CRACOW
UNIVERSITY
OF ECONOMICS
1925

# APPLIED INFORMATICS
# GRADUATE MA STUDIES

FULL TIME

W – a module conducted in a Winter semester
S  – a module conducted in a Summer semester
Detailed information about the modules applies to the current academic year.

## CONTENT

## YEAR ONE

### COMPUTER GRAPHICS (W)

You will learn the mathematical foundations of algorithms used in computer graphics. You will gain the ability to create applications using computer graphics algorithms.

More information: https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1011215

### DATA WAREHOUSES (W)

You will understand what a data warehouse is, what it is not, and what role it can play in a modern organization. You will be able to place the data warehouse in the business processes of the organization and understand its role in the functioning of the organization. You will understand the role and importance of information systems in the functioning of a modern organization. You will learn about the role of continuous development of information technology in the functioning of various types of organizations in the modern world.

More information: https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1011208

### SOFTWARE ENGINEERING (W)

You will become familiar with the field of software engineering and the positioning of software engineering among other fields of modern computer science. You will understand the specificity of the various phases of the software life cycle, the types of actions taken and the methods and techniques used. You will understand the differences between different software life cycle models, learn about their strengths and weaknesses, and understand the differences between software development methods, project management methods and life cycle models. You will be able to choose a set of methods necessary to produce software and be able to use them to create a computer program in each case.

More information: https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1011207

### DISCRETE MATHEMATICS (W)

You will become acquainted with the mathematical apparatus necessary to construct and analyze algorithms. You will develop the ability to use the mathematical apparatus necessary to construct and analyze algorithms. You will develop communication skills at the level of discrete mathematics concepts.

More information: https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1011204

### PROCESS MANAGEMENT (W)

You will acquire knowledge about the organizational processes taking place in various types of organizations and the techniques of introducing changes in them. You will learn advanced methods of design and decision making in various functional areas of the organization using a process approach. You will acquire the competence of critical assessment and innovative thinking.

More information: https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1011206

### RICH INTERNET APPLICATIONS (S)

You will gain knowledge in the field of creating rich web applications. You will apply the rich web applications in economic and social domains. You will gain the ability to divide the application into interface and business logic layers.

More information: https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1011209

### E-COMMERCE (S)

You will gain knowledge about the use of the Internet in marketing and commerce. You will develop skills that allow you to plan and evaluate activities in the area of marketing and e-commerce. You will develop an attitude of openness to the knowledge and ideas of other people and develop an attitude of work commitment and responsibility for the project.

More information: https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1011211

### PROCESS OPTIMIZATION (S)

You will become acquainted with optimization problems (classification of problems, methods of solving). You will acquire the ability to choose the right optimization methods to solve real decision problems. You will acquire the skills to create computer software supporting solving decision-making problems.

More information: https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1011210

### DIGITAL MODELLING AND SIMULATION (S)

You will learn the basic techniques of computer simulation and their use to describe the course of economic processes. You will develop skills of organizing and conducting simulation experiments and the ability to interpret the results of simulation experiments.

More information: https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1011213

### CREATIVE PROGRAMMING (S)

You will learn the basic techniques of creativity. You will develop the ability to use creative thinking techniques in the area of application development. You will gain the ability to adapt creative thinking techniques to the organization and work of a project team.

More information: https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1011216

### FOREIGN LANGUAGE (W, S)

Classes at different levels. The possibility to prepare for standardized exams.

More information: https://cj.uek.krakow.pl/site

## YEAR TWO

### STRATEGIC MANAGEMENT (W)

You will learn the importance of the impact of the distant and closer environment on the functioning of an organization, the characteristics of the classic and the latest approaches used in strategic management, in particular the methods used in strategic analysis and in the process of formulating and implementing the strategy, including methods of managing individual functional areas of the company. You will improve your analytical and creative thinking skills in solving complex decision-making problems. You will develop the ability to select and use strategic analysis methods to solve these problems and the ability to work in a team, the ability to fulfil different roles, notice differences in attitudes and views, resolve conflicts and conduct negotiations, group decision-making, active participation in discussions and a culture of openness.

### AGILE SOFTWARE DEVELOPMENT (S)

You will learn the basics and key values of agile approaches in software development. You will develop knowledge of common tools and practices used in agile approaches and the ability to use them. You will develop social competences necessary for effective work in a team using agile software development methodologies.

### COMPUTATIONAL MODELS IN ECONOMY AND FINANCE (S)

You will learn about the theoretical and practical aspects of time series modelling and simulation of stochastic processes in empirical economics and finance. You will learn the procedure of specification and estimation of selected models of empirical economics or finance. You will learn how to implement selected time series models and simulate stochastic processes in R or Python.

### VIRTUALIZATION AND CLOUD COMPUTING (S)

You will consolidate and expand your knowledge about the possible architectures of modern distributed systems and master the concepts of system virtualization as an effective mechanism to reduce the total cost of ownership of the system (TCO). You will consolidate and expand your skills in working in the environment of network operating systems and transfer your competences to virtualized computer networks using cloud computing techniques. You will master the skills of lifelong learning in the field of rapidly developing techniques for automating information processes through virtualization and cloud computing techniques.

### MACHINE LEARNING (W)

You will learn the theoretical foundations of machine learning. You will acquire knowledge and practical skills related to the implementation of machine learning systems. You will learn about the possibilities of using machine learning systems.

### KNOWLEDGE PROCESSING SYSTEMS (S)

You will learn about modern methods of knowledge representation and automatic reasoning. You will acquire the ability to search knowledge bases available on the Internet and you will acquire the ability to save knowledge in a formalized way. You will develop group work skills.

### DATA SECURITY (W)

You will learn the legal requirements and available norms and standards in the field of data protection in IT systems. You will learn about data security threats in IT systems and various methods of their protection. You

will gain the skills to identify data security threats in IT systems and the appropriate selection, configuration and use of methods to protect them.

## ENTERPRISE SOFTWARE (W)

You will gain knowledge about the complexity of implementation projects of integrated management systems, the variability of project conditions over time and the mutual influence of various factors on each other. You will deepen your knowledge of the various stakeholders of the implementation project and the mutual relations between them. You will learn the conditions for implementing integrated management systems based on modern approaches, such as cloud computing and free and open source software.

## SOFTWARE QUALITY (S)

You will get acquainted with the issues of quality theory and you will be able to relate them to an intangible product, which is computer software. You will gain knowledge in the field of software quality characteristics (properties describing quality) taking into account the specifics of quality perception and priorities of various computer software users (direct users, administrators, creators). You will be able to design a quality assurance system in an IT project. You will learn the quality methods used in various phases of software development. You will gain knowledge of the basic norms and standards used for quality assurance in software engineering (ISO, CMM, ...) and be able to interpret and apply them in a specific case.

## ELECTIVE MODULES (1 IN THE WINTER SEMESTER, 1 IN THE SUMMER SEMESTER)

The range of modules varies from year to year.

## MASTER'S DEGREE SEMINAR (W, S)

Work under the supervision on the preparation of the master's thesis.

## DETAILED STUDY PLAN

https://usosweb.uek.krakow.pl/kontroler.php?_action=katalog2/programy/pokazProgram&prg_kod=ZI-IA-S2

https://planystudiow.uek.krakow.pl/index.php?a=226&id=99&idSemestruRoku=45