Study Guide

Masters Degree Program

"Applied Informatics"

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Introduction

Rector's Greeting

With great pleasure, I welcome you to Harokopio University!

Harokopio University was established in 1990, realizing the vision and determination of its founder, the national benefactor Panagis Harokopos.

Our university offers distinctive study programs within the Greek territory, excellent physical and technological infrastructure, and a high level of research work. It ensures its international presence and provides a unique academic environment for its students.

According to special studies, such as the study by the National Foundation for Research for the period 1996 – 2010, Harokopio University ranks high among the country's universities regarding the research work of its professors.

An undeniable aspect of the academic environment it offers its students is the visit to its premises, laboratories, lecture halls, and technological facilities. These spaces are ones of culture and education, suited for an academic environment of competition and creation.

The smooth academic life of our institution is an achievement of our students and staff. It relies on extroversion, mutual respect, and regular collaboration among the members of our academic community.

The Department of Informatics and Telematics is the youngest and fastest-growing department of our university. It adheres to international standards, ensuring the quality of its study program through continuous evaluation. It provides optimal educational practices, combining theory, laboratory exercises, group work, and analysis of real case studies. It forges partnerships with the job market and consistently promotes the department's recognition and the quality of its graduates through various activities and events. Moreover, it supports these activities with significant research work.

The overwhelming majority of the department's graduates have found employment in a field related to the department's specialization, either continuing their studies at other recognized institutions or in the department's postgraduate program.

I hope and wish that the progress of the department will be continuous and steadily increasing. In this effort, the contribution of the new academic citizens, our new students, is invaluable. With new ideas, creativity, love for science, and our university.

Our colleagues, professors, the department's staff, and I personally, will be available to support your noble efforts.

Professor Maria Nikolaidi
Rector of Harokopio University of Athens

Greetings from the Dean of the School of Digital Technology

With great pleasure, I welcome you to the postgraduate program with a Specialization in Research in 'Computer Science and Informatics' at the Department of Informatics and Telematics of the School of Digital Technology!

Our department, established in 2006 and admitting its first students in the academic year 2007–2008, offers diverse study programs that meet the needs of the international community and the job market. The postgraduate program in 'Computer Science and Informatics' is the department's effort to enhance the research-oriented nature of its educational programs.

The graduates of this program are distinguished for their academic completeness in the department's subject areas and their close connection with every field of application in Informatics. The professional career prospects are highly encouraging, and the program is housed in a modern building with state-of-the-art facilities, providing students access to modern equipment and fostering excellent collaboration between professors and students.

Participation in a postgraduate study program not only allows you to test your knowledge in the respective field but also to evolve it into issues and problems that concern the research community, cultivating your critical thinking. In today's pace of Informatics evolution, the purpose is not only to educate you on current tools and scientific methodologies but also to actively contribute your own research results.

As the Dean of the Department of Informatics and Telematics, I welcome you as new students and express my best wishes for your successful journey. Seize the opportunities provided, expand your knowledge, and shape the horizons of your life.

Athens, 2023

The Dean of the School

Professor Thomas Kamalakis

Greeting of the Postgraduate Program's Director

Dear students,

Welcome to the Postgraduate Program "Applied Informatics" of the Department of Computer Science and Telematics of the School of Digital Technology!

Applied Informatics is a conversion program, which is addressed to graduates of Departments that do not belong to the field of Computer Science, giving them the opportunity to change the direction of their undergraduate studies and focus on a completely new and innovative field, such as the field of Computer Science and Digital Technology in general.

The aim of the Program is to promote knowledge, develop research and train scientists for the needs of the labor market, in order, on the one hand, to meet the great and constantly increasing demand of the labor market for IT executives and, on the other hand, to provide job prospects to graduates of schools where unemployment is observed. Such programs have been quite popular for several years in many countries both in Europe (such as Great Britain, France, the Netherlands) and in the rest of the world (such as in the USA). They aim to train graduates in a new subject and prepare them for specific professions.

By completing your studies, you will have specialized in the field of Computer Science and Digital Technology in general, as you will acquire the necessary knowledge to ensure your scientific and professional development, to become competitive in a national and international environment, and to prepare for postgraduate studies at doctoral level in cutting-edge subjects.

As the Program Director, I warmly welcome you to this journey of experience and knowledge. Both myself and the faculty will be with you to make this journey unforgettable!

Athens, 2023

The Director of the MSc

Associate Professor Christos Michalakelis

To Prospective Students

Ten reasons to study at the Department of Informatics and Telematics of Harokopio University in Athens:

1. It is the only one of its kind in the field of Telematics and the only one of its kind in the world.
2. Modern curriculum: (i) responds to the challenges of science and technological developments (ii) places great emphasis on laboratory courses (iii) provides practical skills necessary for the labor market.
3. It is located in a privately owned, new - erected building with new and modern laboratories and educational infrastructure.
4. Excellent organization and administrative functioning of the Department and the Institution to reduce the loss of teaching hours.
5. Excellent cooperation between faculty members and students resulting in the completion of studies in the stipulated time.
6. Through the institution of internship, students have the opportunity to practice their knowledge within modern and competitive companies based in the capital city of the country.
7. The absorption of graduates in the labor market with very high rates, as a consequence of their high level of training and the quality of the market interface actions.
8. The knowledge and the level of the studies allow the continuation of studies in postgraduate programs in other departments in Greece or abroad.
9. Modern postgraduate curriculum with 3 directions covering the full range of knowledge needed to successfully cope with the modern business environment and performance-based scholarships, covering the tuition fees in all semesters for 17% of students.
10. In the context of postgraduate studies, there is the possibility of preparing a doctoral thesis, participation in the production of high-quality research work, as well as participation in projects and collaborations with research organizations and industries in the fields of Computer Science and Telematics.

Harokopio University of Athens

Establishment / History

The Harokopio University of Athens is the 18th university, in chronological order, established in the country. It was founded in 1991 by the initiative of Professor Georgios Karampatzou (†2011). Named after the national benefactor Panagis Harokopos, a cosmopolitan Greek of the diaspora with a European orientation, the university was envisioned to be an educational

institution with excellent facilities and equipment in harmony with the natural environment, providing the most modern scientific knowledge. This allowed for the full utilization of the property elements of Panagis Harokopos and Euanthia Harokopou-Petroutsi, according to their wishes.

The planning and development of the institution were carried out in accordance with international standards after a study conducted by the Ministry of National Education and Religious Affairs, under whose supervision it falls.

Harokopio University offers high-level studies at both undergraduate and postgraduate levels. Embracing the vision of Panagis Harokopos, the educational programs provided focus on different areas of human activity with the goal of improving the quality of life. Significant importance is given to ensuring modern infrastructure and smooth conditions for conducting educational work, as well as strengthening cooperation between students and teachers.

Particular emphasis is placed on research activities and promoting excellence. According to relevant studies conducted by the National Documentation Centre for bibliometric analysis of Greek publications, Harokopio University consistently ranks among the top five universities in the country in terms of the number of publications and recognizability. This is evidenced by the number of citations, at the researcher level, in the cognitive fields cultivated within it.

The University consists of the following Schools and Departments:

- School of Environment, Geography, and Applied Economics

    o   Department of Economics and Sustainable Development
    o   Department of Geography

- School of Health Science and Education

    o   Department of Dietetics and Nutrition Science

- School of Digital Technology

    o   Department of Informatics and Telematics

All departments offer full four-year programs leading to a degree.

Harokopio University is housed in a privately owned complex, an inheritance of the benefactors, covering an area of approximately 20 acres, located at 70 El. Venizelou Street in Kallithea, is very close to the center of Athens. It is easily accessible by all means of public transportation and very close to the "El. Venizelos - Tavros" METRO station.

Research at the University

The institution promotes both basic and applied research, contributing to the advancement of science and providing scientific, research, and technological services. It also encourages the undertaking and execution of scientific, research, and technological projects funded by international organizations or conducted within their framework. The Research Funds Special Account manages funds from any source dedicated to covering expenses necessary for research, training, development, continuous education projects, provision of scientific, technological, and artistic services, drafting specifications on behalf of third parties, and other related services or activities that connect education and research to production, executed or provided by the University's scientific staff or in collaboration with other specialists. All research conducted within the institution is characterized by transparency, and its results are communicable and accessible to the University Community members, who can use them by Greek, Community, and International Law on the protection of the creator's intellectual property.

To date, the Research Funds Special Account has managed over one hundred and seventy programs, a significant portion of which have been successfully completed in both physical and financial terms, while others are in the research phase. As part of research promotion, the institution has been involved in and managed programs from the EU's Second and Third Framework Support Programs and programs directly from the European Union.

