DOCUMENT

Study programme	BIOTa-DoE18 - Biotechnology
Study	Grade of study - III. - doctoral, study form - external, study type - Single degree study
Document type:	Description of the study programme
The name of the university	University of Ss. Cyril and Methodius in Trnava
The seat of the university	Nám. J. Herdu 2, 917 01 Trnava
The name of the faculty	Faculty of Natural Sciences
The seat of the faculty	Nám. J. Herdu 2, 917 01 Trnava

Institution body for approving the study programme:

The Board for Internal System of Quality Assurance at UCM

Date of the study programme approval or the study programme modification:

10.09.2018

Date of the latest change in the study programme description:

10.08.2022

1. - Basic information about the study programme

a) - Name of the study program and its number according to the register of study programmes.

Biotechnology 183532

b) - Degree of higher education and ISCED-F education degree code.

1 S 864

c) - Place(s) of delivery of the study programme.

Trnava

d) - Name and number of the field of study in which higher education is obtained by completing the study programme, or a combination of two fields of study in which higher education is obtained by completing the study programme, ISCED-F codes of the field/fields.

1. Biochemistry - 0512

e) - Type of the study programme: academically oriented, professionally oriented; translation, translation combination study programme (listing the specializations); teaching, teaching combination study programme (listing the specializations); artistic, engineering, doctoral, preparation for regulated profession, joint study programme, interdisciplinary studies.

academically oriented learning

Awarded academic degree after the name

PhD.

g) - Form of study.

external

h) - In the case of joint study programmes, cooperating institutions and the range of study obligations the student fulfills at each of the given institutions (§ 54a of the Act on Higher Education Institutions).

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i) - Language or languages in which the study programme is delivered.

English

j) - Standard length of the study expressed in academic years.

5 years

k) - Capacity of the study programme (planned number of students), the actual number of applicants and students.

Planed number of students 3

2. - Graduate profile and learning objectives

a) - The institution defines the learning objectives of the study programme such as student's abilities at the time of completion of the programme and the main learning outcomes.

The study program encourages:
- principles of scientific work, its ethical and social aspects, scientific problem formulation, presentation, and publication of scientific results, provides the necessary knowledge for the development of scientific and study field, emphasizes the link research
- development - application and evaluation of own contribution to practice.
- the creative activity of the graduate in the field of biotechnology.
The graduate is fluent in an active foreign language (English), can work in a team, forecast developments in their field.
- As part of the study, he/she deepens his/her knowledge of biotechnology, biology, and analytical chemistry, learns the principles of scientific work, forms of processing and presentation of results. They gain an experimental skills and experience in working with modern devices.
- They will learn to search, process, and interpret information from available sources (scientific databases, professional publications). They can process, publish, and present the obtained results at scientific events.
- Students are also involved in solving scientific projects, which develops and deepens the principles of scientific work, solving complex problems, analytical and synthetic thinking, a sense of teamwork.

b) - The institution indicates the professions for which the graduate is prepared at the time of completion and the potential of the study programme from the point of view of graduate's employability.

The graduate of the study program is an expert who finds employment in various areas of social practice. He will gain knowledge of biotechnology and related areas (especially biological, chemical, genetic and their specializations) conditioning the development of biotechnology, especially in the areas of so-called white, green, and red biotechnologies. He can participate in research, development, and innovation, especially in industry, agriculture, health, environment, energy, as well as apply his/her knowledge directly in production practice in these areas.
The graduate
- is fluent in English,
- can work in a team and forecast developments in his field,
- can work independently and creatively scientifically in various fields of biotechnology as well as in frontier disciplines,
- masters scientific approaches and research methodology in selected application areas of biotechnology
- is also able to design, manage and objectively evaluate problem-oriented experiments focused on serious problems of current social practice
- also performs activities in various other areas of social practice, in quality assurance and management, in environmental monitoring, in pharmaceutical, clinical biochemistry, laboratory medicine, food industry and elsewhere
- the graduate has basic managerial skills, can lead a research team, plan team tasks and has knowledge of relevant economic, legal, and ethical aspects. Based on the acquired knowledge, the graduate of the study program can teach specialized biotechnology subjects at the university.
The graduates of the Biotechnology study program can seek employment in a wide range of workplaces with a biological and chemical focus in research teams, as well as independent work with research and technical focus (SAS, universities, ministries of health, agriculture and forestry, food industry, environment, etc.), as well as directly in production practice. They are ready to meet the requirements of specialized institutions requiring fieldwork, especially in workplaces dedicated to modern biotechnologies, as well as environmentally oriented workplaces. They will also be used in state and

local government institutions. Graduates also have a wide range of applications in private companies and industrial enterprises with an innovation-technological orientation in biotechnology, but also in related fields.

Occupations from profesia.sk:

- researcher,
- laboratory diagnostician,
- product specialist,
- chemical production operator,
- raw material intake worker,
- yeast production distiller/distiller,
- production technician,
- quality controller,
- research and development specialist,
- technologist,
- agronomist,
- sanitation and hygiene specialist.

Specific application in companies:

• Enviral (Leopoldov) - bioethanol production
• Chateau Modra (Modra) - wine production
• Natures (Trnava) - production of food supplements
• Saneca Pharmaceutical (Hlohovec) - production of medicines
• Zentiva (Bratislava) - pharmaceutical production
• Evonik Fermas (Slovenská Ľubča) – industrial fermentation processes
• Biotika (Slovenská Ľubča) - production of drugs
• Bioscience Slovakia - production of antibodies
• AXON Neuroscience- medical diagnostics
• Cloetta Slovakia (Levice) - confectionery production
• Považský cukor (Považská Bystrica) - sugar factory
• GlaxoSmithKline Consumer Healthcare (Levice/Bratislava) - research, development and production of drugs
• Alphamedical (Banská Bystrica) - laboratory equipment
• Unilabs Slovensko, s.r.o. (Martin) - laboratory technology
• Axxence Slovakia s.r.o. (Bratislava) - food additives

c) - Relevant external stakeholders who have provided the statement or a favorable opinion on the compliance of the acquired qualification with the sector-specific requirements for the profession.

