

## Description of the study programme – outline

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| Name of the higher education institution:                  | Alexander Dubček University of Trenčín                 |
| Address of the higher education institution:               | Študentská 2, 911 50 Trenčín                           |
| Identification number of the higher education institution: | 719 000 000  |
| Name of the workplace:                                     | Centre for Functional and Surface Functionalized Glass |
| Address of the workplace:                                  | Študentská 2, 911 50 Trenčín                           |

Institution body for approving the study programme: **Committee for the internal evaluation TnUAD**

Date of the study programme approval or the study programme modification: **8.7.2022**

[Zapisnica c. 5 2022 zo dna 08.07.2022.pdf](#)

Date of the latest change in the study programme description: **8.7.2022**

[Zapisnica c. 5 2022 zo dna 08.07.2022.pdf](#)

Reference to the results of the latest periodic review of the study programme by the institution:

<https://tnuni.sk/univerzita/organy-univerzity/rada-pre-vnutorne-hodnotenie-tnuad/>

Reference to the assessment report of the application for accreditation of the study programme under § 30 of Act no. 269/2018 Coll.:

[Internal Assessment Report of the Study Programme](#)

### 1. Basic information about the study programme

- a) Name of the study program and its number according to the register of study programmes.  
Inorganic technologies and non-metallic materials, 4616
- b) Degree of higher education and ISCED-F education degree code.  
III. degree- doctoral study, code 6 864
- c) Place(s) of delivery of the study programme.  
Alexander Dubček University of Trenčín, Študentská 2, 911 50 Trenčín
- 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.  
16. Chemical Engineering and Technologies
- 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
- f) Awarded academic degree.  
PhD.
- g) Form of study.  
Daily, Full-time
- h) In the case of joint study programmes, cooperating institutions and the range of study obligations the student fulfils at each of the given institutions (§ 54a of the Act on Higher Education Institutions).  
Not relevant
- i) Language or languages in which the study programme is delivered.  
Slovak/English
- j) Standard length of the study expressed in academic years.  
4 years
- k) Capacity of the study programme (planned number of students), the actual number of applicants and students.  
Capacity of the study program = planned number of students in all 4 years of study: 28  
Actual number of students in all 4 years of study: 25  
Planned number of students in the first year of study in AR 2022/2023: 7  
Actual number of applicants: 151  
Actual number of students in the first year of study: 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 graduate masters scientific methods of research in the preparation of new non-metallic inorganic materials. He is able to independently solve the problems of the development of inorganic technologies, including the reduction of waste generation and solutions for their recovery. He has special knowledge in the field of glass. He has deep theoretical knowledge in the field of thermodynamics and kinetics and is able to solve challenging engineering problems in technical practice. He actively masters computer technology and informatics. He is able to actively work in a team, forecast developments in his field and perform project management. His theoretical knowledge is a prerequisite for application in research and development workplaces in the academic sector, industry and interdisciplinary disciplines.

| Learning outcomes and outputs                                     |  |
|---|--|
| 1. Systematic understanding and acquisition of skills and methods | Graduate:<br>- has deep theoretical knowledge in the field of thermodynamics and kinetics and is able to solve challenging engineering problems in technical practice, |

|  |   |
|--|---|
|  | <ul style="list-style-type: none"> <li>- masters the methods of studying the structure and properties of materials,</li> <li>- has special and in-depth knowledge in the field of research and development of glass, progressive ceramic materials with specific functional properties and functional coatings, with a comprehensive understanding of the broader context in the field,</li> <li>- has a practical experience in research in the field of high temperature processes,</li> <li>- masters scientific research methods in the field of preparation of new non-metallic inorganic materials,</li> <li>- demonstrates a systematic understanding of the field of study of non-metallic inorganic materials and masters relevant research methodologies,</li> <li>- is able to work effectively with professional literature and to extract from it targeted information relevant to its scientific-research activity,</li> <li>- masters the ethical principles of scientific work and actively uses them in its research and publishing activities.</li> </ul>   |
| 2.Application of knowledge and understanding | <p>Graduate:</p> <ul style="list-style-type: none"> <li>- independently designs and implements research activities while maintaining the integrity of the research plan,</li> <li>- critically evaluates and proposes new research concepts and procedures,</li> <li>- independently solves the problems of the development of inorganic technologies, including the reduction of waste production and the solution of their recovery, such as the reduction of the environmental impacts of these technologies,</li> <li>- supports technical and societal progress in the concept of the knowledge society,</li> <li>- his/her theoretical and practical knowledge enables his/her application in research and development workplaces in academic workplaces, in industrial development and in interdisciplinary fields.</li> </ul>   |
| 3. Creation of opinion                       | <p>Graduate:</p> <ul style="list-style-type: none"> <li>- independently plans research activities, performs the necessary practical experiments using modern experimental and analytical techniques, analyses and statistically evaluates the obtained results, according to which is able to draw substantiated conclusions,</li> <li>- predicts the choice of a suitable material in view of its complex production and utility properties for the selected application, or applications, while assessing its impact on the environment in terms of the requirements of the circular economy,</li> <li>- solves research problems by integrating comprehensive knowledge and synthesizing valid conclusions and recommendations.</li> </ul>   |
| 4. Communication                             | <p>Graduate:</p> <ul style="list-style-type: none"> <li>- has the ability to communicate constructively with its colleagues and the wider scientific community,</li> <li>- is able to present the basic ideas of research activities to the professional and lay public,</li> <li>- actively masters a foreign (especially English) language and can actively use it in communication within an international team, as well as in disseminating the results of their research in oral (presentation) and written (in the form of scientific or professional publication),</li> <li>- contributes with its results to the expansion of the current state of knowledge: it documents this fact by publishing the results obtained at international conferences and in renowned scientific journals,</li> <li>- actively masters computer technology and is able to use it in an appropriate manner in communication within the international team, as well as in the analysis, evaluation and presentation of the results of his/her scientific research activities,</li> <li>- is able to actively work in a team, forecast developments in his/her field and manage a small research team.</li> </ul> |
| 5. Ability for further                       | <p>Graduate:</p>  |