In alignment with the requirements of the Community and national legislation for the Management of co-financed projects of the Operational Program of the Fourth Programming Period, the Education and Research Committee obtained certification-confirmation for the implementation and management of projects in categories B and C. Consequently,

Harokopio University possesses both the technical and scientific adequacy to promote and advance research.

The Department of Informatics and Telematics

Establishment - Operation

The Department was founded in 2006 with the aim of promoting Computer Science, primarily in the areas of web/telecommunications applications, big data, machine learning, and network-centric applications. The Department emphasizes application fields such as Internet technologies, digital transformation, e-business, e-governance, e-health, smart transportation, and more.

The global market demands professionals with broad training in web and internet technologies to support the design and development of complex information systems and advanced services. Graduates from the Department possess a comprehensive set of scientific and technical skills directly related to the fields of application in Computer Science, enabling them to meet the modern demands of the job market. The Department encourages

students to develop innovative services using open-source platforms through their theses within R&D projects and to contribute to the university's ecosystem of electronic services.

The professional rights of the Department's graduates are equivalent to those of all University Departments in the country in the fields of Computer Science and Telecommunications.

Aims - Objectives

As mentioned, the Department focuses on studying the application, use, and impact of digital technology in various areas of human activity. To achieve this, it requires the design, development, and integration of standard methods and tools in computer and telecommunications technology to provide modern telecommunication applications. Within this framework, the Department's activities are centered on the following areas:

- Provision of electronic services without restrictions on mobility and interface devices (e.g., e- and m-services) in various sectors of human activity such as health, transportation, governance, and commerce.

- Management and exploitation of the large volume of information generated and disseminated in the modern environment (e.g., the Internet), transforming it into knowledge by leveraging the links found in various types of networks (e.g., computational, corporate, human).
- Development of technologies (e.g., next-generation wireless optical systems, services, and cloud computing management) and integration of smart devices (e.g., sensors, smartphones) for more effective service and facilitation of the modern individual's daily life. Examples of such applications are the Internet of Things and smart cities.
- Comprehensive support for established application domains of digital technology, such as corporate informatics, health informatics, educational informatics, etc. (in collaboration with other departments of our university).
- Study of the impact of digital technology on daily life and business activities, highlighting areas such as techno-economic and social analysis of the impact of adoption of technologies and products.

The Department aims to promote research and excellence in these areas to support integrated technological solutions and their efficient exploitation in modern society. To achieve this, it has developed a specific strategic plan for medium and long-term research, prioritizing application areas related to specialization.

It also aims to provide high-level study programs in accordance with international standards and guidelines, offering specialized knowledge to its graduates at both undergraduate and postgraduate levels in these fields.

Research

The Department constitutes a recognizable research unit at both national and international levels, engaging in various cutting-edge research fields related to computer science and its applications. The research conducted in the department includes the following areas:

- Data management, artificial intelligence/machine learning, computer vision, statistics, and applications.
- Algorithms, techniques, and programming languages.
- Information systems (management, pervasive computing, supply chain, e-commerce, simulation, system security).

- Cloud computing (distributed computing, design and performance study of architectures and services, programming techniques and optimization, techno-economic analysis).
- Communication networks and the Internet of Things (wireless and wired technologies and applications, cyber-physical systems, smart transportation and autonomous vehicles, smart cities applications, e-health).

Graduates

The graduates of the Department, trained with scientific completeness in the cognitive subjects of Computer Science, with an emphasis on telecommunication applications, possess the tools to respond adequately to the increased demands of modern society and the highly competitive environment.

- The professional rights of the Department's graduates are fully defined by the legislative decree of the competent Ministries. They are identical to those of the corresponding Departments of other Universities in the country in the subjects of Computer Science and Telecommunications.
- Our alumni often pursue postgraduate studies at recognized Universities in Greece or abroad.

According to a study conducted in April 2014, they are employed to a large extent in the private sector in positions related to the specialization of the Department. They do not face problems related to unemployment.

Activities

Initiatives of the Department that have been successfully completed and ongoing activities are briefly summarized below:

Research - Collaborations

- Participation in research and development projects funded by national and European resources, as well as private entities.
- Collaboration with other departments of the University (Department of Geography and Department of Nutrition and Dietetics) for submitting research proposals and executing research projects.
- Establishment of cooperation agreements with Research Institutions and Universities in the European and international arena.
- Establishment of scholarships for students and prospective doctoral candidates.
- Establishment and organization of student and researcher mobility in Europe and internationally through Erasmus and Erasmus+ programs, leveraging existing University collaborations and establishing new ones.

Organization of conferences

- IEEE CISOSE 2023: IEEE International Congress on Intelligent and Service-Oriented Systems Engineering
- Annual National Free and Open Source Software Communities Meeting (FOSSCOMM) in 2012 and 2017
- Annual Panhellenic Conference on Informatics in October 2014 (PCI 2014)
- IEEE Research Challenges in Information Science in May 2015 (RCIS 2015)
- 13th International Conference on Economics of Grids, Cloud, Systems and Services (GECON 2016)
- 14th International Conference on Open Source Systems (OSS 2018)
- 11th International Conference on Random Generation of Combinatorial Structures (GASCom 2018)

Relations with the job market and society

- Incorporation of internships.
- Participation in the Free Software/Open Source Software Society (FS/OSS).
- Undertaking projects for training and educational actions in collaboration with other Universities (University of Athens, Aristotle University of Thessaloniki, University of Peloponnese) and non-profit organizations (FS/OSS).

A successful organization, in collaboration with the Department's student association, of the annual Free and Open Source Software Communities Meeting (FOSSCOMM) in April 2013 and November 2017, each with over 600 participants.

- Recognition of students, both undergraduate and postgraduate, in technology and entrepreneurship competitions at national and European levels.
- Enhancement of the Department's position in the job market through the organization of established entrepreneurial conferences (ICT Forum) and workshops/seminars in the field of Computer Science and Telecommunications.

Study programs

- Providing high-quality education at both undergraduate and postgraduate levels, combining scientific principles and theories with an understanding of the market's needs and societal demands, is a priority of the Department.
- The provided study programs have been designed based on the relevant guidelines of international bodies such as the Association for Computing Machinery (ACM) and the Institute for Electrical and Electronic Engineers (IEEE). They encourage daily engagement in the Department's laboratories and the systematic presence of students within the Department. Emphasis is also placed on the connection with the job market and supporting internships for students who choose this path.
- The Department supports the European Credit Transfer and Accumulation System (ECTS) for its study programs from its inception (determination of ECTS credits, issuance of diploma supplements in Greek and English).
- The education provided combines the use of modern educational methods, such as:
  - Integration of theory with laboratory exercises,
  - Group projects,
  - Analysis of real case studies.

Scholarships/Awards

The State Scholarships Foundation annually grants excellence scholarships as well as scholarships and loans to support students who excel in entrance exams and semester examinations at the Higher Education Institutions. The Department's Secretariat issues a notice with the names of the scholarship and award recipients and sets a reasonable deadline for students to submit their supporting documents. The scholarships aim to highlight exceptional cases of effort, ethics, and performance and to financially support students who stand out under adverse conditions.

Harokopio University operates the Foundation "Spyros Harokopos and Eftychia Harokopou - Petroutsi," which grants scholarships for postgraduate studies to graduates of Harokopio University based on their academic performance, combined with their family and social circumstances, and their individual or family income. Each October, the Foundation announces the number of scholarships, their duration, and the method and deadline for submission of applications by interested students.

The Department of Informatics and Telematics, in honor of the late Professor Georgios Karabatzos, has established the "G. Karabatzos Performance Scholarship." This scholarship is awarded to three (3) students from each specialization of the Postgraduate Program. The scholarship fully covers tuition fees for the top 3 students (1 per specialization) and partially for the 2nd and 3rd-ranked students in each specialization (a total of 9 scholarships). The scholarship is disbursed at the end of each semester based on the students' performance.

Other sources of funding for awards and scholarships may include donations, grants, university endowments, and special income from cultural and sporting events of the Foundation. Information regarding awards and scholarships is provided by the Liaison Office.

