University of Debrecen

Faculty of Engineering

Engineering Management MSc Program

2025

TABLE OF CONTENTS

DEAN'S WELCOME

Welcome to UD's Faculty of Engineering!

The Faculty of Engineering of the University of Debrecen has become an outstanding centre of education and research in the Eastern Hungarian region. Following the footsteps of our predecessors, the academic and administrative staff of the Faculty work hand in hand to make our training programmes and researches meet both national and international standards.

The Faculty of Engineering is one of Hungary's most significant institutions of higher-education, and its 3000 students make it a dominant faculty of the University of Debrecen which - having the most international students, offering the most academic programmes among Hungarian universities and having been classified as a research university, the highest of qualifications - is officially listed among the best universities in the country.

We welcome the most outstanding and inquisitive students of the region with an enthusiastic and professional team of academics and researchers, and a set of laboratories unique in the country. We consciously aspire to develop the quality of education and research further, based on a close cooperation between the Faculty and the industry. Our students enter many prestigious competitions and they are becoming increasingly successful and acclaimed, while our instructors are working on a growing number of national and international projects of basic and applied research.

The Faculty bridges the gap between theory and practice and provides a high-quality theoretical background merged into practice-oriented training based on industrial relations. We do our best to maintain the high prestige of the engineering diplomas awarded by the University of Debrecen and to make sure that the knowledge and achievements of students who graduate from our Faculty continue to be recognised in the labour market.

All things considered, you are kindly advised to read this bulletin which hopefully reflects our endeavours appropriately and provides all the information you need to know about your chosen training programme. We are looking forward to supporting the personal and professional growth of our future engineers.

With the best of wishes for the years to come,

Géza Husi

Dean

HISTORY OF THE UNIVERSITY

The history of Debrecen's higher education dates back to the 16th century. The Calvinist Reformed College, established in 1538, played a central role in education, teaching in the native language and spreading Hungarian culture in the region as well as in the whole country. The College was a sound base for the Hungarian Royal University, founded in 1912. Apart from the three academic faculties (arts, law, theology) a new faculty, the Faculty of Medicine was established, and the University soon became one of the regional citadels of Hungarian higher education. Today, University of Debrecen is classified as "University of National Excellence" and offers the highest number of academic programs in the country, therefore it is considered to be one of the best universities in Hungary. Its reputation is the result of its quality training, research activities and the numerous training programs in different fields of science and engineering in English. With 14 faculties and a student body of almost 30.000, out of which about 3700 are international students, the University of Debrecen is one of the largest higher education institutions in Hungary.

The history of the Faculty of Engineering dates back to 1965, when the Technical College was established. In 1972 it was renamed Ybl Miklós Polytechnic and in 1995 it became part of Kossuth Lajos University. In 2000 the Faculty of Engineering became part of the integrated University of Debrecen.

In 2005 the Bologna System was introduced which supports the competitiveness of qualifications received at the University of Debrecen against universities all over Europe.

The Faculty of Engineering is practice-oriented and develops skills required for the current needs of the national and international labour market. The teaching staff is involved in numerous domestic and international research and design projects. The recently-opened new building wing with its ultra-modern design hosts several lecture halls, seminar rooms and laboratories equipped with the latest technology. Our students are provided with practical knowledge, training and field practice from numerous prestigious domestic and multi-national industry partners. The internship periods are excellent opportunities for students to experience how theory is put into practice at the most renowned industry representatives and become more successful in the labour market of this highly competitive sector. Students learn how to work in the working environment of multi-national companies and adapt to challenges easily. After graduation they will be able to work at a strategic decision-making level, giving priority to efficiency and engineering ethics.

The Faculty of Engineering offers a great variety of BSc, MSc courses and post-graduate training courses tailored to the needs of the rapidly changing world of engineering and focusing on European and international trends. In 2011 the Faculty of Engineering launched engineering trainings in English. In order to optimize the quality of training, the Faculty continuously strives to expand the number of industrial and educational partners at home and abroad.

The Faculty of Engineering has been a pioneer in the introduction of Quality Management System at faculty level to measure and evaluate the efficiency of its education and teaching staff in order to improve the quality of education and training from the feedback received.

The Faculty of Engineering has a vivid student life. There is a film club waiting for movie buffs and the door of the Faculty library is always open. The library is not only the host to the latest technical books, exhibitions and tea afternoons with invited speakers, but students can also purchase theatre and concert tickets from the librarians. The Borsos József Dormitory is also a hub of activities for students.

The increasing number of international students brings cultural and ethnic diversity to the faculty.

Our aim is to aid students to become efficient members of the labour market and enrich the world of engineering in Hungary and abroad with their knowledge and expertise.

ADMINISTRATION UNITS FOR INTERNATIONAL PROGRAMMES

COORDINATING CENTER FOR INTERNATIONAL EDUCATION

98, Nagyerdei körút, Debrecen 4032
Telephone: +36-52-512-900/62796
E-mail: info@edu.unideb.hu

Program Director (Non-Medical Programmes)	László Kozma PhD
Admission Officer (for fee paying students)	Ms. Ibolya Kun Mr. Norbert Tanki
Admission Officer (for scholarship students)	Ms. Lilla Almási-Fónai Ms. Annamária Rácz
Administrative Assistant (for fee paying students)	Ádám Losonczi Norbert Balogh
Administrative Assistant (for scholarship students)	Mr. Norbert Tanki

The Coordinating Centre for International Education supports the international degree programmes of the University of Debrecen in giving new students information on admission and entrance exam. It has tasks in promoting and is in charge of tasks like enrolment, study contracts, modifying student status or degree programme, activating student status, modifying students' personal data, requesting and updating student cards, providing certificates for the Immigration Office (for residence permit), issuing student status letters and certificates on credit recognition, concluding health insurance contract and providing Health Insurance Card, helping students with visa process application.

INTERNATIONAL OFFICE AT THE FACULTY OF ENGINEERING

2-4, Ótemető utca, Debrecen H-4028

Telephone: +36-52-415-155/78709

Head of Education Office room 120	Ms. Krisztina Tóth JD toth.krisztina@eng.unideb.hu
International Relations Officer room 123	Márton Lévai levai.marton@eng.unideb.hu
International Relations Officer room 123	Ms. Zsuzsa Flóra Péter peter.zsuzsa.flora@eng.unideb.hu
International Relations Officer room 124	Ms. Zita Popovicsné Szilágyi szilagyizita@eng.unideb.hu
Dean’s Representative for Foreign Affairs	Zsolt Tiba PhD habil. tiba@eng.unideb.hu

The International Office has been functioning since 2014 in order to ensure the smooth running of the international degree courses. The office is responsible for student administration (full-time students, full-time transfer students, visiting/Erasmus students), providing certificates for students, considering and accepting requests, solving problems related to course registration, giving information about internship, final exam, thesis, etc.

DEAN'S OFFICE

Faculty of Engineering

2-4, Ótemető utca, Debrecen H-4028

Dean:	Géza Husi PhD, habil., Full Professor
E-mail:	husigeza@eng.unideb.hu
Vice-Dean for Educational Affairs:	Ms. Judit T. Kiss PhD, Associate Professor
E-mail:	tkiss@eng.unideb.hu
Vice-Dean for Scientific Affairs:	Imre Kocsis PhD habil., Full Professor
E-mail:	kocsisi@eng.unideb.hu
Head of Directory Office:	Mr. Szabolcs Kovács
E-mail:	kovacs.szabolcs@unideb.hu

DEPARTMENTS OF FACULTY OF ENGINEERING

Department of Architecture
Department of Basic Technical Studies
Department of Building Services and Building Engineering
Department of Civil Engineering
Department of Engineering Management and Enterprise
Department of Environmental Engineering
Department of Mechanical Engineering
Department of Mechatronics
Department of Vehicles Engineering
Off-Site Department of Aviation Engineering

DEPARTMENT OF ARCHITECTURE

2-4, Ótemető utca, Debrecen, H-4028, room 409, Tel: +36-52-512-900 / 78704

name, position	e-mail, room number
János Vági DLA, Associate Professor, Head of Department	vagi.janos@eng.unideb.hu room 409
Ms. Réka Aradi, Master Instructor	reka0416@gmail.com room 409
Miklós János Boros DLA, Associate Professor	boros.miklos.janos@gmail.com room 409
Ms. Edit Huszthy DLA, Associate Professor	huszthyedit@gmail.com room 409
Ferenc Kállay, Master Instructor	kallay.epitesz@t-online.hu room 409
Ferenc Keller, Master Instructor	kellerfeco@gmail.com room 409

Péter Kovács DLA, Associate Professor	kovacspeterdla@gmail.com room 409
Zoltán Major DLA, Senior Lecturer	m.zoltan@eng.unideb.hu room 409
Ms. Dóra Eszter Molnár, Assistant Lecturer	molnar.dora.e@gmail.com room 409
Péter Müllner DLA, Senior Lecturer	mullner.peter@eng.unideb.hu room 409
Dénes Nagy, Departmental Engineer	nagy.denes@eng.unideb.hu room 409
Balázs Rose, Assistant Lecturer	balazs.sunarq@gmail.com room 409
Ms. Dóra Szuszik, Assistant Lecturer	szuszik.dora@gmail.com room 409
Ms. Renáta Zsiros, Assistant Lecturer	sienat91@gmail.com Room 409
Ms. Bettina Lékó, Administrative Assistant	leko.bettina@eng.unideb.hu room 409

DEPARTMENT OF BASIC TECHNICAL STUDIES

2-4 Ótemető utca, Debrecen, H-4028, ground floor 2, Tel: +36-52-512-900 / 77732

name, position	e-mail address, room number
Imre Kocsis PhD habil, Full Professor, Head of Department	kocsisi@eng.unideb.hu ground floor 2
Gusztáv Áron Szíki PhD, College Professor	szikig@eng.unideb.hu ground floor 7
Balázs Kulcsár PhD, Associate Professor	kulcsarb@eng.unideb.hu ground floor 4
Ms. Rita Nagyné Kondor PhD habil, Associate Professor	rita@eng.unideb.hu ground floor 5
Csaba Gábor Kézi PhD, Associate Professor	kezicsaba@science.unideb.hu ground floor 6
Ms. Adrienn Varga PhD, Associate Professor	vargaa@eng.unideb.hu ground floor 3/B.
Ms. Gyöngyi Bodzásné Szanyi PhD, Senior Lecturer	szanyi.gyongyi@science.unideb.hu ground floor 5
Ms. Boglárka Burján-Mosoni, Senior Lecturer	burjan-mosoni.boglarka@eng.unideb.hu ground floor 3/B
Ms. Ildikó Papp PhD, Associate Professor	papp.ildiko@inf.unideb.hu ground floor 3/B
Ms. Éva Szikiné Ádámkó PhD, Associate Professor	adamko.eva@eng.unideb.hu ground floor 7
Ms. Erika Perge PhD, Associate Professor	perge@eng.unideb.hu ground floor 6

Péter Puskás, Department engineer	puskas.peter@eng.unideb.hu ground floor 6
Attila Szántó PhD, Senior Lecturer	szanto.attila@eng.unideb.hu ground floor 7
Ms. Nikolett Bodnár, Administrative Assistant	bodnar.nikolett@eng.unideb.hu ground floor 2

DEPARTMENT OF BUILDING SERVICES AND BUILDING ENGINEERING

Ótemető utca 2-4., Debrecen, H-4028, room 121, Tel: +36-52-512-900 / 77770

name, position	e-mail, room number
Ákos Lakatos PhD, habil., DSc, Full Professor Head of Department	alakatos@eng.unideb.hu 323. Gáz- és tüzeléstechnika labor
Imre Csáky PhD, Associate Professor, Deputy Head of Department	imrecsaky@eng.unideb.hu U.2.07. Légtechnika labor
Ferenc Kalmár PhD, habil., DSc, Full Professor	fkalmar@eng.unideb.hu U.2.04. BKM labor
Ms. Tünde Klára Kalmár PhD, Associate Professor	kalmar_tk@eng.unideb.hu Vízellátás, csatornázás labor, udvar
Zoltán Verbai PhD, Senior Lecturer	verbai@eng.unideb.hu 323. Gáz- és tüzeléstechnika labor
Ferenc Szodrai PhD, Associate Professor	szodrai@eng.unideb.hu 323. Gáz- és tüzeléstechnika labor
Béla Bodó, Master Instructor	bela.bodo@eng.unideb.hu 322. Fűtéstechnika labor

Sándor Hámori, Master Instructor	sandor.hamori@eng.unideb.hu 323. Gáz- és tüzeléstechnika labor
Gábor L. Szabó PhD, Associate Professor	l.szabo.gabor@eng.unideb.hu 323. Gáz- és tüzeléstechnika labor
Attila Kostyák, Assistant Lecturer	kostyak.attila@eng.unideb.hu U.2.07. Légtechnika labor
Szabolcs Szekeres, Assistant Lecturer	szekeres@eng.unideb.hu U.2.07. Légtechnika labor
Ferenc Kostyák, Master Instructor, part-time	kostyak.ferenc@eng.unideb.hu 323. Gáz- és tüzeléstechnika labor
Máté Csontos, Departmental Engineer	csontos.mate@eng.unideb.hu 323. Gáz- és tüzeléstechnika labor
Ákos Szabó, Departmental Engineer	szabo.akos@eng.unideb.hu 323. Gáz- és tüzeléstechnika labor
Ms. Krisztina Bereczki Administrative Assistant	bkriszti@eng.unideb.hu 323. Gáz- és tüzeléstechnika labor

DEPARTMENT OF CIVIL ENGINEERING

2-4 Ótemető utca, Debrecen, H-4028, room 212, Tel: +36-52-512-900 / 78701

name, position	e-mail, room number
Imre Kovács PhD, College Professor, Head of Department	dr.kovacs.imre@eng.unideb.hu room 212/e
György Csomós PhD, University Professor	csomos@eng.unideb.hu room U.2.06., Lab

Ms. Kinga Nehme PhD, Associate Professor	knehme@eng.unideb.hu room U.0.12., Lab
Ms. Herta Czédli PhD, Associate Professor	herta.czedli@eng.unideb.hu room U.2.05., Lab
Ms. Gabriella Hancz PhD, Associate Professor	hgabi@eng.unideb.hu room U.2.05., Lab
László Radnay PhD, Associate Professor	laszlo.radnay@eng.unideb.hu room U.2.06., Lab
Zsolt Varga PhD, Associate Professor	vzs@eng.unideb.hu room 119, Lab
Ms. Éva Lovra PhD, Senior Lecturer	lovra.eva@eng.unideb.hu room U.2.05., Lab
Zoltán Bereczki PhD, Senior Lecturer	bereczki.zoltan@eng.unideb.hu room U.2.06., Lab
Titusz Igaz, Assistant Lecturer	igaz.titusz@eng.unideb.hu room 212/b
Alex Zoltan Juhasz, Assistant Lecturer	juhasz.alex@eng.unideb.hu room 212/c
János Bíró, Master Instructor	biroj@eng.unideb.hu room 119, Lab
Péter Lugosi, Master Instructor	lugosi.peter@eng.unideb.hu room U.2.06., Lab
Ms. Beáta Pataki, Master Instructor	pataki.bea@eng.unideb.hu, room U.2.05., Lab
Ms. Beáta Szakács, Master Instructor	beaszakacs@eng.unideb.hu room 212/b

Attila Vámosi, Master Instructor	vamosi.attila@eng.unideb.hu room 212/a
Zsolt Vadai, Master Instructor	vadai@eng.unideb.hu room U.2.06. Lab
József Kovács, Departmental Engineer	j.kovacs@eng.unideb.hu room U.0.12., Lab
Ádám Ungvárai, Departmental Engineer	ungvarai@eng.unideb.hu room 212/a
Ms., Mónika Tóthné Csákó, Administrative Assistant	csmoni@eng.unideb.hu room 212.

DEPARTMENT OF ENGINEERING MANAGEMENT AND ENTERPRISE

2-4 Ótemető utca, Debrecen, H-4028, room 206, Tel: +36-52-512-900 / 77766

name, position	e-mail, room number
Ms. Judit T. Kiss PhD, Associate Professor, Head of Department	tkiss@eng.unideb.hu room V.0.11
Ms. Edit Szűcs PhD habil, Full Professor	edit@eng.unideb.hu room V.0.11
Ms. Andrea Emese Matkó PhD habil, Associate Professor	andim@eng.unideb.hu room V.0.11
Domicián Máté PhD habil, Associate Professor	mate.domician@eng.unideb.hu room V.0.11
László Török PhD, Associate Professor	dr.torok.laszlo@eng.unideb.hu room V.0.11

Ms. Éva Diószeginé Zentay, Master Instructor	zentayevi@eng.unideb.hu room V.0.11
Ms. Tünde Jenei PhD, Master Instructor	jeneit@eng.unideb.hu room V.0.11
Ms. Anita Mikó-Kis, Master Instructor	drkisanita@eng.unideb.hu room V.0.11
Emil Varga, Master Instructor	emil@eng.unideb.hu room V.0.11
Zsolt Buri, Assistant Lecturer	Buri.zsolt@eng.unideb.hu room V.0.11
Norbert Mátrai, PhD, Assistant Lecturer	matrai.norbert@eng.unideb.hu room V.0.11
Dániel Gácsi, Assistant Lecturer	mikula.gyula@gmail.com room V.0.11
Ms Viktória Mannheim, Associate Professor	mannheim.viktoria@eng.unideb.hu room V.0.11
Ms. Judit Bak Administrative Assistant	bakjudit@eng.unideb.hu room V.0.11
Ms. Tímea Török Administrative Assistant	torok.timea@eng.unideb.hu room V.0.11

DEPARTMENT OF ENVIRONMENTAL ENGINEERING

2-4 Ótemető utca, Debrecen, H-4028, room V.0.10., Tel: +36-52-512-900 / 77827

name, position	e-mail, room number
Dénes Kocsis PhD, Associate Professor, Head of Department	kocsis.denes@eng.unideb.hu room V.0.10
Ms. Ildikó Bodnár PhD, College Professor	bodnari@eng.unideb.hu room V.0.10
János Szendrei PhD, Associate Professor	szendrei.janos@eng.unideb.hu room V.0.10
Ms. Dóra Beáta Buzetzky PhD, Senior Lecturer	dorabeata@eng.unideb.hu room V.0.10
Gábor Bellér PhD, Associate Professor	beller.gabor@eng.unideb.hu room V.0.10
Ms. Andrea Izbékiné Szabolcsik, Assistant Lecturer	szabolcsikandi@eng.unideb.hu room V.0.10
Ms. Alexandra Truzsi PhD, Senior Lecturer	truzsi.alexandra@eng.unideb.hu room V.0.10
Lajos Gulyás PhD, Emeritus College Professor, Lecturer	lgulyas@eng.unideb.hu room V.0.10
Ms. Andrea Halászné Ercsei, Administrative Assistant	halaszneandi@eng.unideb.hu room V.0.10

DEPARTMENT OF MECHANICAL ENGINEERING

2-4 Ótemető utca, Debrecen, H-4028, room V.0.13., Tel: +36-52-512-900 / 77776

name, position	e-mail, room number
Tamás Mankovits PhD, Associate Professor, Head of Department	tamas.mankovits@eng.unideb.hu room V.0.13
Sándor Bodzás PhD, Associate Professor, Deputy Head of Department	bodzassandor@eng.unideb.hu room V.0.13
Ms Szilvia Barkóczyné Gyöngyösi PhD, Associate Professor	szilvia.gyongyosi@eng.unideb.hu room U.0.16
Levente Czégé PhD, Associate Professor	czege.levente@eng.unideb.hu room V.0.13
Dávid Huri PhD, Associate Professor	huri.david@eng.unideb.hu room V.0.13
László Molnár PhD, Associate Professor	molnar.laszlo@eng.unideb.hu room V.0.13
Sándor Pálinkás PhD, Associate College Professor	palinkassandor@eng.unideb.hu room V.0.13
István Árpád PhD, Senior Lecturer	arpad.istvan@eng.unideb.hu room V.0.13
Csilla Enikő Czégéni, Senior Lecturer	csilla.czegeni@eng.unideb.hu room V.0.13
Krisztián Deák PhD, Senior Lecturer	deak.krisztian@eng.unideb.hu room V.0.13
Czomba Sándor PhD, Senior Lecturer	sandor.czomba@eng.unideb.hu room V.0.13

Gábor Balogh, Master Instructor	balogh.gabor@eng.unideb.hu room U.0.16
Tibor Pálfi, Master Instructor	tibor.palfi@eng.unideb room 301
Sándor Andráskó, Master Instructor	sandor.andrasko@eng.unideb.hu room U.0.16
Márton Lévai, Engineer Instructor	levai@eng.unideb.hu room U.0.16
Attila Debreceni, Department Engineer, PhD Student	debreceni.attila@eng.unideb.hu room V.0.13
István Domokos, Department Engineer, PhD Student	istvan.domokos@eng.unideb.hu room V.0.13
Dániel Nemes, Department Engineer, PhD Student	nemes.daniel@eng.unideb.hu room V.0.13
Gábor Ruzicska, Department Engineer, PhD Student	ruzicska.gabor@eng.unideb.hu room V.0.13
Máté Bereczki, Department Engineer	mate.bereczki@eng.unideb.hu room V.0.13
Zoltán Gergő Géresi, Department Engineer	zoltan.geresi@eng.unideb.hu room U.0.16
Ms. Lilla Csonkáné Dóró, Administrative Assistant	lilla.csonkane@eng.unideb.hu room V.0.13
Ms. Szandra Kalmárné Sitku, Administrative Assistant	szandra.sitku@eng.unideb.hu room V.0.13

DEPARTMENT OF MECHATRONICS

2-4 Ótemető utca, Debrecen, H-4028, room 120, Tel: +36-52-512-900 / 77742

name, position	e-mail, room number
Sándor Hajdu PhD associate professor, Head of Department	hajdusandor@eng.unideb.hu Room V.1.06.
Kornél Sarvajcz PhD, Senior Lecturer	sarvajcz@eng.unideb.hu Room V.1.05.
Prof. Péter Korondi PhD, Full Professor	korondi.peter@eng.unideb.hu Room V.1.09.
Husam Abdulkareem Neamah Almusawi, PhD, Senior Lecturer	husam@eng.unideb.hu Room V.1.10.
Gyula Attila Darai, Department Engineer	darai@eng.unideb.hu Room V.1.10.
Gyula Korsoveczki, Assistant Lecturer, PhD student	korsoveczki.gyula@eng.unideb.hu Room V.1.03.
Róbert Mikuska, Assistant Engineer, PhD student	mikuska.robert@eng.unideb.hu Room V.1.03.
Kornél Katona, Assistant Engineer, PhD student	katona.kornel@eng.unideb.hu Room V.1.12.
László Keczán, Assistant Engineer, PhD student	keczan.laszlo@eng.unideb.hu Room V.1.02.
Dávid Nusser, Department Engineer	nusser.david@eng.unideb.hu Room V.1.02.
Dániel Vígh, Department Engineer	vigh.daniel@eng.unideb.hu Room V.1.02.
Károly Árpád Kis, Department Engineer	kis.karoly@eng.unideb.hu Room V.1.02.
Péter Szilágyi, Assistant Engineer, PhD student	szilagyi.peter@eng.unideb.hu Room V.1.12.
Taleb MAyar Abdullah Abdo, Assistant Engineer, PhD student	mayart@eng.unideb.hu Room V.1.11.