|           |  |
|-----------|--|
| education | <ul style="list-style-type: none"> <li>- is prepared for the career of researcher and for further career and personal growth in the academic sphere, or in the field of industrial research and development,</li> <li>- while maintaining the ability to work in a team, demonstrates a high degree of independence, as well as the ability to quickly and effectively learn and master new issues using theoretical and practical experience and skills acquired during the study,</li> <li>- is prepared to make a significant contribution to technical development and social progress, whether in scientific research or in professional practice.</li> </ul> |
|-----------|--|

- 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.  
Pursuant to the Annex to Decree No. 516/2011 Coll. Statistical classification of occupations SK ISCO-08 are graduates of the study program Inorganic Technologies and Non-Metallic Materials prepared for the performance of the professions listed in the table.

| Code    | Job title   |
|---------|---|
| 1223001 | Research institution manager  |
| 1223002 | Research, development and technical development manager in production |
| 1321008 | Chemical production manager   |
| 1321009 | Manager in glass production   |
| 2113999 | Chemist not elsewhere classified (except chemical engineering)        |
| 2141029 | Specialist in research and development in glass production            |
| 2141030 | Glass production management specialist                                |
| 2141032 | Specialist technologist in glass production                           |
| 2145001 | Chemical specialist technologist                                      |
| 2145002 | Chemical specialist in research and development                       |
| 2310003 | University teaching assistant   |
| 3116001 | Application technician in chemical production                         |
| 3116003 | Process technician in chemical production                             |
| 3122009 | Master (supervisor) in glass production                               |

**From the graduate's point of view, the study program offers a wide range of applicability in:**

- research and development in academic institutions in the Slovak Republic, in particular:
  - on universities providing education in materials and chemical technologies,
  - on SAS institutes dealing with research in the field of materials and chemical technologies,
- glass companies, but also in companies producing refractory materials and inorganic binders (cement plants) in various positions, from foremen, technologists and production managers to industrial development researchers in the field and application and operational laboratory staff. Potential employers in the Slovak Republic are RONA, a.s. Lednické Rovne; Vetropack Nemšová; Johns Manville Slovakia, Trnava; Knauff Insulation, Nová Baňa; Medical Glass, Bratislava; PPC Insulators, Čáb; Ladce Cement Plant; CEMMAC, Horne Srnie; etc.
- Due to the experience with working in the international environment at the training workplace, employment is not limited to employers in the Slovak Republic, but ensures the possibility of employment in the European labour market.

- 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.  
Relevant involved groups were contacted in the form of questionnaires to comment on the compliance of the acquired qualification.

[Opinion of the Relevant Involved Subjects](#)

**3. Employability**

- a) Evaluation of the study programme graduates employability.  
In terms of KAP for the year 2021 - 100%

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

| Name                  | Graduated | Employer                 | Job position    |
|-----------------------|-----------|--------------------------|-----------------|
| Vojtech Soltész       | 2013      | VÚEZ, a.s. Levice        | Project manager |
| Branislav Hruška      | 2013      | TnUAD, FunGlass          | Researcher      |
| Petra Masaryk-Gaalová | 2015      | Yanfeng Slovakia         | Test Technician |
| Lukáš Šimurka         | 2018      | TNO Eindhoven, Holandsko | R&D scientist   |

|                        |      |                            |                       |
|------------------------|------|----------------------------|-----------------------|
| Ivana Petříková        | 2018 | TnUAD, FunGlass            | Researcher            |
| Marianna Čierniková    | 2018 | RONA, a.s., Lednické Rovne | Specialist technician |
| Jaroslava Micháľková   | 2019 | TnUAD, FunGlass            | Qualified technician  |
| Ewa Aleksandra Nowicka | 2020 | TnUAD, FunGlass            | Researcher            |

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

[Opinion of the relevant involved subjects- Employers](#)

#### 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 rules for the creation of study plans in the study program Inorganic Technologies and Non-Metallic Materials are regulated by the following internal regulations of TnUAD:

- 2-U-013 Rules for the internal system of quality assurance and evaluation of higher education, creative activities and other related activities at TnUAD in Trenčín,

<https://tnuni.sk/univerzita/organy-univerzity/rada-pre-vnutorne-hodnotenie-tnuad/>

- Guidelines for the design, modification and approval of TnUAD study programs - part 2-U-013 Rules for the internal system of quality assurance and evaluation of higher education, creative activities and other related activities at TnUAD in Trenčín

<https://tnuni.sk/univerzita/organy-univerzity/rada-pre-vnutorne-hodnotenie-tnuad/>

**The conditions for completing the study in this study program, which are specified in the Study Plans, are defined in:**

3-U-046 Directive- Organisation of Doctoral Studies at Alexander Dubček University in Trenčín, can be found on the webpage: <https://www.funlass.eu/study-programs/doctoral-study/> in the section „Documents“.

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

The study program Inorganic Technologies and Non-Metallic Materials is a modern study program that reflects the individual nature of doctoral studies, but does not resign to the requirement of extensive, deep and comprehensive knowledge needed in scientific work, as well as in the later employment of graduates. It also includes practical training in selected experimental methodologies, as well as training in soft skills such as ethics of scientific work, project management and presentation skills.

