices. Design of control systems - basics.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	The student has knowledge in the analysis of systems control and tools for this purpose.	ME_K1_W01	W P	A K
	2				
Skills	1	The student is able to analyze the control system using appropriate tools, consciously using their technical documentation and assess the correctness of the analysis.	ME_K1_U06	W P	A K
	2				
Social Competence	1	Is aware of the responsibility associated with the decisions made.	ME_K1_K03	W P	A K
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname

Lecture (W)	15	dr hab. inż. Bartoszuk Marian
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	15	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	15
Seminar (S)	0
Preparation for classes	15
Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	0
Examination or final colloquium	15
Additional contact hours	0
Total student workload	60
Number of contact hours (from the study plan)	30

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering		
Profile of Education	General Academic		
Level of study	First Cycle Studies		
Specialization	Manufacturing Technology		
Form of Study	Full-Time Studies		
Semester	Fifth		
Course Title	Programming of cnc machines		
Nazwa przedmiotu	Programowanie obrabiarek CNC		
ECTS points	3	Subject type	W-K

Language of lecture	angielski	Mode of completing the course	Course credit

Course code	5.WK.T3	Subject related to scientific research/pract. profess. prepar. (Y/N)	N

Preliminary requirements of the course	Knowledge	1	The student has the knowledge of the basics of machine technology, machining, cutting tools and construction materials.
		2	
	Skills	1	The student has the ability to design technological machining processes.
		2	
	Social Competence	1	S/he is able to analyze the tasks assigned to be carried out.
		2	S/he is aware of the responsibility and consequences of decisions made.

Course Goals Providing students with knowledge about various methods of programming CNC machines.

Programme content History of the development of numerically controlled machine tools. Methods of programming NC/CNC machine tools. Construction of CNC machine tools. Numerical control systems. Operator communication systems with the CNC machine. Structure of a control program, basics of G code and M code. Manual, computer-aided and workshop-oriented programming. SIMENS controller – cycles, subroutines, advanced functions. Possibilities of interactive, advanced machining programming in CAD/CAM systems. Development trends in CNC machine tool programming systems.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	S/he has knowledge of the production of machine parts and mechanical devices.	ME_K1_W08	W	C
	2				
Skills	1	S/he is able to obtain information from professional literature, databases and other sources - information related to CNC machine programming issues.	ME_K1_U01	L	H
	2	S/he is able to use information and communication techniques appropriate to carry out tasks in the field of design, production and operation of machine parts.	ME_K1_U04	L	H
Social Competence	1	S/he is aware of the responsibility associated with decisions made as part of engineering activities, with particular emphasis on the consequences of these decisions.	ME_K1_K03	L	P
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr hab. inż. Bartoszuk Marian
Calculation class (C)	0	
Laboratory class (L)	30	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	30
Project (P)	0
Seminar (S)	0
Preparation for classes	15

Preparation of a report/paper/ project/presentation	0
Independent study of the course topics	30
Examination or final colloquium	0
Additional contact hours	0
Total student workload	90
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Manufacturing Technology
Form of Study	Full-Time Studies
Semester	Seventh

Course Title	Rapid prototyping techniques
Nazwa przedmiotu	Techniki szybkiego prototypowania

ECTS points	3	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	7.WK.T3	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	He/She has knowledge of technical drawing and drafting geometry.
		2	He/She knows the principles of design using CAD programs.
		3	He/She has a structured knowledge of structural modeling.
	Skills	1	He/She is able to prepare technical documentation in the form of manufacturing and assembly drawings.
		2	
	Social Competence	1	He/She is aware of the need to supplement knowledge throughout life.
		2	He/She is able to analyze the tasks assigned for implementation.

Course Goals The purpose of the course is to familiarize students with modern rapid prototyping methods for manufacturing machine and equipment components.

