**Heading**

| | |
|---|---|
| Passed by the FIT AS: | 19 November 2019 |
| Valid from: | the date of approval |
| Effective from: | the date of coming into force |
| Responsibility: | Vice-Dean for MSc. education |
| Number of pages: | 7 |
| Number of annexes: | 1 |

# GUIDELINE OF THE DEAN OF THE FIT No. 5/2019:

# ADMISSION PROCEDURE RULES AND CONDITIONS FOR ADMISSION OF STUDENTS IN THE FOLLOW-UP MASTER'S PROGRAMME AT THE FACULTY OF INFORMATION TECHNOLOGY OF BRNO UNIVERSITY OF TECHNOLOGY FOR THE ACADEMIC YEAR 2020/21

## Article 1
## General Provisions

(1) These *Admission Procedure Rules and Conditions for Admission of Students* (hereinafter the Rules) stipulate the rules for the admission procedure and conditions for admission of students in the follow-up Master's programme "Information Technology" at the Faculty of Information Technology (hereinafter "FIT") of Brno University of Technology (hereinafter "BUT").

(2) Admission of applicants for study at the FIT is governed by Act No. 111/1998 Coll., on higher education institutions, as amended (hereinafter the "Act"), the BUT Statute, the FIT Statutes and these Rules.

(3) The admission procedure is initiated by submitting an application for study.

(4) The course of the admission procedure is directed by the Dean. To this end, the Dean appoints the admission board headed by a chairperson, usually the Vice-Dean for MSc. education.

(5) For the academic year 2020/21, the faculty opens the follow-up Master's degree programme Information Technology and Artificial Intelligence (N0619A140001) in the Czech language comprising of the following fields of study: Application Development (NADE), Bioinformatics and Biocomputing (NBIO), Cyberphysical 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 (NMAL), Computer Networks (NNET), Cybersecurity (NSEC), Software Engineering (NSEN), Sound, Speech and Natural Language Processing (NSPE), Software Verification and Testing (NVER) and Computer Vision (NVIZ).

(6) The Computer Graphics and Multimedia (1802T011) field of study of the follow-up Master's degree programme Information Technology (N2646) will be opened as a part of the English-language study programme in academic year 2020/21.

## Article 2
## Application for Study

(1) An application for study may be submitted either in hard copy of electronically.

(2) Applications in hard copy shall be sent to the following address:

Study Affairs Department
FIT BUT
Božetěchova 2
612 66 Brno
Czech Republic

(3) Applications in electronic form shall be submitted through the BUT Information System (BUT IS) at the following URL:

(4) The application must be properly completed and include in particular the following requisities:

- Programme number
- Programme name
- Programme type: Master's
- Studies: full-time (distance and combined forms of study will not be opened)
- The name of the study field is to be entered in the "*Field of study*" box.
- Furthemore, the applicant must make an honest disclosure in the box "*Previous studies at higher-education institutions*".
- If the applicant already studies at a higher-education institutiion, s/he shall provide details in an annex to the application.

(5) Application shall be submitted by 15 April 2019. In justified cases, the Dean may allow submission of the application at a later date. In this case, the application shall be submitted in hard copy.

(6) The administrative fee for the admission procedure is set out in Annex 1 to **Rector's Decision No. 5/2017**. When submitting the application in hard copy, the applicant shall remit or deposit a fee of **CZK 650** into the FIT BUT's bank account No. **27-8684040287/0100**, indicating his/her **birth identification number** (without the forward slash) as the variable symbol (VS), **0308** as the constant symbol (KS) and **14005** as the specific symbol (SS).

(7) When submitting the application in electronic form, the applicant shall pay the fee according to the instructions contained in the electronic application.

(8) The fee must be paid by 15 April 2020. If the applicant fails to pay the fee by the set deadline, the admission procedure will be discontinued.

(9) The fee is non-refundable.

(10) Only one application may be submitted the study programme.

## Article 3
## Conditions for Admission of Students

(1) Pursuant to Section 48 (1) of the Act, proper completion of studies at a higher-education institution (completion of at least a Bachelor's degree programme) is a prerequisite for admission into a Master's degree programme. The application shall demonstrate compliance with this prerequisite by submitting an authenticated copy of the university diploma or a document pursuant to Section 48 (5) of the Act upon the admission examination or enrolment. If the copy of the diploma is not delivered by the end of the enrolment period in the relevant academic year, the applicant cannot be admitted for study and the admission procedure will be discontinued.