In the study part of the study plan, it prescribes the completion of a two-semester English language course and two compulsory subjects, Inorganic Technologies and Materials I and Inorganic Technologies and Materials II, which consist of 10 compulsory and 31 optional modules. Each module is compiled as an intensive course devoted to selected issues in the range of 10-30 teaching hours, and can be taught in the form of lectures, or in the form of a combination of lectures, exercises and laboratory exercises. Contact teaching is supplemented by individual consultations and self-study. The choice of optional modules will be made by the student in consultation with his / her supervisor. The selection reflects the individual needs of the student in relation to his / her previous education, as well as to the topic and goals of his/ her dissertation thesis. The student must pass a dissertation exam, the regular deadline of which is no later than half of the standard length of the study. At the end of the study, usually in the fourth year of study, the student must prepare a dissertation thesis and defend it before an established commission. The requirements for the composition of the commission are defined in the Directive- Organisation of Doctoral Studies at Alexander Dubček University in Trenčín.

can be found on: <https://www.funlass.eu/study-programs/doctoral-study/> in the section „Documents“.

In the scientific part, the study program prescribes to the student experimental work aimed at obtaining scientific results related to the topic of his/her dissertation. Other subjects of the scientific part are focused on acquiring presentation and publishing skills. Their scope is defined in the Directive- Organisation of Doctoral Studies at Alexander Dubček University in Trenčín <https://www.funlass.eu/study-programs/doctoral-study/> in the section „Documents“.

The recommended study plan with the designation of compulsory and compulsory optional subjects and modules, profile subjects, prerequisites, student workload, obtained credits, persons providing individual subjects with contacts, and subject teachers, is given in:

[Study Plan](#)

Learning outcomes and related criteria and rules of their evaluation, learning outcomes, conditions of completion of subjects and modules, prerequisites, used educational activities, methods by which educational activities are carried out, syllabi / syllabi of subjects / modules, teachers of subjects / modules, number of credits obtained per the subjects as well as the place of the course are listed in the **Information letters - [Study Plan](#)**

- c) *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.*

Number of credits required for proper completion of studies in the full-time form of the study program III. degree Inorganic technologies and non-metallic materials: **240**, where 1 ECTS credit corresponds to the requirements of 25 to 30 hours of study, depending on the complexity and requirements of the subject in accordance with Act no. 131/2002 Coll. on Higher Education Institutions and on Amendments to Certain Acts.

Further conditions for graduation are defined in the following internal regulations of TnUAD:

- 2-U-001 Study regulations <https://tnuni.sk/studenti/studijny-poriadok/>
- In Articles 6 to 13 of the Directive- Organisation of Doctoral Studies at Alexander Dubček University in Trenčín: <https://www.funlass.eu/study-programs/doctoral-study/> in the section „Documents“.

- d) *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:*

| <b>Condition/Number of credits for:</b> | <b>Daily study</b> |
|---|--------------------|
| Compulsory subjects                     | 240                |
| Compulsory elective subjects            | 0                  |
| Elective courses                        | 0                  |
| Credits needed to graduate              | 240                |
| Dissertation exam                       | 20                 |
| Dissertation project                    | 12                 |
| Defence of the dissertation             | 10                 |
| Professional practice                   | 0                  |

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

Verification of learning outcomes and their evaluation is defined in Articles 24 to 29 of the Study Regulations in TnUAD <https://tnuni.sk/studenti/studijny-poriadok/>

As a part of the corrective procedures, the Study Regulations in TnUAD allow the student to use one regular and one corrective examination date.

The rules for partial and final evaluation of learning outcomes are defined for each subject in the Information letters. The rules are explained by each teacher to the students, usually in the first lesson. In justified cases (absence of a student due to health indications, serious family reasons, etc.), the corrective procedures of partial assessments allow the provision of additional time to complete the assigned tasks (e.g. semester work).

- f) *Conditions for recognition of studies or a part of studies.*

The conditions for the recognition of studies are defined in Article 20 of the Study Regulations in TnUAD <https://tnuni.sk/studenti/studijny-poriadok/>

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

Topics of final theses of the study program of students studying in the academic year 2021/2022.

| <b>Topic</b>   | <b>Student</b>   | <b>Supervisor</b>               | <b>Beginning of study</b> |
|--|------------------|---------------------------------|---------------------------|
| Polymer Composites with Incorporated Mesoporous Bioactive Glass and Magnetic Nanoparticles as Enhanced Multifunctional Platforms for Biomedical Applications | Susanta Sengupta | prof. Ing. Dušan Galusek, DrSc. | 2017/18                   |
| Bioactive Scaffolds from Preceramic Polymers   | Fulden Dogrul    | prof. Ing. Dušan Galusek, DrSc. | 2018/19                   |
| Incorporation of Borate Bioactive Glasses into Soft Matrices for Wound Healing Applications  | Nursen Mutlu     | prof. Ing. Dušan Galusek, DrSc. | 2018/19                   |

