

## Computer-aided design (IInd Year of study, IVth Semester)

Credit value (ECTS) 3

### Course category

Domain fundamental (Optional)

### Course holder:

Assoc. Prof. Dr. Eng. Petru Marian CÂRLESCU

### Discipline objectives (course and practical works)

The aim of the course is to have students acquire knowledge about the theoretical elements specific to the design of flowsheet and operation lines in the agro-food industry using the computer. It also attaches great importance to the development of students' working abilities by using the algorithms of calculating the productivity and power required for operating lines, equipments, as well as mechanical and thermal stresses on which components of operation lines that operate under different working regimes are subjected.

Practical works seek to familiarize students with the specific software to the design of operation lines and technologies in the agro-food industry using the computer. Special emphasis is placed on designing the operation lines specific to a production process.

### Contents (syllabus)

Course (chapters/subchapters)
<b>General considerations on the subject of computer aided design.</b>
<b>Designing a flowsheet and a operation line in the agro-food industry.</b>
<b>Principles for balances design:</b> material and energy balances.
<b>Simulation a flowsheet and a operation line in the agro-food industry:</b> optimizing the production process, optimizing material and energy consumption.
<b>Basics on Computer-Aided Design:</b> CAD.
<b>Advanced Computer Assisted Design:</b> Computational Fluid Dynamics (CFD), heat transfer simulation, strength of materials simulation (FEM).
<b>Graphical representations specific to technical information:</b> images, drawings, graphs, charts.
<b>Steps for making presentation of projects using specific software.</b>

Practical works
General training for NTN and PSI; Symbols used in the technical drawing for equipment and machinery specific to the agro-food industry.
Computer-aided design. SolidWorks (I) - part 2D, 3D.
Computer-aided design. SolidWorks (II) - assembly 3D.
Computer-aided design. SolidWorks (III) - drawing 2D.
Computer-aided simulation. SolidWorks (IV) - simulation CFD, FEM.
Optimizing the production process. Plant Simulation.
Use of graphics processing software. AdobePhotoshop, Excel, CurveExpert.
Use of graphical presentation tools. Power Point.
Final colloquium of knowledge evaluation.

## Bibliography

1. Cârlescu, P. - *Proiectare asistată de calculator - SolidWorks*, Suport de curs 2017.
2. Cârlescu, P. - *Modelarea și simularea numerică a proceselor fizice industriale*, Ed. Performantica, Iași, 2005.
3. Cârlescu P. – *Procese și operații în industria alimentară*, vol. I, Ed. PIM Iași, 2016.
4. Cârlescu, I., Cârlescu P. – *Arta prezentării rezultatelor științifice*, Ed. PIM, Iași, 2016.
5. Stănescu Oprea P.D. – *Simularea numerică a proceselor de ardere cu FLUENT*, Ed. Politehnica, București, 2001.
6. Popescu D. – *Sisteme 3D CAD pentru proiectare mecanică*, Ed. Aius PrintEd, Craiova, 2009.
7. Ciobanu, L. – *Grafică asistată de calculator*, Politehnia, Iași, 2008.
8. Teodosiu C. – *Modelarea și simularea sistemelor în domeniul instalațiilor pentru construcții*, Ed. MatrixRom, București, 2007.
9. Curteanu S. – *Tehnologia informației. Partea I. Curs și aplicații*, Tipografia UT, Iași, 2004.
- 10.\*\*\*\*\* - *Using ADOBE PHOTOSHOP CS6. Help.*
- 11.\*\*\*\*\* - *MS Office Power Point 2016 - instrucțiuni de utilizare, Help.*
- 12.\*\*\*\*\* - *MS Office Excel 2016 - instrucțiuni de utilizare Help.*

## Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Exam	Writing examination	60%
Appreciation of the activity during the semester	Assessment during the semester of a project on a computer - practical application and final laboratory colloquium. (Presentation of the project).	40%

## Contact

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