MODULE INFORMATION SHEET

Name of Module Unit	**Descriptive Geometry**
Name in polish language	Geometria wykreślna
Module type	compulsory
Form of studying	full-time day courses
Level of study	undergraduate course (B.Sc. level)
Type of study (for extra-mural courses)	-
Programme	Environmental Engineering
Speciality	Environmental Engineering
Responsible department	Department of District Heating and Gas Systems
Responsible person	M. Sc. Eng. Ewa Duda

Semester	Lectures(E)	Tutorials	Laboratory	Computer Exercises	Projects	ECTS
1	15				15	3

Objectives (summary)

Introductory course in engineering geometry – a review of principal methods to give a one-to-one representation of 3D-space on a plane. Aims of the subject are pedagogical, mathematical and practical.
Pedagogical: To introduce the student to ideas and ways of thinking - without the use of numbers - which generally are new to him and thus to form and develop his 3D-space imagination, as well as the ability of logical thinking and coming to right conclusions concerning 3D-systems.
Mathematical: To give rudiments of projective geometry. To study the principle and properties of parallel projection: axonometric and orthogonal projections (Monge's projections).
Practical: To give a working knowledge of the engineer's language – how to make and how to read drawings. To become familiar with presented methods and acquire the ability to specify their use with assurance. To apply obtained skills to solve some problems.

Prerequisites

Basic knowledge of *plane geometry*: triangles; regular polygons; parallelism and perpendicularity; constructions by using a ruler and compasses involving straight lines and circles (particularly tangents to circles).
Elementary knowledge of 3*D-space geometry*: straight lines, planes and relationships; dihedral angles; distances; parallelism and perpendicularity in the space; prisms; pyramids; regular polyhedrons.

Rules of integrated grade setting

Average of results obtained in the final lecture test and in guided projects

Recommended readings

[1] French Th. E., Vierck Ch. J.: *Graphic Science* Mc GRAW-HILL Book Company, Inc.
[2] Ryan D. L.: *CAD/CAE Descriptive Geometry* CRC Press, Inc. 1992
[3] Silvester J. R.: *Geometry Ancient and Modern* Oxford University Press Inc., New York 2001

[4] Giesecke F.E., and others: *Technical Drawing* Pearson Education International, USR, NJ, 2003
[5] Bielefeld B., Skiba I.: *Basics Technical Drawing* Publishers for Architecture, Berlin 2007

Contents of lectures (syllabus)

	Topics	**Time** (hrs.)	**Scope** (S / Ex)
1	Parallel projection; invariants. Oblique axonometric projection. Usual axonometric systems.	2	S
2	Orthogonal projections. Representation of a point, a line and a plane.	2	S
3	Common elements. Third projection plane.	2	S
4	Surfaces of revolution. Piercing and sections of surfaces of revolution.	2	S
5	Plane section of a cone. Classification of conics. Intersection of surfaces of revolution.	2	S
6	Intersection of surfaces of revolution. Cutting-plane method. Reducibility of the intersection line of quadratic surfaces.	2	S
7	Developments of cones and cylinders.	2	S
8	Test.	1	S
	Total	**15**	**hours**

S – topics listed in the legal study programme standards from 12.07.2007
Ex – extended topics

Lecturers

M. Sc. Eng. Ewa Duda

Assessment method

Final test

Contents of guided projects

	Topics	**Time** (hrs.)	**Scope** (S / Ex)
1	Construction of lines and plane figures. Parallelism and perpendicularity. Regular polygons and polyhedrons.	2	S
2	Axonometric projection of polyhedrons and surfaces of revolution with a part removed.	2	S
3	Monge's projections. Drawing orthogonal projections of a detail given in axonometry.	2	S
4	Drawing three projections and axonometry of a pyramid with a hole.	2	S
5	Drawing three projections and axonometry of a cylinder with a part removed.	2	S
6	Conics. Drawing an intersection of a cylinder and a cone or a torus.	2	S
7	Drawing a conical connection between circular cylinders. Development of a surface of transition piece.	2	S
8	Application of obtained skills.	1	S
	Total	**15**	**hours**

S – topics listed in the legal study programme standards from 12.07.2007
Ex – extended topics

Person responsible for guided projects

M. Sc. Eng. Ewa Duda

Assessment method for guided projects

It is based on:
· execution of all obligatory drawings concerning studied projects
· participation in classes.