BRNO UNIVERSITY OF TECHNOLOGY
Faculty of Information Technology

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DIRECTIVE OF THE DEAN OF
THE FACULTY OF INFORMATION TECHNOLOGY NO. 6/2022:

RULES OF THE ADMISSION PROCEDURE AND CONDITIONS OF ADMISSION FOR STUDY IN A MASTER'S DEGREE PROGRAMME FOR THE ACADEMIC YEAR 2023/2024

Article 1
Subject of the directive

1. These rules govern the conditions of admission for study in Master's degree programmes implemented by the Faculty of Information Technology at Brno University of Technology (hereinafter referred to only as the "Faculty") for the academic year 2023/2024 in accordance with Act No. 111/1998 Coll., on Higher Education Institutions and on amendment and supplementation of certain other Acts (the Higher Education Act) as amended (hereinafter referred to only as the "Act") and the Statutes of Brno University of Technology (hereinafter referred to only as the "Statutes").

2. For the academic year 2023/24, the Faculty will be opening a Master's degree programme in Czech in Information technology and artificial intelligence (N0619A140001) with the specialisations Application development (NADE), Bioinformatics and biocomputing (NBIO), Cyber-physical systems (NCPS), Embedded systems (NEMB), Computer graphics and interaction (NGRI), High performance computing (NHPC), Intelligent devices (NIDE), Information systems and databases (NISD), Intelligent systems (NISY), Machine learning (NMAL), Mathematical methods (NMAT), Computer networks (NNET), Cybersecurity (NSEC), Software engineering (NSEN), Sound, speech and natural language processing (NSPE), Software verification and testing (NVER) and Computer vision (NVIZ).

3. In the academic year 2023/24, a Master's degree programme in English will be opened entitled Master of Information Technology (N0613A140038), which is not subdivided into specialisations.

4. Study programmes allow only full-time study.

5. The Dean manages the course of the admission procedure. For this purpose, he/she appoints an Admissions Committee headed by a chairperson, who is usually the Vice-Dean for Educational Activities in Master's Studies.

Article 2
Conditions of admission

1. A basic condition of admission for study in a Master's degree programme is, in accordance with Section 48(1) of the Act, that the applicant has obtained a university degree.

2. Another condition of admission for study is meeting of the prerequisites for studying in the study programme in question, as defined in Section 49(1) of the Act. This condition is verified by an entrance examination. The need for the applicant to take the entrance examination may be waived.

Article 3
Waiving of the need to take the entrance examination

1. The entrance examination may be waived at the applicant's request on the basis of documented previous outstanding results (professional or academic). The application must be accompanied by:
   a. assessment of all completed courses (or a Diploma Supplement),
   b. a professional CV.

2. The applicant must apply for waiving of the entrance examination in writing or electronically and provide the necessary documents by 5 May 2023.

3. The Dean will decide on waiving of the entrance examination on the basis of proposal by the Admissions Committee and will notify the applicant of this decision.

4. The applicant will be notified whether the application for waiving of the entrance examination has been granted within a period of one month before the date of the entrance examination, this being by e-mail sent to the e-mail address provided in the e-application. At the same time, this notification will be made available in the e-application.

5. Active students in the Bachelor's degree programme at the FIT whose weighted average of results from the compulsory courses completed so far in this programme does not exceed the threshold announced by the Dean's decision for the given year do not need to submit this application and the entrance examination is waived for them on the basis of a duly submitted application.

Article 4
Maximum number of accepted applicants

In total, a maximum of 300 applicants can be accepted for each study programme.

Article 5
Deadline for submission of applications for study

1. An application for study may be submitted **from 1 January 2023 until 15 April 2023.**

Article 6
Application for study

1. The admission procedure is initiated for the applicant by delivery of the application to the Faculty by the specified deadline.

2. Applications for study are submitted electronically.

3. The applicant is also obliged, at the latest before the decision on admission for study is issued, to submit an officially certified copy of a document proving completion of a course of higher education or a document pursuant to Section 48(5) of the Act or a simple copy of the diploma if the applicant is a graduate of Brno University of Technology. If the diploma or the document referred to in Section 48(5) of the Act is not delivered by the deadline for enrolment in a given

academic year, the applicant cannot be admitted for study and the admission procedure will be terminated.

4. The fee for acts relating to the admission procedure for the academic year 2023/2024, according to Decision No. 5/2022 of the Rector of Brno University of Technology, amounts to:

   - **CZK 700.00** for each submitted study application when paying in the Czech Republic to the account of Brno University of Technology number 117729823/0300, name of bank Československá obchodní banka, a.s., IBAN: CZ5603000000000117729823, BIC CEKOCZPP, name of account: Vysoké učení technické v Brně.
   - **€ 30.00** for each submitted study application when paying in all other countries except the Czech Republic to the account of Brno University of Technology number 1017476763/0300, name of bank Československá obchodní banka, a.s., IBAN: CZ0403000000001017476763, SWIFT (BIC) CEKOCZPP, name of account: Vysoké učení technické v Brně.

