DESCRIPTION OF THE COURSE

- **Course code**: **ARR 3106**
- **Course title: ENGINEERING GRAPHICS**
- **Language** of the lecturer: Polish

Course form	***Lecture***	***Classes***	***Laboratory***	***Project***	***Seminar***
*Number of hours/week**	*1*		*2*		
*Number of hours/semester**	*15*		*30*		
Form of the course completion	*written test*		*completion of tasks*		
ECTS credits	*2*		*2*		
Total Student's Workload	*60*		*60*		

- Level of the course: basic
- **Prerequisites**: The skill to work with computer and Windows system.
- **Name, first name and degree of the lecturer/supervisor**: Krzysztof Makowski D.Sc. Ph.D. Eng.
- **Names, first names and degrees of the team's member**s: Paweł Zalas, Ph.D. Eng.
- **Year**: **1 Semester**: **2**
- **Type of the course**: obligatory
- **Aims of the course** (effects of the course): To learn principles of computer engineering graphics, methods of axonometric and multi-view projection of 2D and 3D geometric objects, dimensioning, sections and intersection of solids, drawing of standard elements and joints in electromechanical constructions, principles of making assembly and detail drawings.
- **Form of the teaching**: traditional
- **Course description**:
  Principles of engineering graphics. Computer engineering graphics – *AutoCAD 2002 LT* program. Methods of projection: axonometric and multi-view projection. Graphic notation of 2D and 3D geometric objects. Standard multi-view projection: views and sections. Dimensioning, toleration, mating, surface texture. Sections and intersection of solids. Drawing of standard elements and joints in electromechanical constructions. Technical documentation – working drawings: assembly and detail drawings.
- **Lecture:**

Particular lectures contents	*Number of hours*
1. Introduction to the course, requirements. Principles of engineering graphic notation.	2
2. Principles of computer engineering graphics – introduction to AutoCAD 2002 LT.	1
3. Methods of projection: axonometric and multi-view projection. Projection of 2D and 3D geometric objects. Types of drawings, drawing sizes, lines, scales.	2
4. Multi-view projection of 3D geometric objects. Sections and intersection of solids. Projection of elements using straight and	2

complex sections.	
5. Dimensioning: principles, symbols and size dimensions, detailed cases.	2
6. Tolerancing and types of mating. Tolerance of position and form.	2
7. Standard elements and joints in mechanical constructions.	2
8. Technical documentation: detail and assembly drawings.	2

- **Laboratory** – the contents:

1. Introduction to AutoCAD program: tools, drawing and modification of basic geometrical objects.
2. Drawing of plane curves: parabola, hyperbola, spiral of Archimedes and sinusoid.
3. Precisely drawing of 2D elements of different geometrical shapes.
4. Multi-view projection of a plane figure that lies over projecting plane surface.
5. Multi-view projection of plane-wall solids and solids of revolution.
6. Multi-view projection of 3D elements – views
7. Multi-view projection of 3D elements – sections
8. Isometric drawing: 3D model in an isometric projection.
9. Isometric projection of 3D object which is given by multi-view projection.
10. Working drawing of an individual part with sections and dimensioning - sketch.
11. Working drawing of an individual part with sections and dimensioning – CAD.
12. Drawing of standard elements and joints in mechanical constructions – sketch + CAD
13. Assembly drawing of the sub-assembled unit with list of parts and joints - sketch.
14. Assembly drawing of the sub-assembled unit with list of parts and joints – CAD.
15. Completions and credits.

- **Basic literature**:

1. Suseł M., Makowski K.. *Grafika inżynierska z zastosowaniem programu AutoCAD*, Oficyna Wydawnicza Politechniki Wrocławskiej, 2005.
2. Suseł M., *Komputerowa grafika inżynierska. Zbiór zadań*. Oficyna Wydawnicza PWr, 1999.
3. Dobrzański T., *Rysunek techniczny maszynowy*. WNT, Warszawa 1997.
4. Rydzanicz I., *Zapis konstrukcji - zadania*. WNT, Warszawa, 1999.
5. Podręcznik AutoCAD 2002 LT., *Pierwsze kroki,* Autodesk, Inc., 2001.

- **Additional literature**:

1. Zbiór Polskich Norm *Rysunek techniczny maszynowy.*
2. Zbiór Polskich Norm *Rysunek elektryczny.*

- **Conditions of the course acceptance/credition**: passing of a written test and completion of drawings made in laboratory.

***** - depending on a system of studies