STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Computer Aided Design**		Code **1010702111010722573**
Field of study **Chemical and Process Engineering**	Profile of study (general academic, practical) **(brak)**	Year /Semester **1 / 1**
Elective path/specialty **Chemical Engineering**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time) **full-time**	

No. of hours				No. of credits
Lecture: **-** Classes: **-** Laboratory: **-** Project/seminars: **2**				**2**

Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**

Education areas and fields of science and art	ECTS distribution (number and %**)**
technical sciences	**2 100%**
Technical sciences	**2 100%**

Responsible for subject / lecturer:	Responsible for subject / lecturer:
dr inż. Piotr Tomasz Mitkowski email: piotr.mitkowski@put.poznan.pl tel. +48 616652789 Faculty of Chemical Technology ul. Piotrowo 3, 60-965 Poznań	dr inż. Szymon Woziwodzki email: szymon.woziwodzki@put.poznan.pl tel. +48 616652147 Faculty of Chemical Technology ul. Piotrowo 3, 60-965 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	- the basis of mathematical calculations, physics and chemistry, - the basis of physical chemistry, - the principles of engineering drawing
2	**Skills**	- the ability to use AutoCad - the ability to use calculations software
3	**Social competencies**	- student is aware of the advantages and limitations of individual work in solving the problems of an industrial character and design, - student knows the limits of his knowledge and sees the need for the exploration of knowledge.

Assumptions and objectives of the course:

The purpose of training is to master the tools to create objects in 3D space, science

texturing, lighting, rendering and development and creating the correct technical documentation of the project. Classes enhanced with 2D elements to prepare for self-development of graphic materials used in the work and the presentation of the final project. Identify methods of solvent selection and phase equilibrium calculations (calculation of flash).

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. He knows methods of selection of solvents - [K_W01]

2. He knows methods of flash type calculations - [K_W02]

3. He knows methods of 3D design with CAD software - [K_W03, K_W04]

Skills:

1. He can creates simple 3D models - [K_U07, K_U09, K_U20]

2. He can creates 3D models from 2D objects - [K_U07, K_U09, K_U20]

3. He can apply texturing and lightning of objects - [K_U07, K_U09, K_U20]

4. He can use the solvents selection software - [K_U07, K_U09, K_U20]

5. He can do calculations in flash. - [K_U07, K_U09, K_U20]

Social competencies:

1. The student has the awareness and understanding of aspects of the practical application of knowledge and skills in 3D design and selection of solventswith flash calculations - [K_K01, K_K02]

2. The student has formed awareness of the limitations of modeling - [K_K01, K_K02]

3. The student is aware of the of lifelong learning - [K_K01, K_K02]

Assessment methods of study outcomes

Knowledge

Exam project (1-3)

Skills

Activity in courses (1-5)

Social competencies

Exam project (1-3)

Course description

The course discusses the principles and design methods used in CAD techniques: three-dimensional drawing, a precise description of the model and edition of elements, projection, shading and rendering methods, automated documentation, efficient use of CAD application.

Methods of selection of solvents typically use chemical compounds databases, but also based on the achievements of a computer supporting the design of molecules (Computer Aided Molecular Design). An essential element of these methods are the calculation of physical and chemical equilibria (flash calculations).

At the course the followinf software will be used:: CAD, CAM and simulation of chemical processes

Basic bibliography:

1. P.T. Mitkowski, S. Woziwodzki, Komputerowe wspomaganie projektowania, Wydawnictwo Politechniki Poznańskiej, Poznań, 2011.

2. A. Jaskulski, AutoCAD 2011/LT2011+, Wydawnictwo Naukowe PWN, Warszawa 2011.

3. Training Course: AutoCAD 2010: Learning AutoCAD 2010 3D; acces: http://students.autodesk.com

4. ICAS 11.0 documentation

5. Termodynamika procesowa, Michałowski S., Wankowicz K., WNT, Warszawa 1999.

Additional bibliography:

1. A. Jaskulski, AutoCAD 2010/LT2010+, Wydawnictwo Naukowe PWN, Warszawa 2011.

2. A. Pikoń, AutoCAD 2011 PL: pierwsze kroki, Helion, Gliwice, 2011.

Result of average student's workload

Activity	Time (working hours)
1. Participation in the course	30
2. Preparation of projects	15
3. Consultations	5

Student's workload

Source of workload	hours	ECTS
Total workload	50	2
Contact hours	30	1
Practical activities	30	1