   The bank details will also be displayed on the website of Brno University of Technology after submission of the electronic application. The fee must be paid no later than **15 April 2023**. If the applicant fails to pay this fee by the deadline, the admission procedure will be terminated.

5. The fee for acts relating to the assessment of foreign education within the framework of the admission procedure for the academic year 2023/2024, according to Decision No. 3/2022 of the Rector of the Rector of Brno University of Technology, amounts to:

   - **CZK 750.00** for each submitted application for assessment of foreign education when paying in the Czech Republic to the account of Brno University of Technology number 117729823/0300 name of bank Československá obchodní banka, a.s., IBAN: CZ5603000000000117729823, BIC CEKOCZPP, name of account: Vysoké učení technické v Brně,
   - **€ 32.00** for each submitted application for assessment of foreign education when paying in all other countries except the Czech Republic to the account of Brno University of Technology number 1017476763/0300, name of bank Československá obchodní banka, a.s., IBAN: CZ0403000000001017476763, SWIFT (BIC) CEKOCZPP, name of account: Vysoké učení technické v Brně.

   The bank details will also be displayed on the website of Brno University of Technology after submission of the electronic application. If the fee for acts relating to the assessment of foreign education is not paid, the Faculty will not perform assessment pursuant to Section 48(5)(c) of the Act. In such a case, the applicant is obliged to prove the condition of his/her prior education in accordance with Section 48(5)(a) or (b) of the Act, otherwise the Faculty will terminate the admission procedure.

6. The fee is deemed to have been paid at the moment of crediting of the fee to the account. The fee is non-refundable.

7. If the application exhibits any defects, the Faculty will invite the applicant to remedy them. If the applicant fails to remedy these defects in the application within the prescribed time limit or if he/she fails to pay the admission fee in the prescribed manner, the Faculty will terminate the admission procedure. The applicant must be informed of this consequence.

8. Conditions of study for foreigners in Czech are given in Article 30 of the Statutes.

Article 7
Entrance examination

1. The entrance examination is taken in writing in Czech by applicants for enrolment in the study programme and verifies their knowledge at the level of the Bachelor's degree programme in Information Technology. Its content is defined by the subject areas listed in Appendix 1. In the event that objective external circumstances, e.g. decisions of state authorities, do not allow the

entrance examination to be conducted in person, the Dean may waive the requirement for applicants so sit the entrance examination.

2. For applicants for study in the programme conducted in English, the entrance examination takes the form of an interview, which may be conducted by electronic means via videoconference. Before the interview, the applicant must send his/her CV, an evaluation of the courses taken in the Bachelor's degree programme relevant to the field of information technology, a cover letter for study in the Information Technology study programme at the FIT at Brno University of Technology and an example of one IT project which he/she has implemented himself/herself.

3. The Dean appoints the chairpersons and members of the examination committees. Article 27(5) of the Statutes governs management of documentation relating to the entrance examination and other facts relevant to admission for study.

4. The written entrance examination will be held for applications submitted pursuant to Article 5(1) for the study programme in Czech on 9 June 2023.

5. Applicants will be invited to attend at least one month before the actual examination. The invitation will state the place, date and time of the examination. The invitation is sent electronically to the e-mail address provided in the e-application. At the same time, the invitation is made available to the applicant in his/her e-application.

6. If a candidate fails to turn up for the entrance examination without an excuse or if his/her excuse is not accepted, the admission procedure is terminated.

7. The admission examination may only be taken on an alternative date for serious and documented medical or other comparable reasons. In the event that a candidate is unable to attend the examination for serious reasons, he/she must excuse himself/herself in writing before the date of the entrance examination or no later than five working days after the date of the examination with statement of this reason sent to the Dean via the Study Department. The Dean will decide whether to accept this excuse and hold the examination on an alternative date. The Dean's decision is final and the candidate will receive electronic notification of this sent to the e-mail address provided in the e-application. This is also made available to the applicant in the e-application. The alternative date of the entrance examination is set as 25 August 2023.

8. Those applicants who have successfully passed the entrance examination and have gained a place in accordance with Art. 4 may be accepted for study.

Article 8
Acceptance for study

1. Applicants for course of study who have been exempted from taking the entrance examination are deemed to have been admitted. Others are ranked in descending order of their scores.

2. The Admissions Committee will draw up a proposal for the admission of applicants. Applicants with an entrance examination score equal to or higher than the admission threshold will be proposed for admission. This threshold will be set by the Dean subject to proposal by the Admissions Committee. In addition to this, all applicants who have the same score on the waiting list as the last admitted applicant will be proposed for admission. The proposal will become valid after approval by the Dean.