(2) The admission procedure for a study programme includes the admission examination; the admission is conditional on sucessfully passing of the admission examination or waiver of the same (see Article 4 (2)).

(3) No medical certificate is required for admission.

## Article 4
## Admission Examination

(1) The admission procedure for admission to the follow-up programme includes the admission examination. The admission examination is written for applicants for a Czech-language programme and it tests knowledge corresponding to the Information Technology Bachelor's degree programme. The contents of the examination are defined by the topics specified in Annex 1.

(2) The admission examination for applicants for an English-language programme takes the form of an interview that may be conducted by electronic means using a video conference. Before the interview, the applicant must send his/her curriculum vitae, evaluation of courses relevant for the field of information technology completed in a Bachelor's degree programme, motivation letter for study in the Information Technology programme at FIT BUT and one specific IT project independently developed by the applicant.

(3) The applicant may apply for waiver of the admission procedure on the basis of previously achieved and documented excellent professional or learning outcomes. The application must be submitted in electronic form or in writing by **4 May 2020**. The application must be accompanied by the following:

- evaluation of all completed courses (or Diploma Supplement);
- professional curriculum vitae

Students of the Bachelor's degree programme B2646 at the FIT whose weighted average of the results from the compulsory courses of this programme completed to date does not exceed the limit announced in the Dean's decision for the relevant year need not submit the application and the admission examination will be waived for them on the basis of a properly submitted application.

The Dean decides on waiver of the admission examination on the basis of the admission board's proposal and will notify the applicant of the decision not later than one month before the date of the admission examination.

(4) The chairpersons and members of the examination boards are appointed by the Dean. The manner of keeping documents on the admission examinations and other facts decisive for admission are governed by Article 27 (5) of the BUT Statutes.

(5) The scoring of the written admission examination will be published within two business days of the examination.

(6) The written admission examination will take place on 5 June 2020. Only properly registered applicants will be invited to the admission examination. Applicants will be invited through a registered letter or electronically via IS BUT, not later than 1 month before the date of examination. The invitation will specify the place, date and time of the examination.

(7) An excuse from the admission examination must be delivered in writing not later than 3 days after the date of examination. The excuse will be assessed by the Dean and the excused applicant shall take the examination at a substitute date. The substitute date of the written examination is 28 August 2020. If the applicant fails to appear for the admission examination without an excuse or if his/her excuse is not accepted, the admission procedure will be discontinued.

## Article 5
## Decision on Admission

(1) Applicants whose admission examination has been waived and who complied with the condition under Article 3 (1) will be admitted. Others will be ranked in a decreasing order according to the score achieved.

(2) The admission board will prepare a proposal for adoption of the applicants. Applicants will be proposed for admission if their score in the admission examination is equal to or higher than the set limit for admission. The aforementioned limit will be determined by the Dean on the admission board's proposal. All applicants with score equal to the last admitted applicant in the scoring list will also be proposed for admission. The proposal will become valid after being approved by the Dean.

(3) The decision o admission or non-admission will be delivered to the applicant in writing into the applicant's own hands within 30 days of verification of compliance with the conditions for admission to studies (Section 50 (4) of the Act). If the applicant fails to take over the decision on admission sent to him/her, the decision will be published on the official notice board, where the date of publication is considered to be the date of delivery. The decision on admission includes reasoning and advice on the possibility to apply for review.

(4) If the applicant indicated in the application form his/her consent that the decision on admission for study will be delivered through the IS BUT, the decision will be delivered to the applicant via the IS BUT.

## Article *6*
## Appeals Procedure

(1) The applicant may peruse the materials relevant for the decision on admission for studies on Monday 7 July 2020 from 1:00 p.m. to 2:00 p.m. at the Student Affairs Department of the FIT.

(2) Applicants who were notified of non-acceptance to the faculty may appeal against the decision pursuant to Section 50 (6) of the Act. The appeal shall be submitted to the Dean within 30 days of the date of delivery of the decision.