Sarvajcz-Bánóczy Emese, Assistant Engineer, PhD student	emese.banoczy@eng.unideb.hu
Gabriella Kövér, Administrative Assistant	kover.gabriella@eng.unideb.hu Room V.1.06.

DEPARTMENT OF VEHICLE ENGINEERING

2-4 Ótemető utca Debrecen, H-4028, room V0.05, Tel: +36-52-512-900 / 77805

name, position	e-mail, room number
József Menyhárt PhD, Head of Department, Associate Professor	jozsef.menyhart@eng.unideb.hu Room V.0.05
Zsolt Tiba PhD habil., College Professor	tiba@eng.unideb.hu Room 122.
Péter Tamás Szemes PhD, Associate Professor	szemespeter@eng.unideb.hu Room V.0.04
Timotei István erdei, Assistant Lecturer, Phd student	timoteierdei@eng.unideb.hu Room V.0.04
József Kertész, Assistant Lecturer, PhD student	kertesz.jozsef@eng.unideb.hu room V.0.04
Zoltán Telepóczki, Master Instructor	telepoczki.zoltan@eng.unideb.hu Room V.0.04
Ms. Éva Csomor, Master Instructor	csomor.eva@eng.unideb.hu Room V.0.04
János Szilágyi, Department engineer	janos.szilagyi@eng.unideb.hu Room V.0.04
Masuk Abdullah, Department engineer	masuk@eng.unideb.hu Room V. 0.09
Mrs. Klára Ágnes Törökné Kiss, Administrative Assistant	toroknekissklara@eng.unideb.hu Room V.0.05
Mrs. Beáta Ványai, Administrative Assistant	vanyai.beata@eng.unideb.hu Room V.0.09

DEPARTMENT OF AVIATION ENGINEERING

1 Szatke Ferenc utca, Debrecen, H-4030, Tel: +36-52-870-270, www.pharmaflight.hu

name, position	e-mail, room number
Ms. Enikő Földi JD, Chief Executive Director	training@pharmaflight.hu
Gyula Győri, Honorary Associate Professor, Head of Department	training@pharmaflight.hu
Ms. Krisztina Szabó MD, Head of Aeromedical Department	aeromedical@pharmaflight.hu

Academic Calendar
Faculty of Engineering

2025/2026

SEMESTER 1	
Registration week	September 1–7, 2025
Exam week for exam courses scheduled for the 1st semester of the academic year 2025/2026	September 1–12, 2025
"Celebrating 60 Years of the Faculty of Engineering" anniversary event series – jubilee celebration	September 4, 2025
"Celebrating 60 Years of the Faculty of Engineering" anniversary event series – "MK 60" staff day	September 5, 2025
Opening ceremony of the academic year	September 7, 2025 (Sunday)
"MSc Open Day" event	October 7, 2025
"1st IEEE International Conference on Crisp & Soft Computing in AI, Modeling and Control 2025" conference	October 15–16, 2025
"Innovation Forum on Digital Design and Manufacturing 2025" fair	October 15–16, 2025
"Nations on Stage" event	October 21, 2025
"Career Days in Mechanical Engineering" (Fair and ISCAME – International Scientific Conference on Advance in Mechanical Engineering)" – organized by the Department of Mechanical Engineering	November 6–8, 2025
Scientific Students' Associations Conference (TDK)	November 21, 2025
"International Dessert Day – Treat Yourself" event	December 10, 2025
"Open Day and Parent Meeting" event	January 21, 2026
For non-graduating students	
Study period	September 8–December 12, 2025 (14 weeks)
Drawing week 1 – for completing assignments	October 20–24, 2025

Drawing week 2 – for completing and improving assignments except for final-semester subjects	December 8–12, 2025
Exam period	December 15, 2025–January 30, 2026 (7 weeks)
For graduating students	
Study period	September 8–November 7, 2025 (9 weeks)
Drawing week 1 – for completing assignments	October 20–24, 2025
Exam period	November 10–December 12, 2025 (5 weeks)
Thesis submission deadline	Determined by the department, no earlier than 14 days before the beginning of the final exam period, no later than 14 days before the final exam.
Final exam (state exam) period	Determined by the department, at least one occasion between December 15-19, 2025 or January 5-23 2026.
SEMESTER 2	
Registration week	February 2–8, 2026
“Building Engineering Industry days and Fair” organized by the Department of Building Services and Building Engineering	March 5–6, 2026
“Industry Day in Debrecen” event	March 25, 2026
“New Trends and Challenges in Management – Management of Global Business Processes”– conference by Department of Engineering Management and Enterprise	March 26–27, 2026
“Environment, Health, Safety (EHS) International Symposium V 2025 / ISEHS 2025” organized by the Department of Environmental Engineering	March 26–27, 2026
For non-graduating students	
Study period	February 9–May 15, 2026 (14 weeks)
Drawing week 1 – for completing assignments	March 23–27, 2026

Drawing week 2 – for completing and improving assignments except for final-semester subjects	May 11–15, 2026
Exam period	May 18–July 3, 2026 (7 weeks)
For graduating students	
Study period	February 9–April 10, 2026 (9 weeks)
Drawing week 1 – for completing assignments	March 23–27, 2026
Exam period	April 13–May 15, 2026 (5 weeks)
Thesis submission deadline	Determined by the department, no earlier than 14 days before the beginning of the final exam period, no later than 14 days before the final exam.
Final exam (state exam) period	Determined by the department, at least one occasion between 18 May – June 5, 2025
Closing ceremony of the academic year, graduation ceremony	Determined by the department, between June 12 – July 5 2026

THE ENGINEERING MANAGEMENT MASTER'S PROGRAM

INFORMATION ABOUT THE PROGRAM

Name of master's program:	Engineering Management Master's Program
Specializations available:	• Industrial Process Engineering Specialization • Material Handling and Logistics • Construction Industry Specialization
Field, branch:	Engineering; Engineering management
Level:	MSc (master)
Qualification:	Engineering Manager
Mode of attendance:	Full-time
Faculty:	Faculty of Engineering
Program coordinator:	Dr Edit Szűcs, Professor
Program length:	4 semesters
Credits total:	120 (Thesis: 30, Optional subjects: 6)

Professional competencies to be acquired

An engineering manager

Knowledge:

- understands the general and specific principles, rules, relations and procedures pertaining to natural sciences, engineering sciences, agricultural science, organisational science necessary to work in the field of engineering.
- knows the functional operation, requirements of engineering devices, production systems.
- knows the conditions, methods of creating and improving economical maintenance.
- knows the operational principles of organisations as purposeful systems.
- knows the engineering-, agriculture- and management-related activities and their relations.
- knows the theory and methodology necessary to found production and service organisations and to control and improve their operation.

- knows the engineering, economic and legal regulations relating to quality management, environmental protection, consumer protection, product responsibility, health and safety at work.
- possesses the widely-used problem-solving techniques necessary for research and scientific work.
- knows the main quantitative analytical methods and the basics of operation research, programming in mathematics, probability theory and statistics in mathematics.

Abilities:

- is capable of the practical application of the acquired knowledge and using problem-solving techniques.
- is able to review production and service processes from engineering, economic, human and other social perspectives and communicate with representatives from different professional fields.
- is able to prepare and realise business plans, complete pre-decision-making tasks and make decisions, work out and implement innovation strategies.
- is capable of the application of integrated knowledge from the following areas: engineering devices, technological processes, materials and technologies, electronics, informatics.
- is able to complete the tasks of engineering value analysis, quality assurance of production systems and technologies, improve the quality and efficiency indicators of economy.
- is able to harmonize the design and implementation of innovation processes.
- is able to harmonize tasks which need multidisciplinary engineering skills and control their realisation.
- is creative, flexible, has good communication, argumentative, cooperative and problem-solving skills.
- is able to apply statistical and econometric devices to deepen research activity.

Attitude:

- is open and sensitive to professional and technological development and innovation and their proactive application.
- identifies with the professional and ethical value system relating to his/her professional field.
- endeavours to design and complete the tasks at a professionally high level individually or in teamwork.
- is characterised by continuous readiness to learn, profound and in-depth education, highly developed analytic and synthetic skills, environmental sensitivity.
- is ethically strong, critical and self-critical.

- is capable of cooperation, teamwork and completing leadership tasks individually followed by the necessary amount of practice.
- shows respect for other people's professional opinion, results.
- is characterised by system-based thinking and approach.

Autonomy and responsibility:

- is capable of solving engineering-economic-like tasks individually.
- is careful before individually making decisions in consultation with representatives from diverse fields (primarily that of engineering, economics, law). He/she takes responsibility for his/her decisions.
- is characterised by initiative, responsibility and decision-making ability.
- when making decisions he/she takes into account health and safety at work; engineering, economic and legal regulations; professional-ethical aspects.
- evaluates his/her inferiors' work, facilitates professional development through his/her critical remarks, educates them to take responsibility and shows ethical behaviour in their professional field.
- is able to individually keep track of technical, technological, economic, financial, legal, social changes, problem-solving techniques, global social and economic processes in relation to his/her professional field.

Specializations

Students select a specialization prior to enrolling on the program. The minimum number of applicants per specialization shall be 10.

Certain subject groups are common for all Engineering Management MSc students (scientific knowledge, economics and humanities, field-specific subjects). The subject group "Differentiated Field-specific Subjects" contains specialized topics and fields.

COMPLETION OF THE ACADEMIC PROGRAM

The Credit System

Majors in the Hungarian Education System have generally been instituted and ruled by the Act of Parliament under the Higher Education Act. The higher education system meets the qualifications of the Bologna Process that defines the qualifications in terms of learning outcomes: statements of what students know and can do on completing their degrees. In describing the cycles, the framework uses the European Credit Transfer and Accumulation System (ECTS).

ECTS was developed as an instrument of improving academic recognition throughout the European Universities by means of effective and general mechanisms. ECTS serves as a model of academic recognition, as it provides greater transparency of study programmes and student achievement. ECTS in no way regulates the content, structure and/or equivalence of study programmes.

Regarding each major, the Higher Education Act prescribes which professional fields define a certain training program. It contains the proportion of the subject groups: natural sciences, economics and humanities, subject-related subjects and differentiated field-specific subjects.

For the Engineering Management MSc programme, the following professional fields define the training:

- Natural Sciences (Mathematics, Physics, Chemistry and other subjects, e.g. Quantitative Methods, Mechanics, Ecology, Nanotechnology, Econometry) 20-35 credit points;
- Economics and Humanities (International Management and Economics, Analysis of Competitiveness, Labour Economics, Sustainable Development, Organisational Improvement, Human Resources Management, Communication Skills), other professional skills defined in the curriculum: 10-20 credit points;
- Engineering Management [System Analysis, Design and Control of Systems, Process Control, Technologies in different branches (engineering industry, chemical industry, nanotechnology, biotechnology, waste management), other professional skills defined in the curriculum]: 15-35 credit points.

Credit points assigned to field-specific subjects along with thesis: 40-60.

Minimum of credit points assigned to optional subjects: 6

Credit points assigned to thesis: 30

Credits total: 120

During the program students have to complete a total amount of 120 credit points. It means approximately 30 credits pro semester. The curriculum contains the list of subjects (with credit points) and the recommended order of completing subjects which takes into account the prerequisite(s) of each subject.

There is a certain degree of freedom in the order students can complete the subjects. However, it is recommended that the suggested order be followed because some subjects can only be taken after the completion of the prerequisite subject(s), and/or can be the prerequisites for other subjects. You can find the recommended list of subjects in chapter "Guideline".

Guideline (List of Subjects/Semesters)

The total number of credit points (120) of the training program can be obtained by completing the subjects of the curriculum. There is a certain degree of freedom in the order students can complete the subjects. However, it is recommended that the suggested order be followed because some subjects can only be taken after the completion of the prerequisite subject(s), and/or can be the prerequisites for other subjects.

About the prerequisites of each subject please read the chapter "Course Descriptions"!

The list of subjects one must complete during the semesters according to the model curriculum of Engineering Management MSc programme **Construction Industry specialization**.

1st semester	2nd semester
Quantitative Methods Applied Mathematics in Manufacturing Design Development of Organization and Human Resource Advanced Corporate Finance Negotiation and Conflict Management Risk and Reliability Building Energetics II Optional subject Work and Fire Safety	Econometrics Introduction to Nanotechnology Applied Engineering Advanced Quality and Lean Management Control of Integrated Information System Organization of Construction Processes in BIM Environment Complex Project Industrial Internship Optional subject
3rd semester	**4th semester**
International and Management Accounting Leadership Competencies Development Operation Management Reconstruction MSc Thesis I	Environmental Impact Assessment Project Leadership Construction Management III MSc Thesis II

The list of subjects one must complete during the semesters according to the model curriculum of Engineering Management MSc programme **Industrial Process Engineering specialization**:

1st semester	2nd semester
Quantitative Methods Applied Mathematics in Manufacturing Design Development of Organization and Human Resource Advanced Corporate Finance Negotiation and Conflict Management Risk and Reliability Production Technologies Optional subject Work and Fire Safety	Econometrics Introduction to Nanotechnology Applied Engineering Advanced Quality and Lean Management Control of Integrated Information System Cellular Manufacturing Complex Project Industrial Internship Optional subject
3rd semester	**4th semester**
International and Management Accounting Leadership Competencies Development Operations Management Advanced Applied Engineering MSc Thesis I	Environmental Impact Assessment Project Leadership System Engineering MSc Thesis II

The list of subjects one must complete during the semesters according to the model curriculum of Engineering Management MSc programme **Material Handling and Logistics specialization**:

1st semester	2nd semester
Quantitative Methods Applied Mathematics in Manufacturing Design Development of Organization and Human Resource Advanced Corporate Finance Negotiation and Conflict Management Risk and Reliability	Econometrics Introduction to Nanotechnology Applied Engineering Advanced Quality and Lean Management Control of Integrated Information System Advanced Production Logistics Complex Project Industrial Internship

Digital Logistics Optional subject Work and Fire Safety	Optional subject
3rd semester	4th semester
International and Management Accounting Leadership Competencies Development Operations Management Advanced Warehouse Systems MSc Thesis I	Environmental Impact Assessment Project Leadership Planning of Logistics Systems MSc Thesis II

Work and Fire Safety Course

According to the Rules and Regulations of the University of Debrecen students have to complete the online course for work and fire safety in the first semester of their studies. Registration for the course and completion are necessary for graduation. For MSc students the course is only necessary only if BSc diploma has been awarded outside of the University of Debrecen.

Registration in the Neptun system by the subject: MUNKAVEDELEM

Students have to read an online material until the end to get the signature on Neptun for the completion of the course. The link of the online course is available on webpage of the Faculty.

Physical Education

According to the Rules and Regulations of University of Debrecen a student has to complete Physical Education courses at least in one semesters during his/her Master's training. Our University offers a wide range of facilities to complete them. Further information is available from the Sport Centre of the University, its website: http://sportsci.unideb.hu or on the webpage of the Faculty: https://eng.unideb.hu/en/node/214.

Optional Courses

According to the Rules and Regulations of the University of Debrecen a student has to complete elective courses during his/her Master's training. These elective courses are opened by the Departments at the Faculty of Engineering at the beginning of the actual semester. You can find the list of the actual semester under “Current Students”>”Useful Information about your Study”>”Optional subjects”.

A student can also select optional courses from other faculties of University of Debrecen to complete.

In the Engineering Management MSc programme, you have to gain at least 6 credits by completing elective subjects.

Pre-degree Certification

The pre-degree certificate verifies in the Neptun that the student has successfully completed the study and exam requirements as set out in the curriculum, namely gained the necessary credit points (120), completed all the required subjects and the criterium subjects (Physical Education, Internship, Work and Fire Safety course). Submitting thesis is not a requirement for the pre-degree certificate. Student status ends at the end of that semester when the pre-degree certificate is obtained.

Students who obtained the pre-degree certificate can take the final exam. Final exam can be taken in the final exam period of both the fall semester and the spring semester.

If the final exam is taken within two years after obtaining the pre-degree certificate, the conditions are the same as the ones effective in the academic year of the student’s starting year.

If the final exam is taken more than two years after obtaining the pre-degree certificate the conditions of taking the exam are stipulated by the Faculty.

No final exam can be taken later than five years after the termination of the student status.

Thesis

Thesis is the creative elaboration of a professional task (fields: engineering processes, finance, economics, marketing, corporate finance, management, quality and environment controlling, production and banking) in written form as defined in the requirements of the training program. By solving the task, the student relies on his/her studies using national and international literature under the guidance of an internal and external supervisor. By preparing and defending thesis, students who complete the Engineering Management master’s program prove that they are capable of the practical applications of the acquired skills, summarizing the work done and its results in a professional way, creatively solving the tasks related to the topic and doing individual professional work.

Students in the master program must write a thesis as a prerequisite of the final exam. Requirements regarding the content of the thesis, the general aspects of evaluation and the number of credits assigned to it are defined based on the requirements of the program. In Engineering Management Master Programme the number of credits assigned to the thesis is 30.

Thesis topics are announced by the departments until the end of Week 4 of the study period of the last but one semester. The department hands out thesis guides to assist students with preparing their thesis. Students may also offer a topic for the thesis, which the competent head of the department may accept or reject. The conditions on the acceptance of a SSS (Student Scientific Society) paper as a degree thesis are defined by the Faculty. SSS papers are supposed to meet the requirements of a thesis both in form and content. Furthermore, it is necessary that the committee of the Pre-SSS make suggestions on the SSS papers to be accepted as theses.

Thesis is prepared under the guidance of an internal supervisor previously approved by the department and with the assistance of an external supervisor also previously approved by the department.

The thesis submission deadline is defined in the academic calendar of the Faculty (issued by the Vice-Rector for Education) or, failing that, the Head of the Department sets the date.