|   |  |  |         |
|---|--|--|---------|
| Tailoring the dissolution kinetics of mesoporous ion-doped bioactive glasses under different conditions for drug delivery applications  | Akrity Anand                           | Ing. Dagmar Galusková, PhD               | 2019/20 |
| Co-Doping of Photoluminescent Active Species in Core-Shell Structure. Synthesis & Energy Transfer Effects   | Bruno Wolfrum                          | doc. Ing. Róbert Klement, PhD.           | 2019/20 |
| Multifunctional sol-gel glass coatings for different applications   | Ajitha Haridasan Haritha               | doc. José Joaquín Velázquez García, PhD. | 2019/20 |
| Transparent Nano-Glass-Ceramics for Up-and Down-Conversion  | Mai-Phuong Truong                      | doc. Ing. Róbert Klement, PhD.           | 2019/20 |
| Second Life of Waste Glasses, Application of Glass Microspheres in Advanced 3D Glass Structures   | Mokhtar Mahmoud                        | Ing. Jozef Kraxner, PhD.                 | 2019/20 |
| Corrosion protection of Al alloys by using integrated self-healing systems  | Kumar Udhaya Aruchamy                  | prof. Ing. Dušan Galusek, DrSc.          | 2019/20 |
| Geopolymer-like materials from engineered mixtures of inorganic waste   | Abel Woldu Ourgessa                    | Ing. Jozef Kraxner, PhD.                 | 2020/21 |
| Novel oxysulfides for NIR mechanoluminescence and biomechanical imaging   | Hosseini Ebrahim Hosseini Tazeh Khandi | doc. Ing. Róbert Klement, PhD.           | 2020/21 |
| Advanced materials with eutectic microstructure for high temperature and functional applications  | Maryam Vakhshouri                      | prof. Ing. Dušan Galusek, DrSc.          | 2020/21 |
| Preparation and study of selected mechanical and optical properties of glass-ceramics materials in the Al <sub>2</sub> O <sub>3</sub> -RE <sub>2</sub> O <sub>3</sub> system. | Mária Janičiková                       | Ing. Anna Prnová, PhD.                   | 2020/21 |
| Microstructural study and thermal shock behaviour of thermal barrier coating reinforced with YSZ fiber  | Mahdi Alebrahim                        | doc. Amirhossein Pakseresht, PhD.        | 2020/21 |
| Translucent luminescent glass-ceramic materials sintered in viscous flow  | Marzieh Ghadamyari                     | Ing. Monika Micháľková, PhD.             | 2020/21 |
| Characterization, functionalization and improvement of glasses for pharma   | Ahmed Gamal                            | Ing. Jozef Kraxner, PhD.                 | 2020/21 |
| Structure and properties of bioactive glasses doped with ions with potential therapeutic and antibacterial effects  | Onat Basak                             | doc. Ing. Mária Chromčíková, PhD.        | 2021/22 |
| Surface modification of NiTi alloy by coating silicon-hydroxyapatite composite layers intended for biomedical applications  | Reza Samiee                            | doc. Amirhossein Pakseresht, PhD.        | 2021/22 |
| Identification and determination of cations in apatite phases formed under the conditions of in vitro bioactivity tests   | Jacob Peterson                         | Ing. Dagmar Galusková, PhD               | 2021/22 |
| High entropy oxide ceramics by pressure-assisted sintering of multi-component rare-earth oxide based glasses  | Avnee Chauhan                          | prof. Ing. Dušan Galusek, DrSc.          | 2021/22 |
| Study of surface morphology and characterization of corrosive products of industrially produced glasses   | Katarína Heglasová                     | doc. Ing. Mária Chromčíková, PhD.        | 2021/22 |

|  |                           |                                |         |
|--|---------------------------|--------------------------------|---------|
| Development of multifunctional nanodevices based on silica and magnetic nanoparticles for theragnostic applications. | Martina Vitázková         | Ing. Martin Michálek, PhD      | 2021/22 |
| Advanced manufacturing of 3D scaffolds using solid, hollow and mesoporous bioactive glass microspheres               | Ertugrul Varlik           | Ing. Martin Michálek, PhD      | 2021/22 |
| Development of corrosion resistant polymer derived ceramic coatings on stainless steel substrates                    | Parisa Naghadian Moghadam | Ing. Milan Parchovianský, PhD. | 2021/22 |
| Spectrofluorochemical study of luminescence switches immobilised on inorganic substrates and nanoparticles           | Mir Saeed Sajjadi         | doc. Ing. Róbert Klement, PhD. | 2021/22 |

The list of all published final theses topics in the study program is published on the website of the FunGlass workplace in the section "Dissertation theses topics of the study program" <https://www.funglass.eu/study-programs/doctoral-study/> as well as in [Dalsie relevantne dokumenty](#)

h) *The institution describes or refers to:*

- *rules for the assignment, processing, opposition, defense and evaluation of final theses in the study programme,*

The rules for submitting, processing, opposing, defending and evaluating final theses are defined in the Internal Regulations in TnUAD:

- In Articles 10 to 13 of the Directive- Organisation of doctoral studies at Alexander Dubček University in Trenčín <https://www.funglass.eu/study-programs/doctoral-study/> in the section „Documents“.
- In Articles 27 to 29 of the Study Regulations in TnUAD <https://tnuni.sk/studenti/studijny-poriadok/>

- *opportunities and procedures for participation in student mobility,*

Information on opportunities and procedures for participating in Erasmus + student mobility is published on the TnUAD website [https://erasmus.tnuni.sk/index.php?id=185&no\\_cache=1](https://erasmus.tnuni.sk/index.php?id=185&no_cache=1) as well as on the FunGlass website in the part "Personnel of the study program" <https://www.funglass.eu/study-programs/doctoral-study/>. In addition, students of the study program "Inorganic Technologies and Non-Metallic Materials" have the opportunity to participate in mobilities and complete part of their studies at partner workplaces with which TnUAD has signed contracts and double diplomas:

- University of Padua, Italy
- Autonomous University of Madrid, Spain
- Friedrich Alexander University of Erlangen-Nuremberg, Germany.

To complete such a mobility, the student must meet the following conditions:

- Apply for a topic that is listed together with the partner workplace,
- Complete the study part of the studies at TnUAD, including passing the dissertation exam,
- Prepare a plan of activities carried out at the partner workplace, approved by the trainer, the director of the training workplace and the responsible staff of the partner workplace, [Training plan.pdf](#)
- Fulfil the conditions defined in the Double Diploma Agreement with the relevant partner office,
- After completing the internship, prepare a detailed report on the results of the mobility.