Programme content Lecture on the topic of rapid prototyping. Incremental techniques. Kinematics and principle of operation of devices working with selected 3D printing technologies. Materials for 3D printing. Design exercises in the laboratory: 3D printer.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	He/She has the knowledge necessary to understand the economic aspects of engineering activities.	ME_K1_W12	W P	C L
	2	He/She has knowledge of management in a mechanical engineering company.	ME_K1_W13	W P	C L
Skills	1	He/She can make a preliminary economic analysis of engineering activities in the field of production organization.	ME_K1_U07	W P	C L
	2	He/She has a background in organizational work in an industrial environment.	ME_K1_U06	W P	C L
Social Competence	1	He/She is aware of the responsibility associated with decisions, made in the organization and management of production.	ME_K1_K03	W P	C L
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan

The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr inż. Chudy Roman
Calculation class (C)	0	
Laboratory class (L)	0	
Project (P)	30	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0
Laboratory class (L)	0
Project (P)	30
Seminar (S)	0
Preparation for classes	5
Preparation of a report/paper/ project/presentation	10
Independent study of the course topics	10
Examination or final colloquium	5
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Manufacturing Technology
Form of Study	Full-Time Studies
Semester	Sixth
Course Title	Technological instrumentation

Nazwa przedmiotu	Oprzyrządowanie technologiczne		
ECTS points	4	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Examination
Course code	6.WK.T1	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	He/She knows the basic principles of engineering structural design.
		2	He/She knows the principles of error analysis.
	Skills	1	He/She knows how to make construction documentation.
		2	He/She knows how to identify sources of errors.
	Social Competence	1	He/She is able to analyze the engineering tasks performed.
		2	

Course Goals Familiarize students with the principles of operation and design of machining jigs and fixtures.

Programme content Lecture covering issues related to the construction, application and design solutions of technological tooling used in machinery. Design of a special handle. Laboratory classes: evaluation and applicability of technological tooling.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	He/She has knowledge in analyzing the operation, construction and design principles of machining fixtures.	ME_K1_W05	W L P	C H K
	2				
Skills	1	He/She can design a machining fixture typical of a manufacturing process.	ME_K1_U09	W P	D K
	2				
Social Competence	1	He/She demonstrates ingenuity in task-related activities in the design of machining fixtures.	ME_K1_K06	W L P	C H K
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan

The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr inż. Chudy Roman
Calculation class (C)	0	
Laboratory class (L)	15	
Project (P)	15	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	0
Laboratory class (L)	15
Project (P)	15
Seminar (S)	0
Preparation for classes	5
Preparation of a report/paper/ project/presentation	15
Independent study of the course topics	15
Examination or final colloquium	5
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

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Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic
Level of study	First Cycle Studies
Specialization	Manufacturing Technology
Form of Study	Full-Time Studies
Semester	Seventh
Course Title	Technology machinery and equipment repair

Nazwa przedmiotu	Technologia napraw maszyn i urządzeń		
ECTS points	4	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Examination
Course code	7.WK.T1	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	Has knowledge of engineering materials and new technologies
		2	
	Skills	1	Is able to identify and formulate specifications for simple engineering tasks of a practical nature in the design of machines and devices.
		2	
	Social Competence	1	Understands non-technical aspects of a mechanical engineer's activity, impact on the environment and user safety.
		2	

Course Goals Preparing students to look for new methods of repairing machines and devices.

Programme content Discussion of the basic characteristics and definitions of maintenance and repair work. Using artificial intelligence to plan and carry out machine renovation works. Methods and principles of inspection after repair.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	Has knowledge of the life cycle of machines and mechanical devices in the field of machine technology,	ME_K1_W14	W C L	C H I
	2				
Skills	1	Is able to critically analyze the functioning of a machine or its assembly and evaluate existing technical solutions in the construction, production and operation of machines.	ME_K1_U10	L	I
	2				
Social Competence	1	Is aware of the responsibility associated with decisions made as part of engineering activities, especially in terms of the safety of oneself and other people.	ME_K1_K07	C	I K
	2				