Thesis is evaluated by a reviewer. Based on the review, the internal supervisor makes suggestions for the evaluation of thesis. Finally, the committee assesses it on a five-grade scale. If the reviewer evaluates the thesis firmly as fail, the student may not take the final exam and must create a new thesis. Students must be informed about it. Conditions on resubmitting the thesis are designated by the head of the relevant educational unit responsible for the major or specialization.

Final exam

After obtaining the pre-degree certificate, students conclude their studies in the Engineering Management master's (MSc) program by taking the final exam. The final exam shall test and assess the knowledge, skills and abilities requisite to the award of the degree, whereby students shall also prove their ability to apply the acquired knowledge in practice. The conditions for taking the final exam and the parts of the final exam itself shall be defined in the requirements for the training program (see entry 'Completion of studies'). The final exam shall be taken in front of a board in the examination period following the award of the pre-degree certificate. If a candidate does not pass the final exam until the termination of his/her student status, that student can sit for the final exam any time after the termination of his/her student status according to the provisions regarding the final exam, effective at the time of taking the final exam.

The final exam consists of different parts:

1. thesis defence, answers to possible questions, remarks;
2. oral exam

a. Integrated Management Module (for all specializations):

questions and topics related to the subjects *Advanced Corporate Finance, Operation Management, Advanced Quality Management, Project Leadership*.

b. Engineering modules depending on the specialization:

Engineering Module – Industrial Process Engineering Specialization:

questions and topics related to the subjects: *Production Technologies, Cellular Manufacturing, Advanced Applied Engineering, System Engineering*.

Engineering Module – Construction Industry Specialization:

questions and topics related to the subjects: *Building Energetics II, Organization of Construction Processes in BIM Environment, Reconstruction, Construction Management III*.

Engineering Module – Material Handling and Logistics Specialization:

questions and topics related to the subjects: *Advanced Production Logistics, Digital Logistics, Advanced Warehouse Systems, Planning of Logistics Systems*.

The requirements for the oral part of the final exam and the agenda of the topics with the indication of their literature are announced by the department no later than the last week of the study period. The oral examination shall be assessed on a five-grade scale by the members of the final examination board. The board shall then consult behind closed doors and vote about the final grade for the final exam. In case of equal division of the votes, the chairperson shall be given the casting vote. The result of the final exam shall be announced by the chairperson of the board. Minutes shall be taken during the final examination. The marking scheme contains the diploma grade and the grades awarded for the different parts of the final exam.

Improving failed final exam

If any parts of the final exam are evaluated as fail, according to the existing rules of the university, it can be retaken. The retake of the final exam may be attempted in the following examination period at the earliest.

Final examination board

The chair of the final exam board shall be delegated and by the dean of the faculty. He/she is selected from among the acknowledged internal and external experts of the professional field. The final exam board consists of – besides the chairperson – at least two members and the required number of examiners. The length of the appointment of membership in the final exam board shall be one year. Students are assigned to different examination boards by the department.

COURSE DESCRIPTIONS FOR ENGINEERING MANAGEMENT MSC

The order of subject follows the subject list of the model curriculum (see Appendix).

Subject group “Science Knowledge” (for all 3 specializations)

Quantitative Methods

Code: MK5KVANA04MX17-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 1st year, 1st semester

Number of teaching hours/week (lecture + practice): 2+2

Topics:

Basics of probability calculus (probability space, conditional probability, independence of events, random variables, distributions sights, the law of large numbers); Sampling methods, descriptive statistics; Estimates (the estimated properties, point estimates, interval estimates); Non-parametric tests (fit testing, homogeneity, independence test); Parametric tests (Tests for the expected value and the standard deviation); The basic tasks of linear programming, applications; Time series analysis; Statistics in quality management (Statistical Process Control, Six Sigma); Simulation, Monte Carlo methods; Decision theory, decision model, decision matrix, decision-making process; Game theory

Literature:

Compulsory:

- Rice, J. A. (2007): Mathematical statistics and Data Analysis. Belmont. Thomson’s.
- Wolfram, S. (2003): The mathematica book. Champaing. Wolfram Media.

Recommended:

- STATISTICS Methods and Applications:
- http://www.statsoft.com/textbook
- Murphy, P.: Introduction to Quantitative Methods:
- http://www.ucd.ie/statdept/classpages/introductiontoquantitativemet.htm
- Investopedia (www.investopedia.com) CFA Level 1 - Chapter 2: Quantitative Methods:
- http://www.investopedia.com/study-guide/cfa-exam/level-1/quantitative-methods/
- Cornuejols, G. - Trick, M.: Quantitative Methods for the Management Sciences (Course Notes)

- http://mat.gsia.cmu.edu/classes/QUANT/

Schedule

1st week Registration week	
2nd week: **Lecture:** Survey of probability calculus (probability space, conditional probability). **Practice:** Problems related to probability calculus.	**3rd week:** **Lecture:** Discrete and continuous random variables. **Practice:** Problems related to random variables.
4th week: **Lecture:** Special random variables (binomial, Poisson, exponential, uniform and normal distribution). **Practice:** Problems related to random variables.	**5th week:** **Lecture:** Basics of statistics: point estimation, interval estimation, hypothesis testing **Practice:** Hypothesis testing
6th week: **Lecture:** Normality test, one- and two-factor ANOVA **Practice:** ANOVA	**7th week:** **Lecture:** Normality test, one- and two-factor ANOVA **Practice:** ANOVA
8th week: 1st drawing week	
9th week: **Lecture:** Types of optimization problems: unconstrained and constrained optimization. **Practice:** Problems related to optimization.	**10th week:** **Lecture:** Methods of optimization: derivative-based optimization. **Practice:** Problems related to derivative-based optimization.
11th week: **Lecture:** Derivative-free optimization I (genetic algorithms, neural networks). **Practice:** Problems related to derivative-free optimization.	**12th week:** **Lecture:** Basics of decision theory – decision model, decision matrix, decision-making process. **Practice:** Process simulation
13th week: **Lecture:** Basics of game theory **Practice:** Problems related to game theory.	**14th week:** **Lecture:** Markov chains. **Practice:** Problems related to Markov chains.
15th week: 2nd drawing week	

A, for a signature:

Participation at practice classes is compulsory. Students must attend practice classes and may not miss more than three occasions during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students can't take part in any practice class with another group. Attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed practice classes must be made up for at a later date, being discussed with the tutor.

During the semester there are two tests: the mid-term test on the 8th week and the end-term test on the 15th week. Students must sit for the tests.

B, for a grade:

The grade is based on the average grade of the two tests.

The minimum requirement of the mid-term and the end-term test is 60% separately. The grade for each test is given according to the following (score/grade): 0-59 % = fail (1); 60-69 % = pass (2); 70-79 % = satisfactory (3); 80-89 % = good (4); 90-100 % = excellent (5).

If the score of any test is below 60, the student once can take a retake test of the whole semester material.

Applied Mathematics in Manufacturing Design

Code: MK5AMTTM04MX18-EN

ECTS Credit Points: 4

Evaluation: exam grade

Year, Semester: 1st year, 1st semester

Number of teaching hours/week (lecture + practice): 1+2

Topics:

The applied mathematics in manufacturing design course is covered the following topics: Business Forecasting and product lifecycle, time series forecasting, capacity analysis of machine, Models and indicators in production system, inventory design, aggregate planning. At the end of the semester the student should be have a basic understanding of design, and schedule manufacturing system.

Literature:

Compulsory:

- Wayne L. Winston: Operations research: Applications and Algorithm, 4th Edition, Brook/Cole, Canada, 2004, ISBN: 978-0534380588
- William J. Stevenson: Operations management, 13th ed., McGraw-Hill Education - New York, 2018, ISBN 978-125-9921-81-0
- Stephen N. Chapman, J. R. Tony Arnold, Ann K. Gatewood, Lloyd M. Clive: Introduction to Materials Management, 8th. global ed., Pearson New - Jersey, 2016, ISBN: 978-1-292-16235-5

Recommended:

- Steven Nahmias, Tava Lennon Olsen: Production and Operations Analysis, 7th ed., Waveland press, Inc., - Long Grove Illinois, 2015, ISBN 978-1-4786-2306-9

Schedule

1st week Registration week	
2nd week: **Lecture:** Applied mathematics in manufacturing processes: introduction to production and service operations. Components of demand. **Practice:** Knowledge survey – solved problem.	**3rd week:** **Lecture:** Competitiveness, productivity, model of manufacturing systems. **Practice:** Determination of manufacturing system's components. Productivity – problem solving.
4th week: **Lecture:** Introduction to Forecasting. Elements, steps in the forecasting process. Qualitative Forecasts. **Practice:** Forecast based on time series data.	**5th week:** **Lecture:** Monitoring forecast error. Choosing a forecasting technique, using forecast information. **Practice:** Associative forecasting technique.
6th week: **Lecture:** Capacity planning for products and services, waste in the manufacturing. **Practice:** Determination of real and theoretical capacity. Bottleneck in process – developing capacity strategies.	**7th week:** **Lecture:** Service level improving. Capacity planning for services. **Practice:** Developing capacity strategies for services.
8th week: 1st drawing week	
9th week: **Lecture:** Introduction to Aggregate planning. **Practice:** Techniques for Aggregate planning.	**10th week:** **Lecture:** MRP - Inputs of MRP, steps of MRP. **Practice:** MRP processing
11th week: **Lecture:** Lean operation – characteristics of lean systems. **Practice:** Lean tools.	**12th week:** **Lecture:** Introduction to Life Cycle Assessment. **Practice:** CML2001, ISO14067GWP,
13th week: **Lecture:** Life cycle Assessment – LCA. **Practice:** Examples, case studies.	**14th week:** **Lecture:** LCA programming **Practice:** LCA project.

15th week: 2nd drawing week

Requirements

A, for a signature:

Participation at practice is compulsory. Students must attend lectures and may not miss more than three of them during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Attendance at lectures will be recorded by the lecturer. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed lectures must be made up for at a later date, being discussed with the tutor.

End of the semester the students must write a test for signature. The minimum requirement of the test is 60%. If the score of test is below 60% the student once can take a retake test of the whole semester material until 1st week of the exam period. If the result is 60 % or better the retake test is success.

B, for grade:

B, for a grade:

The course ends in an examination in the exam period.

The grade is given according to the following (score/grade): 0-59 % = fail (1); 60-69 % = pass (2); 70-79 % = satisfactory (3); 80-89 % = good (4); 90-100 % = excellent (5).

Econometrics

Code: MK5OKONM04MV17-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 1st year, 2ndsemester

Number of teaching hours/week (lecture + practice): 1+3

Topics:

The objective of this course is to prepare students for basic empirical work in economics. This course aims to make students familiar with the basic concepts of econometric analysis. In particular, the course will be focused on data analysis, regression analysis, testing, and forecasting. By the end of the course, the student should be able to understand the scope and limitations of classical econometric techniques, read, write and properly interpret studies and reports of an applied econometric nature using these techniques.

Literature:

Compulsory:

- Wooldridge, J. (2013): Introductory Econometrics: A Modern Approach Upper Level Economics Titles Series. South-Western Cengage Learning. ISBN: 1111531048, 9781111531041. Fifth Edition.
- Ramanathan, R. (2002): Introductory econometrics with applications. Harcourt College Publishers. Fifth Edition. ISBN: 0-03-034342-9.

Recommended:

- Brooks, C. (2008): Introductory Econometrics for Finance. Second Edition. Cambridge University Press. ISBN: 1139472305, 9781139472302.
- Dougherty, C. (2011): Introduction to Econometrics. Fourth Edition. Oxford University Press. ISBN: 978-0-19-956708-9.

1st week Registration week	
2nd week: **Lecture:** The nature of econometrics and the structure of economic data Introduction (Types of data, Data sources, The structure of economic data, steps of empirical analysis, econometric model, Mean, Mode, Median, Measures of dispersion) **Practice:** Calculating Problems – Computer-related problems	**3rd week:** **Lecture:** Relationship among variables - Correlation Analysis (Types of correlation, Scatter diagrams, Correlation graph, Pearson's coefficient of correlation, rank correlation) **Practice:** Correlation (negative and positive correlation – examples, linear and non-linear correlation, Properties of Pearson Correlation Coefficient, Calculations for Coefficient of Correlation.
4th week: **Lecture:** Linear Regression – The simple regression model I. Deriving the Ordinary Least Squares Estimates **Practice:** Calculating Problems – Computer-related problems. (Dependent – independent variable, error term, fitted values and residuals, Algebraic Properties of OLS Statistics)	**5th week:** **Lecture:** Linear Regression – The simple regression model II. - Goodness of Fit **Practice:** Calculating Problems - the total sum of squares (SST), the explained sum of squares (SSE), and the residual sum of squares (SSR), R-squared of the regression.
6th week: **Lecture:** The Expected of the OLS estimators The Variances of the OLS Estimators - Unbiasedness of OLS **Practice:** Calculating Problems – Computer exercises	**7th week:** **Lecture:** Estimating the Error variance (Variances of the OLS Estimators, Heteroskedasticity, homoskedasticity) **Practice:** Sampling Variances of the OLS Estimators, Case study analysis
8th week: 1st drawing week	

9th week: **Lecture:** Hypotheses Testing: The t Test, Confidence intervals, The F test **Practice:** Calculating Problems – Computer-related problems. (Confidence intervals, F and t statistics)	**10th week:** **Lecture:** Nonlinear regression model I - Linearization **Practice:** The linearized regression - Logarithmic Functional Forms; Quadratic function, The double logarithmic functions
11th week: **Lecture:** Non-linear regression model II **Practice:** Functional forms - exponential, hyperbolic, polynomial model	**12th week:** **Lecture:** Multiple regression analysis I - estimation **Practice:** The Model with Two Independent Variables (Obtaining the OLS Estimates, Interpreting the OLS Regression Equation - interpreting the coefficients)
13th week: **Lecture:** Multiple regression analysis II - estimation **Practice:** The Model with k Independent Variables – computer-related problem	**14th week:** **Lecture:** Time series data analysis (The nature of time series data, Time series regression models, index numbers) **Practice:** Computer-related problems – Complex model problem (estimation of time series regression model)
15th week: 2nd drawing week	

Requirements

A, for a signature:

Participation at practice classes is compulsory. Students must attend practice classes and may not miss more than three occasions during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students can't take part in any practice class with another group. Attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed practice classes must be made up for at a later date, being discussed with the tutor.

During the semester there are two tests: the mid-term test on the 8th week and the end-term test on the 15th week. Students must sit for the tests.

B, for a grade:

The course ends in an examination.

The minimum requirement of the mid-term, the end-term test and the teamwork is 50% separately. Based on the score of the tests separately, the grade for the tests and the examination is given according to the following table:

The grade is given according to the following: 0-49 = fail; 50-62 = pass (2); 63-75 = satisfactory (3); 76-89 = good (4); 90-100 = excellent (5).

If the score of any test is below 50, the student once can take a retake test of the whole semester material.

An offered grade: It may be offered for the students if the average of the mid-term test, end-term tests and the teamwork is at least good (4). The offered grade is the average of them.

Introduction to Nanotechnology

Code: MK5NANOM04MX17-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 1st year, 2nd semester

Number of teaching hours/week (lecture + practice): 1+2

Topics:

The chemistry and physics nanotechnology importance of two aspects may take: structure for the operation of chemical nanotechnology devices, respectively, development of physical methods and onset of nanotechnology tools and processes chemical, physical, physical-chemical interactions. The aim of this course is describing the importance of nanotechnology in practice and the role of chemistry and physics in development of nanotechnology.

Literature:

Compulsory:

- Bharat Bhushan (ed.): Springer handbook of nanotechnology, (2004) Berlin, New York, Springer-Verlag
- Alain Nouailhat: An Introduction to Nanoscience and Nanotechnology, (2008) WILEY, London
- Duncan Shaw: Introduction to Colloid and Surface Chemistry, (1992) Butterworth-Heinemann, Oxford

Recommended:

- Peter Fratzl, John W.C. Dunlop, Richard Weinkam (ed.): Materials Design Inspired by Nature: Function Through Inner Architecture, (2013), RCS Publishing
- Gabor L. Hornyak, J. J. Moore, H.F. Tibbals, J. Dutta: Fundamentals of Nanotechnology, (2008), CRC Press

Schedule

1st week Registration week

2nd week:

Lecture: Introduction to the course, Historical perspective of micro and nano-manufacturing technology, advantages and applications of nanotechnology.

Practice: Ethics and environmental effects of nanotechnology. Safety Education.

3rd week:

Lecture: Materials overview, atomic structure, bonding, polymers, electrical characteristics, crystal structures and defects, physical chemistry of solid surfaces.

Practice: Real crystal structures models building

4th week:

Lecture: Overview of nano fabrication methods: top-down and bottom-up approaches.

Practice: Effects of grain size variation.

5th week:

Lecture: Physical and chemical properties of materials Introduction to composites materials and their application.

Practice: Corrosion Tests of Materials

6th week:

Lecture: Nanomaterial characterization Observing with electrons.

Practice: Application of scanning electron microscope, Investigation of nano structures.

7th week:

Lecture: Characterization techniques, Optical microscopy, Spectrophotometer, AFM, FFM, TEM, X-ray.

Practice: EDS - Energy Dispersive X-ray Spectroscopy.

8th week: 1st drawing week

9th week:

Lecture: Introduction to colloid chemistry sol-gel processing, applications.

Practice: Making of colloid structure.

10th week:

Lecture: Dispersion in physical and chemical systems.

Practice: Investigation of colloid structures.

11th week:

Lecture: Introduction to the rheology of complex fluids.

Practice: Rheological characterization of Fluids –suspensions, emulsions.

12th week:

Lecture: Fundamentals of electrochemistry.

Practice: Industrial applications, Determination of concentration by conductivity.

13th week:

Lecture: Organic compounds and bio-applications of nano-materials.

Practice: Application of bio- and chemi-sensors, Sensor technologies.

14th week:

Lecture: Nanomaterial inspired by nature

Practice: Nature tech application.

15th week: 2nd drawing week

Requirements

A, for a signature:

Participation at practice is compulsory. Students must attend lectures and may not miss more than three of them during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Attendance at lectures will be recorded by the lecturer. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed lectures must be made up for at a later date, being discussed with the tutor.

End of the semester the students must write a test for signature. The minimum requirement of the test is 60%. If the score of test is below 60% the student once can take a retake test of the whole semester material until 1st week of the exam period. If the result is 60 % or better the retake test is success.

B, for a grade:

The course ends in an examination in the exam period in written.

The grade is given according to the following (score/grade): 0-59 % = fail (1); 60-69 % = pass (2); 70-79 % = satisfactory (3); 80-89 % = good (4); 90-100 % = excellent (5).

Environmental Impact Assessment

Code: MK5KOHVM04MX23-EN

ECTS Credit Points: 4

Evaluation: exam

Prerequisites: Introduction to Nanotechnology

Year, Semester: 2nd year, 2nd semester

Number of teaching hours/week (lecture + practice): 1+2

Topics:

The subject deals with the environmental side of corporate decision-making. Aim of the course is to help students become familiar with greening company operations. To this end, students learn analysing stakeholder approaches as well as similarities and differences in sustainability evaluation methods of various business activities.

Literature:

Compulsory:

Debref, Romain: Environmental Innovation and Ecodesign: Certainties and Controversies. John Wiley & Sons, Inc. 2018. ISBN 9781786302380, 9781119543947.

· Sroufe, Robert: Integrated Management: How Sustainability Creates Value for Any Business. Emerald Publishing Limited, 2018. ISBN 9781787145627, 9781787145610.

· Literature Reviews on Corporate Environmental Management, Emerald Publishing Limited, 2020. ISBN 9781787145627, 9781787145610.

Schedule

1st week Registration week	
2nd week: **Lecture:** Sustainability basics **Practice:** Case studies	**3rd week:** **Lecture:** Air quality and climate change **Practice:** Case studies
4th week: **Lecture:** Water and wastewater **Practice:** Case studies, test 1	**5th week:** **Lecture:** Soil and food **Practice:** Student presentations
6th week: **Lecture:** Biodiversity **Practice:** Case studies	**7th week:** **Lecture:** Waste and energy **Practice:** Case studies, test 2
8th week: 1st drawing week	
9th week: **Lecture:** Environmental and sustainability management **Practice:** Student presentations error principle	

Requirements

A, for a signature: Participation at practice classes is compulsory. Students must attend practice classes and may not miss more than three practice classes during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students can't take part in any practice class with another group. Attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed practice classes must be made up for at a later date, being discussed with the tutor.