Staff

Faculty members

Mara Nikolaidou has been a Professor at the Department of Informatics and Telematics at Harokopio University since 2007. She received her bachelor's degree in Computer Science and her doctoral degree from the Department of Informatics at the National and Kapodistrian University of Athens. Before her election to the University, she worked as a computer engineer in both the private and broader public sectors. During this period (since 2016), she has served as the Rector at Harokopio University. For the 2023-2024 term, she was appointed as the representative of Greek Universities to the European Union of Universities. Her research focuses on distributed systems and the design of complex systems. In this field, she has participated in numerous national and European research projects, with recent focuses on designing and managing IoT systems, Cloud and Edge systems, and cyber-physical systems, emphasizing human-centric and autonomous systems. Additionally, she is involved in the design of responsible computing systems and ethical requirements. She is a member of IEEE (SMC society) and the Systems Council. She also participates in OMG, working groups for the SyML and Responsible Computing standards. (https://mara.dit.people.hua.gr)

Malvina Vamvakari is a Professor at the Department of Informatics and Telematics at Harokopio University. She graduated from the Department of Mathematics at the National and Kapodistrian University of Athens in 1991 and obtained her doctoral degree from the same department in 1997. She has served as a postdoctoral researcher at the Department of Computer Engineering and Informatics at the University of Patras and as a researcher at the Institute of Computer Technology in Patras. Her research interests include asymptotic combinatorics, discrete probability distributions, random graphs, and statistical data analysis.

Thomas Kamalakis (https://thkam.dit.people.hua.gr/) was born in Athens in 1975. He obtained his Bachelor's degree in Computer Science and his Master's degree in Telecommunications with distinction from the University of Athens in 1997 and 1999 respectively. In 2004, he completed his doctoral thesis on the design and modeling of Arrayed Waveguide Grating devices. From 2004 to 2007, he was a research collaborator at the Laboratory of Optical Communications at the University of Athens and a contracted lecturer in Electronics at the University of Peloponnese during the same period. In 2008, he joined the Department of Informatics and Telematics at Harokopio University of Athens, where he is currently a professor and the Dean of the School of Digital

Technology. He has over 100 publications in top scientific journals and international conferences. His interests include integrated optical systems, optical networks, free-space optical communications, and techno-economic analysis of systems.

Iraklis Varlamis is a Professor at the Department of Informatics and Telematics at Harokopio University, specializing in Data Management. He holds a doctoral degree in Computer Science from the Athens University of Economics and Business, having previously completed his Master's in Information Systems Engineering at UMIST in the UK. His research focuses on knowledge discovery from the web, behavior analysis in social networks and journalism, as well as the creation and management of business knowledge. He has published 3 books and 1 edited book, and over 200 articles in international journals and conferences. He has participated in numerous national, European, and international research projects as Scientific Coordinator. For more information, visit https://varlamis.dit.people.hua.gr/.

Chrysa Sofianopoulou is an Associate Professor at the Department of Informatics and Telematics at Harokopio University, specializing in "Analysis of educational performance and informatics training". She holds a degree from the Department of Mathematics at the National and Kapodistrian University of Athens and a PhD in Education Sciences. She is the National Coordinator of the OECD's PISA program, a member of the Board of the Institute of Educational Policy, a National Expert in the EU, and a visiting professor at the University of Cergy-Pontoise in Paris and the University of Mons in Belgium. She has served as an advisor to the French Minister of Education on educational performance matters. Her research interests focus on socio-economic factors related to educational performance and the use of ICT for improving learning quality.

George Dimitrakopoulos is an Electrical Engineer and Computer Engineer graduate from the National Technical University of Athens (2002) and received his PhD from the University of Piraeus (2007). He serves as an Associate Professor at the Department of Informatics and Telematics at the School of Digital Technology at Harokopio University since 2010. For over 20 years, he has actively participated in research and development programs in the field of Telecommunications and Computer Science in collaboration with major industries, mainly funded by the European Union (Horizon2020, ECSEL, Horizon Europe, KDT), and the Qatar Fund. Simultaneously, he has been involved in multiple activities within startups in Greece and the United States. His research interests include the design and development of communication network optimization algorithms, focusing on cognitive networks, intelligent transportation systems, and automated driving. He is the author of three books and over 180 scientific articles in international journals and conferences.

Dimitrios Michail is an Associate Professor at the Department of Informatics and Telematics at Harokopio University. He holds an Electrical and Computer Engineering degree from the Technical University of Crete. He further obtained a Master's Degree in Computer Science and a PhD in Algorithms from the Max Planck Institute for Informatics in Germany. He has been a postdoctoral researcher at the Max Planck Institute for Informatics and at the INRIA Institute in Sophia-Antipolis, France. His research revolves

around the development of algorithms in modern computational models, focusing on graph algorithms, knowledge discovery with an emphasis on graphs, and machine learning. He has recently engaged in issues related to the use of machine learning in computer vision problems in the field of tele-scanning. He has worked as a researcher in various European research and development programs (TELEIOS, Fortissimo, AfarCloud, TEACHING, and DeepCube).

Christos Michalakelis is an Associate Professor at the Department of Informatics and Telematics of the Harokopio University of Athens. His research interests and expertise lie in techno-economic analysis services, demand and competition prediction in the high-tech market, as well as costing, pricing, and evaluation of investments in the field of ICT, mainly in cloud computing and the Internet of Things (IoT). He has worked for many years with the Greek Ministry of Education as the head of the IT management department. He has participated in numerous projects related to database system design and implementation, as well as various ICT projects, and has published more than 100 works in international journals and conferences. He is the Director of the Postgraduate Studies Program in "Applied Informatics," a program redirecting studies in informatics for professionals without a relevant academic background. Additionally, he serves as the President of "Study in Greece," the National Agency of Greece, for the internationalization of Greek Universities.

Konstantinos Tserpes has been an Associate Professor at the Department of Informatics and Telematics of Harokopio University since 2021. He graduated in 2003 from the Department of Computer Engineering and Informatics and successfully defended his doctoral thesis in 2007 at the School of Electrical and Computer Engineering of the National Technical University of Athens. His research revolves around modern computational infrastructures and distributed systems for new applications in data analysis and management. He has participated in more than 10 collaborative research projects in these areas, coordinated an additional 4 (+Spaces, SocIoS, Consensus, BASMATI), and is scientifically responsible for another 6 projects (TEACHING, ACCORDION, COLLABS, CHARITY, MASTER, and SmartShip). In these projects, he contributes as the software architecture leader and coordinator of the software development team.

Panagiotis Rizomiliotis is an Associate Professor at the Department of Informatics and Telematics of Harokopio University, specializing in Information Systems Security and Cryptography. He holds a bachelor's degree in Computer Science, a master's degree in Electronics and Radioelectronics, and a Ph.D. in Cryptography from the Department of Informatics and Telecommunications of the National and Kapodistrian University of Athens. From 2012 to 2018, he served as a member of the plenary of the Hellenic Data Protection Authority (HDPA), and during the same period, he was an adjunct lecturer at the Department of Informatics and Communication Systems of the University of the Aegean. Between 2005 and 2007, he worked as a researcher at the COSIC security and cryptography lab at Katholieke Universiteit Leuven in Belgium, funded by a Marie Curie fellowship from the European Commission. For the last three years, he has been an external expert for the European Union Agency for Cybersecurity, ENISA. He has participated in numerous national and European research projects focusing on systems

security and privacy protection, acting as a technical manager or researcher, and has provided consulting services to public organizations on security matters. He has published more than 60 articles in scientific journals and conferences, covering information systems security and cryptography.

George Kousiouris is an Assistant Professor at the Department of Informatics and Telematics of Harokopio University. He received his diploma in Electrical and Computer Engineering from the University of Patras in 2005 and obtained his Ph.D. in Cloud Computing Services from the National Technical University of Athens in 2012. He has participated in various European research programs (H2020 PHYSICS, H2020 BigDataStack, H2020 CloudPerfect, H2020 SLALOM, FP7 COSMOS, FP7 ARTIST, FP7 OPTIMIS, FP7 IRMOS) in roles such as researcher, work package coordinator, and technical coordinator. He has published over 70 original research papers in scientific journals, international conferences, and book chapters. His interests focus on cloud service performance and modeling, application performance estimation and prediction, service level agreements, cloud and IoT platform design, and architecture.

Cleopatra Bardaki is an Assistant Professor focusing on "Distributed Computing Systems and Supply Chain Systems" at the Department of Informatics and Telematics at Harokopio University of Athens (HUA). Dr. Bardaki is also the scientific responsible and coordinator of the Technology Transfer Office at HUA. She graduated with honors from the Department of Informatics and Telecommunications at the University of Athens and holds an MSc in Information Systems from the Athens University of Economics and Business (AUEB). Her Ph.D. thesis delved into the realm of IoT-enabled Distributed Information Systems in Supply Chains, conducted at the Department of Business Administration and Technology at AUEB. Her research revolves around the development and assessment of information systems utilizing cutting-edge innovative technologies, supply chain management, data analytics for decision support, information quality, and digital process transformation. Previously, she served as a Research Associate and Research Coordinator at the Electronic Commerce Lab (ELTRUN) of AUEB, with extensive experience in managing and coordinating research, primarily within European research projects. She has authored over 60 scientific articles published in international academic conferences and journals. Additionally, she co-edited a book titled "Strategy and Governance for the Next Day" by G. Doukidis and K. Bardaki, published by Sideris Publications in 2021, proposing strategies for organizations and the government to address challenges arising from the pandemic.

