AGH UNIVERSITY OF SCIENCE AND TECHNOLOGY

Module name: Technical Trends of the Modern Industry

Academic year: 2019/2020 Code: ZSDA-3-0214-s ECTS credits: 3

Faculty of: Szkoła Doktorska AGH

Field of study: Szkoła Doktorska AGH Specialty: —

Study level: Third-cycle studies Form and type of study: Full-time studies

Lecture language: English Profile of education: Academic (A) Semester: 0

Course homepage: —

Responsible teacher: dr hab. inż, prof. AGH Lelito Janusz (lelito@agh.edu.pl)

Module summary

Introduction to the modern production processes of foundries. Basics of designs of divisions of foundries. Regional and international trends in the foundry market. Technical tends of the casting designs. The advantages as well as disadvantages of foundry processes. Introduction of modern digital tools in foundries (Foundry 4.0).

Description of learning outcomes for module

MLO code	Student after module completion has the knowledge/ knows how to/is able to	Connections with FLO	Method of learning outcomes verification (form of completion)
Social competence: is able to			
M_K001	Can appreciate the advantages of different types of foundries and understand the major trends in the international competition.	SDA3A_K01, SDA3A_K02	Report, Case study, Activity during classes
Skills: he can			
M_U001	Student has the ability to see the trends in the foundry automatisation	SDA3A_U02, SDA3A_U01, SDA3A_U04	Report, Participation in a discussion, Oral answer, Activity during classes
M_U002	Student can see the trends in the international development of the markets.	SDA3A_U02, SDA3A_U01, SDA3A_U04	Report, Presentation, Oral answer, Case study, Activity during classes
Knowledge: he knows and understands			
M_W001	Student has a general understanding of the advantages of digital tools in the foundries	SDA3A_W07, SDA3A_W01	Report, Participation in a discussion, Oral answer, Case study, Activity during classes

M_W002	Student knows how to solve future issues of foundries in Europe	SDA3A_W07, SDA3A_W01	Report, Participation in a discussion, Oral answer, Case study, Activity during classes

Number of hours for each form of classes

	Form of classes										
Suma	Lectures	Auditorium classes	Laboratory classes	Project classes	Conversation seminar	Seminar classes	Practical classes	Fieldwork classes	Workshops	Prace kontrolne i przejściowe	Lektorat
30	15	0	0	0	0	15	0	0	0	0	0

FLO matrix in relation to forms of classes

MLO code	Student after module completion has the knowledge/ knows how to/is able to	Form of classes										
		Lectures	Auditorium classes	Laboratory classes	Project classes	Conversation seminar	Seminar classes	Practical classes	Fieldwork classes	Workshops	Prace kontrolne i przejściowe	Lektorat
Social competence: is able to												
M_K001	Can appreciate the advantages of different types of foundries and understand the major trends in the international competition.	+	-	-	-	-	+	-	-	-	-	-
Skills: he can												
M_U001	Student has the ability to see the trends in the foundry automatisation	+	-	-	-	-	+	-	-	-	-	-
M_U002	Student can see the trends in the international development of the markets.	+	-	-	-	-	+	-	-	-	-	-
Knowledge: he knows and understands												
M_W001	Student has a general understanding of the advantages of digital tools in the foundries	+	-	-	-	-	+	-	-	-	-	-
M_W002	Student knows how to solve future issues of foundries in Europe	+	-	-	-	-	+	-	-	-	-	-

Student workload (ECTS credits balance)

Student activity form	Student workload
Udział w zajęciach dydaktycznych/praktyka	30 h
Preparation for classes	20 h
przygotowanie projektu, prezentacji, pracy pisemnej, sprawozdania	10 h
Realization of independently performed tasks	10 h
Contact hours	5 h
Summary student workload	75 h
Module ECTS credits	3 ECTS

Additional information

Module content

Lectures

Increase of energy and material efficiency in foundries
Automatisation of the key processes in the foundries
Present situation and the development of trend in foundries
Industrialization of hand molding foundries.
Layout of melting shop in iron foundries
Layout of melting shop in non-ferrous foundries.

Seminar classes

Increase of energy and material efficiency in foundries
Automatisation of the key processes in the foundries
Present situation and the development of trend in foundries
Industrialization of hand molding foundries.
Layout of melting shop in iron foundries
Layout of melting shop in non-ferrous foundries.

Teaching methods and techniques:

Lectures: Oral presentation, multimedia presentation, animations
Seminar classes: Oral presentation, multimedia presentation

Warunki i sposób zaliczenia poszczególnych form zajęć, w tym zasady zaliczeń poprawkowych, a także warunki dopuszczenia do egzaminu:

Participation in the classes
Positive grade from the seminar

Zasady udziału w poszczególnych zajęciach, ze wskazaniem, czy obecność studenta na zajęciach jest obowiązkowa:

Lectures:
– Attendance is mandatory: Yes

– Participation rules in classes: Participation in the classes is mandatory
Seminar classes:
– Attendance is mandatory: Yes
– Participation rules in classes: Participation in the classes is mandatory

Method of calculating the final grade
Grade from participation and discussions at the seminars will be the basis of the final mark

Sposób i tryb wyrównywania zaległości powstałych wskutek nieobecności studenta na zajęciach:
In the event of the student’s absence from the seminar and lectures, the student is obliged to independently catch up the material on his own. Other options will be discussed during the first class.

Prerequisites and additional requirements
Prerequisites and additional requirements not specified

Recommended literature and teaching resources
Minkhoff, I.: The Physical Metallurgy of Cast Iron. Haifa, John Wiley and Sons, 1983

Dötsch, E.: Inductive Melting and Holding.

Vulkan Kurz, W., Fisher, D.J.: Fundamentals of Solidification. Trans Tech Publications, 1989

Campbell, J.: Castings. Butterworth-Heinemann, 2003

Flemings, M.C.: Solidification Processing.

McGraw-Hill Series in Materials Science and Engineering

Scientific publications of module course instructors related to the topic of the module
AFS – the International Journal of Metalcasting

www.thewfo.com

Additional information
None