During the semester there are two tests: the mid-term test is on the 4th week and the end-term test is on the 7th week. Students must sit for the tests.

B, for a grade: The course ends in an examination.

The minimum requirement of the mid-term, the end-term test and the presentations is 50% separately. Based on the score of the tests separately, the grade for the tests and the examination is given according to the following table:

The grade is given according to the following: 0-49 = fail; 50-62 = pass (2); 63-75 = satisfactory (3); 76-89 = good (4); 90-100 = excellent (5).

If the score of any test is below 50, the student once can take a retake test of the whole semester material.

An offered grade: It may be offered for the students if the average of the mid-term test, end-term tests and the presentations is at least good (4). The offered grade is the average of them.

Subject group "Economics and Humanities" (for all 3 specializations)

Development of Organization and Human Resource

Code: MK5SZEMM04MX17-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 1st year, 1stsemester

Number of teaching hours/week (lecture + practice): 2+2

Topics:

This course aims to describe organizational changes and the management of organizational development processes, tools, and models by processing case studies.

Literature:

Compulsory:

- Mee-Yan Cheung-Judge, Linda Holbeche (2015): Organization Development: A Practitioner's Guide for OD and HR. Kogan Page; 2nd edition. ISBN-10: 0749470178
- W. Warner Burke, Debra A. Noumair (2015): Organization Development: A Process of Learning and Changing. Pearson FT Press; 3rd edition. ISBN-10: 0133892484
- W. Warner Burke (2013): Organization Change: Theory and Practice (Foundations for Organizational Science series). SAGE Publications, Inc; 4th edition. ISBN-10: 145225723X
- Stephen Taylor (2023): Armstrong's Handbook of Human Resource Management Practice. Kogan Page Ltd. ISBN-10: 1398606634

- Gary Dessler (2019): Human Resource Management, Global Edition. Pearson Education Limited Robert N. Lussier, John R. Hendon (2012): Human Resource Management: Functions, Applications, Skill Development. SAGE Publications, Inc; 1st edition. ISBN-10: 1292309121

Recommended:

- Cornelia Gamlem (2022): Big Book of HR – 10th Anniversary Edition. Career Press. ISBN-10: 1632651947

Schedule

1st week Registration week	
2nd week: **Lecture:** Situation analysis, Organizational Structure Determination, job Descriptions, information flow **Practice:** SWOT, PEST, BCG, Drawing an organization chart and information flow map	**3rd week:** **Lecture:** Identification of problems, exploring the causes of problems, Appointment of intervention points **Practice:** Ishikawa and pareto analyses, What you need to improve?
4th week: **Lecture:** The designation of specific (quantitative and qualitative) development goals, Appointment of persons involved in organizational development **Practice:** Ordering tools and methods of intervention points, Assigning tasks	**5th week:** **Lecture:** Establish a timetable **Practice:** Gantt chart
6th week: **Lecture:** Ordering quantitative and qualitative indicators of the planned interventions **Practice:** SMART method	**7th week:** **Lecture:** Planning corrective actions **Practice:** PDCA cycle
8th week: 1st drawing week	
9th week: **Lecture:** Human resource management planning system, Strategies, planning, evaluation **Practice:** Creating a concrete strategy	**10th week:** **Lecture:** Job and competence analysis, Elements and analyses of the job system, Process analysis **Practice:** Job and competence analysis based on case studies
11th week:	**12th week:** **Lecture:** Career Management, Lifetime phases, career components

Lecture: Resource insurance systems, Recruitment, selection, insertion and retraction **Practice:** Case study, situational tasks	**Practice:** Creating a career plan
13th week: **Lecture:** Performance Management and Performance Evaluation Systems, Design and strategy of Performance Management **Practice:** Case study	**14th week:** **Lecture:** Staff Development System and Employee Relations System **Practice:** Case study
15th week: 2nd drawing week	

Requirements

A, for a signature:

Participation in practice classes is compulsory. Students must attend practice classes and may not miss more than three practice classes during the semester. If a student does so, the subject will not be signed, and the student must repeat the course. Students can't take part in any practice class with another group. The practice leader will record attendance at practice classes. Being late is equivalent to an absence. In case of further absences, a medical certification needs to be presented. Missed practice classes must be made up for later, being discussed with the tutor.

During the semester, there is one test: the end-term test is on the 15th week. Students must sit for the test. The minimum requirement of the test is 60%. If the test score is below 60%, the student can take a retake test of the whole semester material until 1st week of the exam period. If the result is 60 % or better, the retake test succeeds.

B, for a grade:

The course ends with an examination.

The grade is given according to the following: 0-59 % = fail (1); 60-69 % = pass (2); 70-79 % = satisfactory (3); 80-89 % = good (4); 90-100 % = excellent (5).

Advanced Corporate Finance

Code: MK5HVLPM04MX17-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 1st year, 1stsemester

Number of teaching hours/week (lecture + practice): 1+3

Topics:

Cash flow analysis. Future value of money and present value of money. The relationship between future value and present value. Economic evaluation of investments with identical (different life-times). Investment decision-making processes. The value of bonds Project Analysis. Capital investment process; Sensitivity analysis, Option algebra. Investments and economic rents. The relationship between risk and return. Examination of portfolio risk. Valuation of stocks, Economic and market value added.

Literature:

Compulsory:

- T. Kiss Judit (2016): Introduction to Corporate Financial Decisions for Engineers and Engineering Managers. Debrecen, University Press. ISBN: 978963318583 4.
- Brealey, R. A. - Myers, S. C. – Allen, F (2011): Principles of Corporate Finances. McGraw-Hill/Irwin. ISBN: 0077356381, 9780077356385
- Ogden, J. – Jen, F. C. – O'Connor, P. F. (2002): Advanced corporate finance. Prentice Hall. ISBN-10 0130915688

Recommended:

- Scott Besley - Eugene F. Brigham (2011): Principles of Finance. Cengage Learning. ISBN: 1111527369, 9781111527365

1st week Registration week

2nd week:

Lecture: Corporate finance investment and financing decisions. The financial goal of the corporation. Future value calculation I.

Practice: Preparatory overview of financial calculation I. Calculation Problems – Cash flow analysis. Future value and present value. Continuous compounding.

3rd week:

Lecture: Review of the future value and present value calculation.

Practice: Preparatory overview of financial calculation II. Calculation exercises: Ordinary annuity and annuity due. Review of the future value and present value calculation. Valuing Cash Flows in Several Periods.

4th week:

Lecture: The present value of an investment opportunity. Net Present Value. The opportunity cost of capital. Profitability index.

Practice: Calculation Problems – Net present value. Profitability Index and Modified Profitability Index calculation.

5th week:

Lecture: Net present value and other investment criteria. Making investment decisions I. Investment in Physical Capital and Human Capital.

Practice: Calculation Problems/computer-related problems – Internal rate of return, modified IRR, problem of limited resources.

6th week:

Lecture: Making investment decisions II.

7th week:

Lecture: Investment decisions – economic rent – purchasing decisions, annuities. Complex investment problem - Sensitivity

Practice: Calculation Problems – equivalent annual cost- choosing the discount rate, choosing among projects.	analysis. Interest rates, risk, inflation and present value. **Practice:** Calculation Problems, Complex investment problem – computer-related problems.
8th week: 1st drawing week	
9th week: **Lecture:** Valuation of bonds I, Market value added - Economic value added. **Practice:** Price and interest rate, time to maturity. Relationship between price and Face value. Interest rate and Coupon rate. Calculation Problems.	**10th week:** **Lecture:** Valuation of bonds II, Yield to Maturity estimation, Duration, volatility. **Practice:** Yield to maturity, and yield to call Risk and rates of return, cost of capital. Computer related problems.
11th week: **Lecture:** The value of Common Stocks. Portfolio analysis. Portfolio returns and risk. **Practice:** Portfolio analysis – Calculation problems.	**12th week:** **Lecture:** Options I. (Call options, put options). Exercise price. Position and profit diagram. **Practice:** Calculation Problems – computer-related problems.
13th week: **Lecture:** Options II. – Option algebra **Practice:** Option strategies – computer-related problems (bull, bear call/put spread, call/put butterfly, Call/put straddle options).	**14th week:** **Lecture:** Integrated financial/ investment problems. International investment decisions. **Practice:** Computer-related problems.
15th week: 2nd drawing week	

Requirements

A, for a signature:

Participation at practice classes is compulsory. Students must attend practice classes and may not miss more than three occasions during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students can't take part in any practice class with another group. Attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed practice classes must be made up for at a later date, being discussed with the tutor.

During the semester there are two tests: the mid-term test on the 8th week and the end-term test on the 15th week. Students must sit for the tests.

B, for a grade:

The course ends in an examination.

The minimum requirement of the mid-term, the end-term test and the teamwork is 50% separately. Based on the score of the tests separately, the grade for the tests and the examination is given according to the following table:

The grade is given according to the following (score/grade): 0-49 % = fail (1); 50-62 % = pass (2); 63-75 % = satisfactory (3); 76-89 % = good (4); 90-100 % = excellent (5).

If the score of any test is below 50, the student once can take a retake test of the whole semester material.

An offered grade: It may be offered for the students if the average of the mid-term test, end-term tests and the teamwork is at least good (4). The offered grade is the average of them.

Negotiation and Conflict Management

Code: MK5TKOMM04MX17-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 1st year, 1st semester

Number of teaching hours/week (lecture + practice): 1+2

Topics:

This course provides a comprehensive overview of negotiation and conflict resolution, essential skills for effective leadership and management. Students will explore what makes negotiations effective, including the key elements and potential pitfalls during preparation and execution. Various types of negotiations and techniques, such as bargaining, concessions, BATNA, and ZOPA, will be discussed and practiced. The course also covers persuasive communication, types of negotiators, and handling different negotiation styles. In the second half, students will examine conflict definitions, sources, and resolution techniques, including mediation, arbitration, litigation, and party-directed mediation. Practical sessions with role-plays and discussions will reinforce the theoretical concepts and enhance students' negotiation and conflict management skills.

Literature:

Compulsory:

- Lewicki, R. J., Saunders, D. M., & Barry, B.: Essentials of Negotiation, 7th ed. McGraw-Hill Education, 2021.
- Fisher, R., Ury, W. L., & Patton, B.: Getting to yes: Negotiating agreement without giving in. Penguin, 2011.
- Moore, C. W.: The mediation process: Practical strategies for resolving conflict. John Wiley & Sons, 2014.

Miscellaneous articles, clippings and videos of the most recent literature published in the Harvard Business Review

Schedule

1st week Registration week	
2nd week: **Lecture: What Makes an Effective Negotiation? 1** **Practice:** the elements of an effective negotiation discussed, how negotiations work and what can go wrong during the preparations or at the negotiating table	3rd week: **Lecture: What Makes and Effective Negotiation? 2** **Practice:** the elements of an effective negotiation discussed, how negotiations work and what can go wrong during the preparations or at the negotiating table
4th week: **Lecture: Types of Negotiations and Negotiating Techniques** **Practice:** how the different types of negotiations work in, examples and practice, the different negotiating techniques discussed and practiced; role-plays	5th week: **Lecture: Bargaining and Concessions, BATNA and ZOPA** **Practice:** the bargaining phase of the negotiation is discussed and practiced, how to set conditions for concessions and where to give concessions, BATNA and ZOPA explained through practice
6th week: **Lecture: Persuasion, suasion and assertive communication** **Practice:** practicing the communication techniques for persuasion, suasion and assertive communication	7th week: **Lecture: Types of Negotiators** **Practice:** Types (DISC Model, Thomas-Kilman Model etc.) of negotiators and how to handle them.
8th week: 1st drawing week	
9th week: **Lecture: Conflicts: Definitions, Types and Perception** **Practice:** discussion of the different types of conflicts	10th week: **Lecture: The Most Common Sources of Conflicts at Workplaces** **Practice:** discussion of workplace conflicts
11th week: **Lecture: Dealing with Conflicts by their Types and Intensity, Conflict Resolution techniques** **Practice:** role-play and discussion	12th week: **Lecture: The Thomas-Kilman conflict Model Explained** **Practice:** discussion of the Thomas-Kilman conflict test and its results
13th week: **Lecture: Mediation, Arbitration, Litigation and Party-Directed Mediation** **Practice:** role-play and discussion	14th week: **Lecture: Conflict Stages Modell the Escalation of conflicts, De-Escalation**

	Practice: conflict escalation and de-escalation examples, analysis and discussion
15th week: 2nd drawing week	

Requirements

A, for a signature:

Participation at practice classes is compulsory. Students must attend practice classes and may not miss more than three practice classes during the semester otherwise the signature and the grade for the course will be denied. The recording of the attendance on an attendance sheet starts from the 1st week of the semester. Attendance at practice classes will be recorded by the course instructor. Being late for more than 15 minutes is equivalent with an absence. If someone has more than three absences, the International Office deals with the issue.

B, for a grade:

There will be a written test on the lecture materials at the end of the semester. The result of the written test and the in-class participation in practice classes and also the completion of the written assignment by deadline will give the final grade. Please note that if someone gets a 1 (fail) for the final test, they cannot get a grade until the test is repeated successfully. There are two possible retakes, if they both happen to be unsuccessful the student must repeat the course.

International and Management Accounting

Code: MK5NVSZM04MX17-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 2nd year, 1stsemester

Number of teaching hours/week (lecture + practice): 2+2

Topics:

This course introduces the students into the fundamentals of managerial accounting – the internal use of accounting information to manage firms, including planning, analysis, and decision-making. The course's main objective is to equip students with the knowledge and ability to prepare, understand, evaluate, and execute financial and non-financial reports used in business organizations. Managers face several daily business decisions that require financial and non-financial information about products, processes, employees, suppliers, customers, competitors, and resources. These decisions range from evaluating the profitability of investment projects to managing product-line portfolios and pricing, from supply chain and customer management to evaluating and motivating employees. For this reason, utilizing relevant information (both financial and non-financial) to make efficient decisions is essential to business organizations and is an important skill for a career in corporate management, business consulting, and financial services.

Literature:

Compulsory:

- Kaplan Publishing (2015): ACCA Paper F2 and FIA Diploma in Accounting and Business, Management Accounting (MA/FMA) Complete Text, Kaplan Publishing UK, ISBN: 978-1-78415-441-7
- Study materials provided by the lecturer

Recommended:

- Hongren C. – Sundem G. – Stratton W. – Burgstahler D. – Schatzberg J. (2022): Introduction to Management Accounting, Global Edition. Pearson Education Limited, ISBN: 1292412569
- Pauline Weetman (2019): Financial and Management Accounting. Pearson Education Limited, ISBN: 1292244410

Schedule

1st week Registration week	
2nd week: **Lecture:** The overview of financial accounting. Legal frameworks. The aim of accounting law (IFRS accounting, according to standards. The smallholder's concept. Scope of the Accounting Act. Structure of the Accounting Act. Accounting principles, Accounting obligations. Structure of account classes and their relationships with other account classes. Accounting for specific economic events. Types of accounting documents. **Practice:** Accounting of different business events. The content elements of the primary accounting documents of accounting and bookkeeping documents are familiar to them in the context of actual tasks.	**3rd week:** **Lecture:** The annual report (financial statement IFRS). Balance structure, relationship with account classes. Structure the profit and loss account and its relationship with the account classes. **Practice:** For an existing company's financial statements. Understand the balance sheet, the financial statement, the supplementary attachment, and the content of the business report.
4th week: **Lecture:** The role and limits of traditional management accounting. Management accounting as the most crucial constructor element of controlling. Controlling definition, aims and functions within the	**5th week:** **Lecture:** Cost Accounting. The purpose of cost calculation. Definition and clarification of cost, expenditure, and expense concepts. Nature and behaviour of costs. Accounting Cost, Economic Cost, Normal

organization. The place of management accounting in corporate management. Structure of the management accounting information system. The final product of management accounting is the management report. Responsibility principle in management accounting.

Practice: A complex task is solved by using the lessons learned so far and the topics to be studied during the semester, as well as the students to gain insight into the topics to be dealt with during the semester. Planning, control, management, information supply.

Cost, Economic and Accounting Profit Relationship. Costs related to continuous operation, functions costs (OPEX). The concept of explicit cost, implicit cost (accountable, non-eligible). Remittance of Costs. Analytic and ledger register of costs.

Practice: The relationship between costs, expenses and expenditures through a concrete example. The identification of costs, expenses and expenditures in the process from procurement to sales. The identification of accounting processes for major processes. Voucher order.

6th week:

Lecture: Cost Consciousness. Definition of cost management. The areas of Cost Planning. Planning of costs, cost allocation, cost calculation, contribution margin analysis. Interpretation of capacity and cost. The operating of capacity is his maintenances. Non-controllable resources, flexible controllable resources. Substance (CAPEX) and human (HUMEX) expenditures of investment and development.

Practice: Practical questions of cost management. Practical application of coverage analysis in a numerical example. The contact of the resource and capacity through exercises.

7th week:

Lecture: Certified and not certified expenses. Relationship between costs and expenditures. Total Cost Procedure, expense result statement according to procedure. Expenses incurred during the period and incurring a period. Possibilities for additional grouping of costs. Accountability, volume relationship, the form of appearance, complexity, classification according to level of responsibility, controllability, and influence ability.

Practice:
Identification of certified and non-certified costs. Analysis of Total Cost and cost procedures. The structure of their information system and their peculiarities.

8th week: 1st drawing week

9th week:

Lecture: Principles of cost calculation: justiceship, emphasis direct costs; consistency; completeness; accruals, correct choice of the project funds. Time horizon of cost calculation. Structure of a possible calculation data sheet. The identification of the direct costs. Cost calculation methods, costing.

10th week:

Lecture: Divisor costing (simple, equivalent); complementing costing (global; sorter; activity-based), mixed costing; normative costing. Other traditional cost calculation methods. Connection between the content of the production costs and the outcome. Positive negative stock changes.

Practice: Exercising structure of a possible calculation data sheet. Identifying the elements through practical examples. Determining the value of the self-produced stocks.

Practice: Knowing prime cost calculation through practical examples. Equivalent, simple one-stage, multistage, divisor costing examples. Complementing costing examples (global; sorter). Normative costing examples.

11th week:

Lecture: New calculation methods. Information request on the activity-based cost calculation, and its structure. Identifying costing places. Repair option of the effectiveness of the cost allocation. Comparison the traditional and activity-based complementing method.

Practice: Practical questions of identifying costing places. Solving several examples with the activity-based cost calculation methods. Comparison of the traditional and activity-based complementing methods through practical examples.

12th week:

Lecture: Classification of economic analysis. Grouping criteria. Time, analytical procedure, scope, status and frequency of the production process, method and content of analysis. Balance sheet, profit and loss statement, cash flow analysis. Creating indicators. Liquidity, asset management, tax treatment, profitability. Comprehensive analysis of economic activity.

Practice: Analysis of the report of an existing economically active company based on the principles known in the lecture

13th week:

Lecture: Analysis the Balance sheet. Quick Diagnosis Indicators. Liquidity quick ratio, Stability and indebtedness indicator. Analysis of the status of the assets. The process of converting assets into cash. Liquidity analysis. Vertical analysis options. Vertical indicators of assets and sources. Horizontal indicators. Analysis of profit and loss statement. Categories of the profit and loss and selection of suitable projection funds. Analysis of income status. Profitability indicators.

Practice: Analysis of the report of an existing economically active company based on the principles known in the lecture. Analysis the Balance sheet, and the Profit and loss statement.

14th week:

Lecture: Efficiency indicators. Yields (Net sales, gross output, value-free production, net production value, value-added, and enterprise income funds). Returns indicators. ROCE (rate of return on capital employed), EPS (earnings per share), ROA (return on asset), ROE (return on equity), ROI (return on investment), ROIC (return on invested capital), EBIT (operational/ business/profit), EBITDA (EBIT+ amortization). NOPLAT (Net Operating Profit Less Adjusted Taxes).

Practice: Analysis of the report of an existing economically active company based on the principles known in the lecture

15th week: 2nd drawing week

Requirements

A, for a signature:

Participation in practice classes is compulsory. Students must attend practice classes and may not miss more than three occasions during the semester. If a student does so, the subject will not be signed, and the student must repeat the course. There are two tests during the semester: the mid-term test on the 7th week and the end-term test on the 14th week. Students must complete both tests.

B, for a grade:

The course ends in a mid-semester grade based on the average grade of the two tests.

The minimum requirement for both tests is 60% separately. The grade for each test is given according to the following (score/grade): 0-59 % = fail (1); 60-69 % = pass (2); 70-79 % = satisfactory (3); 80-89 % = good (4); 90-100 % = excellent (5).

