



SOFIA UNIVERSITY “ST. KLIMENT OHRIDSKI”

FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION

CURRICULUM

Approved (signature):

RECTOR OF THE SOFIA UNIVERSITY “ST. KLIMENT OHRIDSKI”

Adopted by the Academic Council

Record № /

Professional Field: 3.8. Economics

Doctoral Programme: Application of computing technology in the economics

Educational and scientific degree “Doctor”

Mode of study: Full-time, part-time, or independent preparation

Duration: 3 years full-time / 4 years part-time/ 5 years independent preparation

QUALIFICATION DESCRIPTION

I. PROGRAMME SUMMARY: FOCUS, AIMS, AND TASKS

The doctoral program in Application of computing technology in the economics aims at the development of the research and teaching potential of doctoral students. The training adheres to the traditions and the latest achievements in the area of information technology (IT) and its application in economics and economic modeling. The programme prepares highly qualified researchers with a solid theoretical and practical background who are capable of performing both analytical and managerial tasks. The process of preparation combines the modern developments in the mentioned areas with the application of ICT, artificial intelligence, and EU's best practices concerning decision making in academia, businesses, the financial sector, government, and public administration, as well as in the NGO sector. The curriculum has a markedly interdisciplinary nature, including subjects related to the application of ICT in economics, on the one hand, and courses related to scientific research, on the other. The interdisciplinary nature of the doctoral programme is consistent with the needs of the labour market in Bulgaria and in the EU concerning specialists and managers having a STEM background in academia, businesses, finance, and government.

Training can be carried out either **in Bulgarian or in English** in compliance with the announced competition for enrolment of doctoral students. If a doctoral student is enrolled for studies in English, all aspects of study-related, scientific, and teaching activities, including the enrolment itself, are carried out in English. The language of studies cannot be changed for the entire term of studies.

The duration of the programme is up to 3 years for full-time studies, up to 4 years for part-time studies, and up to 5 years for candidates willing to adhere to independent preparation. Training is provided by the Department of Statistics and Econometrics.

The main goals of training in Application of computing technology in the economics:

- Building highly qualified researchers in the field of theoretical and applied economics modeling with IT tools.
- Providing excellently prepared teachers for the purposes of the department and the faculty, thereby ensuring both continuity and quality development with a view to meeting the challenges of the present.
- Development of the research potential of doctoral students according to the changing conditions and innovations in the field of information technologies.

The tasks of the Doctoral Programme Application of computing technology in the economics:

- Attracting the most outstanding and motivated students from Bulgarian and foreign universities and higher schools holding master's degrees in the fields covered by the doctoral program
- Provision of training for doctoral students, aimed at upgrading and developing their methodological and technical training to carry out high-quality research activities
- Provide ongoing consultation for the preparation of independent and joint publications with members of the department and faculty, as well as the dissertation in progress
- Provision of opportunities for inter-institutional and international exchange and mobility of doctoral students
- Enforcing high standards and building habits and incentives in doctoral students for continuous development and improvement of knowledge and skills even after the completion of the doctoral studies.

A. Structure of the curriculum

The Doctoral Programme in Application of computing technology in economics combines the formation of systematized theoretical knowledge with the formation of practical skills in a broad range of fields. At the same time, it ensures the achievement of a narrower specialization of each doctoral student in specific thematic areas, depending on individual interests and research priorities. The main principles which the programme follows are individual approach, flexibility, depth, and completeness.

Training is consistent with the individual needs of doctoral students, as well as with the requirements set for the range of research fields falling within the

internationally established scope of the programme. To a no lesser extent, it also reflects the needs stemming from the characteristics of future jobs of doctoral graduates, including academia, government, and businesses.

The completion of the full course of doctoral studies guarantees in-depth preparedness and ability to carry out adequate scholarly and applied activities, both individually and as a part of a team. It also provides an opportunity to also build a potential for partial of full-scale management of project activities in the chosen area of knowledge.

The curriculum is structured so that it facilitates the achievement of the set educational and research goals to the highest possible extent, while at the same time it allows substantial flexibility in risk management. It is identical for all admissible languages of training (Bulgarian and English).

The personalized curriculum of each doctoral student is elaborated and approved in the language of training (Bulgarian or English).

B. Curriculum format and organization of the study process

The study-related documentation concerning the conduct of training for the educational and scientific degree “Doctor” is prepared in the department in compliance with the current regulatory framework governing training activities.

The thesis advisors, the head of the doctoral programme, the head of the department, and the department secretary monitor the compliance with deadlines and the performance of duties by doctoral students.