3. The decision on admission or non-admission for study will be delivered to the applicant within 30 days of verification of the conditions of admission for study (Section 50(4) of the Act). If the applicant does not accept the decision on admission sent to him/her, it will be published on the official notice board, the date of publication being the date of its delivery. The decision on admission includes a statement of reasons and indication of the possibility to request review of

the decision. If the applicant has agreed in his/her application to receive the decision on admission for study via the IS of Brno University of Technology, the decision will be delivered to the applicant in this manner.

4. Appeal may be lodged against the decision within 30 days of its notification. The appeal procedure consists of review of the entrance examination documentation by an independent appeal committee appointed by the Dean. The committee will only recommend that the application be granted if it finds an error in the evaluation and the corrected evaluation reaches the value required for admission. On the basis of positive recommendation of the committee, the Dean will grant the applicant's application and change the original decision on admission, otherwise he/she will refer the decision to the Rector in accordance with Section 50(8) of the Act.

Article 9
Final provisions

1. The applicant has the right to view his/her file from the date of notification of the decision during the office hours of the Study Department.

2. These rules were approved in accordance with Section 27(1)(e) of the Act by the Academic Senate of the Faculty of Information Technology on 22 November 2022. These rules become valid on the date of their approval. These rules become effective on the date on which they become valid.

Prof. Dr. Ing. Pavel Zemčík, dr. h. c.   Ing. Radek Kočí, Ph.D.
Dean of FIT VUT   Chair of AS FIT VUT

Appendix 1

Thematic areas for the entrance examination for the Master's degree programme in Information technology and artificial intelligence implemented by the Faculty of Information Technology at Brno University of Technology for the Academic Year 2023/2024

1. Principle of operation of semiconductor components (diode, bipolar and unipolar transistor in switching mode, implementation of NAND and NOR logic elements in CMOS technology).
2. Combinational logic circuits (multiplexer, demultiplexer, encoder, decoder, binary adder).
3. Sequential logic circuits (flip-flop circuits, counters, registers, state machines - representation and implementation).
4. Hierarchy of memory in a computer (memory types and principles, locality principle, fast buffer organisation).
5. Embedded systems (microcontroller, peripherals, interfaces, converters).
6. Principles of control and connection of peripheral devices (interrupts, program operation, direct memory access, bus).
7. Computer operating principles (chained instruction processing, RISC, CISC).
8. Minimisation of logical expressions (algebraic methods, Karnaugh map, Quine McCluskey).
9. Representation of numbers and basic binary arithmetic operations in a computer (complementary codes, addition, subtraction, multiplication, fixed and floating point, IEEE 754 standard).
10. FPGA technology (internal structure, LUTs), design steps for applications using FPGAs and basics of synthesisable hardware description (structural and behavioural description of circuits).
11. 2D vector graphics: methods of rasterisation of segments and polygons, representation of objects using Bézier curves.
12. Transformation and display of 3D polygonal models, principles of the programmable rendering chain.
13. Principles of graphical user interfaces (communication channels, communication modes, event-driven systems, standard interface elements).
14. Spectral analysis of continuous and discrete signals.
15. Digital filters (differential equation, impulse response, transfer function, frequency response)).
16. Sets, sessions and views.
17. Differential and integral calculus of functions of one or more variables.
18. Numeral systems and conversions between them.
19. Boolean algebras.
20. Regular languages and their models (finite automata, regular expressions).
21. Context-free languages and their models (pushdown automata, context-free grammars).
22. Structure of a translator and characteristics of translation phases (lexical analysis, deterministic syntactic analysis and code generation).
23. Numerical methods (direct and iterative methods for solving systems of linear equations, numerical solution of algebraic and ordinary differential equations, interpolation and approximation of functions).
24. Problem solving (state space search, decomposition into subtasks, gaming methods).
25. Machine learning (learning with a teacher, learning without a teacher, reinforcement learning).

26. Principles of modelling and simulation of systems (systems, models, simulations, simulation control algorithms).
27. Data and control structures of imperative programming languages.
28. Searching and sorting.
29. Mathematical probability (basic concepts, distribution of probability, generation of pseudorandom numbers).
30. Evaluating the complexity of algorithms (memory and time complexity, asymptotic time complexity, determining time complexity).
31. Software life cycle (characteristics of stages and basic models).
32. UML.
33. Conceptual modelling and relational database design.
34. Representation and storage of structured data, serialisation and deserialisation, relational data model, SQL.
35. File and memory management principles and structures.
36. Scheduling and synchronisation of processes, transactions.
37. Object orientation (basic concepts, class- and prototype-oriented languages, OO approach to software development).
38. Programming in symbolic instruction language (computer operation, machine language, symbolic language, assembler).
39. Application layer services (web, e-mail, DNS, IP telephony, SNMP management, Netflow).
40. TCP/IP communication (client-server model, TCP, UDP and IP protocols, TCP flow control and management).
41. Routing and security of traffic in computer networks (Link-State, Distance-Vector, encryption, authentication and data integrity algorithms)