If the score of any test is below 60, the student once can take a retake test of the whole semester material.

Leadership Competencies Development

Code: MK5KOMPM04MX17-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 2nd year, 2ndsemester

Prerequisite: Negotiation and Conflict Management

Number of teaching hours/week (lecture + practice): 2+2

Topics: Leadership Competencies Development

Literature: Miscellaneous articles, clippings and videos of the most recent literature published in the Harvard Business Review and etc.; sources available at the University Library

Schedule

1st week Registration week	
2nd week: **Lecture:** Orientation, Leadership theories, a historical overview **Practice:** What makes a good leader? Introduction to Leadership styles and to their evolution.	**3rd week:** **Lecture:** Leadership styles and their attributes, essential competencies for leaders and the division of competencies **Practice:** the examination of the most typical leadership styles and their attributes, drawbacks and/advantages; the examination of competencies and their grouping that are essential for leaders.

4th week:

Lecture: Communication for leaders. Motivating colleagues and employees

Practice: assertive vs. aggressive communication, stylistic differences, extrinsic and intrinsic motivation; motivation techniques and their efficiency, communication styles outside and inside the organization

5th week:

Lecture: Public speaking and presenting

Practice: the basics of public speaking and presentation techniques for leaders, functions of a leader as a figurehead, representing and communicating the company and its core values outside the organization and to the employees, defining mission and articulating vision

6th week:

Lecture: Time Management and Team building

Practice: the importance of time management at work and outside work; the most popular techniques aiding managers at different levels and with different experience to improve their own and also their employees time management skills, collaboration vs. competition, team building; complimentary vs competitive skillset

7th week:

Lecture: Development of leadership

Practice: Analyse the leaders' leadership style, which are mentioned in the presentation. SWOT analyse and Johari window to collect the features of the students. Personal test to help to make the analyses about themselves. Ted videos about leadership actions.

8th week: 1st drawing week

9th week:

Lecture: Success in the world of work

Practice: Make their own job description, defining personal goals, and values, analyse their job and find development aims

10th week:

Lecture: Simplicity

Practice: Analyse companies' general processes. Make a flow chart, check the unnecessary processes and create a new one to realize the process of simplicity

11th week

Lecture: How to build a team, empathy

Practice: Analyse a leader's behavior and discuss different methods. Training to check and develop the students EQ

12th week

Lecture: Coaching

Practice: Learn how to use coaching tools in leadership

Requirements

A, for a signature:

Participation at practice classes is compulsory. Students must attend practice classes and may not miss more than three practice classes during the semester otherwise the signature and the grade for the course will be denied. The recording of the attendance on an attendance sheet starts from the 1st week of the semester. Attendance at practice classes will be recorded by the course instructor. Being late for more than 15 minutes is equivalent with an absence. If someone has more than three absences, the International Office deals with the issue.

B, for a grade:

The end of the semester test on the lecture material and in-class participation will give the final grade. If someone gets a 1 (fail) at the final test, there are two possible retakes. If both retakes happen to be unsuccessful the student must repeat the course.

Subject group “Field-Specific Subjects” (for all 3 specializations)

Applied Engineering

Code: MK5ALKRM04MX17-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 1st year, 2nd semester

Number of teaching hours/week (lecture + practice): 1+2

Topics:

The aim of the course is to introduce the students to the basics of Operations Research. During the semester, students are going to learn the basic models and methods which are related to the field of engineering management. Furthermore, students can analyse the results of the optimal solution which is indispensable part of this field. The following topics are covered in the Applied Engineering subject:

- Modelling real-life business situations (identification of objective, constraints, etc…)
- Acquiring the use of MS Excel’s Solver Plugin
- Determination of optimal production structure
- Transportation and transhipment problem solving
- Assignment
- Networks
    - Networks in production and transportation
    - Project management (Critical Path Method, Project Evaluation and Review Technique, Project Crashing)

Literature:

Compulsory:

- Cliff T. Ragsdale: *Spreadsheet Modeling & Decision Analysis*, 8th edition, 2017, ISBN: 9781305947412

- Wayne L. Winston: *Operations research: Applications and Algorithm*, 4th Edition, Brook/Cole, Canada, 2004, ISBN: 978-0534380588
- George B. Dantzig: Linear Programming and Extensions, Princeton University Press, 1998, ISBN: 978-0691059136

Schedule

1st week Registration week	
2nd week: **Lecture:** Basics of decision making **Practice:** Process of decision making	**3rd week:** **Lecture:** Graphical solution **Practice:** Computer related practice – graphical solution of two-variable problems
4th week: **Lecture:** Simplex method **Practice:** Simplex method	**5th week:** **Lecture:** Design of an operations research model by using MS Excel **Practice:** Computer related practice – Model design of two-variable problems.
6th week: **Lecture:** Sensitivity analysis **Practice:** Computer related practice – Optimal production structure problems	**7th week:** **Lecture:** Duality **Practice:** Computer related practice – Optimal production structure problems
8th week: 1st drawing week	
9th week: **Lecture:** Financial problems **Practice:** Computer related practice – Capital Budgeting and Portfolio models	**10th week:** **Lecture:** Assignment method **Practice:** Computer related practice – Work assignment, Optimal changeover sequence
11th week: **Lecture:** Transportation and transshipment problems **Practice:** Computer related practice – Transportation and transshipment methods	**12th week:** **Lecture:** Networks in the production **Practice:** Computer related practice – Generalized network flow problem
13th week: **Lecture:** Project management **Practice:** Computer related practice – CPM, PERT and Project Crashing	**14th week:** **Lecture:** Revision **Practice:** Computer related practice – Solving complex tasks
15th week: 2nd drawing week	

Requirements

A, for a signature:

Participation at practices is compulsory. Students must attend practices and may not miss more than three of them during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Attendance at lectures and practices will be recorded by the lecturer. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed lectures must be made up for at a later date, being discussed with the tutor.

B, for a grade:

The course ends in end-term test. The grade for the test is given according to the following table:

Score	Grade
0-59	fail (1)
60-69	pass (2)
70-79	satisfactory (3)
80-89	good (4)
90-100	excellent (5)

C, Etiquette:

A large portion of class time is spent sharing opinions and sharing information. Therefore, it is of utmost importance to communicate with courtesy and professionalism. Professional courtesy includes respecting others' opinions, being courteous and respectful, and working together in the spirit of cooperation. Discussions and assignments will be graded on quality and professionalism. Please refrain from using cell phones or other disruptive electronic devices while attending class, and please silence all sounds made by such devices while class is in session.

D, Use of English:

In accordance with Faculty Policy, students may be penalized up to 10% of the marks on all assignments, tests, and examinations for the improper use of English.

Advanced Quality and Lean Management

Code: MK5HMLMM04MX23-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 1st year, 2ndsemester

Number of teaching hours/week (lecture + practice): 2+2

Topics:

The subject contains the advanced concepts of quality management. The aim of the course is students become familiar with the elements, installation, operation and tools of integrated management system. During the subject students can be familiar with seven new methods and quality improvement methods.

Literature:

Compulsory:

- Kim-Soon Ng (2012): Quality Management and Practices. InTech, Chapters published. ISBN 978-953-51-0550-3
- David L. Goetsch, Stanley Davis: Quality management: introduction to total quality management for production, Pearson Prentice Hall, 2013, ISBN 0-13-287097-5, 978-0-13-287097-9
- B. G. Dale: Managing Quality, Wiley-Blackwell, 2007, ISBN 978-1-4051-4279-3

Schedule

1st week Registration week	
2nd week: **Lecture:** ISO 9001 standard elements and structure, PDCA, Interested parties **Practice:** Analyze examples for the ISO 9001	3rd week: **Lecture:** Benefits of QMS, Customer Focus, Seven principals **Practice:** Analyze examples for the ISO 9001
4th week: **Lecture:** Scope of Quality management system, quality objectives **Practice:** Analyze examples for the ISO 9001, Audit situations	5th week: **Lecture:** Risk management requirements in QMS, **Practice:** Analyze examples for the ISO 9001, Audit situations, Analyze examples for the ISO 14001
6th week: **Lecture:** Affinity diagrams, charts the relationship between each other, Wood chart, graph matrix **Practice:** Analyze examples for the methods	7th week: **Lecture:** Matrix data analysis, decision-making process card program analyst **Practice:** Analyze examples for the methods
8th week: 1st drawing week	
9th week: **Lecture:** Arrow diagrams, Gantt diagram. Brainstorming, action plan, block diagram, SWOT, FMEA, QFD, why-why, Poka-Yoke, NGT, Multivoting, Logframe matrix	10th week: **Lecture:** Definition of TQM, model of TQM, Principles of TQM **Practice:** Case studies

Practice: Analyze examples for the methods	
11th week: **Lecture:** Introduction to Lean thinking. Key principles and concepts. Lean tools and techniques: VSM **Practice:** VSM exercise to analyze a process and develop future state map	**12th week:** **Lecture:** Lean tools and techniques: 5S, JIT, Kanban **Practice:** 5S, JIT and Kanban simulation
13th week: **Lecture:** Lean tools and techniques: Poka-Yoke, TPM **Practice:** Case studies.	**14th week:** **Lecture:** Lean production systems. **Practice:** Single-Piece Flow. Cell Design and Layout. Heijunka. Takt time.
15th week: 2nd drawing week	

Requirements

A, for a signature:

Participation at practice classes is compulsory. Students must attend practice classes and may not miss more than three practice classes during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students can't take part in any practice class with another group. Attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed practice classes must be made up for at a later date, being discussed with the tutor.

During the semester there are two tests: the mid-term test is on the 8th week and the end-term test is on the 15th week. Students must sit for the tests.

B, for a grade:

The course ends in a mid-semester grade based on the average grade of the two tests.

The minimum requirement of the mid-term and the end-term test is 60% separately. The grade for each test is given according to the following (score/grade): 0-59 % = fail (1); 60-69 % = pass (2); 70-79 % = satisfactory (3); 80-89 % = good (4); 90-100 % = excellent (5).

If the score of any test is below 60, the student once can take a retake test of the whole semester material.

Operation Management

Code: MK5HTEV204MX17-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 2ndyear, 1stsemester

Prerequisite: Applied Mathematics in Manufacturing Design

Number of teaching hours/week (lecture + practice): 2+2

Topics:

The course focuses on the advanced aspects of the production and service management. The goal of the course to summary the advanced engineering technique. Emphasis is placed on the practical implementation of recommendations generated from the advanced modelling and system's understanding gained in the full range of Industrial engineering. The primary goal of the course is to allow students to see the applications of theories in a more realistic and intricate setting to gain a broader view of production and service management.

Literature:

Compulsory:

- Arnold, J. R. Tony; Chapman, Stephen N.; Clive, Lloyd M.: Introduction to Materials Management, Pearson New International Edition Pearson Education 2013
- Ashok D. Belegundu, Tirupathi R. Chandrupatla: Optimization Concepts and Applications in Engineering, (2nd ed.) Cambridge University Press 2011
- William Stevenson: Operations Management (11th ed.) McGraw-Hill 2011

Recommended:

- Hirano, Hiroyuki: JIT Implementation Manual - The Complete Guide to Just-In-Time Manufacturing: Volume 3 - Flow Manufacturing - Multi-Process Operations and Kanban Taylor & Francis, 2009
- Baudin, Michel: Working with Machines: The Nuts and Bolts of Lean Operations with Jidoka Taylor & Francis 2007

Schedule

1st week Registration week	
2nd week: **Lecture:** Introduction to operation management **Practice:** Examples, case studies	**3rd week:** **Lecture:** Building of Process Management System **Practice:** Examples, case studies
4th week: **Lecture:** Production Planning, create Value flow **Practice:** Examples, case studies	**5th week:** **Lecture:** Production control, SPC **Practice:** Examples, case studies
6th week: **Lecture:** Inventory Planning Deterministic Models EOQ models **Practice:** Examples, case studies	**7th week:** **Lecture:** Inventory control: MRP I-II, ERP **Practice:** Examples, case studies

8th week: 1st drawing week	
9th week: **Lecture:** JIT comparison of push and pull systems, MTO-MTS dilemma **Practice:** Examples, case studies	**10th week:** **Lecture:** OEE – overall equipment efficiency, Capacity analyzing **Practice:** Examples, case studies
11th week: **Lecture:** Production process modeling: eEPC –VSM **Practice:** Examples, case studies	**12th week:** **Lecture:** Service pool line model **Practice:** Examples, case studies
13th week: **Lecture:** Service quality level improving **Practice:** Examples, case studies	**14th week:** **Lecture:** Service and production development (Six sigma) **Practice:** Examples, case studies
15th week: 2nd drawing week	

Requirements

A, for a signature:

Participation at practice classes is compulsory. Students must attend practice classes and may not miss more than three practice classes during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students can't take part in any practice class with another group. Attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed practice classes must be made up for at a later date, being discussed with the tutor.

During the semester there are two tests: the mid-term test is on the 8th week and the end-term test is on the 14th week. Students must sit for the tests. The minimum requirement of the mid-term and the end-term test is 60% separately. If the score of any test is below 60%, the student once can take a retake test of the whole semester material. If somebody fails then he/she has to write both tests in the 1st week of the exam period again. If the result is 60 % or better the retake test is success.

B, for a grade:

The course ends in an examination.

The grade is given according to the following (score/grade): 0-59 % = fail (1); 60-69 % = pass (2); 70-79 % = satisfactory (3); 80-89 % = good (4); 90-100 % = excellent (5).

Project Leadership

Code: MK5PROVM04MX17-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 2nd year, 2nd semester

Number of teaching hours/week (lecture + Seminar): 2+2

Topics:

Project management involves both leading people and managing resources to achieve the intended project outcome. Leadership is often the difference between project success and failure. The objective of this course is to equip students with the concepts, tools and techniques for effective leadership within a project context. Within this context, the course primarily focuses on understanding project management, aligning project management with the organization, project management oversight, projects as capital investments, globalization and resources optimization, detailed project planning and scheduling, risk management, cost estimation and budgeting, and project evaluation

Literature:

Compulsory:

Compulsory:

- Pinto K. Jeffrey: Project Management: Achieving Competitive Advantage (Rental Edition), 5/E, 2019
- Madsen, S.: Project Leadership, Routledge, 2016
- Coleman, S.; Macnicol D.: Project Leadership, Gower Publishing, 2015
- Kerzner, H.: Project Management: A Systems Approach to Planning, Scheduling, and Controlling, 12th edition. John Wiley & Sons, 2017

Recommended:

- Lewis, P.J.: Project Leadership. McGraw-Hill, 2003
- Lord G.R., Maher J. K.: Leadership Information Processing. Linking Perceptions and Performance. Routledge, 1993
- Project Management Institute: PMBOK Guide and Standards. 6th edition

Schedule

1st week Registration week	
2nd week: **Lecture:** Introduction, The Organizational Context **Seminar:** Case study, MS Project Software, WBS	**3rd week:** **Lecture:** Project Selection and Portfolio Management **Seminar:** Case study, MS Project Software, Task durations
4th week: **Lecture:** Leadership vs. Management	**5th week:** **Lecture:** Project Leadership

Seminar: Case study, MS Project Software, Predecessors	**Seminar:** Case study, MS Project Software, Gantt
6th week:	**7th week:**
Lecture: Scope Management	**Lecture:** Project Team, Negotiation
Seminar: Case study, MS Project Software, Resources	**Seminar:** Case study, MS Project Software, Overallocations
8th week: 1st drawing week	
9th week:	**10th week:**
Lecture: Risk Management	**Lecture:** Project Planning and Scheduling (1)
Seminar: Case study, MS Project Software, Costs	**Seminar:** Case study, MS Project Software, Precedence diagrams
11th week:	**12th week:**
Lecture: Project Planning and Scheduling (2) **Seminar:** Case study, MS Project Software, CPM, Projects crashing	**Lecture:** Managing Resources and Costs
	Seminar: Case study, MS Project Software, Report resources and costs
13th week:	**14th week:**
Lecture: Resource Management	**Lecture:** Project Evaluation
Seminar: Case study, MS Project Software, report costs	**Seminar:** Case study, MS Project Software, Report critical tasks
15th week: 2nd drawing week	

Requirements

A, for signature:

- active, proactive participation on course
- participation in seminars is mandatory. We also expect all students to be present during the lectures.

B, for a grade:

The calculation of the final grade is as follows:

- Exam 50%
- Own project (Excel, Microsoft Project) 50%
- +Individual assignment on lectures 5 %

Risk and Reliability

Code: MK5KOCKM04MX17-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 1st year, 1stsemester

Number of teaching hours/week (lecture + practice): 2+2

Topics:

Fundamentals of risk, uncertainty, and reliability. Methods to analyse and quantify the risk of failures, and the reliability of complex systems, including fault tree analysis, reliability block diagrams, probabilistic risk assessment. Introduction to research methods for risk and reliability analysis during the early design stages.

Literature:

Compulsory:

- Mohammad Modarres: Risk Analysis in Engineering: Techniques, Tools and Trends, Taylor & Francis (2006).
- Terje Aven: Quantitative risk assessment: the scientific platform Cambridge, UK; New York: Cambridge University Press, 2011.

Schedule

1st week Registration week	
2nd week: **Lecture:** Basic concepts and definitions: Risk vs. Reliability, Hazards, Failures, Uncertainty sources **Practice:** Selection of research project topic	**3rd week:** **Lecture:** Traditional design; Safety Factors; Probabilistic Design **Practice:** Safety fastor Measures and reliability block diagram
4th week: **Lecture:** Reliability engineering; Reliability measures; Reliability block diagrams **Practice:** Reliability block diagrams	**5th week:** **Lecture:** Failure: definitions and modelling (HW vs SW failures; component vs system-level failures) **Practice:** Select system, list failures & provide example of a failure or reliability
6th week: **Lecture:** Failure modes and effects analysis (FMEA), Criticality analysis (CA) **Practice:** Generate FMECA for selected system	**7th week:** **Lecture:** Fault Tree Analysis (FTA), Event Tree Analysis (ETA) **Practice:** Generate FTA for selected system and compare to FMECA results
8th week: 1st drawing week	
9th week: **Lecture:** Probabilistic Risk Assessment (PRA) **Practice:** Generate ETA for selected system and compare to FMECA result	**10th week:** **Lecture:** Risk considerations in early design stages **Practice:** Analyses of design states

11th week:	12th week:
Lecture: Failure analysis during functional design (FFDM) Design repository **Practice:** Use of design repository for selected system	**Lecture:** Functional failure identification and propagation (FFIP) **Practice:** Generate FFIP for selected system
13th week:	**14th week:**
Lecture: Cost-benefit analysis (CBA) **Practice:** Cost-benefit analysis (CBA)	**Lecture:** Hazard identification methods, Process hazards checklists , Hazards surveys and analysis Hazard and operability in industry **Practice:** Course summary
15th week: 2nd drawing week	

Requirements

A, for a signature:

Participation at lectures is compulsory. Students must attend lectures and may not miss more than three of them during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Attendance at lectures will be recorded by the lecturer. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed lectures must be made up for at a later date, being discussed with the tutor.

The minimum requirement of the mid-term and the end-term test is 60% separately. The first (50 points max) in the 8th, the second (50 points max) in the 14th week. At the end of the semester everybody will get a seminar grade on the basis of the table below: The grade for each test is given according to the following (score/grade): 0-59 % = fail (1); 60-69 % = pass (2); 70-79 % = satisfactory (3); 80-89 % = good (4); 90-100 % = excellent (5).

If the score of any test is below 60 point, the student once can take a retake test of the whole semester material. If somebody fails, then he/she has to write both tests in the 1st week of the exam period again. If the result is 50 points (50%) or better, then he can take an exam. If somebody has to repeat his midterm tests, then his seminar grade can't be better than (2).

B, for a grade:

For their exam everybody will get an exam grade. The final grade will be the average of the seminar and the exam grade. If it is for example (3.5) then the lecturer decides if it is (3) or (4).

Control of Integrated Information System

Code: MK5INFRM04MX17-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 1st year, 1st semester

Number of teaching hours/week (lecture + practice): 1+3

Topics:

This course aims to explain the main characteristics of Enterprise Resource Planning systems (ERPs) theoretically and also introduces how to navigate in SAP Easy Access Menu in practice. The illustration of SAP R/3 systems is aimed the students at universities of applied sciences and other learning institutions with no previous experience. After completion of the course, students will be able to understand the major reasons to adopt ERP systems and navigate through the SAP User Interface to work on business processes and case studies on their own. Furthermore, this material serves as a reference for occasional users of SAP R/3 systems

The Course contains the following elements: the Sap Ides and R/3 systems main features and functions of user interface. This course also guides the end-users through different processes of Logistical Information System (LIS), such as Material Management, Sales and Distribution, etc. As one of the most important and implemented finance, accounting, controlling functionalities, the SAP makes information more manageable and accessible.