Christos Diou is an Assistant Professor at the Department of Informatics and Telematics at Harokopio University of Athens, specializing in "Artificial Intelligence and Machine Learning." He obtained his diploma in Electrical and Computer Engineering and his Ph.D. in Multimedia Data Analysis with Machine Learning from Aristotle University of Thessaloniki. He has more than 80 publications in international scientific journals and conferences related to Artificial Intelligence and Machine Learning. His recent research interests include developing robust machine-learning algorithms capable of generalization beyond distribution, modeling uncertainty in machine learning, and developing machine-learning models for causal effect estimation from observational data. With over 15 years of participation in European and national research projects, he serves as the scientific coordinator for the projects REBECCA and RELEVIUM, focusing on applications of artificial intelligence in healthcare.

George T. Papadopoulos is an Assistant Professor at the Department of Computer Science and Telematics at Harokopio University of Athens. He received his Diploma in Electrical Engineering and his Ph.D. from the Department of Electrical and Computer Engineering at the Aristotle University of Thessaloniki (AUTh) in 2005 and 2011, respectively. He has worked as a Postdoctoral Researcher at the National Centre for Research and Technological Development (EKETA) and at the Research and Technology Foundation (ITE). He has published over 50 articles in international journals and conferences with peer review. He has participated in several European Union-funded research programs, such as aceMedia, K-Space, MESH, Vidi-video, GLOCAL, CEEDs, REVERIE, RePlay, LASIE (Deputy Technical Director), DANTE (Technical Coordinator), ANITA (Technical Coordinator), and HR-Recycler (Deputy Coordinator). He is the Technical Coordinator of the European projects Anti-FinTer and Ceasefire. His research interests include computer vision, pattern recognition, machine/deep learning, image and video processing, human-computer interaction, and explainable artificial intelligence.

Angelos Charalampidis graduated in Computer Science and obtained a master's degree in Computer Systems from the University of Athens in 2001 and 2008, respectively. In 2014, he completed his doctoral thesis on high-order logic programming proof procedures. He was a postdoctoral researcher at the Institute of Informatics and Telecommunications of NCSR "Demokritos." In 2020, he was a visiting professor at Jefferson University. In 2022, he joined the Department of Computer Science and Telematics at Harokopio University of Athens, where he is currently an Assistant Professor. His research interests include declarative programming languages, computational logic, and reasoning.

Vasilis Efthymiou is an Assistant Professor at the Department of Computer Science and Telematics at Harokopio University. He received his degree in Computer Science in 2010, his master's in Information Systems and Bioinformatics in 2012, and his Ph.D. in entity matching in the World Wide Web of Data in 2017, from the Department of Computer Science at the University of Crete. Before joining Harokopio University, he was a postdoctoral researcher at the Information Systems Laboratory of FORTH-ICS, a visiting professor at the University of Crete, and a postdoctoral researcher at the database group of IBM Research at the Almaden Research Center in California, USA. Following his work at IBM T.J. Watson Research Center in New York, USA, related to table-to-Knowledge Graph (KG) alignment, he co-organizes the SemTab challenges at the ISWC conference, an effort

for comparative evaluation of systems dealing with the table-to-KG matching problem, and the TaDA workshop at the VLDB conference. He has authored two books, and more than 60 scientific articles, and holds four patents in the USA.

Eirini Liotou (https://eliotou.dit.people.hua.gr/) is an Assistant Professor in the Department of Informatics and Telematics at Harokopio University of Athens. She holds a Ph.D. from the Department of Informatics and Telecommunications at the National and Kapodistrian University of Athens (2017). She obtained an MSc in Informatics and Telecommunications from the National and Kapodistrian University of Athens (2011) and an MSc in Communications and Signal Processing from Imperial College London (2012). She received her Diploma in Electrical and Computer Engineering from the National Technical University of Athens in 2006. She has worked as a Software Engineer at Siemens AG and as a Senior Software Engineer at Siemens Enterprise Communications in the R&D department (2007-2011). Between 2017 and 2021, she worked as a Postdoctoral Researcher at the Network Communications Laboratory of the Department of Informatics and Telecommunications at the National and Kapodistrian University of Athens. Between 2021 and 2023, she worked as a Project Manager/Senior Researcher for EU Research Programs at the Research Academic Institute of Communication Systems & Computer Engineering (RAICSECE), serving as Deputy Project Coordinator for EU projects. She has participated in more than 20 European and national projects as well as COST actions. Her research interests include Software-Defined Networking (SDN), Network Functions Virtualization (NFV), Quality of Experience (QoE), and Cooperative, Connected, and Automated Mobility (CCAM).

Georgia Dede is an Assistant Professor in the Department of Informatics and Telematics at the School of Digital Technology at Harokopio University of Athens, focusing on Systems Evaluation and Electronic Services. She holds a Ph.D. from the Department of Informatics and Telecommunications at the National and Kapodistrian University of Athens (2015) with a topic on "Decision-Making Methods and Uncertainty Studies applied to Next-Generation Home Networks." She obtained a Master's degree in Administration and Economics of Telecommunications Networks from the Departments of Informatics and Telecommunications and Economics at the National and Kapodistrian University of Athens (2007). She received her Bachelor's degree from the Department of Informatics and Telecommunications at the same University (2005). Dr. Georgia Dede manages and participates in research and development programs funded by the European Union (Horizon Europe, Digital Europe). She has worked as a senior consultant and manager in the field of cybersecurity at Netcompany Intrasoft and at ENISA. Previously, she has been a research collaborator at the University of Patras and at the National and Kapodistrian University of Athens, participating in national and European programs. She is the author of scientific articles in international scientific journals and conferences and serves as a reviewer for international scientific journals.

Assisting Staff members

<table>
<tr>
<td></td>
<td>Alexandra-Anna Gasparinatou is a member of the Teaching Staff at the Department of Informatics and Telematics at Harokopio University. She holds a Ph.D. in "Educational Technology – Teaching Informatics" from the Department of Informatics and Telecommunications at the National and Kapodistrian University of Athens, focusing on "Adaptive Online Learning Environments for Distance Education." She graduated in Physics from the University of Patras and holds three Master's degrees in "Medical Physics," "Computational Mathematics and Informatics" from the University of Patras, and in "Educational Sciences" from the Hellenic Open University (HOU). Additionally, she successfully completed four Thematic Units of the MSc in "Information Systems" at HOU. She has worked in Secondary Education as an IT Education Consultant and as an IT Educator. Since 2013, she has collaborated with HOU as a Teaching Associate in "Educational Research in Practice" (EDU51), "Education Studies" (EDU65), "Information and Communication Technologies in Education: online learning and e-learning" (ETA60), and "Digital Media in Education and Communication" (ETA62). She has supervised undergraduate and postgraduate theses. Her research interests mainly revolve around the utilization of Distance Education Media, particularly Adaptive Online Learning Environments, comprehension of Computer Science texts, and learning styles. She has published in over 30 reputable international and Greek journals, books, and conferences, also contributing as a trainer in educational programs.</td>
</tr>
<tr>
<td></td>
<td>Tsadimas Anargyros (https://tsadimas.github.io/) has been working at Harokopio University as a research collaborator since 2004. He graduated in Applied Informatics from the University of Macedonia in 2002, earned a postgraduate diploma in Advanced Information Systems from the Department of Informatics and Telematics at the National and Kapodistrian University of Athens in 2005, and obtained his Ph.D. focusing on "A model-centric approach for designing Enterprise Information Systems emphasizing the integration of discrete design activities" from the Department of Informatics and Telecommunications at Harokopio University in 2018. He has taught courses such as Operating Systems, Distributed Systems, DevOps, and Systems Management in the Department of Informatics and Telecommunications at Harokopio University. His research interests lie in Modeling & Simulation of Systems, Distributed Systems, and Enterprise Information System Design, with over 25 publications in international conferences and journals in these areas. He participates as a researcher in research programs funded by national bodies and the European Union.</td>
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<td>Dr. Vasileios Dalakas is a distinguished professional in the field of Information and Communication Technologies (ICT), with an impressive academic background and over two decades of expertise in IT service management. Holding a degree in Physics, an M.Sc. in Digital Signal Processing, and a Ph.D. specializing in Digital Communications, all from the National and Kapodistrian University of Athens (NKUA), Greece, Dr. Dalakas has been an enthusiastic contributor to the field. Currently serving as a detached advisor to the General Secretary of Information Systems and Digital Governance at the Ministry of Digital Governance in Greece, he plays a pivotal role in advising on topics such as data centers, cybersecurity, cloud computing, artificial intelligence, and IT system</td>
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</table>

	procurement. Simultaneously, he holds a position as a teaching staff member at the Department of Informatics and Telematics at Harokopio University of Athens (HUA).

