

# APPLIED INFORMATICS

## UNDERGRADUATE BA STUDIES

FULL TIME, PART 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.

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## YEAR ONE

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### THEORETICAL FOUNDATIONS OF COMPUTER SCIENCE (W)

You will familiarize yourself with the main areas of computer science and its links with related disciplines, as well as with the basic concepts and determinants of the theory of algorithms and data structures, the issues of formal grammars and the basic concepts of programming languages.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1014808>

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### COMPUTER SYSTEM ARCHITECTURE (W)

You will gain knowledge about the architecture of computer systems, the basics of programming in a low-level language (assembler). You will become familiar with the functioning of computer system architecture. You will also learn about modern computer devices - their construction, functioning, possibilities of use, and configuration.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1014809>

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### COMPUTER PROGRAMMING 1 (W)

You will get acquainted with the current direction of development and the possibilities of modern programming languages. You will develop the skills of writing algorithms in the form of a source code. You will learn the communicative and publishing role of programming languages.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1014810>

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### COMPUTER PROGRAMMING 2 (S)

You will develop programming skills at the level of implementing simple algorithms and using basic web technologies. You will familiarise yourself with the basic methods of transferring input and output data between programs. You will develop the ability to predict and handle errors and unusual situations in data and program behaviour and acquire the ability to effectively search for the solutions to the encountered problems in professional literature and Internet resources. You will get to know the methods and tools for organizing cooperation on the project as well as versioning and documenting the course of work on the project.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1014811>

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### ELECTRONIC DATA INTERCHANGE (W)

You will become acquainted with international standards for electronic data interchange. You will acquire the knowledge and skills needed to manipulate XML documents, manage, and use data in JSON format. You will acquire skills to use basic web technologies. You will gain knowledge of service-oriented architecture and the ability to use web services.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1014820>

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### INTRODUCTION TO INFORMATION SYSTEMS (S)

You will become acquainted with issues of information systems regarding the functioning, construction and development as well as the use of information technology to support the organization management process. You

will learn practical examples of organizational problems in the context of information technology applications. You will develop the skills of effective organizational diagnosis in the context of information technology applications.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1014815>

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#### BEST PRACTICES IN SOFTWARE DEVELOPMENT (S)

You will gain an awareness of the importance posed by the way of designing and editing source code for the success of an IT enterprise. You will familiarise yourself with the classical principles and practices which constitute the basic canon of good practices in IT professions. You will be developing teamwork skills and you will familiarise yourself with teamwork coordination IT tools.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1014817>

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#### INTRODUCTION TO MATHEMATICS (W)

You will gain knowledge and skills in the field of basic topics of mathematical analysis and the possibility of using the theory to describe issues related to economics, methods of solving and interpreting results. You will develop practical skills to solving a mathematical problem, using the acquired knowledge, by analysing the problem and choosing tools to achieve the given goal. You will develop abstract thinking skills and a systematic, consistent, reliable and ethical approach to solving problems.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1014801>

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#### MATHEMATICAL ANALYSIS AND LINEAR ALGEBRA (S)

You will gain knowledge in the field of mathematical analysis and linear algebra and the possibilities of its application in computer science and economics. You will gain the ability to use basic definitions and theorems in the field of mathematical analysis and linear algebra to solve basic mathematical, optimization, economic and IT problems. You will develop abstract thinking skills and awareness of the importance of professionalism in formulating statements and solving professional tasks.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1014802>

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#### PROBABILITY AND STATISTICS (S)

You will learn the basic concepts of probability theory and statistics, selected methods of statistical estimation, statistical hypothesis testing, correlation and regression analysis, and analysis of the dynamics of socio-economic phenomena. You will acquire the ability to calculate and interpret parameters related to the mentioned methods of probability and statistics.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1014803>

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#### ORGANISATION AND MANAGEMENT (W)

You will gain knowledge in the field of managing individual functional areas of the enterprise and the ability to solve problems in the field of managing organizations using organizational methods and techniques. You will be shaping the attitude of cooperation within the team.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1014875>

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### ECONOMICS (S)

You will gain knowledge about the role of entities in the economy, the relationships between them and the effects of their microeconomic decisions on the functioning of the economy as a whole, i.e. at the macroeconomic level. You will acquire knowledge of economic phenomena, their causes and consequences. You will realize how you can use economics to influence economic reality through economic policy. You will gain the ability to correctly interpret economic phenomena and use your knowledge to analyse specific economic processes.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1014806>

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### ENGLISH LANGUAGE (W, S)

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

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

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### FOREIGN LANGUAGE / POLISH FOR FOREIGNERS (W, S)

Classes at different levels. Ability to prepare for standardized exams.

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

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### PHYSICAL EDUCATION (W, S)

Possibility to choose activities according to your interests, e.g. volleyball, swimming classes, fitness classes.