Literature:

Compulsory:

- Bardhan B., Baumgartl A., Nga-Sze C, Dudgeon M., Górecki P., Lahiri A., Meijerink B., Worsley-Tonks A: (2021): SAP S/4HANA: An Introduction, SAP Press, ISBN 978-1-4932-2056-4
- Mazzulo, J. – Wheatley, P. (2006): SAP R/3 for Everyone: Step-by-Step Instructions, Practical Advice, and Other Tips and Tricks for Working with SAP, Prentice Hall, ISBN-13: 978-0131860858
- Schulz. O. (2017): Using SAP: An Introduction for Beginners and Business Users, SAP Press, ISBN 978-1-4932-1405-1.

Schedule

1st week Registration week	
2nd week: **Lecture:** SAP S/4 HANA GUI Systems main features and functions of the User Interface **Practice:** Navigation in the Easy Access Menu	**3rd week:** **Lecture:** What is new in SAP? Navigation in HANA GUI **Practice:** The general configuration options available, setting and changing user defaults, parameters, using the favourites folder, sending messages.
4th week: **Lecture:** The general configuration options available, setting and changing user	**5th week:**

defaults, parameters, using the favourites folder, sending messages **Practice:** Creating documents and sending by Business Workplace, Calendar Function	**Lecture:** Introduction to Enterprise Systems for Management **Practice:** Retrieving the available standard report, report selections, creating and modifying a report variant. Running reports in the background.
6th week: **Lecture:** Global Bike Industries (GBI) **Practice:** Query and manage own jobs and jobs created by other users, display, save and print the resulting lists (export requests) available in the spool folder	**7th week:** **Lecture:** No lecture **Practice:** I. Midterm test at seminars
8th week: 1st drawing week	
9th week: **Lecture:** GBI Navigation in FIORI **Practice:** Navigation course in Fiori	**10th week:** **Lecture:** Sales and Distribution in GUI SD **Practice:** SAP GUI SD - Goods Receipt, Shipping, Billing
11th week: **Lecture:** Integrating ERP systems in practice **Practice:** SAP GUI SD - Inquires, Quotation, Sales Orders	**12th week:** **Lecture:** Sales and Distribution in FIORI **Practice:** Case Study SD Fiori
13th week: **Lecture:** Material Management in SAP GUI **Practice:** Material Management in FIORI	**14th week:** **Lecture:** No lecture **Practice:** II. Midterm test at seminars
15th week: 2nd drawing week	

Requirements

A, Students have to take a midterm tests during the semester. Failed tests can be rewritten as regulated by the Statutes of Examination and Teaching. Personal attendance is required. Students cannot miss more than three (3) seminars for the signature.

B, for a grade:

The exam evaluated according to the following grading schedule: 0 - 50% – 1, 50% - 60% – 2, 60% - 70% – 3, 70% - 80% – 4, 80% - 100% – 5

MSc Thesis I.

Code: MK5DIP1M15MX21-EN

ECTS Credit Points: 15

Evaluation: mid-semester grade

Year, Semester: 2nd year, 1st semester

Number of teaching hours/week (lecture + practice): 0+3

Topics:

This course is an overview of writing and organizational skills necessary for completion of thesis and submission of articles for publication. Thesis I. course is designed to help MSc students undertaking a literature research related to the field of Engineering Management. At the completion of this course students should be able to:

Formulate key questions for a review

Organize a literature search; identify, analyse, evaluate relevant sources.

Create evidence tables and summary tables

Rate the scientific quality of each study and the level of evidence for each question.

Literature:

Compulsory:

- Student Success: A Guide to APA 6th ed. Referencing Style
- Cochrane Handbook for Systematic Reviews of Interventions, Chapter 6: Searching for studies.

Schedule

1st week Registration week	
2nd week: **Practice:** Introduction of literature research	**3rd week:** **Practice:** Structure of Literature review, steps and requirements of literature review and thesis.
4th week: **Practice:** Find a subject and supervisor, read the key articles, make a literature research plan.	**5th week:** **Practice:** APA format references, TEST on e-learning system.
6th week: **Practice:** Using refworks, and Cite and Side	**7th week:** **Practice:** Data clearing in excel
8th week: 1st drawing week	
9th week: **Practice:** Data analysis and visualization.	**10th week:** **Practice:** Survey evaluation in excel and Analysis toolpak
11th week:	**12th week:**

Practice: Structure of presentation	**Practice:** Presentation of literature review
13th week:	**14th week:**
Practice: Presentation of literature review	**Practice:** Presentation of literature review
15th week: 2nd drawing week	

Requirements

Participation at practices is compulsory. Students must attend practices and may not miss more than three of them during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Attendance at lectures and practices will be recorded by the lecturer. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed lectures must be made up for at a later date, being discussed with the tutor. At least 80% has to be reached on reference test for signature.

B, for a grade:

The course ends with a literature review submission. Every student has to submit a literature review in field of engineering management. The content of literature review has to meet with the requirements. The literature review will be graded on the following way: Critical thinking, Coherence/Organization, References, Mechanics.

MSc Thesis II

Code: MK5DIP2M15MX21-EN

ECTS Credit Points: 15

Evaluation: mid-semester grade

Year, Semester: 2nd year, 2nd semester

Number of teaching hours/week (lecture + practice): 0+7

Prerequisite: MSc Thesis I

Based on the literature review performed during the Thesis 1. course, the practical part of the MSc thesis has to be carried out under the supervision of the chosen Professor/Teacher. Furthermore, preparation for the final defence (Binding the thesis and creating the PPT presentation) should be made 1 week before the deadline of the thesis submission. In this semester, students have to consult at least once per week with his/her supervisor to present the progress of his/her practical part.

Formal thesis requirements can be found at the Faculty's website: https://eng.unideb.hu/en/node/288

Building Energetics II

Code: MK5EEN2L04M321-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 1st year, 2^{nd} semester

Number of teaching hours/week (lecture + practice): 1+3

Topics:

The relations between the energy, the economy, the society and the environment. The basic definitions of the energy management, the systems of the energy supply and the different kinds of converters. Heat transfer processes. Thermal balance of a building. Degree-day method. The nearly zero energy buildings. Renewable energy technologies for energy efficient buildings. The importance of the building energetics. Ventilation primer energy use calculation methods. Cooling primer energy use calculation methods. Renewable energy technologies for energy efficient buildings. Improving the energy efficiency of the building and possibilities of reducing the energy need and energy use of the building. Energy performance certification.

Literature:

Compulsory:

- Al-Shemmeri, T. Energy Audits, Willey-Blackwell, 2011.
- EPBD recast (http://eur-lex.europa.eu)
- Richarz, C. and Schulz, C. Energy efficiency refurbishments, FSC, 2013.

Recommended:

- Hodge, B. Alternative Energy Systems and Applications, Wiley, 2009.
- Kalmár, F. Energy conscious heating, Akadémia Kiadó, 2011.
- Moss, J. K. Energy Management in Buildings, Taylor & Francis, 2006.
- Moss, J. K. Heat and Mass Transfer in Buildings, 2nd edition, Taylor & Francis, 2007.
- Littler, J. and Thomas, R. Design with energy The conservation and use of energy in buildings, Cambridge University Press, 2003.
- J.K. Nayak , J.A. Prajapati, Handbook on energy conscious buildings, 2006

Schedule

1st week Registration week

2nd week:

Lecture: The relations between the energy, the economy, the society and the environment. The basic definitions of the energy management, the systems of the energy supply and the different kinds of converters.

Practice: Basic examples of calculation.

3rd week:

Lecture: Heat transfer processes.

Practice: Basic heat transfer calculations.

4th week:

Lecture: Thermal balance of a building.

Practice: Basic heat transfer calculations.

5th week:

Lecture: Degree-day method

Practice: Basic examples of calculation

6th week:

Lecture: The nearly zero energy buildings.

Practice: Basic examples of calculation

7th week:

Lecture: Renewable energy technologies for energy efficient buildings.

Practice: Examples of calculation

8th week: 1st drawing week

9th week:

Lecture: The importance of the building energetics.

Practice: Basic examples of calculation

10th week:

Lecture: Ventilation primer energy use calculation methods.

Practice: Basic examples of calculation

11th week:

Lecture: Cooling primer energy use calculation methods.

Practice: Basic examples of calculation

12th week:

Lecture: Renewable energy technologies for energy efficient buildings.

Practice: Basic examples of calculation

13th week:

Lecture: Improving the energy efficiency of the building and possibilities of reducing the energy need and energy use of the building.

Practice: Basic examples of calculation

14th week:

Lecture: Energy performance certification.

Practice: Basic examples of calculation

15th week: 2nd drawing week

Requirements

A, for a signature:

Participation at practice classes is compulsory. Students must attend practice classes and may not miss more than three practice classes during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students can't take part in any practice class with another group. Attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed practice classes must be made up for at a later date, being discussed with the tutor.

B, for a grade:

During the semester there are two tests: the mid-term test is on the 7th week and the end-term test is on the 14th week. The minimum requirement of the mid-term and the end-term test is 51% separately. If the score for any of the tests is below 51 points, the student can take a retake test of the whole semesters material. Students must sit for the tests. The grade for each test is given according to the following: score/grade: 0-50 fail (1), 51-60 pass (2), 61-75 satisfactory (3), 76-89 good (4), 90-100 excellent (5). The average grade of the two tests represents the final grade.

Organization of Construction Processes in BIM Environment

Code: MK5EPE2M04M321-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 1st year, 2ndsemester

Number of teaching hours/week (lecture + practice): 2+2

Topics:

Students will gain an overview of construction processes and the organization of construction processes in a BIM environment.

During the lectures, students get acquainted with the division of construction processes, including the concepts of contract and commissioning, preparation, design, implementation, commissioning and operation of the structure, and the concepts of quality and quality assurance. After reviewing the classical approach to construction organization, students begin to master the basics of building information modelling and management (BIM).

In the lectures, students will learn the basics of the BIM approach, the history of BIM, the actors in BIM processes, and the basic concepts and definitions related to BIM. The course introduces the application possibilities of BIM. To do this, students will be introduced to international case studies.

The exercises are task-oriented: students become acquainted with the CAD-based programs that are used to design structures and to prepare for the organization of the implementation of the structure.

Students deepen their expertise and develop their skills by processing the knowledge they have acquired in the subject topics during the internships and the individual processing of the curriculum at home.

Literature:

Compulsory:

- Sacks, R. – Eastmen, Ch. – Lee, G. – Teicholz, P.: BIM Handbook. A Guide to Building Information Modeling for Owners, Designers, Engineers, Contractors, and Facility Managers. Third Edition. John Wiley & Sons, Inc. Hoboken, Ney Jersey, 2018.
- Holzer, D.: The BIM Managers Handbook Guidance for Professionals in Architecture, Engineering, and Construction. John Wiley & Sons, Inc. Chichester, West Sussex, 2016.

Recommended:

- Hardin, B. – McCool, D.: BIM and Construction Management. Proven Tools, Methods, and Workflows. Second Edition. John Wiley & Sons, Inc. Indianapolis, Indiana, 2015.
- Daniotti, B. – Pavan, A. – Spagnolo, S.L. – Caffi, V. – Pasini, D. – Mirarchi, C.: BIM-Based Collaborative Building Process Management. Springer Nature Switzerland AG 2020.

Schedule

1st week Registration week	
2nd week: **Lecture:** Organization of the implementation: process segmentation, actors, building processes as one builds on the other process **Practice:** Architect and static designer program	**3rd week:** **Lecture:** The contract. Transfer to the company **Practice:** Mapping and geotechnical design program
4th week: **Lecture:** Preparation and planning	**5th week:** **Lecture:** Implementation (creation, construction)

Practice: Civil engineer and building electrical design program	**Practice:** Budget program
6th week: **Lecture:** Commissioning and operation **Practice:** A workflow planning and scheduling program	**7th week:** **Lecture:** Quality and quality assurance **Practice:** First test (or submission of first case study)
8th week: 1st drawing week	
9th week: **Lecture:** BIM basics (basic concepts, definitions); Information content of BIM models **Practice:** Revit (BIM software architecture, structural design, building engineering, building electricity in one package	**10th week:** **Lecture:** BIM in design, execution, roles **Practice:** Revit
11th week: **Lecture:** BIM collaboration **Practice:** Revit	**12th week:** **Lecture:** BIM in operation **Practice:** Navisworks Manage (project management and implementation support program)
13th week: **Lecture:** BIM-based analyses **Practice:** Navisworks Manage (project management and implementation support program)	**14th week:** **Lecture:** BIM-based simulations **Practice:** Second test (or submission of second case study)
15th week: 2nd drawing week	

Requirements

A, for a signature: Two positive tests, or two positive semester tasks

B, for a grade: Two positive tests or two positive semester tasks (50 %) and oral and written exam (50%)

Complex Project

Codes: MK5KOMPM04M317-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 1st year, 2ndsemester

Number of teaching hours/week (lecture + practice): 0+4

Topics:

In particular, the course will be focused on the student's ability development to manage complex exercises and implement technical, economic, financial and management tasks so that students are able to make comprehensive, comparative and scientific analysis. The course is highly interactive with challenging complex problem solving, team work, individual presentation and case studies.

Literature:

Compulsory:

- Hevner et al., Design Science in IS Research, MIS Quarterly Vol. 28 No. 1, pp. 75-105/ March 2004
- Ken Peffers et al., A design Science Research Methodology for Information Systems Research, Journal of Management Information Systems, August 2007, Vol. 24, No. 3, pp. 45-77
- Research Methods for Operations Management: Edition 2, by Christer Karlsson
- Abdul Razzak Rumane (2010) Quality Management in Constructions Projects, CRC Press

Schedule

1st week Registration week	
2nd week: **Practice:** Introduction to Complex Project. Domestic points and goals of Complex Project. Research as a problem solving process. Examples for it.	**3rd week:** **Practice:** Project Log-frame. Design the requirements of project with log-frame.
4th week: **Practice:** Databases for literature study. Search engines and library databases	**5th week:** **Practice:** Perform literature study. Finding books. Finding journal articles. Selecting keywords
6th week: **Practice:** Define a research question	**7th week:** **Practice:** Research Design – meta process, Conceptualization, Operationalization, and Measurement

8th week: 1st drawing week	
9th week: **Practice:** Structures of artefact. Artefact is built.	**10th week:** **Practice:** Data collecting methods, Data processing methods, Data analysis.
11th week: **Practice:** Data collecting methods, Data processing methods, Data analysis	**12th week:** **Practice:** Data collecting methods, Data processing methods, Data analysis
13th week: **Practice:** Report creation out of the project. Wrap up of Complex Project.	**14th week:** **Practice:** Evaluation of submitted research paper
15th week: 2nd drawing week Research paper presentations (Presentation of Complex project and discussion)	

Requirements

A, for a signature:

Participation at practice is compulsory. Students must attend practices and may not miss more than three of them during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Attendance at practice will be recorded by the lecturer. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed practices must be made up for at a later date, being discussed with the tutor.

B, for a grade:

During the semester research paper is written. The research paper consists of literature study and case study. By the end of the semester the research paper is presented by the students. The course ends in end-semester grade. The grade is calculated as

- 50% from mid-term test
- 25% from submitted paper.
- 25% from presentation of the project

The minimum requirement for passing is 60%, the grade for the final mark is given according to the following (score/grade): 0-59 % = fail (1); 60-69 % = pass (2); 70-79 % = satisfactory (3); 80-89 % = good (4); 90-100 % = excellent (5).

Reconstruction

Code: MK5REKOM04M317-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 2nd year, 1st semester

Number of teaching hours/week (lecture + practice): 2+2

Topics:

During the semester students are familiar with the whole process (steps, phases) of the building reconstruction.

Literature:

Compulsory:

- Edward Allen, Joseph Iano (2013): Fundamentals of Building Construction: Materials and Methods. Wiley; 6 edition. ISBN-10: 1118138910
- Madan L Mehta, Walter Scarborough, Diane Armpriest (2012): Building Construction: Principles, Materials, & Systems. Pearson; 2 edition. ISBN-10: 0132148692
- Francis D. K. Ching (2014): Building Construction Illustrated. Wiley; 5 edition. ISBN-10: 1118458346*Recommended:*

Schedule

1st week Registration week	
2nd week: **Lecture:** Status survey I. **Practice:** On-site visual inspection, material sampling	**3rd week:** **Lecture:** Status survey II. **Practice:** Making of documents, photographs, site plan, floor plan
4th week: **Lecture:** Analysis, structural analysis **Practice:** Collection of structural errors	**5th week:** **Lecture:** Examination of external structural elements I. **Practice:** Plinth, pattern, cellar
6th week: **Lecture:** Examination of external structural elements II. **Practice:** Main wall, pillars	**7th week:** **Lecture:** Structure analysis **Practice:** Slab, roofing
8th week: 1st drawing week	
9th week: **Lecture:** Examination of internal structural elements I. **Practice:** Main wall, pillars, column, beam	**10th week:** **Lecture:** Examination of internal structural elements II. **Practice:** Slab, balcony, internal slab
11th week: **Lecture:** Examination of internal structural elements III.	**12th week:** **Lecture:** Roof structure examination I.

Practice: Examination of partition walls and masonry walls, substrate, crack, water test	**Practice:** Flat roof, water, heat and sound insulation, sloping concrete
13th week:	**14th week:**
Lecture: Roof structure examination II.	**Lecture:** Roof structure examination III.
Practice: High roof, beams	**Practice:** Rafters and roof rails
15th week: 2nd drawing week	

Requirements

A, for a signature:

Participation at practice classes is compulsory. Students must attend practice classes and may not miss more than three practice classes during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students can't take part in any practice class with another group. Attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed practice classes must be made up for at a later date, being discussed with the tutor.

During the semester there is one test: the end-term test is on the 15th week. Students must sit for the test.

B, for a grade:

The course ends in a mid-semester grade based on the one test.

The minimum requirement of the mid-term and the end-term test is 60% separately. The grade for each test is given according to the following (score/grade): 0-59 % = fail (1); 60-69 % = pass (2); 70-79 % = satisfactory (3); 80-89 % = good (4); 90-100 % = excellent (5).

If the score of any test is below 60, the student once can take a retake test of the whole semester material.

Construction Management III

Code: MK5EPS3M04M317-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 2nd year, 2ndsemester

Prerequisite: **Organization of Construction Processes in BIM Environment**

Number of teaching hours/week (lecture + practice): 2+2

Topics:

This course is focusing on various scopes of BIM. Main topics are data standardization and the benefits of model based estimating.

Literature:

Compulsory:

- BIM Forum: Level Of Development Specification. BIM Forum, Digitally printed: 2019 April. 256 pp.

Schedule

1st week Registration week	
2nd week: **Lecture:** Introduction, BIM overview **Practice:** Vico Office software demo and intro training	**3rd week:** **Lecture:** Level of Development Specification **Practice:** Database building - LOD
4th week: **Lecture:** Construction Classification Standards **Practice:** Database building - Work breakdown structure	**5th week:** **Lecture:** 3D planning and quantity takeoff **Practice:** Database building - Quantification
6th week: **Lecture:** Model-based cost planning **Practice:** Cost planning in Vico Office	**7th week:** **Lecture:** Model-based schedule planning **Practice:** Schedule planning in Vico Office
8th week: 1st drawing week	
9th week: **Lecture:** Virtual construction workflows 1 **Practice:** Project communication 1	**10th week:** Lecture: Virtual construction workflows 2 Practice: Project communication 2

Requirements

A, for a signature:

Participation at practice classes is compulsory. Students must attend practice classes and may not miss more than three occasions during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students can't take part in any practice class with another group. Attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed practice classes must be made up for at a later date, being discussed with the tutor.

B, for a grade:

The course ends in mid-semester grade based on a homework assignment.

The grade is given according to the following (score/grade): 0-59 % = fail (1); 60-69 % = pass (2); 70-79 % = satisfactory (3); 80-89 % = good (4); 90-100 % = excellent (5).

In case of fail, students will have a chance to resend the fixed assignment.

Subject group “Differentiated Field-Specific Subjects” for Industrial Process Engineering specialization

Production Technologies

Code: MK5TERMM04M217-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 1st year, 1st semester

Number of teaching hours/week (lecture + practice): 1+3

Topics:

The aim of this course is to develop the systematic approach and process-oriented thinking of the students which allows them to select the related technical fields with complex technical equipment design, operation and development. The course is aimed at the integration of systems thinking mainly to the introduction of the use of modern tools and typical process, manufacturing control engineering design tasks.