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3. - Employability

a) - Evaluation of the study programme graduates employability.

The graduates of SP Biotechnology are employed throughout Slovakia, such as Alpha medical, Ltd. (Slovakia), AXON Neuroscience (Bratislava) - R&D Services SE, Bioscience Slovakia, Ltd. (Bratislava), Biotech, Ltd. (Slovakia) - sales of laboratory equipment, Biotika, Inc. (Slovenská Ľubča), Cloetta Slovania, Ltd. (Levice), Enviral, Inc. (Leopoldov), Evonik Fermas, Ltd. (Slovenská Ľubča), Heineken Slovensko, Inc. (Hurbanovo), Henkel Slovakia, Ltd. (Bratislava), Natures, Ltd. (Trnava), Novartis Slovakia, Ltd. (Bratislava), Považský cukor, Inc. (Považská Bystrica), Saneca Pharmaceutical, Inc. (Hlohovec), GSK Group (Levice / Bratislava), VWR International, Ltd. (Slovakia), Zentiva, Inc. (Bratislava), Zvolenská mliekareň, Ltd.(Zvolen), National Agricultural and Food Center (Bratislava, Piešťany, Modra, Nitra), Slovak Academy of Sciences, Slovak Hydrometeorological Institute, State Institute for Drug Control, Public Health Office and universities.

b) - If applicable, indicate the successful graduates of the study programme.

Assoc. Prof. RNDr. Miroslav Horník, PhD., Associate Professor in Analytical Chemistry
Assoc. Prof. RNDr. Miroslav Ondrejovič, PhD., Associate Professor in Biotechnology
Assoc. Prof. RNDr. Martin Pipíška, PhD., Associate Professor in the field of Environmental Engineering

c) - Evaluation of the study programme quality by employers (feedback).

The selected employers of the graduates of the study program commented positively on the designed study program.
Agromart Inc. (Attachment - Opinion-Agromart a.s.)
BioTech Ltd. (Attachment - Opinion-BioTech s.r.o.)
Celpo spol. Ltd. (Attachment - Opinion-Celpo spol. s.r.o.)
Envien Group (Attachment - Opinion-Envien Group)
Attachment_04_report_on_the_evaluation_of_SP_by_an_interested_part

4. - Structure and content of the study programme

a) - The institution describes the rules for the design of study plans within the study programme.

The process of creating, modifying, and approving study programmes is governed exclusively by the Standards for Study Programmes of the Slovak Accreditation Agency for Higher Education (SAAVŠ SR) and by the university directive developed on the basis of the standards for the internal quality assurance system.
https://www.ucm.sk/files/legislativa/10-2024-smernica_o_vytvarani_uprave_a_schvalovani_studijnych_programov_odborov_habilitacneho_konania_a_inauguracneho_konania_a_podavanie_ziadosti_na_saavs_uplne_znenie.pdf
The study plan fully reflects the requirements defined for the field of Biotechnology within the system of study fields (core knowledge, competences, and skills).
1st–2nd year of study: compulsory elective subjects that appropriately cover a broad area of biotechnology (Advances in Biotechnology, Biological Safety and Marketing of Biotechnologies and Their Products, Biotechnological Biomass Transformations, Biofuels and Biorefineries, Medical and Pharmaceutical Biotechnology for Doctoral Students, Modern Methods for the Study of Structure, Properties and Activity of Compounds and Biomolecules, New Trends, Procedures and Methods in the Study of Living Organisms, Advances in Bioanalytical Chemistry, Agricultural Biotechnology for Doctoral Students, Industrial Biotechnology for Doctoral Students, Project and Grant Preparation in Biotechnology, and DNA Recombination and Genetic Transformation Technologies) and Professional English for Doctoral Students.
Within the study and pedagogical-educational activities, the student completes selected activities for which credits are awarded, including completion of a compulsory subject, completion of a compulsory elective subject, and the doctoral student's own teaching activity I–VII, supervision of a bachelor's thesis, preparation of a review for a bachelor's thesis, co-authorship (or authorship) of developed and published teaching material, and independent study of professional literature as recommended by the supervisor.
Creative activity is appropriately structured and consists of the following components: publication in a scientific journal indexed in the Web of Science I database ranked in Q1, publication in a scientific journal indexed in the Web of Science I database ranked in Q2, publication in a scientific journal indexed in the Web of Science I database ranked in Q3, publication in a scientific journal indexed in the Web of Science I database ranked in Q4, publication in a scientific journal indexed in the Web of Science or Scopus databases ranked Q1–Q4, publication in a peer-reviewed proceedings volume, active participation in an international scientific event (proceedings paper), active participation in a national scientific event (proceedings paper), membership in a research team of an international scientific project, membership in a research team of a national scientific project (e.g., APVV, VEGA, KEGA, OPVaI), citation of a publication output indexed in Web of Science or Scopus (self-citations are not allowed and FPV UCM affiliation is required), obtaining an internal grant, mastering a new experimental methodology, and presenting at a seminar.
In the scientific part, the student is required to publish at least one experimental output in a scientific journal indexed in the Web of Science database and ranked in quartiles Q1–Q2 according to the Journal Impact Factor (JIF) or Journal Citation Indicator (JCI) within the Journal Citation Reports (JCR) database, and at least one output in a scientific journal indexed in the Web of Science or Scopus database ranked in quartiles Q1–Q4. For the Web of Science database, quartile ranking is assessed according to JIF or JCI in JCR, while for the Scopus database it is assessed according to the SCImago Journal Rank indicator (SJR) quartiles. In these published outputs, indexed in the Web of Science and Scopus databases, the doctoral student must have an adequate authorship share (an adequate authorship share is defined as a percentage equal to or greater than: 100% divided by the total number of authors listed on the evaluated publication), which is documented by an extract from the publication activity records from the Online Catalogue of the UCM University Library or the Central Register of Publication Activity (CREPČ). The student is required to obtain a minimum of 95 credits for creative activity.

b) - The institution compiles the recommended study plans for individual study paths.