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	30	dr inż. Prażnowski Krzysztof
Calculation class (C)	15	
Laboratory class (L)	15	
Project (P)	0	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	30
Calculation class (C)	15
Laboratory class (L)	15
Project (P)	0
Seminar (S)	0
Preparation for classes	10
Preparation of a report/paper/ project/presentation	15
Independent study of the course topics	15
Examination or final colloquium	0
Additional contact hours	0
Total student workload	100
Number of contact hours (from the study plan)	60

* hour (class) means 45 minutes

dr hab. inż. Augustynowicz Andrzej
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Opole University of Technology
Faculty of Mechanical Engineering
Course Description Card

Field of study	Mechanical Engineering
Profile of Education	General Academic

Level of study	First Cycle Studies
Specialization	Manufacturing Technology
Form of Study	Full-Time Studies
Semester	Fifth

Course Title	Tool systems
Nazwa przedmiotu	Systemy narzędziowe

ECTS points	3	Subject type	W-K
Language of lecture	angielski	Mode of completing the course	Course credit

Course code	5.WK.T2	Subject related to scientific research/pract. profess. prepar. (Y/N)	T

Preliminary requirements of the course	Knowledge	1	He/She has knowledge of the basics of mechanical engineering and machine parts.
		2	He/She has knowledge of the basics of cavity machining.
	Skills	1	He/She can analyze the functioning of machines.
		2	He/She can determine the effect of basic manufacturing techniques.
	Social Competence	1	He/She is aware of the responsibilities and consequences associated with his decisions.
		2	He/She is aware of the observance of professional ethics.

Course Goals Familiarize students with selected tool systems.

Programme content Lecture on classification of cutting tools. Tooling systems for turning, milling, hole machining. Tool clamping systems. Measurement and diagnostics of cutting tools. Design exercises including design of special tool for hole making and design of special turning tool. Selection of a tooling system for peeling on a CNC milling machine.

Learning outcomes for the course - after completing the training cycle			The reference to the learning outcomes	Form of course (W, C, L, P, S)	Methods of verification of learning outcomes
Knowledge	1	He/She has knowledge of the metrology of eometric quantities.	ME_K1_W09	W L P	C
	2	He/She has knowledge in physics, including the fundamentals of mechanics, thermodynamics, optics, electricity and magnetism, nuclear physics, solid state physics and elements of quantum physics, needed to understand, describe and use physical phenomena in the design manufacture and operation of measuring instruments and systems.	ME_K1_W02	W L P	C K
Skills	1	He/She is able to obtain information from literature, databases and other sources, able to integrate the information obtained.	ME_K1_U08	W L P	C K
	2	He/She can make a critical analysis of how things work and evaluate existing technical solutions.	ME_K1_U01	W L P	C K
Social Competence	1	He/She is aware of the need to supplement knowledge throughout life.	ME_K1_K01	W L P	C K
	2	He/She is aware of the responsibility associated with decisions, made in the framework of engineering activities, especially in terms of safety of his own and other people and protection of the environment.	ME_K1_K01	W L P	C K

Methods of verification of learning outcomes:

A-written exam, B-oral exam, C-written assessment, D-oral assessment, E-based on partial marks of oral answers, F-based on partial marks of written answers, G-term paper, H-assessment from reports, I-assessment from realization of exercises, J-assessment from preparations for exercises, K-assessment from the project implementation, L-assessment of the written implementation of the project, M-assessment of defense of project, N-assessment of form of presentation, O-assessment of content of presentation, P-observation of students' activity, R-observation of the regularity.

Hours in the study plan		
The course format	Hours/sem. (h)	Tutor (coordinator) of the course (title/academic degree/professional title, name and surname
Lecture (W)	15	dr inż. Chudy Roman
Calculation class (C)	0	
Laboratory class (L)	15	
Project (P)	15	
Seminar (S)	0	

Student workload	
Types of student activities*	Average number of hours* allocated on completed activities
Lecture (W)	15
Calculation class (C)	0

Laboratory class (L)	15
Project (P)	15
Seminar (S)	0
Preparation for classes	5
Preparation of a report/paper/ project/presentation	10
Independent study of the course topics	10
Examination or final colloquium	5
Additional contact hours	0
Total student workload	75
Number of contact hours (from the study plan)	45