Literature:

Compulsory:

Mikell P. Groover (2014): Fundamentals of Modern Manufacturing, Danvers, MA, John Wiley & sons, Inc.

Schedule

1st week Registration week	
2nd week: **Lecture:** Introduction and Basic concepts of Manufacturing **Practice:** Laboratory safety, Engineering Materials	**3rd week:** **Lecture:** Processing of ceramics and cements **Practice:** Handmade technologies of ceramics, Bulk deformation of clay
4th week: **Lecture:** Shaping processes in glassworking **Practice:** Product design Consideration	**5th week:** **Lecture:** Shaping processes for plastics **Practice:** Vacuum forming, Additive technology
6th week:	**7th week:**

Lecture: Processing of Polymer Matrix Composites **Practice:** Making of carbon fiber reinforced PMC	**Lecture:** Manufacturing technology of composite materials **Practice:** Making of Bio composite structure
8th week: 1st drawing week	
9th week: **Lecture:** Fundamentals of metal casting. Metal casting processes **Practice:** Metal casting	**10th week:** **Lecture:** Property-Enhancing operations **Practice:** Heat treatment of steel
11th week: **Lecture:** Bulk deformation processes in metalworking **Practice:** Sheet metalworking	**12th week:** **Lecture:** Particulate processing **Practice:** Materials and products for Powder Metallurgy
13th week: **Lecture:** Surface processing operations **Practice:** Ceramic Coating Process with fired enamel technics	**14th week:** **Lecture:** Joining and Assembly Processes **Practice:** Soldering, adhesive bonding, mechanical assembly
15th week: 2nd drawing week	

Requirements

A, for a signature:

Participation at lectures is compulsory. Students must attend lectures and may not miss more than three of them during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Attendance at lectures will be recorded by the lecturer. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed lectures must be made up for at a later date, being discussed with the tutor.

The minimum requirement of the mid-term and the end-term test is 60 % separately. At the end of the semester everybody will get a mid-semester grade on the basis of the table below: The grade for each test is given according to the following (score/grade): 0-59 % = fail (1); 60-69 % = pass (2); 70-79 % = satisfactory (3); 80-89 % = good (4); 90-100 % = excellent (5).

If the score of any test is below 60 point, the student once can take a retake test of the whole semester material. If somebody fails, then he/she must write both tests in the 1st week of the exam period again. If the result is 60 % or better the retake test is success. If somebody must repeat his midterm tests, then his grade can’t be better than (2).

B, for a grade:

The grade will be the average of the two test’s grade. If it is for example (3.5) then the lecturer decides if it is (3) or (4).

Cellular Manufacturing

Code: MK5GYCELM04M217-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 1st year, 2ndsemester

Number of teaching hours/week (lecture + practice): 2+2

Topics:

In this course, we will cover the following topics: design of different manufacturing systems, design and control of cellular manufacturing systems. Push and Pull logistics systems. LEAN based cell planning. LEAN based cell scheduling by HEIJUNKA. At the end of the semester the students should be have a basic understanding of the design, operation and control of cellular manufacturing systems and be able to use quantitative methods to model, analyse, and optimize such systems.

Literature:

Compulsory:

- N. Singh, D. Rajamani: Cellular Manufacturing Systems: Design, planning and control 1996th Edition ISBN-10: 041255710X
- Nahmias, S. 2004. Production and Operations Analysis. 5th Edition. McGraw Hill/Irwin. ISBN 0-07-241741-2

Schedule

1st week Registration week	
2nd week: **Lecture:** Introduction to Cellular manufacturing **Practice:** Case studies	**3rd week:** **Lecture:** Types of cellular **Practice:** Case studies
4th week: **Lecture:** Intelligent automation **Practice:** Jidoka Problem Solving	**5th week:** **Lecture:** Intelligent automation **Practice:** Jidoka tools
6th week: **Lecture:** Material flow scheduling **Practice:** Heijunka	**7th week:** **Lecture:** Production flow analysis **Practice:** Methods of flow analysis
8th week: 1st drawing week	
9th week: **Lecture:** Flexible manpower line	**10th week:** **Lecture:** Standard work

Practice: Technics of optimizing the number of workers	**Practice:** methods of planning standard work
11th week:	**12th week:**
Lecture: Flexible manufacturing	**Lecture:** One piece flow
Practice: Control of cellular flexible manufacturing systems	**Practice:** Lot streaming
13th week:	**14th week:**
Lecture: Multi process handling	**Lecture:** Combined cellular Manufacturing
Practice: Case studies	**Practice:** Case studies
15th week: 2nd drawing week	

Requirements

A, for a signature:

Participation in practice classes is compulsory. Students must attend practice classes and they do not have more than three absences during the semester. In case a student does so, they will not get a signature for the subject, and they must repeat the course. Students cannot take part in any other practice class with another group. Attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. Delayed practice classes will be held on a later date, which will be discussed with the professor.

During the semester there are two tests: the mid-term test on the 8th week and the end-term test on the 15th week. Students must take the tests.

B, for a grade:

The course ends up with an exam based on the average result of the two tests.

The minimum requirement of the mid-term and the end-term test is 60% in each test. The grade for each test is given according to the following (score/grade): 0-59 % = fail (1); 60-69 % = pass (2); 70-79 % = satisfactory (3); 80-89 % = good (4); 90-100 % = excellent (5).

If the score of any test is below 60, the student once can take a retake test of the whole semester material.

Complex Project

Code: MK5KOMPM04M217-EN and MK5KOMPM04M117-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 2nd year, 1stsemester

Number of teaching hours/week (lecture + practice): 0+4

Topics:

In particular, the course will be focused on the student's ability development to manage complex exercises and implement technical, economic, financial and management tasks so that students are able to make comprehensive, comparative and scientific analysis. The course is highly interactive with challenging complex problem solving, team work, individual presentation and case studies.

The course focuses on the theory and application of the following:

Collection of data; The method of data processing and analysis; evaluation of data, data visualizing, interpretation of results. Strategy planning, performance measurement, handle cost constraints, examination of the change in a complex project environment, strategies for identifying and handling scope creep, risk management planning.

Literature:

Compulsory:

- Brealey, R. A. - Myers, S. C. – Allen, F (2014): Principles of Corporate Finances. 11th Edition. McGraw-Hill/Irwin, 2014. ISBN-13: 9780077151560.
- Ploccak, J. – Remington, K. (2012): Tools for Complex Projects. Gower Publishing, Ltd., 2012. ISBN 1409458725, 9781409458722.

Recommended:

- Wysocki, R. K. (2011): Executive's Guide to Project Management: Organizational Processes and Practices for Supporting Complex Projects. John Wiley & Sons, 2011. ISBN 1118089243, 9781118089248
- Stefano Gatti (2013): Project Finance in Theory and Practice Designing, structuring and financing private and public projects ELSEVIER INC.
- Correia, C. – Flynn, D. K. - Besley – Ulian, E. – Wormald, M. (2012): Financial Management. 6th edition. Juta and Company Ltd. ISBN: 0702171573, 9780702171574.
- Yogesh Kumar Singh (2006): Fundamental Of Research Methodology And Statistics. New Age International, 2006. ISBN 8122418864, 9788122418866.

Schedule

1st week Registration week	
2nd week: **Practice:** Structure of Construction Investment	3rd week: **Practice:** documents, plans, permissions Historical
4th week: **Practice:** Authorization documents	5th week: **Practice:** Prime contractor selection criteria
6th week: **Practice:** Building contract and peculiarities	7th week: **Practice:** Participants in building processes, tasks, responsibilities

8th week: 1st drawing week	
9th week: **Practice:** Storage, depositing and logistics of building materials	**10th week:** **Practice:** Substructure works
11th week: **Practice:** Structural works	**12th week:** **Practice:** Finishing works
13th week: **Practice:** Area retrieval and protocol	**14th week:** **Practice:** Warranty, Own project presentation
15th week: 2nd drawing week	

Requirements

A, for signature:

Participation at practice is compulsory. Student must attend the practices and my not miss more than three practice during the semester. In case a student misses more than three, the subject will not be signed and the student must repeat the course. Student can't make up a practice with another group. The attendance on practice will be recorded by the practice leader. Being late is counted as an absence. In case of further absences, a medical certificate needs to be presented. Missed practices should be made up for at a later date, to be discussed with the tutor. Students are required to bring the necessary utensil (e.g. calculator) for the course with them to each practice. Active participation is evaluated by the teacher in every class. If student's behavior or conduct doesn't meet the requirements of active participation, the teacher may evaluate their participation as an absence due to the lack of active participation in class.

During the semester there are two tests: the mid-term test is in the 7th week and the end-term test in the 14th week. Students have to sit for the tests.

B, for grade:

The minimum requirement of the mid-term test and the end-term test is 50% separately.

The course ends in mid-semester grade, the grade is calculated as:

- 30%-30% from the two tests,
- 40% from the result of the teamwork.

The minimum requirement for passing is 50%, the grade for the final mark is given according to the following (score/grade): 0-49 % = fail (1); 50-62 % = pass (2); 63-75 % = satisfactory (3); 76-88 % = good (4); 89-100 % = excellent (5).

If the score of any test is below 50%, the student once can take a retake test of the whole semester material

Advanced Applied Engineering

Code: MK5OPERM04M217-EN
ECTS Credit Points: 4
Year, Semester: 2st year, 1nd semester
Evaluation: mid-semester grade
Number of teaching hours/week (lecture + practice): 2+2

Topics:

In the frame of advanced applied engineering students are going to continue their study in the field of operations research. Uncertain feature of real business problems is included, by which students can carry out a complete analysis of a given problem. Important advanced models are discussed, such as multi-objective linear programming, multi-period production planning, facility location problems, etc. At the end of the course a complex project will be given to the students, which relies on the previously acquired material.

Literature:

Compulsory:

- Cliff T. Ragsdale: Spreadsheet Modeling & Decision Analysis, 8th edition, 2017, ISBN: 9781305947412
- Wayne L. Winston: Operations research: Applications and Algorithm, 4th Edition, Brook/Cole, Canada, 2004, ISBN: 978-0534380588
- George B. Dantzig: Linear Programming and Extensions, Princeton University Press, 1998, ISBN: 978-0691059136

Schedule

1st week Registration week	
2nd week: **Lecture:** Revision of Applied Engineering course **Practice:** Computer related practice – Modell creation, sensitivity analysis	**3rd week:** **Lecture:** Decision making under uncertainty **Practice:** Computer related practice – Decision making under uncertainty
4th week: **Lecture:** Decision making under uncertainty **Practice:** Computer related practice – Decision making under uncertainty	**5th week:** **Lecture:** Multi-objective linear programming **Practice:** Computer related practice – Multi-objective linear programming
6th week: **Lecture:** Multi-objective linear programming **Practice:** Computer related practice – Multi-objective linear programming	**7th week:** **Lecture:** Deterministic Multi-period programming **Practice:** Computer related practice – Multi period models for production

8th week: 1st drawing week	
9th week: **Lecture:** Deterministic Multi-period programming **Practice:** Computer related practice – Multi period models for production	**10th week:** **Lecture:** Queuing theory **Practice:** Computer related practice – Queuing theory
11th week: **Lecture:** Facility location design **Practice:** Computer related practice – Facility location design	**12th week:** **Lecture:** Facility location design **Practice:** Computer related practice – Facility location design
13th week: **Lecture:** Complex project solving **Practice:** Complex project solving	**14th week:** **Lecture:** Complex project solving **Practice:** Complex project solving
15th week: 2nd drawing week	

Requirements

A, for a signature:

Participation at practices is compulsory. Students must attend practices and may not miss more than three of them during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Attendance at lectures and practices will be recorded by the lecturer. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed lectures must be made up for at a later date, being discussed with the tutor.

B, for a grade:

The course ends in end-term test. The grade for the test is given according to the following table:

Score	Grade
0-59	fail (1)
60-69	pass (2)
70-79	satisfactory (3)
80-89	good (4)
90-100	excellent (5)

C, Etiquette:

A large portion of class time is spent sharing opinions and sharing information. Therefore, it is of utmost importance to communicate with courtesy and professionalism. Professional courtesy includes respecting others' opinions, being courteous and respectful, and working together in the spirit of cooperation. Discussions and assignments will be graded on quality and professionalism. Please refrain from using cell phones or other disruptive electronic devices while attending class, and please silence all sounds made by such devices while class is in session.

D, Use of English:

In accordance with Faculty Policy, students may be penalized up to 10% of the marks on all assignments, tests, and examinations for the improper use of English.

System Engineering

Code: MK5RENDM04M217-EN and MK5RENDM04M117-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Prerequisites:

on Industrial Process Engineering specialization: Advanced Applied Engineering

on Material Handling and Logistics specialization: Supply Chain Informatics System

Year, Semester: 2nd year, 2nd semester

Number of teaching hours/week (lecture + practice): 2+2

Topics:

This course in systems engineering examines the principles and process of creating effective systems to meet application demands. Concepts, problems, and methods of systems engineering are introduced in lectures and discussions and applied in assignments and through semester-long group projects.

Literature:

Compulsory:

- Kossiakoff, A., Sweet, W. (2003). Systems Engineering Principles and Practice. John Wiley and Sons, Inc: Hoboken, New Jersey. ISBN 0-471- 23443-5

Schedule

1st week Registration week	
2nd week: **Lecture:** Definition of a system **Practice:** Case studies	**3rd week:** **Lecture:** Structure of a complex system **Practice:** Fault-tree analysis
4th week: **Lecture:** The system life cycle	**5th week:** **Lecture:** Quality function deployment **Practice:** Different dimensions of QFD

Practice: Case studies of Life-cycle cost analysis	
6th week: **Lecture:** Maintainability Engineering **Practice:** MTA and RCM tools	**7th week:** **Lecture:** Advanced System Quality Planning **Practice:** The steps and methods of ASQP
8th week: 1st drawing week	
9th week: **Lecture:** Needs analysis, Risk analysis **Practice:** VOC investigation, Risk factor calculation and risk reporting	**10th week:** **Lecture:** Quality function deployment **Practice:** Requirements of system

Requirements

Participation at practices is compulsory. Students must attend practices and may not miss more than three of them during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Attendance at lectures and practices will be recorded by the lecturer. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed lectures must be made up for at a later date, being discussed with the tutor.

B, for a grade:

The course ends in end-term test. The grade for the test is given according to the following (score/grade): 0-59 % = fail (1); 60-69 % = pass (2); 70-79 % = satisfactory (3); 80-89 % = good (4); 90-100 % = excellent (5).

Subject group “Differentiated Field-Specific Subjects” for Material Handling and Logistics specialization

Digital Logistics

Code: MK5DILOM04M117-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 1st year, 1st semester

Number of teaching hours/week (lecture + practice): 1+3

Topics:

There is widespread recognition among leaders in most industries that the role of digital technology is rapidly shifting, from being a driver of marginal efficiency to an enabler of fundamental innovation and disruption. While it is clear that digital technology will transform most industries, there are a number of challenges that need to be understood and addressed. This course is about the latest developments and trends from the digitalization of business and society affecting logistics during that what is called the Fourth Industrial Revolution.

Focus of the course: effects of digitization on management and technical facilitation of material flows in supply chains.

Literature:

Compulsory:

- Wang, Y.; Pettit, S: E-Logistics, Pearson Education, 2012
- Graham, D.; Manikas, I.; Folinas, D. K.: E-Logistics and E-Supply Chain Management, Eurospan Group, 2013
- Ross, D. F.: Introduction to e-Supply Chain Management, CRC Press, 2002

Recommended:

- Arnold, J. R. Tony; Chapman, Stephen N.; Clive, Lloyd M.: Introduction to Materials Management, Pearson Education, 2014
- Grant, David B.: Logistics Management, Pearson Education, 2012

Schedule

1st week Registration week	
2nd week: **Lecture:** Key concepts of material handling, logistics and supply chain management – the effects of global business and industry digitization. **Practice:** Case study	**3rd week:** **Lecture:** The digital transformation of logistics: Threats and opportunities. **Practice:** Case study
4th week: **Lecture:** Digitalization inpurchasing, procurement and inbound logistics. **Practice:** Case study	**5th week:** **Lecture:** Industry 4.0 - Intelligent operations and material management in production logistics and packaging. **Practice:** Case study
6th week: **Lecture:** Distribution - impact of e-commerce on logistics **Practice:** Case study	**7th week:** **Lecture:** Warehousing and inventory management - systems and software. **Practice:** Case study
8th week: 1st drawing week	
9th week:	**10th week:** **Lecture:** Case study

Lecture: Transportation - self driving andautonomous vehicles, e-Fleet management. **Practice:** Case study	**Practice:** Case study
11th week: **Lecture:** Telematics & Telematics Technology, Reverse logistics and circular economy, Workforce and consumers in the Digital Era. Sharing economy or Uberization **Practice:** Case study	**12th week:** **Lecture:** Progression of capabilities: functional excellence, Progression of capabilities: enterprise logistics management **Practice:** Case study
13th week: **Lecture:** Progression of capabilities: supply chain integration and collaboration **Practice:** Case study	**14th week:** **Lecture:** IoT, cloud, digital supply chain and machine learning vs boxes-and-materials supply chain - new business models **Practice:** Case study
15th week: 2nd drawing week	

Requirements

A, for a signature:

- attendance on study trips
- attendance on the prescribed lectures of scientific and trade conferences
- attendance on at least 60% of course lectures

B, for a grade:

- individual or group analysis of a digital logistics case study
- presentation of the case study

Advanced Production Logistics

Code: MK5HTLOM04M117-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 1st year, 2ndsemester

Number of teaching hours/week (lecture + practice): 2+2

Topics:

In this course, students are taught different material flow techniques, which can be applied in push and pull logistics system. This course covers these fields: planning line capacity, planning work in process, planning material flow, planning material supply.

Literature:

Compulsory:

- Nahmias, S. 2004. Production and Operations Analysis. 5th Edition. McGraw Hill/Irwin. ISBN 0-07-241741-2
- Askin, R.G. and J.B. Goldberg. 2002. Design and Analysis of Lean Production Systems. John Wiley & Sons Inc. ISBN 0-471-11593-2

Schedule

1st week Registration week	
2nd week: **Lecture:** Total Flow Management Model **Practice:** Production flow	3rd week: **Lecture:** Capacity planning **Practice:** Line capacity planning
4th week: **Lecture:** Push flow **Practice:** I. MRP II	5th week: **Lecture:** Material flow scheduling **Practice:** Heijunka
6th week: **Lecture:** Standard work **Practice:** methods of standard work planning	7th week: **Lecture:** Inventory in the material flow **Practice:** Supermarket design
8th week: 1st drawing week	
9th week: **Lecture:** Inventory in the material flow, Pull flow **Practice:** Puffer design, MTS planning	10th week: **Lecture:** Pull flow **Practice:** MTO planning
11th week: **Lecture:** Mizusumashi and milk run **Practice:** Material flow in manufacturing	12th week: **Lecture:** Techniques of components' supply **Practice:** Methods of continuous supply
13th week: **Lecture:** Techniques of components' supply **Practice:** Methods of continuous supply	14th week: **Lecture:** Techniques of components' supply **Practice:** Sequential supply
15th week: 2nd drawing week	

Requirements

A, for a signature:

Participation in practice classes is compulsory. Students must attend practice classes and they do not have more than three absences during the semester. In case a student does so, they will not get a signature for the subject, and they must repeat the course. Students cannot take part in any other practice class with another group. Attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence.

Delayed practice classes will be held on a later date, which will be discussed with the professor.

During the semester there are two tests: the mid-term test on the 8th week and the end-term test on the 15th week. Students must take the tests.

B, for a grade:

The course ends up with an exam based on the average result of the two tests.

The minimum requirement of the mid-term and the end-term test is 60% in each test. The grade for each test is given according to the following table:

Score	Grade
0-59	fail (1)
60-69	pass (2)
70-79	satisfactory (3)
80-89	good (4)
90-100	excellent (5)

If the score of any test is below 60, the student once can take a retake test of the whole semester material.

Complex Project

Code: MK5KOMPM04M217-EN and MK5KOMPM04M117-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 2nd year, 1stsemester

Number of teaching hours/week (lecture + practice): 0+4

Topics:

In particular, the course will be focused on the student's ability development to manage complex exercises and implement technical, economic, financial and management tasks so that students are able to make comprehensive, comparative and scientific analysis. The course is highly interactive with challenging complex problem solving, team work, individual presentation and case studies.