Recommended study plan

c) - The study plan generally states:

Study section
Compulsory courses
Blok - Pedagogical-educational activities
KBT/ded312/21 Own Pedagogical Activity of Doctoral Student I
KBT/ded313/21 Own Pedagogical Activity of Doctoral Student II

Compulsory elective courses
Blok - Compulsory elective subjects
KBT/ded300/21 Advances in Biotechnology
KBT/ded302/21 Medical and Pharmaceutical Biotechnologies for PhD Students
KBT/ded303/21 Preparation of Projects and Grants in the Field of Biotechnology
KBT/ded304/21 Industrial Biotechnology for PhD Students
KBT/ded305/21 Agricultural Biotechnology for PhD Students
KBT/ded306/21 Advances in Bioanalytical Chemistry
KBT/ded307/21 DNA Recombination and Genetic Transformation Technology
KBT/ded308/21 Biotechnological Transformations of Biomass, Biofuels and Biorefineries
KBT/ded309/21 Modern Methods for Studying the Structure, Properties and Activity of Compounds and Biomolecules
KBT/ded310/21 Biosafety and Marketing of Biotechnology and its Products
KBT/ded311/21 New Trends, Procedures and Methods in the Study of Living Organisms
KOJP/ded301/21 Professional English for PhD Students
The student chooses at least five subjects from the offer of compulsory elective subjects.
Elective courses
Blok - Study and pedagogical-educational activities
KBT/ded319/21 Supervision of the Final Bachelor's Thesis
KBT/ded320/21 Elaboration of an Opinion for the Final Work of the Bachelor's Study
KBT/ded321/21 Co-authorship (or Authorship) of Created and Published Teaching Material
KBT/ded322/21 Independent Study of Literature according to the Recommendation of the Supervisor I
KBT/ded323/21 Independent Study of Literature according to the Recommendation of the Supervisor II
Research section
Blok - Creative activity
KBT/ded324/21 Publication I in a Scientific Journal Registered in the Web of Science Databases Included in Q1 in JCF IF
KBT/ded325/21 Publication II in a Scientific Journal Registered in the Web of Science Databases Included in Q1 in JCF IF
KBT/ded326/21 Publication I in a Scientific Journal Registered in the Web of Science Databases Included in Q2 in JCF IF
KBT/ded327/21 Publication II in a Scientific Journal Registered in the Web of Science Databases Included in Q2 in JCF IF
KBT/ded328/21 Publication I in a Scientific Journal Registered in the Web of Science Databases Included in Q3 in JCF IF
KBT/ded329/21 Publication II in a Scientific Journal Registered in the Web of Science Databases Included in Q3 in JCF IF
KBT/ded330/21 Publication I in a Scientific Journal Registered in the Web of Science Databases Included in Q4 in JCF IF
KBT/ded331/21 Publication II in a Scientific Journal Registered in the Web of Science Databases Included in Q4 in JCF IF
KBT/ded332/21 Publication in a Scientific Journal Registered in the Web of Science or Scopus Databases without Inclusion in Q1-Q4 in JCF IF
KBT/ded333/21 Publication in a Peer-Reviewed Proceedings
KBT/ded334/21 Active Participation in a Foreign Scientific Conference (declared by a published contribution in the proceedings)
KBT/ded335/21 Active Participation in a National Scientific Conference (declared by a published contribution in the proceedings)
KBT/ded336/21 Member of the Research Team on a Foreign Scientific Project, Registered at UCM
KBT/ded337/21 Member of the Research Team on a National Scientific Project (eg APVV, VEGA, KEGA, OPVaI), Registered at UCM
KBT/ded338/21 Citation to the Publication Output Registered in the Web of Science or Scopus Databases (it must not be an autocitation, it must be an affiliation of
KBT/ded339/21 Obtaining an Internal Grant
KBT/ded340/21 Adoption of a New Experimental Methodology I
KBT/ded341/21 Adoption of a New Experimental Methodology II
KBT/ded342/21 Presentation at the Seminar

In the scientific part, the student is required to publish at least one experimental output in a scientific journal indexed in the Web of Science database and ranked in quartiles Q1–Q2 according to the Journal Impact Factor (JIF) or Journal Citation Indicator (JCI) within the Journal Citation Reports (JCR) database, and at least one output in a scientific journal indexed in the Web of Science or Scopus database ranked in quartiles Q1–Q4. For the Web of Science database, quartile ranking is assessed according to JIF or JCI in JCR, while for the Scopus database it is assessed according to the SCImago Journal Rank indicator (SJR) quartiles. In these published outputs, indexed in the Web of Science and Scopus databases, the doctoral student must have an adequate authorship share (an adequate authorship share is defined as a percentage equal to or greater than: 100% / the total number of authors listed on the evaluated publication), which is documented by an extract from the publication activity records in the Online Catalogue of the UCM University Library or the Central Register of Publication Activity (CREPČ). The student is required to obtain a minimum of 95 credits for creative activity.
State exams
Blok - State examination
KBT/ded343/21 Dissertation Exam
KBT/ded344/21 Dissertation Thesis Defence
For successful completion of the state exam (dissertation exam + dissertation defense) the student will receive 60 credits.
The total number of credits required to complete the doctoral study is 240 credits.

d) - The institution states the number of credits, the achievement of which is a condition for proper completion of studies and other requirements that the student must meet within the study programme and for its proper completion, including the requirements for state examinations, rules for re-study and rules for the extension, interruption of study.