More information: <https://swfis.uek.krakow.pl/zajecia/>

## YEAR TWO

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### INFORMATION SYSTEMS ANALYSIS AND DESIGN (W)

You will learn methods for analysing and designing information systems, understand concepts related to information systems. You will familiarise yourself with the phases of the system life cycle and various models of information systems design. You will acquire the skills to design an information system using appropriate methods and techniques. You will engage in teamwork, participate in team building and learn to resolve conflicts, think creatively and present your ideas.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1005043>

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### INTRODUCTION TO DATABASE SYSTEMS (W)

You will learn database terminology. You will acquire the skills to design databases, creating selected queries and use the SQL language.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1005045>

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### E-BUSINESS (W)

You will learn about the importance of e-business in the modern economy and the mutual relations between various areas of e-business. You will design and implement an e-business venture.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1005046>

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#### OPERATING SYSTEMS (W)

You will learn the structure and functioning of the operating system as an element of the general concept of information process automation. You will gain basic skills and knowledge in the field of installation, configuration and functioning of the operating system and process automation using system scripts (shell).

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1005048>

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#### COMPUTER NETWORKS (S)

You will gain knowledge about the construction and functioning of modern computer networks, both in terms of abstract models such as ISO OSI, TCP/IP and IEEE 802.2, as well as practical knowledge about the components of the most important basic technology of the Internet, which are the TCP/IP network protocols. You will acquire the ability to use theoretical knowledge to design, install and configure LAN networks on private IP addresses connected to the Internet and offer Internet users their network services. You will improve your skills in the use of network functions of operating systems from the MS Windows and Unix/Linux families, as well as the automation of dynamic system configuration processes and service functions using system scripts (shell) and an available network tool software.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1005049>

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#### COMPUTER PROGRAMMING 3 (W)

You will gain knowledge and skills in the field of software development independent of hardware and software architecture. You will get acquainted with the basic issues related to the security of application operation on the Internet.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1005039>

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#### COMPUTER PROGRAMMING 4 (S)

You will acquire web programming skills to communicate with users with validation of entered data and the ability to create web applications using communication with data sources. You will use different data formats and perform data conversion between different formats.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1005040>

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#### CONTEMPORARY TRENDS IN COMPUTER SCIENCE (S)

You will obtain the general knowledge about the impact of IT on modern society. You will be able to increase your knowledge on the given aspect of IT and share it.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1005052>

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#### NUMERICAL METHODS (W)

You will gain knowledge in the area of numerical methods and their applications in analysis of mathematical models. You will acquire skills of exact and approximate solving the problems with use of adequate numerical methods and estimating the error of result and skills of correct analysis of presented solutions, formulation of logic conclusions and practical interpretation of results. You will gain the ability of abstract thinking and systematic and reliable approach to solving problems.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1005031>

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#### ECONOMICS AND CORPORATE FINANCE (W)

You will gain knowledge about the essence and conditions of the functioning and development of the enterprise, with particular emphasis on the financial conditions of its operations. You will gain knowledge about the basic financial categories in an enterprise and the possibility of using them to make financial decisions.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1005071>

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#### BUSINESS LAW (S)

You will gain knowledge in the field of economic law, in particular in the field of starting, running and ending business activity, as well as organizational and legal structures of entrepreneurs and commercial contracts. You will acquire the ability to apply the provisions of applicable economic law when solving practical problems that may arise in business transactions, in particular in the field of starting, running and terminating business activities and commercial contracts. You will learn about the need to perform professional roles responsibly as a future entrepreneur or his employee.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1005032>

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#### ACCOUNTING (S)

You will gain knowledge in the area of financial and management accounting. You will acquire skills of the correct accounting analysis of business transactions, formation of management reasoning and interpretation of business activity results. You will obtain the ability to evaluate using a critical approach, fulfilling social obligations and acting for the benefit of the public.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=1005034>

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#### ENGLISH LANGUAGE (W, S)

Classes at different levels. Ability to prepare for standardized exams.

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

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#### FOREIGN LANGUAGE / POLISH FOR FOREIGNERS (W, L)

Classes at different levels. Ability to prepare for standardized exams.

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

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#### INTERNSHIP

You will extend the knowledge and skills gained during your studies in a real work environment. You will develop the skills necessary in your future professional work, including the following skills: analytical, organizational, teamwork, networking, negotiating, and you will prepare yourself for independence and responsibility for entrusted tasks.

## YEAR THREE

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### SEMINAR (W, S)

Work under the supervision of the Supervisor on the preparation of the diploma thesis.