The maximum duration of the mobility is 12 months. During the mobility, the training institution provides students with a contribution to cover the cost of living abroad, in an amount equal to the difference between the doctoral student's scholarship in the Slovak Republic and in the partner country.

- *rules for adherence to academic ethics and rules for drawing consequences,*

The study program emphasizes the knowledge and practical application of the principles of academic ethics and scientific work of all students and graduates. Specific measures:

- All students in the course "Inorganic Technologies and Materials I" complete a compulsory module, the content of which is a detailed acquaintance with the principles of research integrity and academic ethics, also presented in the form of case studies.

- all supervisors intensively work with students during their studies, especially in the preparation of publications and laboratory work, taking care to apply the principles of academic ethics described in the **Code of Ethics in TnUAD** <https://tnuni.sk/univerzita/organy-univerzity/poradne-organy-rektora/eticka-komisia-tnuad/>,



- in **Statute of the Ethics Committee** <https://tnuni.sk/univerzita/organy-univerzity/poradne-organy-rektora/eticka-komisia-tnuad/>

- as well as in the **Declaration on strengthening the culture of scientific integrity in Slovakia**, to which TnUAD subscribes

<https://tnuni.sk/univerzita/organy-univerzity/poradne-organy-rektora/eticka-komisia-tnuad/>

- in the case of violation or gross violation of the rules of academic ethics, the **Ethics Committee** solves the complaints

<https://tnuni.sk/univerzita/organy-univerzity/poradne-organy-rektora/eticka-komisia-tnuad/>

- resp. **Disciplinary Board in TnUAD** <https://tnuni.sk/univerzita/organy-univerzity/disciplinarna-komisia/>

and draws consequences according to the seriousness of the offense.

- *procedures applicable to students with special needs,*

The procedures applicable to students with special needs are listed on the TnUAD Support Centre website <http://cp.tnuni.sk/index.php/pomoc-od-centra/koordinator-pre-studentov-so-specifickymi-potrebami>.

Due to the fact that the training workplace does not have its own Coordinator for students with special needs, students can turn to the university-wide coordinator if necessary. The contact is listed on the TnUAD Support Centre website TnUAD <http://cp.tnuni.sk/index.php/kontakt> as well as on the FunGlass website <https://www.funglass.eu/study-programs/doctoral-study/> in the part „Personnel of the study program“.

- *procedures for filing complaints and appeals by students.*

Student can submit his/her complaints and appeals to the Committee for the internal evaluation TnUAD, while the rules for submitting complaints are described in Rules for the internal system of quality assurance and evaluation of higher education, creative activities and other related activities at TnUAD in Trenčín <https://tnuni.sk/univerzita/organy-univerzity/rada-pre-vnutorne-hodnotenie-tnuad/>

The submission of complaints and appeals by the student is also regulated by the TnUAD Study Regulations. <https://tnuni.sk/studenti/studijny-poriadok/>

#### 5. Course information sheets of the study programme

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

Information sheets of the subjects of the study program Inorganic Technologies and Non-Metallic Materials in the full-time study are listed on the FunGlass website in the part “Information letters”

<https://www.funglass.eu/study-programs/doctoral-study/>, as well as in the information system AIS and [Study Plan](#)

#### 6. Current academic year plan and current schedule (or hyperlink).

The schedule of the academic year 2022/2023 for new and continuing students is given at

[https://www.funglass.eu/wp-content/uploads/2022/08/FunGlass\\_schedule-new-and-continuing-students\\_2022\\_2023.pdf](https://www.funglass.eu/wp-content/uploads/2022/08/FunGlass_schedule-new-and-continuing-students_2022_2023.pdf)

The schedule of the academic year 2022/2023 for last year students is given at:

[https://www.funglass.eu/wp-content/uploads/2022/08/FunGlass\\_schedule-new-and-continuing-students\\_2022\\_2023.pdf](https://www.funglass.eu/wp-content/uploads/2022/08/FunGlass_schedule-new-and-continuing-students_2022_2023.pdf)

#### 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. Ing. Dušan Galusek, DrSc., director of FunGlass, [dusan.galusek@tnuni.sk](mailto:dusan.galusek@tnuni.sk), phone 032-7400590

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).

The list of persons providing profile subjects of the study program with assignment to the subject with a link to the central Register of University Employees and with the relevant contacts is given in the **Study Plan** of the Study program.

[Study Plan](#)

Persons providing profile subjects of the study program are marked with a **bold** in the Study Plan. The list is published also on the FunGlass website <https://www.funglass.eu/study-programs/doctoral-study/> in the part “Personnel of the study program – List of persons providing the profile subjects”.



- c) Reference to the research/art/teacher profiles of persons responsible for the profile courses of the study programme.  
References to the research/art/teacher profiles of persons responsible for the profile courses of the Study program are uploaded on: [VUPCH ucitelia zabezpečujúci profilové predmety](#)
- 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).  
The list of teachers of the study program with assignment to the subject, indication of contacts and links to the central register of university employees is given in the **Study Plan**.  
[Study Plan](#)  
At the same time, the names of the teachers of the study program are listed on the FunGlass website <https://www.funglass.eu/study-programs/doctoral-study/> in the section "Personnel of the study program".
- e) List of the supervisors of final theses with the assignment to topics (indicating the contact details).  
The list of supervisors of final theses with assignment to topics and with contacts is available in the Academic Information System (AIS) TnUAD.