The composition of the commission for state examinations is in accordance with the Higher Education Act, pursuant to Section 63, Paragraph 3 of Act no. 131/2002 Coll. on Higher Education Institutions, and with the Study Regulations of the University of Ss. Cyril and Methodius, which was approved by the UCM Academic Senate on June 10, 2013. The State Examination Commission has at least 4 members. The Commission shall be able to act if the chairman of the commission and at least two other members are present. University teachers, acting as professors and associate professors and other experts, approved by the relevant scientific council, have the right to take the state exam in doctoral and master's degree programs. At least two members of the commission shall be university teachers in the capacity of associate professor or professor. In addition to university teachers working as associate professors or professors and other practitioners approved by the Scientific Council, assistant professors with a third-degree university degree also have the right to take state examinations in bachelor's degree programs. At least one member of the commission must serve as an associate professor or professor. The chairman of the commission for state examinations is appointed by the dean from among professors and associate professors at universities. The course of the state examination is managed, and the chairman of the commission is responsible for the activities of the commission.

e) - For individual study plans, the institution states the requirements for completing the individual parts of the study programme and the student's progress within the study programme in the given structure:

The credit allocation of subjects reflects their level of difficulty and the intensity/extent of the student's workload. Core subjects generally involve a higher workload. At the FPV UCM level, student workload is defined as follows:
1 credit corresponds to 30 hours in terms of time requirements, including independent study and independent creative activity.
This means that the student's workload is 900 hours per semester, including independent study and independent creative activity, and 1800 hours per year, including independent study and independent creative activity.
The credit evaluation is in accordance with the forthcoming standards for the internal quality assurance system of UCM, complies with ECTS norms, and reflects the professionally oriented character of the study programme, where a substantial part of the study is focused on the acquisition of students' skills and competences.
50 credits for the study component,
95 credits for the scientific-research component,
60 credits for the state examination.
The missing credits (35) must be completed from either the study or the research part.

f) - The institution describes the rules for verification of learning outcomes, students assessment and the possibilities of appealing against the assessment.

The rules for the verification of educational outcomes and the evaluation of students and the possibilities of corrective procedures against this evaluation are clearly described in the study regulations of the university, which the Faculty of Natural Sciences follows.
https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/2020-8_Studijny_poriadok_UCM_AJ.pdf
Study Regulations
Part Two: § 11, § 14 – § 20

g) - Conditions for recognition of studies or a part of studies.

The rules for the verification of educational outcomes and the evaluation of students and the possibilities of corrective procedures against this evaluation are clearly described in the study regulations of the university, which the Faculty of Natural Sciences follows.
https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/2020-8_Studijny_poriadok_UCM_AJ.pdf
Study Regulations
Part Two: § 11a
Directive on the Recognition of Subjects: https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-17_Smernica_o_uznavani_absolvovanych_predmetov_AJ.pdf

h) - The institution states the topics of final theses of the study programme (or a link to the list).

Topics of final theses for all accredited study programmes:
https://fpv.ucm.sk/sk/veda-vyskum/doktorandske-studium/
All final thesis topics are also available in the university's Academic Information System AIS2 for the given academic year for accredited study programmes:
https://ais2.ucm.sk/ais/portal/changeLocale.do?locale=SK

i) - The institution describes or refers to:

The proposals for the final theses are published by the training institutes through the academic information system (hereinafter referred to as "AIS") during the winter semester, no later than 31 January of the relevant academic year. The listed topics for the biotechnology study program are published on the faculty's website
https://fpv.ucm.sk/sk/veda-vyskum/doktorandske-studium/
The final thesis must be prepared according to the Rector's Directive on the requisites of final theses, their bibliographic registration, control of originality, storage, and access to the University of Ss. Cyril and Methodius in Trnava (valid since 2021)