Department Secretariat

The staff of the Secretariat consists of high-level executives with postgraduate studies and excellent training.

	Angeliki Niki Presvelou is Deputy Head of the Secretariat at the Department of Informatics and Telematics of the School of Digital Technology of Harokopio University from 2022. She holds a PhD degree from the Department of Sociology of the Panteion University of Social and Political Sciences on "Social and demographic changes: health structures, morbidity and mortality in Argolida in the 19th century. The case of the Municipal Hospital of Nafplion, 1837-1861". She holds a Master's Degree (D.E.A.) in Demography from the Paris I-Pantheon-Sorbonne, UFR d'Histoire. She received her Undergraduate Diploma from the Department of Sociology, Panteion University of Social and Political Sciences. She has worked in management positions of responsibility in both the public and private sectors. Her scientific interests are in the field of Historical Demography, Health History and the digitization of Historical Demographic Data.
	Fotini Daneli is a member of the Special Technical Laboratory Staff (STL) at the Department of Informatics and Telematics of the School of Digital Technology of Harokopio University since 2019. He holds a bachelor's degree in Geography (2006) and a master's degree in Applied Geography and Spatial Management / Development and Management of the European Space (2009), from the Department of Geography, Harokopio University of Athens. From 2007 to 2019 she has worked at Harokopio University supporting administrative, financial and technical processes of the Department of Informatics and Telematics and has participated in actions, national and European projects related to quality assurance issues. He has also worked in spatial analysis and real estate in the private sector. Her interests include issues related to urban development and spatial management, geographic information systems (GIS) applications and smart cities.
	Eleni Kalampaliki is a member of the Special Technical Laboratory Staff (S.T.T.L.P.) at the Department of Computer Science and Telematics of the School of Digital Technology of Harokopio University. She holds a Bachelor's degree in Home Economics and Ecology (2006) and a Master's degree in Education and Culture (2011) from the Department of Home Economics and Ecology of Harokopio University. From 2006 to 2023 she has worked at Harokopio University supporting mainly administrative and technical processes of the Department of Informatics and Telematics and participated in actions, national and European projects related to quality assurance issues.

	Fotini Maria Mine works at the Secretariat of the Department of Informatics and Telematics of the School of Digital Technology of Harokopio University from 2022. She holds a Bachelor's degree in International and European Studies and a Master's degree in Shipping from the University of Piraeus. In the past, he has worked in management positions of responsibility in both the private and public sectors.
	Nikolaos Sfakianos is a Sociologist, graduated from Panteion University in 2014 and received two Master's degrees, from the same University, in Sociology and Social Psychology in 2006 and 2020 respectively. Since 2021 he is working on his PhD thesis entitled: "Social Comparison in General Purpose Social Media: patterns of Masculinity - Femininity and Influence on User's Self-Esteem". Subsequently, he has worked in the private sector as a business consultant, has been involved as an external collaborator in research projects since 2019, and his interests focus on social research methods, social representations of Social Media and the sociology of emotions. From 2022 he is working at Harokopio University in support of activities related to quality management and evaluation of the Postgraduate Programmes of the Department of Informatics and Telematics.

Operating Hours

The Secretariat serves requests from the students, staff, and the public on business days from 10:00 to 14:00. Additionally, it assists postgraduate students from Monday to Thursday and in the afternoons from 16:00 to 19:00.

International Advisory Committee

The Department has established an International Advisory Committee composed of distinguished academics in the field of Computer Science and Telecommunications. It consists of internationally distinguished academics from abroad in the field of Computer Science and Telecommunications. Its role is multifaceted, aiming to ensure optimal quality in:

- Developing the academic curriculum
- Participating in high-level research activities

The committee supports the organizational and academic development of the Department and enhances international collaborations to foster partnerships.

Contact

Address:

Omirou 9, Tavros, 177 78 (2nd floor)

Tel.: +30 210 9549400, +30 210 9549402

Email: itpsec@hua.gr

Postgraduate Program "Applied Informatics"

Tel.: +30 21 9549 460

Email: applied@hua.gr

Access

The Department is housed in the newly built University building at 9 Omirou Street, in Tavros. The building is located at a distance of 800 meters from the main complex of Harokopio University on El. Venizelou 70, in Kallithea.

Transportation

Access to the Department of Informatics and Telematics is possible in the following ways:

- HSAP (Line 1). Eleftherios Venizelos stop (Tavros). From there, walking for about 3 minutes alongside the electric train lines, in the direction of Piraeus, you will reach Omirou Street. The building is on your right.
- HLPAP (Trolleybus), Line 3 or 5. OSY (Urban Bus), Line 040. Stop outside the central Harokopeio (El. Venizelou). From there, follow Harokopou Street and then cross the HSAP station of Tavros and walk for about 10 minutes to the Department of Informatics and Telematics.

Map

Teaching

Studies

The duration of study in the postgraduate program for obtaining the degree is three (3) semesters and is organized as follows:

Organization of the Academic Year

The start and end of the academic year, scheduling of semesters and examination periods, the number of planned lectures, and holidays are determined in the institution's study regulations and announced on the program's website (https://applied.dit.hua.gr).

The academic year starts on September 1st and ends on August 31st of the following calendar year. The re-examination period in September is considered part of the previous academic year.

The educational work of an academic year is structured into two (2) academic semesters: the winter and the spring semester. The winter semester starts on September 1st each year and ends within February of the following year. The spring semester starts the day after the end of the winter semester and ends within the first fortnight of July of the same year. Each semester includes at least thirteen (13) full working weeks.

Educational activities are not conducted during the winter semester: on October 28th, November 17th, during the Christmas holidays starting from December 24th to January 6th, and on January 30th. During the spring semester: on Clean Monday, March 25th, during the Easter break starting from Easter Monday to the Sunday after Easter, on May 1st, and on the day of the Holy Spirit. Also, activities are not conducted on the days of Rectoral and Student elections.

Examination periods

The time and location of examination activities are determined by the institution's study regulations. At the discretion of course instructors, assessment may be based on alternative assignments that should correspond to the appropriate workload, in accordance with the ECTS descriptions of the course.

Examinations take place exclusively after the conclusion of the winter and spring semesters for the corresponding courses. During the repeated examination period in September, occurring before the commencement of the winter semester, students have the entitlement to be examined in courses from both semesters. This flexibility allows students the opportunity to address any outstanding assessments and further supports their academic progression.

Integration of ICT in the Educational Process - e-Class Platform

Information and Communication Technologies (ICT) are used in presenting courses through:

- Electronic notes, articles and reading material.
- Course materials (slides and supplementary), as well as various applications used in the educational process, are available through the e-class platform.

Moreover, ICT is used in teaching through:

- The use of an electronic tele-education platform - e-class.
- Electronic presentations, e-class (materials, assignment management, etc.).
- Electronic communication with students (student register, email, announcements, etc.).

ICT is directly connected to laboratory education, as the computer science laboratories are entirely computer-based. Additionally, the laboratories support various application development environments according to the needs of each course.

Finally, ICT is used in student-instructor communication through the following methods:

- Using the e-class electronic platform (student management, communication, discussions).
- Using email.
- Posting announcements electronically.
- Utilizing the students' electronic forum.

Tele-education room

The University has a well-organized tele-education room, adequately supported by the University's technical services. This service's availability is crucial for connecting the Department with other corresponding Departments in Greece and abroad, aiming to improve communication and achieve the educational and research goals of the Department's academic staff.