| Supervisor                                  | Contact                 | Topics of the final theses   |
|---|-------------------------|--|
| <b>prof. Ing. Dušan Galusek, DrSc.</b>      | dusan.galusek@tnuni.sk  | Polymer Composites with Incorporated Mesoporous Bioactive Glass and Magnetic Nanoparticles as Enhanced Multifunctional Platforms for Biomedical Applications |
|   |                         | Mesoporous Bioactive Glass Nanoparticles for Drug Delivery Applications  |
|   |                         | Bioactive Scaffolds from Pre-ceramic Polymers  |
|   |                         | Incorporation of Borate Bioactive Glasses into Soft Matrices for Wound Healing Applications  |
|   |                         | Corrosion protection of Al alloys by using integrated self-healing systems   |
|   |                         | Advanced materials with eutectic microstructure for high temperature and functional applications   |
|   |                         | High entropy oxide ceramics by pressure-assisted sintering of multi-component rare-earth oxide based glasses   |
|   |                         | Multimethod approach to understanding the mechanical properties of optical thin films on glass   |
|   |                         | Polymer derived ceramic coatings for high temperature corrosion protection of metals   |
|   |                         | Corrosion of Zirconia-based dental ceramics  |
|   |                         | Transparent polycrystalline ceramic materials  |
| <b>Dr.h.c.prof. Ing. Marek Liška, DrSc.</b> | marek.liska@tnuni.sk    | Kinetika a termodynamika korózie sklenených izolačných materiálov v kvapalných médiách   |
|   |                         | Korózia izolačných materiálov a tlaková strata na filtračných elementoch bezpečnostných systémov chladenia aktívnej zóny reaktora JE                         |
|   |                         | Štruktúra a vybrané fyzikálne vlastnosti fosforečnanových skiel  |
|   |                         | Štruktúra a vlastnosti oxidových skiel s obsahom oxidov chrómu   |
|   |                         | Termodynamické modely a viskozita kremičitanových skiel  |
|   |                         | Effect of gamma radiation on the structure and properties of glass fibrous insulation used in nuclear power plants   |
| <b>doc. Ing. Róbert Klement, PhD.</b>       | robert.klement@tnuni.sk | Co-Doping of Photoluminescent Active Species in Core-Shell Structure. Synthesis & Energy Transfer Effects  |
|   |                         | Transparent Nano-Glass-Ceramics for Up-and Down-Conversion   |
|   |                         | Novel oxysulfides for NIR mechanoluminescence and biomechanical imaging  |

|   |                              |   |
|---|------------------------------|---|
|   |                              | Spectrofluorochemical study of luminescence switches immobilised on inorganic substrates and nanoparticles  |
|   |                              | Štruktúra a spektrálne vlastnosti sklokeramických materiálov na báze binárnych aluminátov prvkov vzácnych zemín   |
|   |                              | Korózia prírodných a syntetických biomateriálov v kyslých médiách a jej vplyv na mechanické vlastnosti  |
|   |                              | Nové sklené a sklokeramické luminiscenčné materiály na báze hlinitanov vzácnych zemín pre aplikácie v LED diódach vyžarujúcich biele svetlo                                   |
| <b>Ing. Dagmar Galusková, PhD</b>               | dagmar.galuskova@tnuni.sk    | Tailoring the dissolution kinetics of mesoporous ion-doped bioactive glasses under different conditions for drug delivery applications  |
|   |                              | Identification and determination of cations in apatite phases formed under the conditions of in vitro bioactivity tests   |
| <b>doc. Ing. Mária Chromčíková, PhD.</b>        | maria.chromcikova@tnuni.sk   | Structure and properties of bioactive glasses doped with ions with potential therapeutic and antibacterial effects  |
|   |                              | Study of surface morphology and characterization of corrosive products of industrially produced glasses   |
|   |                              | Structure and properties of glass with the composition close glass fibre insulation used in nuclear power plants  |
| <b>doc. José Joaquín Velázquez García, PhD.</b> | jose.velazquez@tnuni.sk      | Multifunctional sol-gel glass coatings for different applications   |
| <b>Ing. Jozef Kraxner, PhD.</b>                 | jozef.kraxner@tnuni.sk       | Second Life of Waste Glasses, Application of Glass Microspheres in Advanced 3D Glass Structures   |
|   |                              | Geopolymer-like materials from engineered mixtures of inorganic waste   |
|   |                              | Characterization, functionalization and improvement of glasses for pharma   |
| <b>Ing. Anna Prnová, PhD.</b>                   | anna.prnova@tnuni.sk         | Preparation and study of selected mechanical and optical properties of glass-ceramics materials in the Al <sub>2</sub> O <sub>3</sub> -RE <sub>2</sub> O <sub>3</sub> system. |
| <b>doc. Amirhossein Pakseresht, PhD.</b>        | amir.pakseresht@tnuni.sk     | Microstructural study and thermal shock behaviour of thermal barrier coating reinforced with YSZ fibre  |
|   |                              | Surface modification of NiTi alloy by coating silicon-hydroxyapatite composite layers intended for biomedical applications  |
| <b>Ing. Monika Micháľková, PhD</b>              | monika.michalkova@tnuni.sk   | Translucent luminescent glass-ceramic materials sintered in viscous flow  |
| <b>Ing. Martin Michálek, PhD</b>                | martin.michalek@tnuni.sk     | Development of multifunctional nanodevices based on silica and magnetic nanoparticles for theranostic applications.   |
|   |                              | Advanced manufacturing of 3D scaffolds using solid, hollow and mesoporous bioactive glass microspheres  |
| <b>Ing. Milan Parchovianský, PhD.</b>           | milan.parchoviansky@tnuni.sk | Development of corrosion resistant polymer derived ceramic coatings on stainless steel substrates   |

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

Reference to the research/art/teacher profiles of the supervisors of final theses are on:

[2022 VUPCH](#)

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

Work group of the Committee for Quality Evaluation of TnUAD in study field 16. Chemical Engineering and Technologies:

- **Mgr. Martina Vitázková**, [martina.vitazkova@tnuni.sk](mailto:martina.vitazkova@tnuni.sk)

Committee for study program „Inorganic Technologies and Non-metallic Materials“ in doctoral degree:

- **Bruno Wolfrum, MSc.**, [bruno.wolfrum@tnuni.sk](mailto:bruno.wolfrum@tnuni.sk)

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

Mgr. Daniela Vavrová, [daniela.vavrova@tnuni.sk](mailto:daniela.vavrova@tnuni.sk)

Information about the consultation schedule as well as other information is published on the FunGlass website <https://www.funlass.eu/study-programs/doctoral-study/> in the "Personnel of the study program" section.

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

**Study advisor**

Mgr. Daniela Vavrová, [daniela.vavrova@tnuni.sk](mailto:daniela.vavrova@tnuni.sk)

**Accommodation department**

<https://tnuni.sk/studenti/ubytovanie/>

**Mobilities**

[https://erasmus.tnuni.sk/index.php?id=185&no\\_cache=1](https://erasmus.tnuni.sk/index.php?id=185&no_cache=1)

**Social department**

<https://tnuni.sk/studenti/stipendia-a-pozicky/>

**Specific needs of students**

<http://cp.tnuni.sk/>

**Library**

<http://kniznica.tnuni.sk/>

**Career counselling for students**

Ing. Andrea Chrastinová Kalinayová, PhD.,

[andrea.chrastinova@tnuni.sk](mailto:andrea.chrastinova@tnuni.sk)

**Residence permits for foreign students**

Marcela Brodová, [marcela.brodova@tnuni.sk](mailto:marcela.brodova@tnuni.sk)

All necessary contacts are also listed on the FunGlass website- "Personnel of the study program"

<https://www.funlass.eu/study-programs/doctoral-study/>

## 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

The training workplace has laboratories that are equipped with state-of-the-art experimental technology, enabling research in the field of development, preparation and characterization of advanced glass and ceramic materials in a quality corresponding to European and world standards. All facilities are available after appropriate training to those doctoral students who use them in solving their dissertation project.

Information regarding spatial, material and technical equipment of the study program is listed on the FunGlass website <https://www.funlass.eu/study-programs/doctoral-study/> as well as <https://www.funlass.eu/equipment/>

- 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.).

- Information resources available at the TnUAD University Library (<https://katalog.kniznica.tnuni.sk/opac>)

- Electronic information sources and access to databases through the TnUAD University Library portal (<http://kniznica.tnuni.sk/index.php?id=371>)

- Book literature provided by tutors and teachers of individual subjects in individual agreement with the student.

The university and student laboratories are equipped with standard computer technology and the necessary software. Examples of specialized SW equipment include software for thermodynamic calculations containing an extensive database of thermodynamic quantities FACT, software for spectrum analysis Solo Mia, software for analysis of X-ray diffraction data HighScorePlus with PDF4 database, software for analysis of chemical analysis results ICP Experts and ICP MS MassHunter, SW for analysis of results of thermal analyses NETZSCH Proteus 6 and TA Instruments Universal Analysis 2000, SW AZTEC for analysis of results of EBSD measurements, SW INCA for analysis of EDS and WDS spectra, SW Wire ver. 5.3 for evaluation of Raman spectra, SW SPECTRA Plus for evaluation of chemical analyses on XRF, SW Cary Win for analysis and evaluation of UV-vis NIR spectra, SW FluorEssence for measurement of steady state spectra also with built-in module for calculation of colour coordinates of emitted light as well as quantum yield, module for fitting curves measured by TCSPC excited state quenching technique SW DAS 6, etc.

- 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.

The scope of distance learning for the combined education method is indicated in the Study Plan. [Study Plan](#)

- d) The procedure for transitioning to distance learning is stated in Article 15 of the Organizational Directive for the Organization of Doctoral Studies at the Alexander Dubček University of Trenčín in Trenčín

<https://www.funlass.eu/study-programs/doctoral-study/> in the section „Documents“

and also in the article 16 of the Study regulations : <https://tnuni.sk/studenti/studijny-poriadok/>

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

| Partners   | The nature of the cooperation   |
|--|---|
| Institute of Inorganic Chemistry SAS                       | External educational institution: provides the scientific part of TnUAD doctoral students' studies on jointly announced topics.               |
| Institute of Materials Research SAS                        | Cooperation in scientific research activities of doctoral students.   |
| Università degli Studi di Padova, Italy                    | Joint education of doctoral students, visiting workplace for doctoral students' mobility, signed contract for the award of double degrees.    |
| Universita Autonoma de Madrid, Spain                       | Joint education of doctoral students, visiting workplace for doctoral students' mobility, signed contract for the award of double degrees.    |
| Friedrich Alexander Universität Erlangen-Nürnberg, Germany | Joint education of doctoral students, visiting workplace for doctoral students' mobility, signed contract for the award of double degrees.    |
| Friedrich Schiller Universität Jena, Germany               | Joint education of doctoral students, visiting workplace for doctoral students' mobility.   |
| INSA Lyon, France  | Visiting workplace for doctoral students' mobility.   |
| CEITEC BUT Brno, Czech Republic                            | Cooperation in scientific research activities of doctoral students.   |
| University of Pardubice, Czech Republic                    | Cooperation in scientific research activities of doctoral students.   |
| VŠChT Praha, Czech Republic                                | Cooperation in scientific research activities of doctoral students.   |
| RONA, a.s. Lednické Rovne                                  | Cooperation in scientific research activities of doctoral students, arranging excursions, cooperation in defining dissertation theses topics. |