https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-31_Smernica_o_nalezitostiach_zaverecnych_prac,_ich_bibliografickej_registracii,_uchovavani_a_sprist upnovani_na_UCM_AJ.pdf
https://www.ucm.sk/en/university/legislation/
and by the Study Regulations of the University of Ss. Cyril and Methodius in Trnava, which was developed by § 15, para. 1, letter b of Act 131/2002 Coll. on Higher Education and approved by the Academic Senate of UCM on April 28, 2020. The final thesis is a bachelor's thesis, a diploma thesis, and a dissertation. Through the dissertation, the student demonstrates the ability to work creatively in the field of study in which he completed the study program. The dissertation will be prepared by the student under the guidance of the supervisor by the internal regulations of UCM and the relevant faculty. The dissertation is assessed by a pair of opponents. The supervisor and the opponents will prepare a written report on the dissertation. The student has the right to one copy of the supervisor's and opponents' report no later than three days before the dissertation defense. The dissertation is a state exam. The commission for state examinations negotiates the result of the dissertation defense by a closed vote.
https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/2019-9_Smernica_o_plagiatorstve_AJ.pdf
- opportunities and procedures for participation in student mobility,
FNS students who are interested in a stay abroad can take advantage of the wide range of mobilities through the Erasmus + program or they can complete a stay abroad based on international bilateral agreements or take advantage of opportunities under other mobility and scholarship schemes and programs. FNS UCM students apply to their department coordinator in the form of a written application, which contains the contact details of the applicant and a brief justification of the study stay, prospective benefits. The system of allocating places within the ERASMUS + program takes place in the form of a selection procedure at the faculty. The application deadline, the date of the selection procedure and the selection criteria for outgoing students are published on the faculty's website.
https://www.ucm.sk/en/university/international-relations/international-relations.html
The faculty, based on a transparent selection procedure, according to proposals from the departments, nominates students for mobility under the valid between departmental bilateral agreements.
- rules for adherence to academic ethics and rules for drawing consequences,
The rules are determined by the UCM Code of Ethics in Trnava. The Code of Ethics is binding for all members of the academic community, pedagogical and non-pedagogical employees of UCM.
https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/ID_N._2018-2_Code_of_Ethics_of_the_University_of_Ss._Cyril_and_Methodius_in_Trnava.pdf
https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-14_Smernica_o_vybavovani_staznosti_na_UCM_AJ.pdf
https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-15_Smernica_o_vybavovani_otazok,_vyjadreni,_nazorov,_ziadosti,_podnetov_a_navrhov_na_UCM_AJ.pdf
- procedures applicable to students with special needs,
Work with students with special needs at UCM is managed by the Support Center for Students with Special Needs. Its mission is to help and support students of all faculties and institutes of the University of Ss. Cyril and Methodius in Trnava in the following areas psychological counselling, social counselling, support for students with special needs, with sensory, physical and multiple disabilities, with chronic illness, with a disability, with mental illness, with autism, with learning disabilities, with social disadvantage.
Responsible staff:
- for UCM Ivana Švikruhová ivana.svikruhova@ucm.sk
- for FNS RNDr. Vanda Adamcová, PhD. vanda.adamcova@ucm.sk
https://www.ucm.sk/en/university/faculties-workplaces/support-centres/counselling-legal-centre-students-from-socially-disadvantaged-backgrounds-students-specific-needs.html
- procedures for filing complaints and appeals by students.
The submission of suggestions by students is carried out through Black Box - for your opinions, comments and questions and follows the university guidelines https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-15_Smernica_o_vybavovani_otazok,_vyjadreni,_nazorov,_ziadosti,_podnetov_a_navrhov_na_UCM_AJ.pdf
The link to enter the Black Box is on the UCM website https://www.ucm.sk/en/university/black-box-ucm.html

5. - Course information sheets of the study programme

In the structure according to Decree no. 614/2002 Coll.

List of information sheets

6. - Current academic year plan and current schedule

(or hyperlink).

https://www.ucm.sk/en/study-ucm/study-english-language/

7. - Persons responsible for the study programme

a) - A person responsible for the delivery, development, and quality of the study programme (indicating the position and contact details).

prof. RNDr. Ján Kraic, PhD.
jan.kraic@ucm.sk

b) - List of persons responsible for the profile courses of the study programme with the assignment to the course and provided with a link to the central Register of university staff and with contact details (they may also be listed in the study plan).

Assoc. prof. RNDr. Michaela Havrlentová, PhD.
michaela.havrlentova@ucm.sk / https://www.portalvs.sk/regzam/detail/20098
Modern methods for the study of the properties and activity of compounds and biomolecules
prof. RNDr. Ján Kraic, PhD.
jan.kraic@ucm.sk / https://www.portalvs.sk/regzam/detail/10524
Independent Study of Professional Literature According to the Supervisor’s Recommendation I, II
Agricultural Biotechnology for PhD. Students
Creative Activity (subjects falling under creative activity in the recommended study plan)
prof. RNDr. Miroslav Ondrejovič, PhD.
miroslav.ondrejovic@ucm.sk / https://www.portalvs.sk/regzam/detail/14389
Advances in Biotechnology
Biotechnological Biomass Transformations, Biofuels and Biorefineries
Industrial Biotechnology for PhD. Students
Assoc. prof. Ing. Jana Moravčíková, PhD.
jana.moravcikova@ucm.sk / https://www.portalvs.sk/regzam/detail/30492
Biological Safety and Marketing of Biotechnologies and Their Products
DNA Recombination and Genetic Transformation Technologies
Assoc. prof. RNDr. Daniela Ondrejovič Chmelová, PhD.
daniela.chmelova@ucm.sk / https://www.portalvs.sk/regzam/detail/22796
Biotechnological Biomass Transformations, Biofuels and Biorefineries
Industrial Biotechnology for PhD. Students

c) - Reference to the research/art/teacher profiles of persons responsible for the profile courses of the study programme.

https://fpv.ucm.sk/sk/fakulta/ustavy-pracoviska/ustav-biologie-biotechnologie.html

d) - List of teachers of the study programme with the assignment to the course and provided with a link to the central Register of university staff and with contact details (may be a part of the study plan).

Ján	Kraic	prof. RNDr. Ján Kraic, PhD.	jan.kraic@ucm.sk
Miroslav	Ondrejovič	prof. RNDr. Miroslav Ondrejovič, PhD.	miroslav.ondrejovic@ucm.sk
Daniela	Ondrejovič Chmelová	doc. RNDr. Daniela Ondrejovič Chmelová, PhD.	daniela.chmelova@ucm.sk
Daniel	Mihálik	prof. Mgr. Daniel Mihálik, PhD.	daniel.mihalik@ucm.sk
Michaela	Havrlentová	doc. RNDr. Michaela Havrlentová, PhD.	michaela.havrlentova@ucm.sk
Stanislav	Miertuš	Dr. h. c. prof. Ing. Stanislav Miertuš, DrSc.	stanislav.miertus@ucm.sk
Dominika	Vešelényiová	Mgr. Dominika Vešelényiová, PhD.	dominika.veselenyiova@ucm.sk
Zuzana	Gerši	RNDr. Zuzana Gerši, PhD.	zuzana.gersi@ucm.sk
Jana	Moravčíková	Doc. Ing. Jana Moravčíková, PhD.	jana.moravcikova@ucm.sk

e) - List of the supervisors of final theses with the assignment to topics (indicating the contact details).

The structure of the academic staff of the department provides a sufficient guarantee of an adequate number of university teachers in relation to the number of final theses at the given level of higher education. All final theses are supervised by teachers who possess appropriate pedagogical experience and the required level of education.

- Mgr. Ľubomíra Jurečková – Advanced Methods for the Production of Polyhydroxyalkanoates by *Cupriavidus necator* (prof. Ondrejovič)
- Mgr. Juraj Habdák – *In vitro* Cultivation Systems of Representatives of the Genus *Sida* L. (prof. Kraic)
- Mgr. Lea Veničáková – *In vitro* Plant Cultures for the Production of Cell Biomass, Stem Cells and Secondary Metabolites (prof. Kraic)
- Mgr. Daniel Jánoška – Fermentation as a Tool to Increase the Nutritional Value of Cereal Grain (doc. Havrlentová)
- RNDr. Laura Žideková – Tolerance of Selected Agricultural Crops to Cadmium Toxicity and Their Strategies for Uptake, Distribution and Allocation of the Heavy Metal in Tissues (doc. Matušíková)
- RNDr. Mária Pavlovičová – Bioaccumulation and Distribution of Cadmium in Flax (*Linum usitatissimum* L.) in the Context of Its Defence Mechanisms under Heavy Metal Stress (doc. Matušíková)
- RNDr. Marcela Blažková – Study of Antioxidant/Pro-oxidant Activity of Compounds Suitable for *In Vitro* Biotechnological Production (doc. Maliar)

Defended theses:

- Mgr. Miroslava Sinčák, PhD. – The Effect of a Variable Magnetic Field on Metabolism and the Induction of Genetic Changes in Selected Organisms with Possible Industrial Applications (prof. Sedláková)
- RNDr. Šarlota Kaňuková, PhD. – *In Vitro* Plant Culture Technologies Applicable for the Production of Specialised Products (prof. Kraic)
- Ing. Simona Grešíková, PhD. – Innovative Diagnostics of Viral Pathogens Attacking Plants of the Leguminosae Family (doc. Mihálik)
- RNDr. Milan Karas, PhD. – Functional Analysis of a Dehydrin Gene from *Quercus robur* L. in the Context of Abiotic Stress (doc. Moravčíková)
- RNDr. Barbora Legerská, PhD. – Plant Inhibitors of Serine Proteases of the Gastrointestinal Tract (doc. Ondrejovič)
- Mgr. Jana Tomašechová, PhD. – Molecular Epidemiology of Viral Pathogens of Economically Important Fruiting Vegetable Species and Their Effective Diagnostics (Ing. Glasa)
- Mgr. Veronika Gregusová, PhD. – Defence Potential of (1-3)(1-4)-beta-D-glucan in Oat (*Avena sativa* L.) (Dr. Havrlentová)
- Mgr. Richard Hančinský, PhD. – Identification and Diagnosis of Viruses in Plant Species of the Family Solanaceae (doc. Mihálik)

Supervisors of doctoral theses:

https://fpv.ucm.sk/sk/veda-vyskum/doktorandske-studium/biotechnologie.html

f) - Reference to the research/art/teacher profiles of the supervisors of final theses.

https://fpv.ucm.sk/sk/fakulta/ustavy-pracoviska/ustav-biologie-biotechnologie.html

g) - Student representatives representing the interests of students of the study programme (name and contact details).

Mgr. Ľubomíra Jurečková (jureckova1@ucm.sk), 3rd-year student of Biotechnology (third cycle, full-time form)

h) - Study advisor of the study programme (indicating contact details and information on the access to counseling and on the schedule of consultations).

RNDr. Daniela Ondrejovič Chmelová, PhD. e-mail: daniela.ondrejovic.chmelova@ucm.sk
The information on access to counselling is published on the faculty's website

i) - Other supporting staff of the study programme – assigned study officer, career counselor, administration, accommodation department, etc. (with contact details).

UCM Study Department
Ing. Zuzana Obúlaná, e-mail: zuzana.obulana@ucm.sk
Head of the UCM Student Residence Hall:
Mgr. Janka Gajdová, e-mail: janka.gajdova@ucm.sk

8. - Spatial, material, and technical provision of the study programme and support

a) - List and characteristics of the study programme classrooms and their technical equipment with the assignment to learning outcomes and courses (laboratories, design and art studios, studios, workshops, interpreting booths, clinics, priest seminaries, science and technology parks, technology incubators, school enterprises, practice centers, training schools, classroom-training facilities, sports halls, swimming pools, sports grounds).

The pedagogical process of the doctoral study program in biotechnology is carried out in classrooms in the UCM central buildings on J. Herdu Square, on Hajdóczyho Street and in the UCM building in Špačince (4 km from the University address in Trnava), where suitable rooms for lectures and seminars are available. All classrooms are equipped with video projection technology. Laboratories used for teaching laboratory exercises at the Department of Biotechnology (separation methods, enzymology, biology, advanced biology) are equipped with basic tools (chemicals, laboratory glassware, scales, small laboratory equipment) needed for each exercise.
The laboratories in which the research activity is carried out have the following equipment:
Equipment for all work in the field of fermentation technologies, protein biochemistry (isolation and characterization) and molecular biology (cloning, gene expression, mutagenesis, bioinformatics analysis). State-of-the-art instrumentation and computer technology is also available. Examples are BIOSTAT A plus Sartorius fermenter, comfort thermomixer, IKA MS3 BASIC, Bandelin Sonopuls UW 2200 sonicator, Astell autoclave, microscopes, Biotek El800 and MRX / (Dynex) microplate counters, HPLC (Waters, Pye Unicam, Young Lin and Philips with UV / Vis and DAD detectors, Shimadzu FTIR-8000 infrared spectrophotometer Shimadzu, CHNS / O Elemental Analyzer FLASH EA2000, UV-Vis spectrophotometers VARIAN CARY 50 and M350 Camspec, laboratory centrifuge UNIVERSAL 320 R, orbital shaker PSU-20 (Biosan), ES-20 environmental shaker, Buchi vacuum evaporators, HETTICH UNIVERSAL 32 centrifuge, HETTICH MIKRO 22 R refrigerated centrifuge, Eppendorf Minispin microcentrifuge, HOEFER SE 245 electrophoresis, MPLC preparative chromatography system (also gradient) laboratory Flow and PCR boxes centrifuges, thermostats, apparatus for agarose and polyacrylamide gels, shakers, DGGE) and has the extensive software needed for bioinformatics research.
Students have access to the internet via WiFi in all university buildings. Lecture rooms, as well as laboratory rooms, are equipped with built-in data projectors, and a lecture room with an interactive whiteboard is also available.
Standard software equipment is installed on computers in the computer classrooms (MS Windows 10, MS Office 365, ESET Endpoint Antivirus, Matlab, Java RE Standard Edition, Firefox, MS IE, ...).

b) - Characteristics of the study programme information management (access to study literature according to Course information sheets, access to information databases and other information sources, information technologies, etc.).

Each faculty student is provided with internet access. FPV UCM students may also work in computer laboratories outside scheduled classes according to their own interests and needs related to seminar and practical assignments. They have access to computer classrooms with internet-connected computers and an open-access internet room with appropriate software equipment located in the main UCM buildings. An additional terminal classroom is available at the FPV UCM facilities in Špačince. Computer classrooms are periodically upgraded with more powerful computers and new informatics and chemical software (Dragon 6, IBM SPSS Statistics 19, Analyse-it, QC Expert 3.1, Statistica 10.2 Base, and Statistica 10.2 DataMiner). All teachers as well as internal doctoral students are assigned a computer connected to the internet network. The faculty uses the Academic Information System AIS2. At the university library, students have on-site access to core study literature (books, professional journals, and company materials). Through the NAVIGA system, access is provided to electronic resources such as Elsevier-ScienceDirect, Elsevier-Engineering Village-Referex, Springer E-Books, SAGE Premier 2008–2009, Emerald Insight, Wiley-InterScience – E-Books, Wiley-InterScience – Reference Works, and the IET Digital Library. Through the NISPEZ system, access is provided to electronic information resources including Knovel Library, ProQuest Central, ScienceDirect, SpringerLink, Wiley Online Library, WoK-Current Contents, WoK-Web of Science, Web of Knowledge, Scopus, and Reaxys.

c) - Characteristics and extent of distance education applied in the study programme with the assignment to courses. Access, manuals of e-learning portals. Procedures for the transition from contact teaching to distance learning.

Study in accredited study programs in full-time and part-time study is carried out at UCM using the full-time method. The method of distance education is used in times of unfavorable epidemiological situation, or in other situations that seriously limit the implementation of full-time teaching, according to § 108e par. 2 of the University Act, in times of crisis, educational activities carried out by the full-time method can be carried out by the distance method. This form of education is governed by the directive: https://www.ucm.sk/docs/legislativa/2021/8_21_distancna_vyucba.pdf

d) - Institution partners in providing educational activities for the study programme and the characteristics of their participation.

- Slovak Academy of Sciences - cooperating workplace, performance of experimental activities of part of dissertations focused on plant and pharmaceutical biotechnologies
- National Agricultural and Food Centre, Research Institute of Plant Production, Piešťany - cooperating workplace, performance of experimental activities of part of dissertations focused on plant biotechnologies
- National Agricultural and Food Centre, Research Institute of Animal Production, Nitra - cooperating workplace, performance of experimental activities of part of dissertations focused on animal biotechnologies Research Institute of Brewing and Malting, Prague, Czech Republic - cooperation within foreign projects, cooperation within
- dissertations International Laser Centre, Bratislava - cooperating workplace, performance of experimental activities of part of dissertations
- ICARST, n.o., Bratislava - joint laboratory in the building in Špačince, ANS, UCM

e) - Characteristics of the possibilities for social, sports, cultural, spiritual and social activities.

University of Ss. Cyril and Methodius in Trnava supports the extracurricular activities of its students in the form of financial contributions to ensure sports and cultural events. Every year, in addition to the earmarked contribution from the Ministry of Education, Research and Sports, a part of the funds is allocated within the university budget.
The procedure for submitting and approving applications for contributions to students' sports and cultural events is regulated by the university's internal regulations. Application for a financial contribution.
Students can participate in activities:
Folklore ensemble Trnafčan
UniTTy University Choir
THE.ART.RE University Theater
Hit UCM Trnava - University Women's Premier League Women's Volleyball Team
Student magazine FF - Parazol
Student magazine Atteliér
Student Radio Aetter
FMK TV
FMK student project gaudeo.sk

f) - Possibilities and conditions for participation of the study programme students in mobilities and internships (indicating contact details), application instructions, rules for recognition of this education.

The possibilities and conditions of students' participation in mobility are published on the faculty's website.
https://www.ucm.sk/en/university/international-relations/international-relations.html
The system of allocating places within the ERASMUS + program takes place in the form of a selection procedure at the faculty.
https://www.ucm.sk/en/erasmus/
The rules for the recognition of this education are governed by the UCM Study Regulations and the document
https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-17_Smernica_o_uznavani_absolvovanych_predmetov_AJ.pdf

9. - Required abilities and admission requirements for the study programme applicants

a) - Required abilities and necessary admission requirements.