* hour (class) means 45 minutes

dr hab. inż. Małecka Joanna
Head of the organizational unit
(stamp/signature)

dr inż. Wydrych Jacek
Dean of Faculty
(stamp/signature)

Wydział Mechaniczny - lista przedmiotów na kierunku Mechanical Engineering - Studia stacjonarne - Studia pierwszego stopnia (od 2024) - spec. Machine Design

symbol	Advanced manufacturing techniques	Automatics and robotics	Construction documentation	Differential and integral calculus	Diploma seminar I	Diploma seminar II	Diploma work (Engineering project)	Diploma work (Engineering project)	Engineering graphics	Engineering statistics	Ergonomic and industrial safety	Exploitation of industrial apparatus	Exploitation of vehicles and machinery	Finite element method	Fluid thermomechanics I	Fluid thermomechanics II	Foreign language	Foreign language	Foreign language	Foreign language	Foreign language	Foreign language	Foreign language	Foreign language	Fundamentals of electrical engineering	Fundamentals of machine design	Fundamentals of machine design in practice	Fundamentals of materials science	General science of mechanics	Humanistic and social subject I	Humanistic and social subject II	Individual report - simulation work	Information technology in engineering	Machinery damage	Material Engineering	Mathematics I	Mathematics II	Mechanical Engineering Introduction	Mechanics I	Mechanics II	Physical education	Physical education	Professional practice	Protection of invention property	Removal processes I	Removal processes II	Selected chipless technologies	Selected measuring techniques and systems	Software engineering and data processing	Strength of materials	Strength of materials in practice	Technical drawing and CAD I	Technical drawing and CAD II	Technical drawing and CAD III	Technical drawing in practice	Technical metrology	Techniques of welding	Technological processes design	Technologies and industrial apparatus	Vehicle and machine propulsion	CAD machine design	CAM process design	Computational engineering	Construction of vehicles and machines	Design of molds with the use of CAD	Diagnostics of machines and devices	Hydraulic and pneumatic drives and control	Individual report - structural work	Machine reliability	Rapid Manufacturing Techniques
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Wiedza - efekty nie pokryte:
Brak

Umiejętności - efekty nie pokryte:
Brak

Kompetencje - efekty nie pokryte:
Brak

Wydział Mechaniczny - lista przedmiotów na kierunku Mechanical Engineering - Studia stacjonarne - Studia pierwszego stopnia (od 2024) - spec. Manufacturing Technology