The documentation consists of:

- A personalized curriculum of the doctoral student for the duration of doctoral studies.
- A standardized form for records concerning the taking of doctoral minima and exams included in the curriculum.
- A standardized form for annual progress reports of doctoral students, prepared in accordance with Art. 41 of the Rules on the Conditions and Terms of Acquiring Scientific Degrees and Taking Academic Positions of Sofia University St. Kliment Ohridski.
- A standardized form for quarterly progress reports of full-time doctoral students, prepared in accordance with Art. 42 of the Rules on the Conditions and Terms of Acquiring Scientific Degrees and Taking Academic Positions of Sofia University St. Kliment Ohridski.

The curriculum has a modular format. There are five modules in total. Out of the first four modules, 180 ECTS credits need to be accrued. The credits obtained under the Other Activities module are not considered in evaluating the execution of individual curricula.

Module description:

1. Study activities including:

- The doctoral minima in specialization and in foreign language, which are required according to the Law on Higher Education of Bulgaria.
- Required doctoral courses in the scientific area of the doctoral studies.
- Elective courses forming specific research skills and competencies.
- Participation in university, national, or international summer schools.

Each course’s duration is one semester, and each course completion is awarded with ECTS credits according to the requirements of the Sofia University.

This major of studies implies the announcement of courses intended only for doctoral students; their content should not duplicate that of courses taught at the bachelor of master level. Each course’s author announces its content, terms of participation, and terms of completion.

2. Scientific research activities including:

- Work on a dissertation.
- Publications, participation in scientific forums, and project activities.

3. Teaching activities: according to the current Rules on the Conditions and Terms of Acquiring Scientific Degrees and Taking Academic Positions of Sofia University St. Kliment Ohridski and the opportunity for doctoral students who successfully passed their specialized exams to teach seminars. Teaching is a required activity for full-time doctoral students and recommended for part-time and independent-preparation doctoral students.

4. Doctoral dissertation defence

5. **Other activities** related to the execution of administrative and support tasks in the department and in the faculty, if necessary. Those activities do not lead to the accrual of credits eligible for curriculum fulfilment evaluation but are reported in the framework of the annual attestation of doctoral students.

II. EXPECTED RESULTS

Following the successful completion by doctoral students of the full course of training offered in the doctoral programme, they are expected to gain the following knowledge, skills, and competencies:

- In-depth knowledge in the narrowly specialized field in which the dissertation work being developed falls.
- Skills for application of the most modern information technologies and computing techniques in the economy.
- Excellent practical skills in working with imposed software applications and programming languages applicable to the economy.
- Abilities for independent construction of scientific research and all its main components, including – effective use of specialized literature; skills in data collection, processing, and analysis; skills for building mathematical models and their implementation in a software environment; skills for prototyping and automation of research tasks on data, skills for interpretation of the obtained results of the conducted analytical studies.
- Skills for effective work in research teams, as well as for presenting the results obtained from the conducted scientific research.

III. JOB PLACEMENT OF GRADUATES

The graduates of the doctoral programme in Application of computing technology in the economics can successfully find employment in academic institutions, as well as in government, the financial sector, analytics companies, consultancy, etc. Their professional placement includes, but is not limited to, the following professions according to the National Classification of Professions and Occupations of the Republic of Bulgaria:

- Economists, software and software application designers, actuaries, and statisticians, applied finance and mathematics specialists, analysts
- Consultants in the field of information and communication technologies, professional services, and business intelligence
- Executives in information and communication technology, professional services, and business analytics
- Lecturers and researchers in academic institutions, researchers in state and private scientific institutes and laboratories

I. STUDY ACTIVITIES

Required minimum of ECTS credits, depending on the mode of studies: 60 (full-time, part-time) and 50 (independent preparation)

1. DOCTORAL MINIMUM

Required 30 ECTS credits (full-time, part-time) and 20 ECTS credits (independent preparation)

Course name	Type of doctoral course	Grading	ECTS credits	Academic hours			Required study, total	Allocation by year of study
				Lectures	Seminars	Out-of-auditorium load		
Major of studies doctoral minimum: The exam is held according to the program and questionnaire proposed by the supervisor and approved by the department	Required	Exam	20	no	no	600	600	I year
Doctoral minimum in a foreign language (not applicable for independent preparation mode)	Required	Exam	10	no	no	300	300	I year

2. REQUIRED DOCTORAL COURSES IN THE SCIENTIFIC AREA OF THE DOCTORAL STUDIES

Required 20 ECTS credits (full-time, part-time, independent preparation)