Requirements for applicants and the method of their selection are specified in §56 to 58 of Act no. 131/2002 Coll. on Higher Education Institutions, they are regulated in more detail by the UCM Study Regulations in Trnava and the UCM Admission Procedure Regulations in Trnava.
https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-29_Poriadok_prijimacieho_konania_UCM_AJ.pdf
The basic condition for admission to doctoral studies is a second-level university education (Section 56 (3) of Act No. 131/2002 Coll. On Higher Education Institutions and on Amendments to Certain Acts). Graduates of domestic or foreign universities can apply for admission to study if they have completed a master's or engineering study.

b) - Admission procedures.

https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-29_Poriadok_prijimacieho_konania_UCM_AJ.pdf
The admission procedure at FPV UCM is carried out in accordance with Act No. 131/2002 Coll. on Higher Education Institutions and on Amendments and Supplements to Certain Acts, §§ 56–58. The admission process allows an applicant who demonstrates fulfilment of the specified admission requirements to become a student of the selected study programme. An applicant who does not demonstrate fulfilment of the basic admission requirements at the time of verification may be admitted conditionally, provided that they demonstrate fulfilment of the basic admission requirements no later than the date set for enrolment in the study. Applications for higher education studies are accepted within a deadline that is publicly announced, usually by the end of April of the respective academic year. Applicants apply for announced topics published on the faculty's website. Admission to doctoral studies includes an admission interview conducted in the form of a discussion, during which the applicant presents their motivation, a project proposal related to the dissertation topic, their prerequisites for study, as well as their knowledge of a foreign language.

c) - Results of the admission process over the last period.

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10. - Feedback on the quality of provided education

a) - Procedures for monitoring and evaluating students' opinions on the study programme quality.

Quality assurance of pedagogical staff and control and monitoring of the pedagogical process in the form of observations are defined by the directive
https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-52_Smernica_o_hodnoteni_tvorivej_cinnosti_na_UCM_AJ.pdf
The faculty ensures that the university teacher is the bearer of knowledge and experience for the transfer of knowledge in the subject he/she teaches. As part of the selection process, the faculty ensures compliance with the requirements of the minimum criteria related to education and the field, while the faculty defines additional criteria by which the teacher checks the carrier of professional knowledge and experience with regard to the subject he teaches. Emphasis is placed on the fact that university teachers use effective methods, methods and procedures for transferring knowledge in the subjects they teach. The function of monitoring the pedagogical process is to monitor and regularly evaluate the quality of the pedagogical process. The faculty declares its support for the professional growth of teachers.
Monitoring and evaluation of study programs and subjects and surveys of the opinions of relevant target groups in the field of education are defined by Directive 3/2014 Creation and monitoring of study programs. The faculty thus strives to eliminate the risk of low quality and content focus of the study program in order to concentrate and process information from implemented questionnaire events and observations or other evaluations, review the pedagogical documentation of the study program and compare it with the concept of analogous study programs at renowned foreign universities.
The function of the survey of opinions of relevant target groups is to find out their opinions on various aspects of educational activities in order to obtain information that will lead to its improvement and to the adoption of effective measures to help increase quality in all areas of faculty activities. The relevant target groups are the internal target groups of the respondents (students, teachers and other staff) and the external target groups of the respondents (especially graduates, employers and practitioners).
https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-18_Ziskavanie_relevantnej_spatnej_vazby_od_zainteresovanych_stran_AJ.pdf
Monitoring and quality evaluation in the field of international relations and cooperation:
UCM offers students and teachers the opportunity to complete a study stay abroad through the ERASMUS program at one of the partner universities. In addition, it supports students and teachers in completing international mobility in other academic cooperation and exchange programs. A report on the summary results of regular monitoring and evaluation of quality in the field of international relations and cooperation is prepared once a year, which is discussed and approved by the Rector's Board, the Dean's Board and the Scientific Council of the relevant faculty.

b) - Results of student feedback and related measures to improve the study programme quality.

Monitoring and evaluation of quality in the area of information and promotion represent a key domain for reducing information inequality and increasing the visibility of the faculty and its study programmes among students, applicants, teachers, employers, and other representatives of the public. Evaluation is carried out through a comprehensively prepared report or via an information system for quality measurement and assessment.
Feedback results at FPV UCM are available on the UCM SharePoint (authorised access), and the evaluation of study programmes by students or staff forms part of each submitted dossier.
All available evaluations of individual stakeholders are accessible here:
https://fpv.ucm.sk/sk/fakulta/politika-kvality/hodnotenie-kvality.html (in slovak)

c) - Results of graduate feedback and related measures to improve the study programme quality.

Feedback results are published in the FPV Quality Report. The report includes an evaluation of questionnaire surveys as well as proposed measures aimed at addressing identified shortcomings. The results are also reflected in the Report on Educational Activities (particularly feedback from students, graduates, and employers), which also contains proposals for corrective actions.
In addition, all stakeholders are invited annually to evaluate the study programmes, and reports based on anonymous questionnaires are prepared. These reports are fully accessible on the FPV UCM SharePoint (authorised access) or here: https://fpv.ucm.sk/sk/fakulta/politika-kvality/hodnotenie-kvality.html (in slovak).

11. - References to other relevant internal regulations and information concerning the study or the study programme student

(e.g study guide, accommodation regulations, fee directive, guidelines for student loans, etc.).

Study Schedule of FPV UCM
https://www.ucm.sk/en/university/calendar/study-schedule.html
Accommodation Regulations of the UCM Student Residence Hall
https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-27_Ubytovaci_poriadok_studentskeho_domova_UCM_AJ.pdf
Directive on Tuition Fees and Study-Related Charges at UCM
https://www-old.ucm.sk/docs/dokumenty/2022/2021-20_Smernica_o_skolnom_a_poplatkoch_spojenych_so_studiom_UCM_AJ.pdf