The course focuses on the theory and application of the following:

Collection of data; The method of data processing and analysis; evaluation of data, data visualizing, interpretation of results. Strategy planning, Process modelling, artefact building. Problem solving by design science research in the frame of Business Process Management (BPM).

Literature:

Compulsory:

- Brealey, R. A. - Myers, S. C. – Allen, F (2014): Principles of Corporate Finances. 11th Edition. McGraw-Hill/Irwin, 2014. ISBN-13: 9780077151560.

- Ploccak, J. – Remington, K. (2012): Tools for Complex Projects. Gower Publishing, Ltd., 2012. ISBN 1409458725, 9781409458722.

Recommended:

- Wysocki, R. K. (2011): Executive's Guide to Project Management: Organizational Processes and Practices for Supporting Complex Projects. John Wiley & Sons, 2011. ISBN 1118089243, 9781118089248
- Stefano Gatti (2013): Project Finance in Theory and Practice Designing, structuring and financing private and public projects ELSEVIER INC.
- Correia, C. – Flynn, D. K. - Besley – Ulian, E. – Wormald, M. (2012): Financial Management. 6th edition. Juta and Company Ltd. ISBN: 0702171573, 9780702171574.
- Yogesh Kumar Singh (2006): Fundamental Of Research Methodology And Statistics. New Age International, 2006. ISBN 8122418864, 9788122418866.

Schedule

1st week Registration week	
2nd week: **Practice:** Design Science Research	**3rd week:** **Practice:** Four main types of Quantitative research: Descriptive, Correlational, Causal-Comparative
4th week: **Practice:** Steps of complex problem solving in the field of Business Process Management (BPM)	**5th week:** **Practice:** Process Modelling by EPC (Event-driven Process Chain diagram)
6th week: **Practice:** Planning and scheduling of complex project by research plan	**7th week:** **Practice:** Project scheduling by logical framework
8th week: 1st drawing week	
9th week: **Practice:** Process analysis and root cause identification.	**10th week:** **Practice:** Ranking of potential root causes by FMEA (Failure Mode and Effect analysis)
11th week: **Practice:** Artefact building and evaluation of possible solutions	**12th week:** **Practice:** Planning the future state of business processes by advanced technique
13th week: **Practice:** Team complex project work	**14th week:** **Practice:** Team complex project work.
15th week: 2nd drawing week	

Requirements

A, for signature:

Participation at practice is compulsory. Student must attend the practices and my not miss more than three practice during the semester. In case a student misses more than three, the subject will not be signed and the student must repeat the course. Student can't make up a practice with another group. The attendance on practice will be recorded by the practice leader. Being late is counted as an absence. In case of further absences, a medical certificate needs to be presented. Missed practices should be made up for at a later date, to be discussed with the tutor. Students are required to bring the necessary utensil (e.g. calculator) for the course with them to each practice. Active participation is evaluated by the teacher in every class. If student's behavior or conduct doesn't meet the requirements of active participation, the teacher may evaluate their participation as an absence due to the lack of active participation in class.

During the semester there are two tests: the mid-term test is in the 7th week and the end-term test in the 14th week. Students have to sit for the tests. During the semester a complex problem-solving process has to be performed in team work. Result of team work is counted into the final grade.

B, for grade:

The minimum requirement of the mid-term test and the end-term test is 50% separately.

The course ends in mid-semester grade, the grade is calculated as:

- 30%-30% from the two tests,
- 40% from the result of the teamwork.

The minimum requirement for passing is 50%, the grade for the final mark is given according to the following (score/grade): 0-49 % = fail (1); 50-62 % = pass (2); 63-75 % = satisfactory (3); 76-88 % = good (4); 89-100 % = excellent (5).

If the score of any test is below 50%, the student once can take a retake test of the whole semester material

Advanced Warehouse Systems

Code: MK5KORAM04M121-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 2nd year, 1stsemester

Number of teaching hours/week (lecture + practice): 2+2

Topics:

The aim of the course is to get acquainted with storage systems. Gets acquainted with the connections and peculiarities of the storage process. Coordinate warehouse product identification methods and communication with production and external actors.

Literature:

Compulsory:

Hompel Michael ten: Warehouse Management, Springer-Verlag 2006, ISBN13 (EAN): 9783540352181

Edward Frazelle: World-Class Warehousing and Material Handling,McGraw hill 2015, ISBN-13: 978-0071842822

Recommended:

Stuart Emmett: Excellence in Warehouse Management: How to Minimise Costs and Maximise Value, Wiley 2005, ISBN: 978-0-470-01531-5

Max Muller: Essentials of Inventory Management, HarperCollins Leadership 2019, ISBN13: 978-1400212378

Scott Keller, Brian Keller: Definitive Guide to Warehousing, The: Managing the Storage and Handling of Materials and Products in the Supply Chain (Council of Supply Chain Management Professionals), Pearson 2013, ISBN-13: 978-0133448900

John J. BARTHOLDI, Steven T. HACKMAN: WAREHOUSE & DISTRIBUTION SCIENCE, The Supply Chain and Logistics Institute School of Industrial and Systems Engineering Georgia Institute of Technology Atlanta, 2014

Schedule

1st week Registration week	
2nd week: **Lecture:** The main material flows and processes in a warehouse. Features and types of storage systems. **Practice:** Case study	**3rd week:** **Lecture:** The process of storing bulk and piece goods. Comparison of piece storage systems from several perspectives. **Practice:** Case study & calculation task
4th week: **Lecture:** Aspects of the design of goods preparation spaces. Selection of storage systems by different methods. **Practice:** Case study	**5th week:** **Lecture:** Product identification systems. Bar Code, QR Code **Practice:** Case study & calculation task
6th week: **Lecture:** Product identification systems. RFID, Biometric, other specific identification systems. **Practice:** Case study	**7th week:** **Lecture:** Specificity of order picking processes, materials handling and order picking workflow design. **Practice:** Case study & calculation task

8th week: 1st drawing week	
9th week: **Lecture:** Traditional and automated material flow and storage of high traffic route planning and optimization. **Practice:** Case study & planning task	**10th week:** **Lecture:** Communication with production characteristics and communication systems coordination. **Practice:** Case study
11th week: **Lecture:** The typical logistics technology variations of storing. Planning of transporting connections and loading technology. **Practice:** Case study & calculation task	**12th week:** **Lecture:** Planning the dimensions of loading bays, and the goods preparation areas of warehouses **Practice:** Case study & calculation task
13th week: **Lecture:** Planning the topology and layout of storage systems in case of a very-narrow-aisle (VNA) system. The sizing tasks regarding to the applied storage equipment. How to create a logistics system plan of a warehousing technology. **Practice:** Case study & Planning task	**14th week:** **Lecture:** Measures of the efficiency of storage systems. (rotation speed, area and volume utilization rates, inventory coverage time, operation, lead times, etc.) **Practice:** Case study & calculation task
15th week: 2nd drawing week	

Requirements

A, for a signature:

- attendance on study trips
- attendance on the prescribed lectures of scientific and trade conferences
- attendance on at least 60% of course lectures

B, for a grade:

Proper solution of an individual task

- Exam

Planning of Logistics Systems

Code: MK5LORTM04M121-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 2nd year, 2nd semester

Prerequisite: Advanced Production Logistics

Number of teaching hours/week (lecture + practice): 2+2

Topics:

The aim of the course is to acquire the basics of the knowledge required for the design of logistics systems. Students will become acquainted with the general theory of systems design and then with its main features for logistics systems. The specific properties and planning process of logistics systems in case of plant facilities and external connection. The main steps and tasks of logistics system planning.

It is important to know how to create a logistics system plan in case of a plant logistics system. The facility layout planning techniques and methods, the systematic facility layout planning. The applied specific facility layout topologies and the mathematical modelling approaches of the theoretical facility layout planning problems. The material flow system architecture in a plant. The planning steps of the material flow systems in a plant. Inbound and outbound system planning steps, and realisation.

Literature:

Compulsory:

- Langevin Andre: Logistics Systems, Springer-Verlag New York 2005, ISBN13 (EAN): 9780387249711
- Gianpaolo Ghiani: Introduction to Logistics Systems Management, John Wiley 2013, ISBN: 1119943388

Recommended:

- Carlos F. Daganzo: Logistics Systems Analysis, Springer-Verlag Berlin 2010, ISBN: 3642062946
- Freitag Michael: Dynamics in Logistics, Springer 2016, ISBN13 (EAN): 9783319451169
- Bruce Robinson: Supply Chain Management: Planning and Operations, Clanrye 2016, ISBN: 1632405741

Schedule

1st week Registration week

2^{nd} week:

Lecture: The main steps and tasks of logistics system planning.

Practice: Case study & calculation task

3^{rd} week:

Lecture: The facility layout planning techniques and methods, the systematic facility layout planning.

Practice: Case study & calculation task

4^{th} week:

Lecture: The applied specific facility layout topologies and the mathematical modelling approaches of the theoretical facility layout planning problems.

Practice: Case study & calculation task

5^{th} week:

Lecture: The models of the value-creating objects, modelling the single, workshop, group and line-based logistics networks, supporting the decisions regarding the spatial layout. Choosing the theoretical layout planning models regarding the previous decided spatial layouts.

Practice: Case study & planning task

6^{th} week:

Lecture: The material flow system architecture in a plant. The planning steps of the material flow systems

in a plant

Practice: Case study & calculation task

7^{th} week:

Lecture: The methodology of material flow system planning, the main heuristic and optimization models. Analytical queueing theory models and simulation methods in the planning of facility logistics systems.

Practice: Case study & planning task

8^{th} week: 1^{st} drawing week

9^{th} week:

Lecture: Issues in the design of external logistics systems. Economic challenges of transport frequencies and sizes

Practice: Case study & calculation task

10^{th} week:

Lecture: Center search problems, basic tasks and different solution methods.

Practice: Case study & calculation task

11^{th} week:

Lecture: Typical cases of freight planning, planning tasks and the basic solution methods and considerations.

Practice: Case study & calculation task

12^{th} week:

Lecture: Integration of the basic arguments of lean philosophy in the planning process.

Practice: Case study & planning task

13^{th} week:

Lecture: Scheduling customer needs, optimizing the logistics system

14^{th} week:

Lecture: System KPIs and their continuous monitoring.

Practice: Case study	**Practice:** Case study & calculation task

15th week: 2nd drawing week

Requirements

A, for a signature:

- attendance on study trips
- attendance on the prescribed lectures of scientific and trade conferences
- attendance on at least 60% of course lectures

B, for a grade:

- Exam

DIPLOMA

Within 30 days of the successful final exam the diploma is issued and given out by the Faculty at the graduate's special request. Otherwise, the diploma will be awarded to him/her at the graduation ceremony of the Faculty.

The diploma is an official document decorated with the coat of arms of Hungary which verifies the successful completion of studies in the Engineering Management master's program. The diploma contains the following data: name of HEI (higher education institution); institutional identification number; serial number of diploma; name of diploma holder; date and place of his/her birth; level of qualification; training program; specialization; mode of attendance; place, day, month and year issued. Furthermore, it has to contain the Rector's (or Vice-Rector's) original signature and the seal of HEI. The University keeps a record of the diplomas issued.

Calculating diploma grade

$$Grade = \frac{A + B + C}{2}$$

where

A: the (cumulative) weighted average calculated over the whole period of study,

B: average of the grades for the oral parts of the final exam,

C: grade awarded for defending thesis on the final exam.

Classification of the award:

Outstanding (5)	4,81 – 5,00
Excellent (5)	4,51 – 4,80
Good (4)	3,51 – 4,50
Satisfactory (3)	2,51 – 3,50
Pass (2)	2,00 – 2,50

The overall qualification of the degree certificate is *"With honours (5)" if* the student obtained grade 5 in all subjects of the final exam, the thesis grade is excellent and the grade average of all his/her other examination grades and seminar grades is minimum 4.00 or better. Moreover, he/she is not permitted to have a grade worse than grade good (4) during his/her studies.

MODEL CURRICULUM OF ENGINEERING MANAGEMENT MSC, CONSTRUCTION INDUSTRY SPECIALIZATION

Nr.	Subject groups	Subject	Code	1st semester				2nd semester				3rd semester				4th semester				Prerequisite
				L	P	E	C	L	P	E	C	L	P	E	C	L	P	E	C	
1	Basics of Natural Sciences	Quantitative Methods	MK5KVANA04MX17-EN	2	2	m	4													
2		Applied Mathematics in Manufacturing Design	MK5AMTTM04MX18-EN	1	2	e	4													
3		Econometrics	MK5OKONM04MX17-EN					1	3	e	4									
4		Introduction to Nanotechnology	MK5NANOM04MX17-EN					1	2	e	4									
5		Environmental Impact Assessment	MK5KOHVM04MX23-EN													1	2	e	4	Introduction to Nanotechnology
6	Economics and Humanities	Development of Organization and Human Resource	MK5SZEMM04MX17-EN	2	2	e	4													
7		Advanced Corporate Finance	MK5HVLPM04MX17-EN	1	3	e	4													
8		Negotiation and Conflict Management	MK5TKOMM04MX17-EN	1	2	m	4													
9		International and Management Accounting	MK5NVSZM04MX17-EN									2	2	m	4					
10		Leadership Competencies Development	MK5KOMPM04MX17-EN									2	2	m	4					
11	Professional Compulsory Subjects	Applied Engineering	MK5ALKRM04MX17-EN					1	2	m	4									
12		Advanced Quality and Lean Management	MK5HMLMM04MX23-EN					2	2	m	4									
13		Operations Management	MK5HTEV2M04MX17-EN									2	2	e	4					Applied Mathematics in Manufacturing Design
14		Project Leadership	MK5PROVM04MX17-EN													2	2	m	4	
15		Risk and Reliability	MK5KOCKM04MX17-EN	2	2	e	4													
16		Control of Integrated Information System	MK5INFRM04MX17-EN					1	3	e	4									
17	Field-specific Compulsory Subjects	Building Energetics II	MK5EEN2L04M321-EN	1	3	m	4													
18		Organization of Construction Processes in BIM Environment	MK5EPE2M04M321-EN					2	2	e	4									
19		Complex Project	MK5KOMPM04M317-EN					0	4	m	4									
20		Reconstruction	MK5REKOM04M317-EN									2	2	m	4					
21		Construction Management III	MK5EPS3M04M317-EN													2	2	m	4	Organization of Construction Processes in BIM Environment
22		Msc Thesis I	MK5DIP1M15MX21-EN									0	3	é	15					
23		Msc Thesis II	MK5DIP2M15MX21-EN													0	7	é	15	Msc Thesis I
24	Optional Subjects*	Optional Subject					3													
25		Optional Subject									3									
26	Criterium Subjects***	Industrial internship	MK5SZGYM00MX18-EN					4 weeks		s	0									
27		Physical Education**	SI-003																	
28		Work and Fire Safety	MUNKAVEDELEM			s	0													

MODEL CURRICULUM OF ENGINEERING MANAGEMENT MSC, Industrial Process Engineering Specialization

Nr.	Subject groups	Subject	Code	1st semester				2nd semester				3rd semester				4th semester				Prerequisite
				L	P	E	C	L	P	E	C	L	P	E	C	L	P	E	C	
1	Basics of Natural Sciences	Quantitative Methods	MK5KVANA04MX17-EN	2	2	m	4													
2		Applied Mathematics in Manufacturing Design	MK5AMTTM04MX18-EN	1	2	e	4													
3		Econometrics	MK5OKONM04MX17-EN					1	3	e	4									
4		Introduction to Nanotechnology	MK5NANOM04MX17-EN					1	2	e	4									
5		Environmental Impact Assessment	MK5KOHVM04MX23-EN													1	2	e	4	Introduction to Nanotechnology
6	Economics and Humanities	Development of Organization and Human Resource	MK5SZEMM04MX17-EN	2	2	e	4													
7		Advanced Corporate Finance	MK5HVLPM04MX17-EN	1	3	e	4													
8		Negotiation and Conflict Management	MK5TKOMM04MX17-EN	1	2	m	4													
9		International and Management Accounting	MK5NVSZM04MX17-EN									2	2	m	4					
10		Leadership Competencies Development	MK5KOMPM04MX17-EN									2	2	m	4					
11	Professional Compulsory Subjects	Applied Engineering	MK5ALKRM04MX17-EN					1	2	m	4									
12		Advanced Quality and Lean Management	MK5HMLMM04MX23-EN					2	2	m	4									
13		Operations Management	MK5HTEV2M04MX17-EN									2	2	e	4					Applied Mathematics in Manufacturing Design
14		Project Leadership	MK5PROVM04MX17-EN													2	2	m	4	
15		Risk and Reliability	MK5KOCKM04MX17-EN	2	2	e	4													
16		Control of Integrated Information System	MK5INFRM04MX17-EN					1	3	e	4									
17	Field-specific Compulsory Subjects	Production Technologies	MK5TERMM04M217-EN	1	3	m	4													
18		Cellular Manufacturing	MK5GYCELM04M217-EN					2	2	e	4									
19		Complex Project	MK5KOMPM04M217-EN					0	4	m	4									
20		Advanced Applied Engineering	MK5HALMM04M219-EN									2	2	m	4					
21		System Engineering	MK5RENDM04M217-EN													2	2	m	4	Advanced Applied Engineering
22		Msc Thesis I	MK5DIP1M15MX21-EN									0	3	é	15					
23		Msc Thesis II	MK5DIP2M15MX21-EN													0	7	é	15	Msc Thesis I
24	Optional Subjects*	Optional Subject					3													
25		Optional Subject									3									
26	Criterium Subjects***	Industrial internship	MK5SZGYM00MX18-EN					4 weeks		s	0									
27		Physical Education**	SI-003																	
28		Work and Fire Safety	MUNKAVEDELEM			s	0													

MODEL CURRICULUM OF ENGINEERING MANAGEMENT MSC, Material Handling and Logistics Specialization

Nr.	Subject groups	Subject	Code	1st semester				2nd semester				3rd semester				4th semester				Prerequisite
				L	P	E	C	L	P	E	C	L	P	E	C	L	P	E	C	
1	Basics of Natural Sciences	Quantitative Methods	MK5KVANA04MX17-EN	2	2	m	4													
2		Applied Mathematics in Manufacturing Design	MK5AMTTM04MX18-EN	1	2	e	4													
3		Econometrics	MK5OKONM04MX17-EN					1	3	e	4									
4		Introduction to Nanotechnology	MK5NANOM04MX17-EN					1	2	e	4									
5		Environmental Impact Assessment	MK5KOHVM04MX23-EN													1	2	e	4	Introduction to Nanotechnology
6	Economics and Humanities	Development of Organization and Human Resource	MK5SZEMM04MX17-EN	2	2	e	4													
7		Advanced Corporate Finance	MK5HVLPM04MX17-EN	1	3	e	4													
8		Negotiation and Conflict Management	MK5TKOMM04MX17-EN	1	2	m	4													
9		International and Management Accounting	MK5NVSZM04MX17-EN									2	2	m	4					
10		Leadership Competencies Development	MK5KOMPM04MX17-EN									2	2	m	4					
11	Professional Compulsory Subjects	Applied Engineering	MK5ALKRM04MX17-EN					1	2	m	4									
12		Advanced Quality and Lean Management	MK5HMLMM04MX23-EN					2	2	m	4									
13		Operations Management	MK5HTEV2M04MX17-EN									2	2	e	4					Applied Mathematics in Manufacturing Design
14		Project Leadership	MK5PROVM04MX17-EN													2	2	m	4	
15		Risk and Reliability	MK5KOCKM04MX17-EN	2	2	e	4													
16		Control of Integrated Information System	MK5INFRM04MX17-EN					1	3	e	4									
17	Field-specific Compulsory Subjects	Digital Logistics	MK5DILOM04M117-EN	1	3	m	4													
18		Advanced Production Logistics	MK5HTLOM04M117-EN					2	2	e	4									
19		Complex Projekt	MK5KOMPM04M117-EN					0	4	m	4									
20		Advanced Warehouse Systems	MK5KORAM04M121									2	2	m	4					
21		Planning of Logistics Systems	MK5LORTM04M121													2	2	m	4	Advanced Production Logistics
22		Msc Thesis I	MK5DIP1M15MX21-EN									0	3	é	15					
23		Msc Thesis II	MK5DIP2M15MX21-EN													0	7	é	15	Msc Thesis I
24	Optional Subjects*	Optional Subject					3													
25		Optional Subject									3									
26	Criterium Subjects***	Industrial internship	MK5SZGYM00MX18-EN					4 weeks		s	0									
27		Physical Education**	SI-003																	
28		Work and Fire Safety	MUNKAVEDELEM																	