Course name	Type of doctoral course	Grading	ECTS credits	Academic hours			Required study, total	Allocation by year of study
				Lectures	Seminars	Out-of-auditorium load		
Scientific and research project management	Required	Exam	10	30	No	270	300	I-II year
Research methods	Required	Exam	10	30	No	270	300	I-II year

3. ELECTIVE DOCTORAL COURSES FORMING SPECIFIC RESEARCH SKILLS AND COMPETENCES

Required minimum of 10 ECTS credits (full-time, part-time, independent preparation)

Course name	Type of doctoral course	Grading	ECTS credits	Academic hours			Required study, total	Allocation by year of study
				Lectures	Seminars	Out-of-auditorium load		
Management Information Systems III	Elective	Exam	5	30	No	120	150	I - III year
Information and Communication Security III	Elective	Exam	5	30	No	120	150	I - III year
Cloud computing and AI for business research III	Elective	Exam	5	30	No	120	150	I - III year
Business intelligence III	Elective	Exam	5	30	No	120	150	I - III year
Empirical Banking and Fintech	Elective	Exam	5	30	No	120	150	I - III year
Participation in doctoral courses at university and inter-university level	Elective	Exam	5	30	No	120	150	Current

Note:

1. *Elective courses different from the above-mentioned ones can be also included in the personalized curriculum after a proposal by the thesis supervisors and an approval by the Department Council.*
2. *The following are admissible: courses leading to the formation of academic skills and competencies, or to specific research skills and competencies, as well as courses in the scientific area and thematic focus of doctoral studies organized by:*
 - 2.1. *Other doctoral schools of the University.*
 - 2.2. *Other universities with which Sofia University St. Kliment Ohridski has partnership agreements, incl. for doctoral student mobility.*
3. *Doctoral students choose together with their thesis supervisors at least two of the elective doctoral courses and integrate them in their personalized curricula.*
4. *Required and elective doctoral courses attendance and grades are certified with a record issued by the Dean's Office of the Faculty of Economics and Business Administration. The record is presented to the inspector responsible for doctoral students within 10 days of the exam date.*

II. SCIENTIFIC RESEARCH ACTIVITIES

Required minimum of ECTS credits: depending on the mode of studies: 85 (full-time), 95 (part-time), 105 (independent preparation)

1. WORK ON DISSERTATION

Required minimum of ECTS credits: 40 (full-time), 50 (part-time) and 60 (independent preparation)

Name of activity	ECTS credits	Report
Work on the dissertation project presented upon enrolment in independent-preparation mode	20	First year
Elaboration of dissertation (design of dissertation structure; review of literature related to the dissertation; preparatory and auxiliary activities related to the dissertation: collection and processing of empirical material, etc.; elaboration of separate parts of the dissertation)	15/y (full-time) 20/y (part-time) 15/y (independent preparation)	Current
Presentation of results from current research work at the Doctoral student seminar of the department	15/y (full-time) 20/y (part-time) 15/y (independent preparation)	Current
Elaborated and presented draft version of the completed substantial part of the dissertation	10	Last year

Note: "y" indicates the number of years in the various forms of education (full-time-3; part-time-4; independent preparation-5).

2. SCIENTIFIC RESEARCH ACTIVITY

Required minimum of 45 ECTS credits (full-time, part-time, and independent preparation).

Note: Required minimum of publications – 30 ECTS credits, according to the Development of the Academic Staff in the Republic of Bulgaria Act

PUBLICATIONS related to the dissertation incl.	A minimum of 30 ECTS credits accrued from scientific publications	Report
- Studies published in scientific print media referenced and indexed in world-known databases of scientific information (Scopus and Web of Science)	45/n per publication	Current

PUBLICATIONS related to the dissertation incl.	A minimum of 30 ECTS credits accrued from scientific publications	Report
- Articles and reports published in scientific print media referenced and indexed in world-known databases of scientific information (Scopus and Web of Science)	30/n per publication	Current
- Published chapter of a collective monograph	20/n per publication	Current
- Studies published in non-referenced journals with scientific refereeing or in edited collective volumes	15/n per publication	Current
- Articles and reports published in non-referenced journals with scientific refereeing or in edited collective volumes	10/n per publication	Current
Participation with reports in scientific forums in the country or abroad	10/n per participation/report	Current
Participation in scientific applied-scientific university projects	5 per participation	Current
Participation in scientific applied-scientific national projects	10 per participation	Current
Participation in scientific applied-scientific international projects	25 per participation	Current
PRIZES FROM INTERNATIONAL AND NATIONAL SCIENTIFIC COMPETITIONS (<i>Bulgarian National Bank, Bulgarian Macroeconomic Association, Union of Economists in Bulgaria, etc.</i>)	10 per prize	Current