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

All students have the following opportunities for social, sports, cultural, spiritual and social activities:

- Gym,
- University Pastoral Centre, <https://tnuni.sk/univerzita/univerzitne-pracoviska/univerzitne-pastoracne-centrum-sv-andreja-svorada-a-benedikta-pri-trencianskej-univerzite-alexandra-dubceka-v-trencine/>,
- Astronomical observatory, <http://hvezdaren.tnuni.sk/>,
- Student radio TrenchTown, <http://radio.tnuni.sk/>,
- Student centre, <https://www.facebook.com/%C5%A0tudentsk%C3%A9-centrum-Tren%C4%8Dianskej-univerzity-1722165551387862/>

g) 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 participation of students in the study program in mobilities and internships are described in detail in the section "**Possibilities and procedures of participation in the student mobility**" of this Description of the study program.

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

a) Required abilities and necessary admission requirements.

The basic prerequisite, the fulfilment of which is necessary for admission to the study, is the completion of the second degree of university study, namely in the field of study Chemical Engineering and Technology (Chemical Engineering, Chemical Technology, Inorganic Technology and Materials, Organic Technology and Fuel Technology, Macromolecular Substances Technology, Chemistry and environmental technology), or in the fields of study Chemistry (chemistry, inorganic chemistry, organic chemistry, analytical chemistry, physical chemistry, macromolecular chemistry, theoretical and computer chemistry, biochemistry), Physics (physics, chemical physics, condensed matter physics and acoustics, biophysics) or Engineering (materials). The applicant must demonstrate skills for independent scientific work and must have an active knowledge of English. As part of the admission procedure for doctoral studies, an entrance examination will take place. The content of the entrance exam for doctoral studies is to check the applicant's knowledge of the issue, which is the content of the dissertation selected by the applicant from the proposals published topics of doctoral dissertations. The required skills and prerequisites for admission to the study are updated on an ad hoc basis, and after the approval of the AS TnUAD, the current wording is published in

<https://www.funlass.eu/study-programs/doctoral-study/> as well as on the Higher Education portal <https://www.portalvs.sk/en/studijny-program/anorganicke-technologie-a-nekovove-materialy1#details-conditions>

b) Admission procedures.

The applicant is admitted to study on the basis of the results of the entrance examination, which is transparent and objective. The entrance exam takes place in the form of an oral interview, at which the admissions committee examines the applicant's knowledge of the issue, which is the content of the dissertation topic selected by the applicant from the proposals published topics of doctoral dissertations. The admissions committee will evaluate the result of the entrance exam in a closed session. If several candidates apply for the entrance examination on one published topic, the admissions committee will determine the order of their success. For joint topics with partner institutions with which TnUAD has signed double degree agreements, an authorized representative of the partner institution will also take part in the entrance examination. The decision on admission / non-admission to the study is sent to the applicant in writing no later than 30 days after the entrance examination. Admission conditions for foreign applicants are the same as admission conditions for students from the Slovak Republic. In the case of applicants from abroad, it is possible to take the entrance exam online.

Current valid admission procedures are available on the University Portal

<https://www.portalvs.sk/en/studijny-program/anorganicke-technologie-a-nekovove-materialy1#details-conditions> as well as on the FunGlass website <https://www.funlass.eu/study-programs/doctoral-study/>.

The detailed admission procedure is described in the Organizational Guidelines for the Organization of Doctoral Studies at the Alexander Dubček University of Trenčín in Trenčín <https://www.funlass.eu/study-programs/doctoral-study/> in the section „Documents“.

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

The evaluation of the results of the admission procedure for the last period is given in the Regular Evaluation Report on the admission procedure at TnUAD / faculty / CUP published on [CUP FunGlass- Pravidelná hodnotiacá správa o prijímacom konaní](#)

**10. Feedback on the quality of provided education**

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

Procedures for monitoring and evaluating students' opinions on the quality of the study program are defined by 2-U-013 Rules for the internal system of quality assurance and evaluation of higher education, creative activity and other related activities at TnUAD in Trenčín <https://tnuni.sk/univerzita/organy-univerzity/rada-pre-vnutorne-hodnotenie-tnuad/>

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

The results of students feedback and related measures to improve the quality of the study program are published at [CUP FunGlass- Pravidelná hodnotiacá správa garanta](#) as well as on FunGlass website [https://www.funlass.eu/accreditation-documents/committee-for-study-program/Opinion\\_of\\_the\\_relevant\\_involved\\_subjects-students](https://www.funlass.eu/accreditation-documents/committee-for-study-program/Opinion_of_the_relevant_involved_subjects-students)

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

The results of graduates feedback and related measures to improve the quality of the study program are published at:

[https://www.funlass.eu/accreditation-documents/committee-for-study-program/Opinion\\_of\\_the\\_relevant\\_involved\\_subjects-graduates](https://www.funlass.eu/accreditation-documents/committee-for-study-program/Opinion_of_the_relevant_involved_subjects-graduates)

**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.).**

**Accommodation** <https://tnuni.sk/studenti/ubytovanie/>

**Fees Directives** <https://tnuni.sk/studenti/skolne-a-poplatky/>

**Student cards** <https://tnuni.sk/studenti/studentske-preukazy/studentske-preukazy/oznamy/>

**Scholarships and loans** <https://tnuni.sk/studenti/stipendia-a-pozicky/>

**Support Centre** <http://cp.tnuni.sk/>

**Student Organizations** <https://tnuni.sk/studenti/studentske-organizacie/iaeste-slovakia/>

**Alumni Portal** <https://www.funlass.eu/alumni/>