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### COMPUTER PROGRAMMING 5 (W)

You will familiarize yourself with the definitions and characteristics of frameworks and develop the skills of practical use of frameworks based on Java. You will consolidate your skills in object-oriented programming and develop your skills in object-oriented programming in Java. You will enhance application design skills based on object-oriented design paradigms and the practical use of this skill. You will consolidate the skills of using database systems and their practical use in a web application. You will develop the habits of planning work and implementing the plan - meeting deadlines. You will get into the habit of preparing technical documentation and user documentation during application development. You will familiarize yourself with an example version control system and develop the skills to organize group work using any version control system.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=46774>

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### IT PROJECT MANAGEMENT (W)

You will deepen your knowledge about the role of IT in an organization - IT solutions as a tool to achieve the organization's goals. You will learn about the basic issues related to project management. You will be able to define a project based on the organization's hierarchy of goals, prepare a requirements specification, plan project implementation based on an existing requirements specification and carry out a risk analysis for the project.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=46836>

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### ENTERPRISE SYSTEMS (S)

You will deepen your knowledge related to the theoretical and practical aspects of the use of integrated systems (ES) supporting enterprise management. You will understand the complexity of the conditions of the implementation project and the high level of technical advancement of integrated systems. You will get to know various stakeholders of the implementation project and their roles within the project. You will acquire the ability to indicate a diverse perspective of perceiving conditions depending on the group of stakeholders. You will learn and understand the variability of the conditions for the implementation of integrated systems depending on the type of project. You will acquire the ability to properly assess implementation projects depending on the size of the enterprise, the scope of the implementation project and the level of economic development of the country.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=46787>

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### OCCUPATIONAL SAFETY AND HEALTH AND ERGONOMICS (S)

Identification of the main contemporary threats in the work process. You will learn how to identify the following problems: • workaholic, burnout and evaluative confusion - difficulties in assessing the reality due to, among others, lack of opportunity for career advancement • unfavourable psychophysical states - loss of health, death, suicide, apathy, impotence. Presentation of contemporary problems may occur at work: • lack of enjoyment of life, lack of love and happiness, adverse changes in the value system • chronic lack of time • culture merging – multinational corporations are driven by their own code of values that are often difficult to accept for their employees. You will be able to identify contemporary threats in the work process and will get to know the ways of prevention and dealing with them.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=46790>



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ELECTIVE MODULE (SOCIOLOGY OR PSYCHOLOGY OR PEDAGOGY)

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ELECTIVE MODULES (TWO IN THE WINTER SEMESTER, THREE IN THE SUMMER SEMESTER)

Options might differ from year to year.

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COMPUTER SYSTEM ADMINISTRATION (W)

You will become acquainted with the complex issues of administering modern computer systems. You will learn the variety of available tools, methods and techniques for administering complex information systems built on the basis of modern distributed systems technology. You will perform practical tasks in the area of basic computer system administration tasks of a modern company, including practically mastering the principles of using directory services to centralize the administration of distributed systems as an important method of increasing the efficiency of the information system administration process of any company and / or organization. You will gain the ability to transfer your competences in the field of computer systems administration from one system environment to another, taking into account the growing role of multi-faceted data security and protection of sensitive information in the world of automated information technologies.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=46783>

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OBJECT-ORIENTED ANALYSIS AND DESIGN (W)

You will gain knowledge about the object-oriented approach in systems analysis and modelling. You will acquire the skills to use the object-oriented approach in building conceptual models of the problem domain and designing their implementation. You will become familiar with the issues of design patterns.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=46784>

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CONCURRENT AND DISTRIBUTED PROGRAMMING (W)

You will consolidate and expand your knowledge of the construction, architecture, organization and functioning of modern, distributed computer systems. Knowing modern object-oriented programming tools, such as Java, and familiarizing yourself with a variety of available, ready-made mechanisms offered on the market that facilitate the programming of practical problems, you will be able to use this knowledge to solve typical programming tasks for the distributed systems environment. Based on your economic and IT knowledge, you will analyse specific problems and needs of economic and business practice and design solutions to these problems based on the currently available information technologies.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=46786>

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INFORMATION SYSTEM SECURITY (S)

You will become acquainted with the complex issues of computer systems security (e.g. difficulties in clearly defining, assessing and measuring security) and how to manage security (e.g. by creating an appropriate security policy and protection system). You will learn about the legal requirements and available norms and standards in the field of computer systems security. You will become familiar with different types of computer system threats and the appropriate protection mechanisms.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=46788>

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#### DATA MINING (S)

You will learn theoretical and practical methods and techniques for analysing large data sets in order to gain knowledge hidden in data, and discover hidden patterns and rules. You will learn how to create data-driven models for practical tasks such as estimation, prediction, and classification. You will acquire the ability to apply a wide range of data mining techniques to various data analysis problems (mainly of an economic nature), using professional software packages (e.g. Statistica Data Miner).

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=46791>

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#### KNOWLEDGE MANAGEMENT (W)

You will gain knowledge about knowledge organizations and knowledge economy, knowledge management tools and systems. You will develop abilities of solving knowledge management problems and knowledge sharing. You will develop an attitude of full commitment in processes of continuous learning, knowledge generation, with particular emphasis on knowledge sharing.

More information: <https://planystudiow.uek.krakow.pl/ukp.php?idPrzedmiotu=46789>

#### DETAILED STUDY PLAN

<https://usosweb.uek.krakow.pl/kontroler.php?action=katalog2%2Fprogramy%2FpokazKierunek&kod=ZI-IA&lang=en>

<https://planystudiow.uek.krakow.pl/index.php?a=226&id=65&idSemestruRoku=45>