Building and Laboratory Facilities
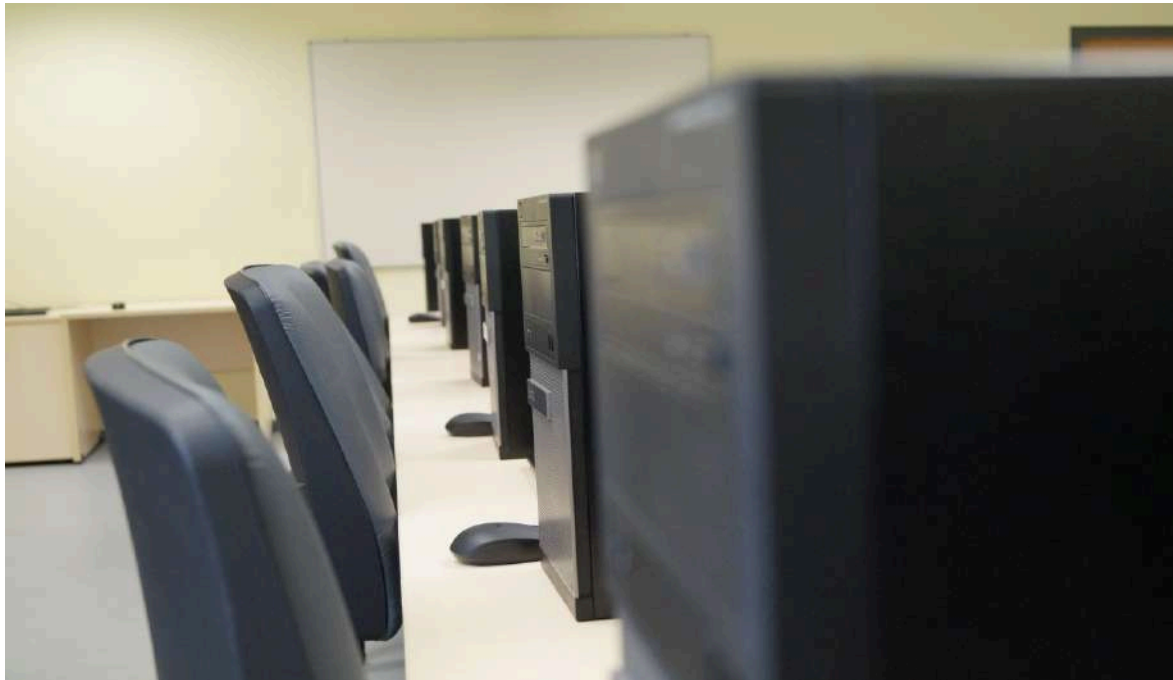
In June 2013, the construction and equipping of the new six-story building of the University were completed. This building was initially designed to house the new Department, and the Department was relocated there along with the renewal of its laboratory, central computing, and network equipment. With the assistance of the Information Technology and Networks Center, a proprietary fiber optic network has been installed and operates, connecting the Department's building on Omirou Street with the university's main complex. The fiber optic network allows seamless internet access while conserving resources, as no telecommunications fees are paid to service providers.

The Department has all the necessary rooms and laboratory facilities to support its primary educational work:

Rooms:

- An amphitheater with a capacity of 120 people, equipped with multimedia tools.
- Three (3) rooms with a capacity of over 30 people, each equipped with a projection system, camera, and microphone.

Laboratories:

2 PC/Linux laboratories, each with 35 workstations, a heavy-duty printer, and an interactive board.

Student Exchange Program - Erasmus at the Department

The Department has established a network of collaborations with internationally renowned universities and research centers. Through the Erasmus+ program, it aims to enhance the mobility of students, teaching, and administrative staff between partner European institutions. For this purpose, it has initiated the signing of Erasmus+ bilateral agreements with European universities across all levels of study (undergraduate, postgraduate, doctoral). These agreements support the movement of personnel for teaching and administrative staff for training purposes.

The Department of Computer Science and Telematics actively participates in this process, constantly exploring new collaborations and creating new prospects for its students. Within the framework of these bilateral agreements, student exchanges between European institutions are arranged, while visits of teaching and administrative staff for teaching and practical training are supported, respectively.

Students participating in the Erasmus program receive full recognition for their academic work completed successfully at any collaborating institution. They can transfer these academic credits to their home institution based on prior agreements between the students and the Erasmus departmental coordinator at their institution.

Upon successful completion of their study program as pre-agreed between their respective universities, when students return to their home country, the academic credits are transferred, allowing students to continue their studies without losing time or academic credits.

The department consistently ensures the support of bidirectional mobility (to and from Harokopio University) of students, professors, and staff in the activities it undertakes. It invites lecturers both at undergraduate and postgraduate levels and creates suitable conditions for incoming students to attend the courses it offers.

Similarly, participating in the Erasmus Mundus program aims to enhance the mobility of researchers to and from international universities outside Europe. The ERASMUS Office - Department of International & Public Relations supports the process of concluding and operating agreements, thereby strengthening external relations, internationalization of Harokopio University, and the establishment of robust academic partnerships, primarily within the European Higher Education Area, and beyond.

Erasmus+ Collaborations

At present, the department has signed bilateral agreements with the following institutions:

- Freie Universitat Berlin, Germany (D BERLIN01): Department of Mathematics and Computer Science, Info for international studies.
- Bordeaux Institute of Technology, France (F BORDEAU 54): Graduate School of Engineering in Electronics, Computer Sciences, Telecommunications, Mathematics, and Mechanics, Courses Syllabus.
- Université des Sciences & Technologies de Lille (F LILLE01): UFR IEEA - Informatique, Electronique, Electrotechnique et Automatique. FIL - Formations en Informatique de Lille1.
- University of Granada (E GRANADA01): ETSIIT – Escuela Tecnica Superior de Ingenieras, Informatica y de Telecomunicacion and Escuela Internacional de Posgrado - International School of for Post-Graduate Studies.
- University of Malaga (E MALAGA01): ETSII - Escuela Técnica Superior de Ingeniería Informática (Undergraduate & Postgraduate level).
- Middlesex University, London, UK (UK LONDON067): School of Science and Technology, Department of Computer Science, Info for international studies.
- AGH University of Science and Technology, Krakow (PL KRAKOW02): Faculty of Computer Science, Electronics and Telecommunications και International Courses Program.
- European University of Cyprus, Nicosia. (CY NICOSIA24): Department of Computer Science and Engineering.
- It also aims to enter into agreements with institutions in other countries in order to create more mobility opportunities.

Extroversion

The department implements specific extroversion initiatives, aimed at increasing its penetration into society while simultaneously targeting internationalization. Specifically, this includes the official pages of the department on social networks like Facebook and LinkedIn, the department's channel on YouTube containing various video lectures from undergraduate and postgraduate courses, and the courses offered through the opencourses.gr platform, and the department's website. Occasionally, through the institution's liaison office, the department organizes school visits to its facilities, aiming to familiarize students with new technologies and attract prospective students through national examinations. Simultaneously, it arranges events and talks inviting speakers from the IT industry in Greece and internationally. Additionally, the department organizes student groups to participate in coding competitions (hackathons) such as the EUvsVirus hackathon 2020, conducting similar

events within the framework of research programs (e.g., AffectUs hackathon 2018, PHYSICS hackathon 2023). Similarly, it encourages the creation of student groups (Harokopio Google Student Developer Club) and their participation in relevant activities (Google Summer of Code 2022, 2023).

In addition, the Department of Informatics and Telematics of Harokopio University hosts Study in Greece (https://studyingreece.edu.gr/) the organization of Hellenic Universities and the national agency of Greece for the support of their internationalization.

Social Networks

The Department has a significant presence on social networks through its official pages, which are as follows::

Facebook	https://www.facebook.com/ditharokopio/
LinkedIn	https://www.linkedin.com/company/77699385
YouTube	https://www.youtube.com/channel/UCEHkYirpXF1nSLxDCrfDZ4A
Instagram	https://www.instagram.com/dithua/

Postgraduate Program "Applied Informatics"

Aims

The Postgraduate Program "Applied Informatics" is a conversion program. Its main objective is to train, in the science of Digital Technology, graduates from departments not coming from the field of Information Technology, in order to fill the rapidly growing number of jobs requiring digital skills.

The Program aims to promote knowledge, develop research and train scientists for the needs of the labor market, who are not graduates of Computer Science Departments, in order to meet the high and growing demand for IT executives and to provide job prospects to graduates of schools where unemployment is observed. These are the Humanities and Philosophy faculties and some faculties of Science, such as Mathematics, Physics, etc. Similar programs have been quite popular, for several years, in many countries both in Europe (such as Great Britain, France, the Netherlands) and in the rest of the world (such as the USA, Canada, etc.). They aim to train graduates in a new subject and prepare them for specific professions.

In addition, through the Program, efforts are being made to bridge the gap between the skills of graduates (from non-computer science departments) and the needs of the labor market for IT and digital technology knowledge and skills in general. The knowledge, training and development of digital skills will be the driving force with which the students of the MSc will be able to cope with the increased technological demands of the market and international competition.