Note:

1. *The credits accrued from publications related to the dissertation correspond to the number of points attributable according to the minimum national requirements set by the Rules for Implementation of the Law on the Development of Academic Staff.*
2. *When the credits are accrued from more than one publication or from more than one participation with a report in a scientific forum, the different publications/reports should present results different from the ones presented in the dissertation.*
3. *In case of publications/participations with reports in co-authorship, the credits are re-calculated proportionally to the declared participation share (n is the number of authors in the respective publication).*

III. TEACHING ACTIVITIES

Required 10 ECTS credits only for full-time doctoral students

Name of activity	ECTS credits	Allocation by year
Assignment of teaching activities (up to 45 hours per academic year without pay)	5 for each 30 hours of seminars	After passing the required doctoral exams
Elaboration of master's theses reviews	1 per review	After passing the required doctoral exams

Note:

1. *Teaching activities are stipulated by Art. 59, Para. 2 of the Rules on the Conditions and Terms of Acquiring Scientific Degrees and Taking Academic Positions of Sofia University St. Kliment Ohridski. After taking the exams according to the personalized curriculum, IT IS ADMISSIBLE to assign to full-time doctoral students teaching activities, with 45 hours per academic year being unpaid, and the remainder between 45 and 120 per year being paid.*
2. *A seminar planned for 30 hours and carried out with one group provides 5 credits. If the course involves more hours, more groups, or both, the number of credits is increased proportionally. If there is no organizational possibility to assign to a doctoral student effective delivery of seminars, and if the thesis supervisor considers it appropriate, the doctoral student is assigned the task of developing method-related material for seminars.*

IV. DISSERTATION DEFENCE

Required 25 ECTS credits

Name of activity	ECTS credits	Allocation by year
Preliminary discussion on the draft dissertation in the department, followed by a decision of the Faculty Council to launch a public defence procedure	10	After the public defence procedure is launched
Public defence	15	After a successful public defence.

V. OTHER ACTIVITIES

No credits contributed to the fulfilment of the personalized plan.

Completion of activities is reported at individual attestation of doctoral students.

<i>Name of activity</i>	<i>Allocation by year</i>
Participation in the meetings of the Department Council at which issues related to doctoral studies are discussed	Current
Assignment of administrative tasks (participation as supervisor in candidate, semestrial, or state exams, etc.)	Current
Participation in the organization of seminars, meetings, conferences, or other initiatives	Current
Support of the work with students preparing master's theses (if necessary)	After taking the required doctoral exams
Assignment of expert activities related to the work of the department	After taking the required doctoral exams

Note: The additional activities are included based on Art. 36, Para 1, and Art. 51, Para 1 of the Rules on the Conditions and Terms of Acquiring Scientific Degrees and Taking Academic Positions of Sofia University St. Kliment Ohridski.

The application of the system of accrual and transfer of credits in the process of training according to the curriculum is in line with Ordinance 21/2004 for the Application of the System for Accrual and Transfer of Credits in Higher Education Institutions as follows: 60 credits per academic year.

The present curriculum provides a required minimum of **180** hours auditorium load and **5220** hours of out-of-auditorium load, providing the equivalent of **180** ECTS credits.

Based on this curriculum each doctoral student, in cooperation with his/her supervisor, elaborates a personalized curriculum for the entire duration of studies not later than three months after enrolment, in compliance with the Rules on the Conditions and Terms of Acquiring Scientific Degrees and Taking Academic Positions of Sofia University St. Kliment Ohridski. Each year (for full-time doctoral students: each quarter) a report and an attestation of completed tasks according to the curriculum are presented and (if necessary, a further specification of the curriculum, too), which are discussed and approved by the Department Council and are submitted for approval by the Faculty Council (Art. 41 and Art. 42 of the Rules on the Conditions and Terms of Acquiring Scientific Degrees and Taking Academic Positions of Sofia University St. Kliment Ohridski). For each year of doctoral studies, doctoral students should accrue a minimum of credits which are due for working on the dissertation according to the personalized plan. If this requirement is not met, the doctoral student receives a negative attestation.

A doctoral student is admitted to **dissertation defence** for the award with the educational and academic degree "Doctor" if he/she has passed all exams envisaged in the personalized curriculum, has reported the minimum number of credits depending on the mode of study, has been granted end-of-enrolment with a right to defence, has elaborated a dissertation, and complies with the minimum national requirements.

The curriculum is approved by a decision of the Faculty Council of the Faculty of Economics and Business Administration with record No 7/03.04.2023.

DEAN:

Assoc. Prof. Atanas Georgiev, PhD