Course description

Department/Unit /	KKY / BBS			**Academic Year**	2023/2024
Title	Biometric and Security Systems			**Type of completion**	Exam
Accredited/Credits	Yes, 5 Cred.			**Type of completion**	Combined
Number of hours	Lecture 2 [Hours/Week] Tutorial 2 [Hours/Week]				
Occ/max	Status A	Status B	Status C	**Course credit prior to**	Yes
Summer semester	0 / -	0 / -	0 / -	**Counted into average**	YES
Winter semester	0 / -	0 / -	0 / -	**Min. (B+C) students**	10
Timetable	Yes			**Repeated registration**	NO
Language of instruction	Czech			**Semester taught**	Winter semester
Optional course	Yes			**Internship duration**	0
Evaluation scale	1|2|3|4			**Ev. sc. – cred.**	S|N
No. of hours of on-premise					
Auto acc. of credit	Yes in the case of a previous evaluation 4 nebo nic.				
Periodicity	every year				
Specification periodicity					
Substituted course	None				
Preclusive courses	N/A				
Prerequisite courses	N/A				
Informally recommended courses	N/A				
Courses depending on this Course	N/A				

Course objectives:

The goal of the subject is to give the students information about various biometric technologies (e.g. fingerprints, voice, handwriting, retina, iris, DNA) and about their usage in information and security systems.

Requirements on student

Credit: solution of a given task from the field of biometric and security systems.
Exam: knowledge corresponding to the extent of the course (lectures + seminars)

Content

1.-2.	Biometrics. Basic processing of biometric information.
3.-4.	Recognition and classification in security systems.
5.	Security systems exploiting fingerprints and hand geometry.
6.	Voice security systems.
7.	Security based on handwriting.
8.	Security based on face characteristics.
9.	Security systems exploiting retina and iris patterns.
10.	Biometric characteristics of DNA.
11.-12.	Further systems supporting security of persons and property.
13.	Practical demonstration of security and biometric systems.

Fields of study

Guarantors and lecturers

- **Guarantors:** doc. Dr. Ing. Vlasta Radová (100%)
- **Lecturer:** doc. Dr. Ing. Vlasta Radová (100%)
- **Tutorial lecturer:** doc. Dr. Ing. Vlasta Radová (100%)

Literature

- **Basic:** Zhang, David D. *Automated biometrics : technologies and systems*. Boston : Kluwer Academic Publishers, 2000. ISBN 0-7923-7856-3.
- **Basic:** Pankanti, Sharath; Jain, Anil K.; Bolle, Ruud. *Biometrics : personal identification in networked society*. Boston : Kluwer Academic Publishers, 1999. ISBN 0-7923-8345-1.
- **Extending:** Bitto, Ondřej. *Šifrování a biometrika, aneb, Tajemné bity a dotyky*. Kralice na Hané : Computer Media, 2005. ISBN 80-86686-48-5.
- **Recommended:** Rak, Roman; Matyáš, Vašek,; Říha, Zdeněk. *Biometrie a identita člověka ve forenzních a komerčních aplikacích*. 1. vyd. Praha : Grada, 2008. ISBN 978-80-247-2365-5.

Time requirements

All forms of study

Activities	Time requirements for activity [h]
Undergraduate study programme term essay (20-40)	30
Preparation for an examination (30-60)	48
Contact hours	26
Practical training (number of hours)	26
Total:	**130**

assessment methods

Knowledge - knowledge achieved by taking this course are verified by the following means:

Combined exam

Seminar work

Skills - skills achieved by taking this course are verified by the following means:

Combined exam

Skills demonstration during practicum

Seminar work

Competences - competence achieved by taking this course are verified by the following means:

Combined exam

Seminar work

Skills demonstration during practicum

prerequisite

Knowledge - students are expected to possess the following knowledge before the course commences to finish it successfully:

Students should have knowledge of mathematical analysis.

rozumět základům strojového učení a rozpoznávání

rozumět principům strojového vnímání prostředí

Skills - students are expected to possess the following skills before the course commences to finish it successfully:

aplikovat znalosti z matematické analýzy a lineární algebry

aplikovat metody strojového učení a rozpoznávání

aplikovat principy strojového vnímání prostředí

Competences - students are expected to possess the following competences before the course commences to finish it successfully:

N/A

N/A

N/A

N/A

N/A

teaching methods

Knowledge - the following training methods are used to achieve the required knowledge:

Lecture

Lecture with visual aids

Practicum

Self-study of literature

Individual study

Skills - the following training methods are used to achieve the required skills:

Lecture

Lecture with visual aids

Practicum

Individual study

Self-study of literature

Competences - the following training methods are used to achieve the required competences:

Lecture

Lecture with visual aids

Practicum

Self-study of literature

Individual study

learning outcomes

Knowledge - knowledge resulting from the course:

vysvětlit princip různých biometrických technologií (např. otisky prstů, hlas, rukopis, sítnice, duhovka, DNA)

compare principles of various biometric security systems

posoudit spolehlivost a výkonnost jednotlivých biometrických technologií

Skills - skills resulting from the course:

analyze capabilities of various biometrics in concrete security systems

design a biometric security systems for real aplications.

Competences - competences resulting from the course:

N/A

Course is included in study programmes: