DOCUMENT

Study programme	BIOTa-BcD18 - Biotechnology
Study	Grade of study - I. - bachelor, study form - full time, 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:

13.11.2015

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 183412

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

1 R 645

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.

Biochemistry - 0512

f) - Awarded academic degree before the name

Bc.

g) - Form of study.

full time

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

english

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

3 years

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

Planed number of students 50 - - -

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.

At the time of graduation, students of the biotechnology study program have the theoretical knowledge, practical skills and abilities in the basic natural science disciplines, especially biotechnology, biology and chemistry, as well as their border areas.
Due to the fact that the program belongs to the study field of Biotechnology, these are mainly subjects emphasizing biotechnological aspects. An important part of the study, in addition to classical chemical and biological subjects, is emphasis
- chemical (general, inorganic, organic, analytical, physical, biochemistry), biological disciplins (microbiology and molecular), genetics, biotechnology (microbial, agricultural, enzymatic and environmental), ecology, but also mathematics, physics and statistical analysis. In the bachelor's study, they also acquire knowledge from selected, specialized areas, such as virology, food quality, nutrition, toxicology, bioinformatics, scientific databases. They improve their knowledge and practice in science English.
They acquire habits for defining scientific hypotheses, preparation of projects (experimental) for their verification, experimental solution, definition of outputs and their characterization, presentation, advocacy and implementation (even in practice).

Bachelor's degree graduates
- have a theoretical knowledge of the structures of prokaryotic and eukaryotic biological systems and the nature of the processes (physico-chemical, biochemical and physiological) taking place in them, as well as the mechanisms of their regulation,
- gain an overview of them and know how to apply them in practice,
- know the basics of methods of interventions in the genome of prokaryotic and eukaryotic cells, the principles of genetic modification of organisms, basic methods of characterizing genetic changes and gain an overview of the use of genetically modified organisms in various areas of practice,
- are able to prepare biological systems for their practical use and independently solve (manage) partial operations related to their targeted use in the agri-food, pharmaceutical-medical and chemical-environmental areas,
- have sufficient theoretical knowledge and practical experience to carry out laboratory control and evaluation of the data obtained and are able to communicate with an equivalent level of management.
- have knowledge of economic, legal, ethical and environmental aspects of biotechnology, which enables them to apply at the intermediate level of functional activities in the scientific research, production and business sphere.

Attachment_13_Educational_objectives_and_outputs_Bc._Biotechnology

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 bachelor's degree graduate is already able to apply in the production sphere of economics their knowledge gained from chemistry, biotechnology, while these branches also have knowledge of mathematics, physics, but also in selected, specialized and related areas (especially microbiology, food quality, toxicology, material and energy balances in production processes).
The graduate is able to have a minimum of basic communication in scientific English. He can also work as a highly qualified worker (laboratory technician, operator) in industry (chemical, food), pharmacy and healthcare. As he also has practical habits and basics of analytical, inorganic chemistry, biochemistry, biology and biotechnology (especially using microbiology), he is also an optimally prepared worker for performing laboratory work in science, research and development. Thanks to biotechnological bases, it will also find application in the field of energy production from renewable sources and the use of secondary raw materials from such and similar productions. As he is already able to orientate himself in economic, legal and ethical aspects of biotechnology, design and marketing basics, he is able to move the implementation of experimentally confirmed scientific hypotheses to the level of business, especially small but special and production with higher added value (for example products with biotechnology processing but also in the provision of biotechnology services). He has the knowledge that enables him to apply at the middle management levels of related activities in production and business practice.

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.

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.

Graduates of the bachelor's study program in biotechnology are employed in chemical, pharmaceutical, medical, environmental research and operational facilities, in the production sphere in monitoring the natural environment, processing and use of databases.
90% of students continue their university studies at the 2nd level in the field of biotechnology or in one of the related fields.

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

Assoc. Prof. RNDr. Miroslav Horník, PhD., Associate Professor in Analytical Chemistry
Prof. RNDr. Miroslav Ondrejovič, PhD., Associate Professor in Biotechnology
Prof. RNDr. Martin Pipíška, PhD., Associate Professor in the field of Environmental Engineering
https://fpv.ucm.sk/absolvent/absolvent.html
https://fpv.ucm.sk/sk/studuj-fpv/uspesni-studenti/

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

90% of the graduates of the bachelor's study program in biotechnology continue their university studies at the 2nd level in the field of biotechnology, but the selected employers commented positively on the designed study program.
Agramart 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 programs is governed exclusively by the standards for the SAAHE SR study program and the university guidelines created based on the standard for the internal quality assurance system.
https://www-old.ucm.sk/docs/legislativa/2022/predpisy_-_en/2022-23_vnutorny_system_zabezpecovania_kvality_AJ.pdf
The study plan fully takes into account the requirements set for the field of biotechnology in the system of study fields (core of knowledge, abilities and skills) and at the same time has ambitions to enable students, especially in the last, third year of study, to improve according to their choice in frontier biotechnology disciplines.
The main topics of the knowledge core (1st level) are fulfilled as follows:
1st year of study: Introduction to Biotechnology, Basics of Biology for Biotechnologists, Laboratory Exercise in Basics of Biology, Computational Seminar I, Basics of Biotechnological Processes and Equipment, Advanced Biology for Biotechnologists, Laboratory Exercise in Biology, Computational Seminar II
2nd year of study: Environmental Biotechnology, Balance Systems in Biotechnological Processes, Principles of Molecular Biology and Laboratory Exercise in Molecular Biology, Biochemistry, Laboratory Exercise in Biochemistry, Agricultural Biotechnology, Microbial Biotechnology, Semester Project
3rd year of study: Enzymology, Laboratory Exercise in Enzymology, Methods and Techniques of Gene Manipulation, Bachelor Thesis Theory and Methodology, Enzyme Biotechnology, Computer-aided Molecular Design, Regulation and Biosafety of Biotechnology, Bachelor Project and Experimental Activities for Bachelor Thesis.
The study plan also includes subjects providing theoretical knowledge of chemical (General Chemistry and Laboratory Exercises in General Chemistry, Inorganic Chemistry and Laboratory Exercises in Inorganic Chemistry, Organic chemistry, Laboratory Exercises in Organic Chemistry, Separation Methods and Laboratory Exercises in Separation Methods), physical (Introduction to Physics, Biophysical Chemistry) of biological disciplines (Basics of Microbiology, Laboratory Exercises in Microbiology, Genetics, Plant Physiology, Animal Biology, Evolutionary Biology, General Virology, Natural Remedies) and environmental disciplines (Environmental Toxicology, Renewable Energy, Sustainable Development, Waste Management Environmental Monitoring and Bioindicators).
Other topics of the core of knowledge are filled with the subjects Professional Communication in English I to IV and within the elective subjects Sports Activities I to VI and Mathematics and Basics of Statistics.
At least 60% of the content of the study program in each year corresponds to the core topics of the core of knowledge, both in terms of the number of credits required and the number of teaching hours. Almost all subjects falling into this category are defined as compulsory subjects. Other subjects of the study program are focused on the profiling of the graduate in frontier disciplines. Such subjects are marked as compulsory elective subjects, so that the student can, to the maximum extent possible, realize his own interest in a special area or his own ideas about applying in practice.

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

Attachment_12_Recommended_study_plan_Bc._Biotechnology

c) - The study plan generally states:

Attachment_11_Subject information sheets_Bc._Biotechnology

List of subjects

Compulsory subjects:

1. **Inorganic Chemistry**
2. **Bachelor Project**
3. **Balance Systems in Biotechnological Processes**
4. **Biophysical Chemistry**
5. **Biochemistry**
6. **Environmental Biotechnology**
7. **Enzymology**
8. **Enzyme Biotechnology**
9. **Experimental activity for Bachelor Thesis**
10. **Information and Communication Technologies**
11. **Laboratory Exercise in Inorganic Chemistry**
12. **Laboratory Exercise in Biochemistry**
13. **Laboratory Exercise in Biology**
14. **Laboratory Exercise in Enzymology**
15. **Laboratory Exercise in Microbiology**
16. **Laboratory Exercise in Molecular Biology**
17. **Laboratory Exercise in Organic Chemistry**
18. **Laboratory Exercise in Advanced Biology**
19. **Laboratory Exercise on Separation Methods**
20. **Laboratory Exercise in General Chemistry**
21. **Methods and Techniques of Gene Manipulation**
22. **Microbial Biotechnology**
23. **Molecular-Biological Databases**
24. **Professional Communication in English I**
25. **Professional Communication in English Ii**
26. **Organic Chemistry**
27. **Computer-aided Molecular Design**
28. **Advanced Biology for Biotechnologists**
29. **Agricultural Biotechnology**
30. **Principles of Molecular Biology**
31. **Regulation and Biosafety of Biotechnologies**
32. **Semester Project**
33. **Separation Methods**
34. **Theory and Methodology of Bachelor Thesis**
35. **Introduction to Biotechnology**
36. **Introduction to Physics**
37. **General Chemistry**
38. **Computational Seminar I**
39. **Computational Seminar II**
40. **Basics of Biology for Biotechnologists**
41. **Basics of Biotechnological Processes and Equipment**
42. **Basics of Microbiology**

*** profile objects are marked in bold**

Compulsory optional subjects:

43. **Biophysical Chemistry II**
44. **Animal Biology**
45. **Environmental Toxicology**
46. **Evolutionary Biology**
47. **Plant Physiology**
48. **Genetics**
49. **Mathematics**
50. **Environmental Monitoring and Bioindicators**
51. **Renewable Energy Sources**
52. **Professional Communication in English III**
53. **Professional Communication in English IV**
54. **Waste Management**
55. **Organic Chemistry II**

55. **Organic Chemistry II**
56. **Natural Remedies**
57. **Sustainable Development**
58. **introduction to radioecology**
59. **General Virology**
60. **Basics of Statistics**

Optional subjects:

61. **Sports Activities I**
62. **Sports Activities II**
63. **Sports Activities III**
64. **Sports Activities IV**
65. **Sports Activities V**
66. **Sports Activities VI**

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 Board, 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 endowment of subjects reflects their difficulty and the intensity/measure of the student's workload. Profile subjects generally have a higher workload. At the FNS UCM level, the student's workload is approached as follows:

- 1 credit corresponds in terms of time intensity to 30 hours 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.

156 credits for compulsory subjects required for the proper completion of studies / completion of part of the study,
12 credits for compulsory elective subjects required for the proper completion of studies / completion of part of studies,
0 credits for elective subjects required for proper completion of studies / completion of part of study,
12 credits for the final thesis and the defense of the final thesis required for the proper completion of the study.

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.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.ucm.sk/docs/legislativa/2022/predpisy_-_en/2020-8_Studijny_poriadok_UCM_AJ.pdf

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

https://ucmtt.sharepoint.com/teams/FPV/SitePages/Z%C3%A1vere%C4%8Dn%C3%A9-pr%C3%A1ce.aspx

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://ucmtt.sharepoint.com/teams/FPV/SitePages/Z%C3%A1vere%C4%8Dn%C3%A9-pr%C3%A1ce.aspx
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)
Smernica o náležitostiach záverečných prác, ich bibliografickej registrácii, uchovávaní a sprístupňovaní na UCM
https://www.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-31_Smernica_o_nalezitostiach_zaverecnych_prac,_ich_bibliografickej_registracii,_uchovavani_a_spristupnovani_na_UCM_AJ.pdf

template for the elaboration of the final thesis is given https://katedra-biotechnologii.webnode.sk/informacie-pre-studentov/zaverecne-prace/) in accordance with the Study Regulations of the University of Ss. Cyril and Methodius,

https://www.ucm.sk/docs/legislativa/2022/predpisy_-_en/2020-8_Studijny_poriadok_UCM_AJ.pdf
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. With the bachelor's thesis, the student demonstrates the ability to work creatively in the field of study in which he completed the study program. The bachelor's thesis will be prepared by the student under the guidance of the supervisor in accordance with the internal regulations of UCM and the relevant faculty. The bachelor thesis is assessed by the opponent. The supervisor and the opponent will prepare a written report for the bachelor's thesis. The student has the right to one copy of the supervisor's and the opponent's report no later than three days before the defense of the bachelor's thesis. The bachelor thesis together with the defense form one subject and belong to the state exams. The commission for state examinations negotiates the result of the defense of the bachelor's thesis by a closed vote. In the event of a tie, the chairman of the commission shall have two votes. The results of the bachelor thesis defense are evaluated with marks A - FX.
Smernica o plagiátorstve
https://www.ucm.sk/docs/legislativa/2022/predpisy_-_en/2019-9_Smernica_o_plagiatorstve_AJ.pdf
- *opportunities and procedures for participation in student mobility,*

The ANS 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.
The ANS 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.
http://fpv.ucm.sk/sk/studium/studijne-pobyty.html
http://fpv.ucm.sk/sk/o-nas/medzinarodne-vztahy.html
http://fpv.ucm.sk/en/study/erasmusen.html
All information about study stays, the Erasmus + project, student mobility, the pedagogical and non-pedagogical staff is also on a separate page: https://www.ucm.sk/sk/erasmus-01/
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.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.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-14_Smernica_o_vybavovani_staznosti_na_UCM_AJ.pdf
https://www.ucm.sk/docs/legislativa/2022/predpisy_-_en/ID_N._2015_Directive_on_the_Receipt_and_Handling_of_Complaints_about_antiSocial_Activities.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 JUDr. Jana Žitníková jana.zitnikova@ucm.sk
- for ANS RNDr. Vanda Adamcová, PhD. vanda.adamcova@ucm.sk

https://www.ucm.sk/sk/centrum-podpory-studentov-so-specifickymi-potrebami-01/
https://www.ucm.sk/docs/legislativa/2022/predpisy_-_en/2019-11_Smernica_na_zabezpecenie_vseobecne_pristupneho_akademickeho_prostredia_pre_studentov_so_specifickymi_potrebami_AJ.pdf

- *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.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-14_Smernica_o_vybavovani_staznosti_na_UCM_AJ.pdf
The link to enter the Black Box is on the UCM website https://www.ucm.sk/sk/black-box/

5. - Course information sheets of the study programme

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

Attachment_11_Subject_Information_Sheets_Bc._Biotechnology

6. - Current academic year plan and current schedule

(or hyperlink).

All information for students is located on SharePoint:
https://ucmtt.sharepoint.com/teams/FPV/SitePages/Prv%C3%BD-rok-na-fakulte.aspx
https://ucmtt.sharepoint.com/teams/FPV

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. Miroslav Ondrejovič, PhD. (miroslav.ondrejovic@ucm.sk)
https://katedra-biotechnologii.webnode.sk/struktura-katedry-biotechnologii/

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)
Basics of Biology for Biotechnologists
Laboratory Exercise in Biology
Advanced Biology for Biotechnologists
Laboratory Exercise in Advanced Biology
prof. RNDr. Ján Kraic, PhD. (jan.kraic@ucm.sk)
Introduction to Biotechnology
Agricultural Biotechnology
Assoc. Prof. Mgr. Daniel Mihálik, PhD. (daniel.mihalik@ucm.sk)
Principles of Molecular Biology
Laboratory Exercise in Molecular Biology
Methods and Techniques of Gene Manipulation
Assoc. Prof. Ing. Jana Moravčíková, PhD. (jana.moravcikova@ucm.sk)
Basics of Biotechnological Processes and Equipment
Balance Systems in Biotechnological Processes
Regulation and Biosafety of Biotechnologies
Assoc. Prof. RNDr. Miroslav Ondrejovič, PhD. (miroslav.ondrejovic@ucm.sk)
Information and Communication Technologies
Microbial Biotechnology
Enzymology
Laboratory Exercise in Enzymology
Enzyme Biotechnology
Bachelor Project
Experimental Activity for Bachelor Thesis

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

http://fpv.ucm.sk/sk/pracovnici-bt.html
Assoc. Prof. RNDr. Michaela Havrlentová, PhD.
prof. RNDr. Ján Kraic, PhD.
Assoc. Prof. Mgr. Daniel Mihálik, PhD.
Assoc. Prof. Ing. Jana Moravčíková, PhD.
Assoc. Prof. RNDr. Miroslav Ondrejovič, PhD.

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).

1. assoc. Prof. RNDr. Iveta Dirgová Luptaková, PhD.
- Mathematics
- Basics of Statistics
2. assoc. Prof. Mgr. Renata Gašparová, PhD.
- Organic Chemistry
- Organic Chemistry II
- Natural Medicines
3. Ing. Miroslav Glasa, PhD.
- General Virology
4. assoc. Prof. RNDr. Michaela Havrlentová, PhD.

- Basics of Biology for Biotechnologists
- Laboratory Exercise in the Basics of Biology
- Advanced Biology for Biotechnologists
- Laboratory Exercise in Advanced Biology
- Semester Project
- Animal Biology
- Theory and Methodology of Bachelor Thesis

5. assoc. Prof. RNDr. Miroslav Horník, PhD.
- Environmental Toxicology
- Introduction to Radioecology
- Waste Management
- Environmental Monitoring and Bioindicators

6. assoc. Prof. Ing. Štefan Janeček, DrSc.
- Molecular-Biological Methods

7. prof. RNDr. Jan Kraic, PhD.
- Introduction to Biotechnology
- Agricultural Biotechnology

8. prof. RNDr. Juraj Krajčovič, PhD.
- Genetics
- Evolutionary Biology

9. RNDr. Barbora Legerská, PhD.
- Laboratory Exercise in the Basics of Biology
- Laboratory Exercise in Advanced Biology
- Semester Project

10. assoc. Prof. Ing. Tibor Maliar, PhD.
- Biochemistry
- Computer-aided Molecular Design

11. prof. Mgr. Alžbeta Marček Chorvátová, DrSc.
- Introduction to Physics
- Biophysical Chemistry
- Biophysical Chemistry II

12. assoc. Prof. Mgr. Ildiko Matušíková, PhD.
- Sustainable Development
- Environmental Monitoring and Bioindicators

13. assoc. Prof. Mgr. Daniel Mihalík, PhD.
- Principles of Molecular Biology
- Laboratory Exercise in Molecular Biology
- Methods and Techniques of Gene Manipulation

14. assoc. Prof. PaedDr. Juraj Miština, PhD.
- Professional Communication in English
- Professional Communication in English II
- Professional Communication in English III
- Professional Communication in English IV

15. assoc. Prof. Ing. Jana Moravčíková, PhD.
- Basics of Biotechnological Processes and Equipment
- Balance Systems of Biotechnological Processes
- Regulation and Biosafety of Biotechnologies

16. assoc. Prof. RNDr. Miroslav Ondrejovič, PhD.
- Calculations Seminar I
- Calculations Seminar II
- Information and Communication Technologies
- Microbial Biotechnology
- Enzymology
- Enzyme Biotechnology

17. RNDr. Daniela Ondrejovič Chmelová, PhD.
- Laboratory Exercise in Biochemistry
- Laboratory Exercise in Microbiology
- Laboratory Exercise in Enzymology
- Laboratory Exercise on Separation Methods

18. assoc. Prof. Ing. Andrea Purdešová, PhD.