symbol	Advanced manufacturing techniques	Automatics and robotics	Construction documentation	Differential and integral calculus	Diploma seminar I	Diploma seminar II	Diploma work (Engineering project)	Diploma work (Engineering project)	Engineering graphics	Engineering statistics	Ergonomic and industrial safety	Exploitation of industrial apparatus	Exploitation of vehicles and machinery	Finite element method	Fluid thermomechanics I	Fluid thermomechanics II	Foreign language	Foreign language	Foreign language	Foreign language	Foreign language	Foreign language	Foreign language	Foreign language	Fundamentals of electrical engineering	Fundamentals of machine design	Fundamentals of machine design in practice	Fundamentals of materials science	General science of mechanics	Humanistic and social subject I	Humanistic and social subject II	Individual report - simulation work	Information technology in engineering	Machinery damage	Material Engineering	Mathematics I	Mathematics II	Mechanical Engineering Introduction	Mechanics I	Mechanics II	Physical education	Physical education	Professional practice	Protection of invention property	Removal processes I	Removal processes II	Selected chipless technologies	Selected measuring techniques and systems	Software engineering and data processing	Strength of materials	Strength of materials in practice	Technical drawing and CAD I	Technical drawing and CAD II	Technical drawing and CAD III	Technical drawing in practice	Technical metrology	Techniques of welding	Technological processes design	Technologies and industrial apparatus	Vehicle and machine propulsion	Bases of quality engineering	Design of chipless processes	Fundamentals of coordinate metrology	Fundamentals of programming in a CAM system	Individual report - technological work	Machine control techniques	Programming of cnc machines	Rapid prototyping techniques	Technological instrumentation	Technology machinery and equipment repair	Tool systems
ME_K1_W01	.	.	.	X	.	.	.	.	.	X	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	X	X	X	X	X	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	X	.	.	.	.	.
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ME_K1_W05	.	.	.	.	.	.	.	X	.	.	.	X	.	.	.	.	X	.	.	.	.	.	.	.	.	X	X	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	X	.	.
ME_K1_W06	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
ME_K1_W07	.	.	.	.	X	X	X	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.
ME_K1_W08	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	X	X	.	X	.	X	.	.	X	.	X	.	.	.	.
ME_K1_W09	.	.	.	.	.	.	.	.	X	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	X	.	.	.	.	.	.	.	X	.	.	.	.	.	.	X	.	.	.	.	.	.	.	X
ME_K1_W10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.
ME_K1_W11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
ME_K1_W12	.	.	.	.	.	.	.	X	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	X	.	.	.
ME_K1_W13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.
ME_K1_W14	.	.	.	.	X	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.
ME_K1_W15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	X	X	X	X	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
ME_K1_W16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
ME_K1_U01	.	.	.	X	X	X	X	X	.	X	.	.	.	.	.	X	.	.	.	.	.	.	.	.	X	.	.	X	X	.	.	.	.	.	X	.	.	X	.	X	.	.	.	.	X	X	X	X	.	.	.	.	.	.	X	X	X	.	.	.	.	.	X	X	X	.	X	.	.	.	X
ME_K1_U02	.	.	.	.	.	.	.	.	.	.	.	.	.	X	X	.	X	X	X	X	X	X	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
ME_K1_U03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	X	X	X	X	X	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
ME_K1_U04	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	X	X	X	.	.	.	X	.	.	.	.	.	.	.	.	X	.	.	.	.
ME_K1_U05	X	.	.	.	.	.	.	.	.	.	.	X	.	.	X	.	.	.	.	.	.	.	.	.	X	.	X	.	X	.	.	X	.	.	.	X	X	X	X	X	.	.	.	.	.	.	.	.	X	.	X	.	.	.	.	.	.	.	.	.	X	.	.	X	.	.	.	.	.	.	.
ME_K1_U06	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	X	.	X	.	.	.
ME_K1_U07	.	.	.	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	X	.	.	.
ME_K1_U08	.	X	.	.	.	.	X	.	.	.	.	.	X	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	X	X	.	X	.	.	.	.	X	X	.	.	.	.	.	X	.	.	X	.	.	.	.	.	.	.	X
ME_K1_U09	.	.	X	X	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	X	.	X	.	.	.	.	.	.	X	.	.	.	X	.	.	X	.	.	.	X	.	.
ME_K1_U10	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	X	X	.	.	.	.	.	.	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.
ME_K1_K01	.	.	.	X	.	.	X	X	X	X	.	.	.	.	X	.	X	X	X	X	X	X	X	X	X	.	.	X	X	.	.	X	X	X	X	X	X	X	X	X	X	X	X	.	X	X	X	X	X	X	X	.	.	.	.	X	X	X	X	.	.	X	X	.	X	.	.	.	.	.	X
ME_K1_K02	.	.	.	.	X	X	.	.	X	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.
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ME_K1_K04	.	.	.	.	.	.	.	.	X	.	.	X	.	.	.	.	X	X	X	X	X	X	X	X	X	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	X	.	.	.	.	.	.	.
ME_K1_K05	.	.	.	.	.	.	X	.	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	X	.	.	.	.	.	.	.	.	.	.	X	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.
ME_K1_K06	X	.	.	X	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	X	.	.	.	.	.	.	.	.	X	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.
ME_K1_K07	.	.	X	.	X	X	.	X	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	X	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.

Wiedza - efekty nie pokryte:
Brak

Umiejętności - efekty nie pokryte:
Brak

Kompetencje - efekty nie pokryte:
Brak