



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Surgical instruments and their use in surgical operation [S1IBio1>ICiZO]

### Course

Field of study Biomedical Engineering	Year/Semester 3/5
Area of study (specialization) –	Profile of study general academic
Level of study first-cycle	Course offered in Polish
Form of study full-time	Requirements compulsory

### Number of hours

Lecture 15	Laboratory classes 0	Other 0
Tutorials 15	Projects/seminars 0	

### Number of credit points

2,00

### Coordinators

dr inż. Paweł Zawadzki  
pawel.zawadzki@put.poznan.pl

### Lecturers

### Prerequisites

- basic knowledge from the science of materials, propaedeutics of medical sciences and human anatomy - logical thinking and spatial imagination - understands the necessity of learning and acquiring new knowledge

### Course objective

Getting to know basic and specialized surgical instruments, their functions during surgery and directions of development of surgical equipment for modern surgery

### Course-related learning outcomes

Knowledge:

1. student should know the basic types of surgical instruments.
2. student should know the applications of basic surgical tools and directions of development of modern surgical equipment

Skills:

1. student knows how to adapt tools to specific operational techniques and formulate design and

- construction assumptions for these tools.
2. student knows how to customize tools for specialized surgical needs.

Social competences:

1. student can predict the impact of their activities on the work of other professional groups.
2. student is able to cooperate in a group.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Forming rating:

a) for the lectures:

- Based on answers to questions concerning the material discussed in previous lectures

b) for the tutorials:

- On the basis of an assessment of the current progress of tasks,

Summary rating:

Lecture: Crediting based on a test consisting of 20 test questions (pass in the case of a correct answer to at least 60% of questions: <60% - ndst, 60% -75% - dst, 75% -80% - dst +, 80% - 90% - db, 90% -95% - db +, 95% -100% - very good) carried out at the end of the semester.

Tutorials: Credits based on oral or written answer on the content of each exercise performed, report on each exercise as indicated by the instructor. To get a pass, all the exercises must be passed (positive assessment of the answer and report).

### Programme content

Surgical instruments - history, materials and medical applications.

### Course topics

Lecture:

- 1) History of surgical tools development.
- 2) Basic materials used for the production of surgical instruments.
- 3) Basic surgical instruments, rules for their preparation for use.
- 4) Specialist tools for abdominal, orthopedic and traumatic surgery.
- 5) Surgical and visual tools used in endoscopic access.
- 6) Stitching and traditional suture materials, mechanical stitching.
- 7) Additional equipment used during surgical procedures.
- 8) Medical robots and development directions of modern surgical equipment.

Tutorials:

- 1) Recognition of surgical instruments, their basic application.
- 2) Adaptation of surgical instruments to specific anatomical regions, tissues and organs in terms of formulating assumptions for their engineering design.
- 3) Work with surgical instruments, differences in universal and specialist tools

### Teaching methods

1. Lecture: multimedia presentation.
2. Tutorials: solving tasks, practical exercises, discussion.

### Bibliography

Basic

1. Rutheford C.J., Differentiating Surgical Instruments, F. A. Davis Company, 2011
2. Bielecki K., Narzędzia, protezy i szwy chirurgiczne, Makmed, Lublin 2008.

Additional

1. Kramme R., Hoffmann K-P., Pozos R. , Springer Handbook of Medical Technology, Springer, 2011.
2. Nemitz R., Surgical Instrumentation: An Interactive Approach, Saunders, 2009.
3. J. Kirkup , The Evolution of Surgical Instruments: An Illustrated History from Ancient Times to the Twentieth Century , Norman Publishing, 2006.
4. Rosen J., Hannaford B. , Satava R.M., Surgical Robotics: Systems Applications and Visions, Springer

2010.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,20
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	0,80