Through a modern educational program and by utilizing technical infrastructures of modern and asynchronous (distance) education, among the objectives of the MSc are:

● To provide high level knowledge related to the science of Computer Science and its applications to scientists, graduates who do not come from the field of Information and Communication Technology.
● To develop appropriate digital skills in terms of human resources in line with national and European strategies.
● To link education with research so that the content of its courses is based on internationally recognized research.
● To renew the program's scope in close monitoring of the market needs and in line with the findings of relevant Greek and international bodies.

- To ensure a teaching and physical framework including the learning environment that is continuously improved to ensure an effective and modern learning process.
- To comply its ongoing development activities with both the national and European legislation and practice as well as with the objectives of the Department and the Harokopio University.

Structure and operation

The Postgraduate Program **"Applied Informatics"** awards a Diploma of Postgraduate Studies (M.Sc.) and is a conversion program. It is addressed to scientists, graduates of departments that do not belong to the field of Computer Science and Informatics, giving them the opportunity to change the direction of their undergraduate studies and focus on a completely new and innovative field, such as the field of Computer Science and Digital Technology in general. It is specially designed so that it can be attended by graduates of Humanities and Social Sciences.

Studies can be either full-time or part-time. The duration of study for the award of a Master's degree is:

- for **full-time** postgraduate students, a minimum of **12 months**. This duration corresponds to two (2) academic semesters, while the thesis is written during the summer months, in order to complete the studies in September. The maximum duration of studies for full-time students is 24 months.
- for **part-time** postgraduate students, the minimum shall be 24 months and the maximum 48 months. For part-time students, courses will be held in the two winter and spring semesters, followed by the preparation of the thesis. In the part-time program, there will be the possibility of the thesis assignment being carried out at the beginning of the spring semester of the second year.

Key Benefits

Graduates of the Program are scientists who will:

- Acquire the necessary knowledge of information systems and telecommunication systems and network technologies,
- work with public organizations and private sector enterprises, which are characterized by a high and growing demand for IT managers,
- contribute to the technological modernization and progress of the country,

- ensure their scientific and professional development and careers and contribute creatively to development and/or research projects in the new digital era,
- develop skills that will make them competitive in a national and international environment,
- prepare themselves for postgraduate studies at doctoral level in cutting-edge subjects.

The course content is closely linked to cutting-edge technological issues, but also to labor market trends. For this reason, the program will be periodically updated, following international trends, as reflected in the respective programs of foreign universities that have integrated such MSc programs in their curricula. In addition, the needs of the market, as expressed by relevant bodies, Chambers of Commerce, etc., will be taken into account in the design and adaptation of the curriculum.

Student Selection Process

During the spring semester every year, the Department publishes a call for applications, posted on the website, for the admission of students to the MSc, which is scheduled to start in the following academic year. The invitation shall also be communicated to the Ministries and related organizations and to the professional bodies concerned. The Department may, by decision of the Board of Directors, following a recommendation of the Director of the MSc, publish additional invitations for the admission of students during the academic year.

Interested candidate students have the right to apply for admission to the MSc within the time limit set by the publication of the call. Candidates' applications must be accompanied by the required supporting documents.

Details of the procedure and the necessary supporting documents can be found in the Regulations of the program, available on the website: https://applied.dit.hua.gr

Structure and Description of the Program

Course Summary

A/A	Thematic Section	ECTS Credits
	1st Semester	
1	**API01: Software Development I** Algorithmic Thinking, Introduction to Programming, Software Engineering, Internet Application Development	7, 5
2	**API02: Computing and Network Infrastructures I** Introduction to Digital Technology, Computers, and Communication Networks	7, 5
3	**API03: Data Management I** Introduction to Databases, Big Data Management	7, 5
4	**API04: Information Systems and Innovation I** Economics of Digital Technology, Entrepreneurship and Innovation	7, 5
	Total	30
	2nd Semester	
1	**API05: Software Development II** Mobile Device Programming, Object Oriented Programming.	7, 5
2	**API06: Computing and Network Infrastructures II** Modern Digital Tools, Cloud Computing, Internet of Things, and Systems Security.	7, 5
3	**API07: Data Management II** Machine Learning, Artificial Intelligence	7, 5
4	API08: Information Systems and Innovation II **Business Plan, Investment Valuation, Risk Management**	7, 5

	Total	30
	API09: Postgraduate Diploma Thesis (MSc Dissertation)	15
	TOTAL ECTS CREDITS	**75**

Course description

Software Development I

The course consists of the following topics:

Introduction to algorithms and principles of structured programming

Basic principles of programming by using the programming language Python

- Expressions/ Flow control/ Προτεραιότητα τελεστών

- Variables/ assigning values/ Strings/ Lists

- Tuples / Dictionaries

- if/else,

- Loops (while/ break, continue, for)

- range()/ parameters in methods/ modules/ Pandas

Introduction to Object Oriented programming (classes, attributes, methods)

Basic principles of Obj-Oriented programming (encapsulation, abstraction, inheritance, polymorphism)

HTTP protocol, client-server architecture, HTTP2

Flask python framework, python virtual environments, pip, connection with database in Python, Jinja2 template engine

Principles of Software Engineering, SW engineering frameworks/ methodologies

Requirements Analysis and methods, Functional/non-Functional requirements

Software specifications, UML language, Use cases,

UML diagrams (class diagrams, use case diagrams)

Computing and Network Infrastructures I

The course content includes:

- Presentation of the online tools of Google's suite of cloud computing services (Google Workspace).
- Learning and using tools: Google Docs, Google Sheets, App sheet
- (building a mobile application), Google site (building a website), Google forms (creating a form), Google drive (managing Google Drive cloud storage)
- Introduction to UNIX, Remote ssh access, Process management, shell variables, signals, Shell scripts
- Web application development using the flask python framework

Data Management I

- Unit I: Databases

  The Database environment. Database development process. Model Entity-relationship model (ER). Logical database design and the Relational Database Model. Integrity constraints. ER diagram transformation to a relational database schema. Database operations. Database management languages. SQL as a data manipulation language: queries, views, update statements.

- Unit II: Data Management and Applications

  Data Integration with Applications. Micro-services Architecture. Containers and Data. The Budibase Environment. Data Sources: Relational/Non-relational Databases and APIs. Developing an Application in Budibase using a Non-relational Database. Case Study: an HRMS System.

- Unit III: Big Data Analytics-Social Network Analysis

  Introduction to Networks and Graphs. Real world networks. Erdős–Rényi (Gnp and Gnm). Small-world phenomenon. Power-law and scale-free networks. Barabasi-Albert and R-MAT models. Centrality metrics: closeness, betweenness, Katz. Applications to real networks data: Vertex degree distributions-Computation of network metrics using the NetworkX libraries (Python).

Information Systems and Innovation I

- On premise infrastructure, Introduction to Cloud Computing. Cloud computing architecture, Deployment models and Service models. Introducing Container as a Service, Creating VMs in Microsoft Azure Internet of Things, Benefits and Services, Iot

ecosystem and architecture. IoT in financial services, industry and health. Introduction to big data, Evolution of Big Data, V's of Big Data, Challenges.

● Digital transformation of organic and advertising marketing tactics.

● Development and management of IT systems by studying the emerging technologies of digital innovation, such as: cloud computing, Big Data, the Internet of Things.