(3) The appeals procedure consists in review of the admission examination documents by an independent appeals board appointed by the Dean. The board will recommend that the appeal be satisfied only if the board establishes an error in the evaluation and the correct score reaches the limit required for admission.

(4) Following a positive recommendation of the board, the Dean will satisfy the applicant's appeal and reverse the original decision on non-admission; otherwise, the Dean will forward the recommendation to the rector for a decision pursuant to Section 50 (8) of the Act.

## Article 7
## Admission Procedure for Foreigners

(1) The conditions for studies of foreigners are identical to those of applicants who were citizens of the Czech Republic.

## Article 8
## Final Provisions

(1) These Rules were approved by the Academic Senate of the Faculty of Information Technology of Brno University of Technology on 19 November 2020.

(2) These Rules come into force as of the date of their approval.

(3) These Rules come into effect on the date of coming into force.

prof. Dr. Ing. Pavel Zemčík
Dean of the FIT BUT

Ing. Radek Kočí, Ph.D.
Chair of the FIT BUT Academic Senate

## Annex 1

Topics for the admission examination to the follow-up Master's degree programme "Information Technology" at the FIT BUTfor the Academic Year 2020/21:

1. Working principle of semiconductor elements (diode, bipolar and unipolar transistor in switching mode, application of NAND and NOR logic gates in CMOS technology).
2. Combinational logic circuits (multiplexer, demultiplexer, coder, decoder, adder).
3. Sequential logic circuits (flip-flops, counters, registers, state machines – representations and implementations).
4. Computer memory hierarchy (types and principles of memories, principle of locality, cache organisation, etc.).
5. Embedded systems (microcontroller, peripherals, inferfaces, converters).
6. Principles of control and connection of peripherals (interruption, programmed input/output, direct memory access, bus).
7. Working principles of a computer (pipelining, RISC, CISC).
8. Minimalisation of logic expressions (algebraic methods, Karnaugh map, Quine McCluskey).
9. Representation of numbers and basic binary arithmetic operations in computer (two's complements, adding, subtraction, multiplication, fixed- and floating-point arithmetic, IEEE 754 standard).
10. VHDL principles (entitiy, architecture, process, examples of combinational and sequential circuits).
11. Methods of rasterization of 2D vector objects: line segments, circles and curves.
12. Transformation, representation and displaying of 3D objects.
13. Principles of graphic user interfaces (communcation channels, communication modes, event-driven systems, standard interface elements).
14. Spectral analysis of continuous and discrete signals.
15. Digital filters (differential equations, impulse response, transmission function, frequency characterstics).
16. Sets, relations and morphism.
17. Differentiation and integration of functions involving multiple variables.
18. Numerical systems and conversions between them.
19. Boolean algebras.
20. Regular languages and their models (finite state machines, regular expressions).
21. Context-free languages and their models (pushdown automatons, context-free grammars).
22. Translator structure and characteristics of translation stages (lexical analysis, deterministic parsing and code generation).
23. Numerical methods and mathematical probability (numerical solution of algebraic and ordinary differential equations, probability distribution, pseudorandom number generation).
24. Task solving (state space search, breakdown into subtasks, gameplay methods).

25. Principle of modelling and simulation of systems (systems, models, simulations, simulation control algorithms).
26. Data and management structures.
27. Search and classification.
28. Html and Javascript (from the viewpoints of website design).
29. Evaluation of complexity of algorithms (memory and time complexity, asymptotic time complexity, determining time complexity).
30. Software lifecycle (characteristics of stages and basic models).
31. UML.
32. Conceptual modelling and relational database design.
33. Relational data model and SQL.
34. Principles and structures of file and memory management.
35. Planning and synchronisation of processes, transactions.
36. Object orientation (basic concepts, class- and prototype-based languages, OO approach to software design).
37. Programming in the assembly language (the working of a computer, machine learning, symbolic language, assembler).
38. Application layer services (e-mail, DNS, IP telephony, SNMP administration, Netflow).
39. TCP/IP communications (client-server model, TCP, UDP and IP protocols, TCP flow control and administration).
40. Directing and filtering Internet data (Link-state and Distance-vector algorithms, RIP, OSPF, packet classification and filtering, firewalls, quality of services).