18. assoc. Prof. Ing. Andrea Fürstová, PhD.
- Separation Methods
19. assoc. Prof. RNDr. Cyril Rajnák, PhD. PhD.
- Laboratory Exercise in General Chemistry
- Laboratory Exercise in Inorganic Chemistry
20. prof. RNDr. Jana Sedláková, PhD.
- Environmental Biotechnology
- Renewable Energy Sources
21. assoc. Prof. RNDr. Milan Seman, CSc.
- Basics of Microbiology
- General Virology
22. prof. RNDr. Ján Titiš, PhD.
- General Chemistry
- Inorganic Chemistry
23. RNDr. Zita Tokárová, PhD.
- Laboratory Exercise in Organic Chemistry
24. Mgr. Martin Valica, PhD.
- Waste Management
- Renewable Energy Sources
25. assoc. Prof. RNDr. Ľubica Uváčková, PhD.
- Plant Physiology
26. Ing. Eva Ürgeová, PhD.
- Sports Activities I
- Sports Activities II
- Sports Activities III
- Sports Activities IV
- Sports Activities V
- Sports Activities VI

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

The structure of the teachers of the academic workplace provides a sufficient guarantee of the adequacy of the number of university teachers for the number of final theses in a given level of university study. All final theses are supervised by teachers who have adequate teaching experience and an appropriate level of education.

Topics of final theses:

Abiotic forms of stress with emphasis on drought stress in cereals
Antibacterial activity of flavonoid reaction products with AlCl3 *in vitro*
Antimicrobials isolated from spruce bark
Antioxidant active substances of spruce bark
Biotic stress and its effect on metabolism in oat
Enzyme-catalyzed decomposition of azo dyes
Genetic modification of plants as a tool to change the content of essential fatty acids
Heavy metal hyperaccumulators and their use in the process of environmental decontamination
Domestic Rabbit - A model for genomic studies
Qualitative and quantitative changes in the lipid composition of transgenic plants
Microbial production of ligninolytic enzymes
Molecular possibilities of increasing the content of total proteins and selected microelements from wheat grain
Low molecular weight inhibitors of plant protein origin
Optimization of the reproductive process of rabbits by adjusting the conditions of the breeding environment
Sarcomlaslasic reticulum calcium ATPase (SERCA) damage due to oxidative / nitrating stress: protective effect of flavonoids
Damage to calcium homeostasis due to carbonyl stress
Potential human nutrition in oat grain
Preventive-therapeutic properties of vegetable oils
Preparation and use of substances labelled with positron emitters in their PET analysis in model organisms
The process of simulated digestion, as a determinant of the intake of biologically valuable substances of the Chilean lizard, comparison with other crops
Producers of bioplastics based on polyhydroxyalkanoates
Bioethanol production from lignocellulosic materials
Production of recombinant laccases
Production of xylanases and their industrial use
Double grain wheat (*Triticum turgidum* subsp. *Dicoccum*) for food and sustainable agriculture
Endoplasmic reticulum stress in pancreatic beta cells: flavonoids as a possible intervention

Supervisors:

Assoc. Prof. Ing. Jana Moravčíková, PhD.
Prof. Mgr. Daniel Mihálik, PhD.
Assoc. Prof. RNDr. Michaela Havrlentová, PhD.
Prof. RNDr. Miroslav Ondrejovič, PhD.
prof. RNDr. Ján Kraic, PhD.
Assoc. prof. RNDr. Daniela Ondrejovič Chmelová, PhD.
Assoc. Prof. RNDr. Miroslav Horník, PhD.
Prof. Ing. Ildikó Matušíková, PhD.
RNDr. Zuzana Gerši, PhD.
RNDr. Vanda Adamcová, PhD.
RNDr. Šarlota Kaňuková, PhD.

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

https://katedra-biotechnologii.webnode.sk/struktura-katedry-biotechnologii/vedecko-vyskumna-charakteristika-pedagogov-kbt/
http://fpv.ucm.sk/sk/pracovnici-bt.html

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

Mgr. Ľubomíra Jurečková (jureckova1@ucm.sk) – 2nd year student in PhD Biotechnology

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

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

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

Study Department of UCM
Responsible person for FPV:
Ing. Gabriela Jančovičová e-mail: gabriela.jancovicova@ucm.sk
Head of the UCM Student House:
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 The pedagogical process of the bachelor's study program in biotechnology is carried out in classrooms in the UCM central buildings on J. Herda Square, on Hajdóczyho Street and in the UCM building in Špačince (4 km from the University Headquarters 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 (general, inorganic, organic chemistry, biochemistry), biology (basics of biology, advanced biology, microbiology, molecular biology), biotechnology (separation methods, enzymology) are equipped with basic tools (chemicals, laboratory scales). , smaller laboratory equipment) needed for each exercise. In addition, there are 5 special laboratories for work on bachelor's and master's theses.
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 buildings of the University. Lecture rooms, as well as laboratory rooms, are equipped with built-in data projectors, and there is a lecture room with an interactive whiteboard.
Standard software is installed on computers in computer labs (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.).

Every student of the faculty has secure internet access. ANS UCM students have the opportunity to work in computer laboratories outside the program-organized training according to their own interests and the needs of solving tasks from seminars and exercises. They have computer classrooms with computers connected to the Internet and an internet room with free access with adequate software in the main UCM buildings. Another terminal classroom is in the premises of ANS UCM in Špačince.
Computer classrooms are periodically supplemented with more powerful computers and new computer and chemical software (Dragon 6, IBM SPSS Statistics 19, Analysis, QC Expert 3.1, Statistica 10.2 Base and Statistica 10.2 DataMiner). All teachers as well as internal doctoral students have an assigned computer connected to the Internet. The faculty uses the Academic Information System (AIS2).
In the university library, students have the possibility of access to basic study literature (books, professional journals, company materials). Through the NAVIGA system, access to electronic resources is provided. NISPEZ system provides access to electronic information resources: Knovel Library, ProQuest Central, ScienceDirect, SpringerLink, Wiley Online Library, Wok-Current Contents, Wok-Web of Science, Web of Knowledge, Scopus, 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 unfavourable 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.

In the bachelor study program of biotechnology, the offer of selected subjects Sports Activities I to Sports Activities VI is intended for students. 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 (https://www.ucm.sk/sk/sportove-a-kulturne-aktivity-studentov/).
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.
http://fpv.ucm.sk/sk/studium/studijne-pobyty.html
The system of allocating places within the ERASMUS + program takes place in the form of a selection procedure at the faculty.
The system of allocating places under the ERASMUS+ programme is carried out by means of a selection procedure at the faculty.
The rules of recognition of this education are governed by the UCM Study Regulations and the document: https://www.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.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-29_Poriadok_prijimacieho_konania_UCM_AJ.pdf
https://www.ucm.sk/docs/legislativa/2022/predpisy_-_en/2020-8_Studijny_poriadok_UCM_AJ.pdf
The basic condition for admission to a bachelor's degree or a study program according to § 53 par. 3 of the Act is the acquisition of a complete secondary education or a complete secondary vocational education.
A candidate for a Bachelor's degree is able to demonstrate knowledge and skills at the level of completed secondary education. It is necessary to demonstrate a sufficient level of knowledge of the subject in question in relation to the content and performance standards defined in the ISCED 3A State Curriculum or the Target Requirements for the Baccalaureate Examination in Profile Subjects for the programme of study in question. In deciding on admission to study, the results of studies at secondary school are taken into account, as well as the applicant's other activities, such as successful completion of a subject Olympiad or participation in a secondary school vocational activity. Admission to the bachelor's programme is without an entrance examination. In assessing the results of secondary education, the grades in the profile subjects in each year of secondary school and the overall result of the final school-leaving examination are decisive. The profile subjects for the biotechnology study programme are chemistry, mathematics, biology and a foreign language.

b) - Admission procedures.

https://www.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-29_Poriadok_prijimacieho_konania_UCM_AJ.pdf
The admission procedure at FNS UCM is carried out in accordance with Act no. 131/2002 Coll. on Higher Education Institutions and on Amendments to Certain Acts, Sections 56 to 58. The admission process will enable an applicant who proves the fulfillment of the specified conditions for admission to study to become a student of the chosen study program. An applicant who does not prove the fulfilment of the basic conditions for admission to the study at the time of verification of the fulfilment of the conditions for admission may be admitted to the study conditionally provided that he/she is obliged to prove the fulfilment of the basic conditions of admission to the study no later than on the day determined for enrolment.
The method of admission is governed by the general conditions approved by the academic senate of the faculty for the relevant academic year, and these conditions must be published together with the offer of study programs and the planned number of admitted applicants no later than two months before the last application deadline. General conditions of admission to study in accordance with Act no. 131/2002 Coll. about universities and university duties are published on the website of the faculty and university.
Applications for university studies are accepted by the deadline, which is usually published, usually by the end of April of the respective academic year. The admissions process takes into account the benefits achieved by the applicant during secondary school and in the first half of the final year. The condition for inclusion in the decision-making of the admission procedure is the delivery of a school-leaving certificate.
The admission procedure for bachelor's study programs takes place without an entrance examination. For the admission of an applicant to the bachelor's study program, the decisive marks are from the profile subjects in the individual years of secondary school and the overall result of the school-leaving examination. The profile subjects in the bachelor's study program in biotechnology are chemistry, mathematics, biology, foreign language.
For the evaluation of study results in four profile subjects during the study, the student can get a maximum of 80 points. Points are awarded for a mark from a profile subject on the annual report card: For a mark 1 five points, for a mark 2 three points and a mark 3 1 point. 20 points can be obtained for the evaluation of the overall result of the school-leaving examination. The maximum number of points is 100. According to the number of points obtained, students are ranked.

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

Academic year /Study program/ Number of applications/ Admissions Enrolment/Registration

- without students

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.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.
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 promote 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.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.

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

Monitoring and evaluation of quality in the field of information and promotion is a key area for eliminating information inequality and raising 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 comprehensive report or through a quality measurement and evaluation information system.
The results of the FPV UCM feedback are here on SharePointe UCM (authorized access) or the evaluation of the SP by students or employees is included in each submission file.
https://fpv.ucm.sk/fakulta/akademicke-samospravne-organy/komisie-rady/ (faculty quality assessment --- student feedback evaluation)

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

The results of the feedback are published in the FNS Quality Report. The report includes an evaluation of the questionnaire investigations as well as proposed actions to address shortcomings. The results are also present in the Report on Educational Activities (mainly students, alumni and employers), and the report also includes a proposal for measures
Otherwise, every year all stakeholders are invited to evaluate the SP and reports are compiled from the anonymous questionnaires, which are fully accessible on SharePoint FPV UCM (authorized access).

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.).

Schedule of FPV studies for the academic year
ANS study schedule for the academic year https://www.ucm.sk/sk/univerzita/kalendar-ucm/harmonogram-studia.html
Accommodation Regulations of the UCM Student House
https://www.ucm.sk/docs/legislativa/2022/predpisy_-_en/2021-27_Ubytovaci_poriadok_studentskeho_domova_UCM_AJ.pdf
Directive on Tuition Fees and Fees Associated with the Study at UCM
https://www.ucm.sk/docs/dokumenty/2022/2021-20_Smernica_o_skolnom_a_poplatkoch_spojenych_so_studiom_UCM_AJ.pdf