● CMS (Content Management Systems) and delves into Wordpress CMS

● Website hosting environments

● Development of a functional e-shop

Software Development II

● Introduction to internet concepts: Basic Network & Protocol Concepts

● Application layer protocols: HTTP

● Front end application development: HTML & CSS

● Lab: HTML & CSS

● Client Side Programming: Introduction to Javascript

● Lab: Javascript exercises, Javascript objects

● Client-side programming: event-driven programming, dynamic structured content management (DOM)

● Lab: Exercises in Javascript, Events and DOM

● Hybrid programming models & markup languages: AJAX, XML, JSON

● Lab: Exercises in AJAX and APIs

● Introductory knowledge of JAVA programming language

● Introductory knowledge of Android Development

Computing and Network Infrastructures II

● Application layer protocols : HTTP, FTP, SMTP, IMAP

● Multimedia protocols: RTP, RTSP, RTCP

● Session Initiation Protocol

● Domain Name System

● Web caching, proxy servers

● Network infrastructures / introduction to wireless networking

● Object-Oriented Analysis Elements (Packages, Classes, Objects, Relationships, Methods, Attributes)

● Object-Oriented Analysis with UML

● Basic Elements of UML

● Class Diagrams

● Object-Oriented Development Methodologies (e.g., RUP)

● Methodologies and Examples of System Design

● Development Tools for UML, SysML

● Introduction to the Concept of MapReduce

- Lab: Apache Flink, Programming in MapReduce
- Introduction to the concept of NoSQL Database Systems
- Introduction to the Kubernetes container orchestration system
- Introduction to Cloud based Object Storage systems
- Hands-on session with open source Object Storage systems

Data Management II

- Statistical Data Analysis Unit
  o Introduction to Data Analytics

  o Describing and Summarizing Data-Visualizing and Understanding Data-Data preparation-Cleaning Data and data transformations-Descriptive Statistical Measures-Relationships between two variables

  o Probability Distributions and Data Modeling-Sampling and Estimation-Creating representative and unbiased samples.

  o Inferential statistics-Confidence intervals-Designing and Performing Hypothesis Tests.

  o Comparative statistics-Visualizing relationships and correlation coefficient-Regression Analysis.

  o Multivariate Statistical Analysis- Dimension Reduction (Principal Components Analysis, Factor Analysis)-Cluster Analysis (Hierarchical and k-means).

- Machine Learning Unit
  o The content of this unit of the course is:

  o Introduction to Artificial Intelligence and Machine Learning.

  o Introduction to Machine Learning. Datasets, Data types (Supervised, Unsupervised learning), Problem types (Classification, Regression), Performance Measures, The problem of generalization.

  o Linear regression. Simple and multiple linear regression, Ordinary least squares, Logistic regression.

  o Decision Trees. Decision Tree Algorithms (ID3, C4.5, CART), Overfitting avoidance methods (pruning, depth control). Ensemble methods (Random Forests).

  o Introduction to Neural Networks. Initialization, Activation and loss functions, Backpropagation, Tensorflow.

  o Data preprocessing and preparation. Data Transformation and Encoding, Missing data imputation, Outlier Detection.

o   Introduction to Convolutional Neural Networks. Convolution operation, Convolutional layer, Padding, Stride, Pooling layer.

● Methodology Research Unit
  o   This unit course content relates to topics related to the methodology of scientific research, including problem formulation, literature search, organization, design, data analysis, and drawing conclusions/recommendations. It also includes the methodology for writing a scientific paper, which will serve as a significant guide for the completion of the thesis.

Information Systems and Innovation II

● Introduction to Computer Security, protecting the confidentiality and integrity of messages and files, digital signatures, password authentication and digital signatures
● The Search Engine Optimization (SEO) module, which is a pillar of Digital Marketing, focuses on the knowledge and skills of trainees to optimize the content and structure of the websites they create in order to receive better rankings in search engine results. SEO is developed on a computer science background, as it requires technical knowledge of programming, html code management and understanding of search algorithms. The SEO module covers the full range of digital tactics for creating websites that are both marketing-oriented and engaging to the audience, but also meet the search engine requirements for optimal visibility and effective promotion in the digital environment.

Diploma Thesis

The aim of the Diploma Thesis is to engage and deepen the student's knowledge in a modern field of research of Information Technology and its applications, combining literature research, development and study of a system or tool or methodology. In the preparation of the Thesis, students should make use of the knowledge and skills acquired during their studies. Through the Dissertation, students are given the opportunity to acquire judgement and synthetic thinking on research and scientific issues and to produce a comprehensive text that fully describes the work they have carried out.

The dissertation is equivalent to 15 ECTS credits in terms of degree requirements, which corresponds to 2 man-months of effort to complete it. It is assessed by a three-member committee, composed of lecturers of the MSc. The supervisor defines the topic of the thesis. The title of the thesis and the supervisor is declared to the Secretariat on a form to be

co-signed by the student and the supervisor. Suggestions of topics come to the F where each supervisor proposes the other two members of the student's three-member committee.

Requirements for obtaining the Master's Degree

The two (2) full-time semesters of the MSc are semesters of taught courses and the summer period is dedicated to the compulsory preparation of the postgraduate thesis. In order to obtain the Master's Degree, each postgraduate student must successfully complete the courses in order to successfully complete eight (8) courses [a total of sixty (60) credits (ECTS)], and successfully deliver and present the thesis [fifteen (15) credits (ECTS)].

The preparation of the Master's Thesis is compulsory. Part-time students are obliged to attend two (2) courses (half the number of courses attended by full-time postgraduate students) per semester during the two academic years, while they are given two (2) semesters (twice as long as full-time students) to complete their thesis.

Courses may be taught by distance education, in accordance with the provisions of the legislation in force. In addition, this mode of teaching is chosen to cover lectures by distinguished scientists from universities and research centers abroad. The Department has the appropriate technical infrastructure of modern and asynchronous tele-education to meet the educational needs. The Master's Thesis is carried out during the summer months for full-time students and during the summer months of the second year for part-time students. In the part-time program there will be an option for the thesis to be assigned at the beginning of the spring semester of the second year.

Attendance, Examination and Performance Evaluation

Attendance of postgraduate students in the courses is mandatory. The teaching of the MSc modules and the writing of the thesis is in Greek and/or English. The educational activities of the MSc are carried out using the existing technological means and the possibilities of tele-education in accordance with the current legislative framework.

Assessment and grading in each course is the sole responsibility of the lecturer, is carried out in complete independence from other courses and is a derivative of the objective assessment of the student's performance in the course. The minimum acceptable passing grade for a course is 6.0 (out of 10).

Courses are examined during the examination period of the fall or spring semester. Re-examination is in September. The final grade for each course is derived from an overall

assessment of the students' performance in specific areas (e.g., assignments, examinations) according to the instructions provided by each instructor at the beginning of the semester. The minimum acceptable passing grade for a course is 6.0 (out of 10).

Calculation of Degree Grade

Master's degree, T is calculated from the weighted average of course and thesis scores based on the formula:

$$T = \sum_{i=1}^{N} a_i T_i / \sum_{i=1}^{N} a_i$$

where N the number of courses including the thesis, T_i is the grade for the course i and a_i are its ECTS credits. The thesis corresponds to $a_i = 15$ ECTS credits while each course corresponds to 7,5 ECTS credits.

Facilities & Central Services

Electronic Services

Students of all three cycles of studies obtain, upon enrollment, a username and password granting them access to the full range of electronic services provided by the University and the state. The University's Center for Information Technology and Networks registers students in the University's user directory (LDAP) and subsequently generates a password, which students can collect from the secretariat of their respective Department or access electronically as specified by the Center. The use of the password and username is strictly personal.

University students have access to various categories of services, including: a) basic electronic services such as email, web hosting, file creation, and data storage in the computing cloud; b) e-learning services; c) access services to electronic resources; and d) the use of applications provided by the University for all members of the academic community.

Student Advocate - Faculty Advisor for Students with Special Educational Needs

The institution operates the institutions of the Student Advocate (SA) and the Faculty Advisor for Students with Special Educational Needs (FASEN). More specific regulations and procedures are determined in accordance with current legislation and the institution's internal academic regulations.

Library and Information Center (LIC)

Harokopio University houses a Library and Information Center to meet the scientific information needs of the academic community. Specifically for students, user training seminars are organized, providing a reading room, computers for searching printed or electronic materials, and lockers for storing personal items. Additionally, there is the option for automated lending and photocopying of materials that cannot be borrowed, always in accordance with the prevailing legislation on intellectual property rights. Part of the LIC's services can also be provided remotely if conditions require it.

Student Service Center (S.S.C.)

The University operates a Student Service Center responsible for informing students about matters concerning the overall functioning of the University, their rights and obligations, as well as the services provided by the State and the University. This center serves students both electronically and in person. Among other services, the Student Service Center includes Student Welfare Services and the Office of Career and Academic Development, supporting students in their transition to the job market by providing information and advisory services for employment opportunities and continuing their studies in Greece and abroad.

Foreign Language Teaching Center (FLTC)

The Foreign Language Teaching Center offers specialized foreign language courses to students to ensure the learning of a foreign language in accordance with current legislation and the institution's academic regulations.

Student Advisor

The Student Advisor guides and supports students and is appointed as a member of the Department's Academic and Teaching Staff, according to the process approved by the Academic Affairs Committee. The Student Advisor is appointed during the students' first year of enrollment.

Student Mobility

Master's students have the right to participate in mobility programs both domestically and abroad. Mobility programs include the movement or exchange of students within European programs or within the framework of initiatives between European universities or bilateral agreements between domestic and foreign universities. Additionally, movements within internal mobility programs are conducted according to prevailing legislation.