MCI®
INNSBRUCK | AUSTRIA

Additional Exams

Information & sample questions

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1 Admission requirements for bachelor's degree programs

The academic admission requirement for a bachelor's degree program is a general university entrance qualification (e.g. (z.B. Matura, einschlägige Studienberechtigungsprüfung, Berufsreifeprüfung).

Individuals without a general university entrance qualification but who have a relevant professional qualification (e.g. apprenticeship, master craftsman's certificate, deutsche Fachhochschulreife, etc.) may be admitted to a degree program if they pass the "additional exams".

2 Additional Exams

The content and level of the additional exams are based on the examination subjects of the Austrian university entrance qualification examination.

2.1 Overview

Below you will find an overview of the additional exams to be taken in the individual degree programs:

Course of studies	German	English	Mathematics
Business Administration Online (English)		x	x
Business & Management (English)		x	x
Business Administration Online	x	x	x
Biotechnology & Food Engineering	x	x	x
Digital Business & Software Engineering	x	x	x
Management, Communication & IT	x	x	x
Management & Law	x	x	x
Mechatronics	x	x	x
Medical, Health & Sport Engineering	x	x	x
Social, Health & Public Management	x	x	x
Smart Building Technologies	x	x	x
Social Work	x	x	x
Entrepreneurship, Tourism & Leisure Business	x	x	x
Environmental, Process & Energy Engineering	x	x	x
Business & Management	x	x	x
Industrial Engineering & Management	x	x	x

The additional exam in Mathematics is generally taken in German. For non-German-speaking students the exam can be taken in English. In this case, please clarify with the study program in advance.

2.2 Examination content

The following is a brief overview of the subject areas and possible examination content:

2.2.1 German

Essay on a general topic (German)

2.2.2 English

The additional exam in English corresponds to the level B2 according to the European Framework of Reference for Languages. Qualifications are described as follows:

- Can understand the main points of complex texts on both concrete and abstract topics; can also understand technical discussions in their field of specialization.
- Can communicate spontaneously and fluently, so that a normal conversation with native speakers is possible without much effort on either side.
- Can express themselves clearly and in detail on a wide range of topics, explain a point of view on a current issue and indicate the advantages and disadvantages of various options.

2.2.3 Mathematics

The additional exam in Mathematics consists of questions on basic mathematical concepts, based on the standardized qualification-oriented Austrian university entrance examination in mathematics. The basic mathematics skills test essentially covers:

- Numbers and measures (e.g. sets of numbers,...)
- Algebra and geometry (e.g. system of linear equations, quadratic equation, right triangle,...)
- Functional relations (including polynomial functions, trigonometric functions, exponential function, logarithm,...)
- Analysis (including derivation, curve sketching,...)
- Probability and statistics (e.g. tree diagram, complementary probability, location parameter, measure of dispersion, box plot,...)

Further information on qualification requirements can be found at www.matura.gv.at.

Recommended literature mathematics:

https://openstax.org/books/precalculus-2e/pages/1-introduction-to-functions

https://www.ggverlag.at/produktkatalog/kompetent-aufsteigen-mathematik-8-zentralmatura-2020/

https://www.amazon.de/Durchstarten-Zentralmatura-Neubearbeitung-Mathematik-%C3%9Cbungsbuch/dp/3710133246

3 Exam mode of additional exams

Place of examination	On site at MCI. The exact exam location will be announced in due time.
Examination dates / attendance	In accordance with the University of Applied Sciences Act (FHG), the additional exams must be successfully completed before entering the second year of study. To this end, MCI offers three examination dates during the first year of study: **October | March | June** (the specific dates will be communicated in due time). At each examination date, all outstanding exams in the respective subject must be taken; it is not possible to take partial exams. Failure to pass one or more exam subjects within these three dates will result in expulsion from the degree program.
Duration	60 minutes per subject with 30-minute break in-between exams. 08:00 – 09:00 a.m. | German 09:30 – 10:30 a.m. | English 11:00 – 12:00 a.m. | Mathematics
Registration and fees	A fee of EUR 30,- is charged per exam and subject. Students will receive a payment request for this purpose. The payment confirmation serves as registration for the additional exams. Failure to pay the fees on time will result in the loss of the examination date/attempt.
Permitted aids	All necessary tools are provided by MCI. For mathematics, the Texas Instruments TI-30Xa calculator will be used. Using your own tools is treated as cheating.
Important notes on the examination	You must bring a valid photo ID. The use of the Internet, a mobile phone, or other technical devices (smartwatches etc.) during the test is prohibited. Any paper used (also sheets from notepads) must be handed in. Everything that is not to be assessed (concept etc.) must be clearly crossed out.
Assessment	The exams in the individual subjects are graded on a scale of up to 100 points. A score of 50 points or higher is required to pass the exam in the respective subject. In the case of a negative assessment, the student may retake the exam up to two times within the predefined examination dates. If the exam is aborted prematurely without good cause by the candidate, it is considered not passed.
Credibility	Additional exams successfully completed at other recognized institutions may be credited (subject to verification of equivalence). Please contact the respective degree program for further information.

4 Sample tasks with comments

4.1 Additional Exam: German

4.1.1 Linear and dialectical discussions

Depending on the topic, the additional exam in German may involve a **linear or dialectical discussion**; in any case, it is a free discussion, i.e., it does not refer to any text. A linear discussion addresses an issue from only one side. Either only the advantages or only the disadvantages of a topic are discussed. A dialectical discussion addresses an issue from both sides. The topic is examined from both sides.

4.1.2 Structure and layout

The structure of a discussion follows the typical pattern: introduction, main body, conclusion.

4.1.3 Introduction

Unlike many other types of text, the introduction is more detailed, as it is intended to introduce the reader to the topic.

1. Introduction to the topic through
   a. a current event (politics, sports, culture, society, survey, discussion, etc.)
   b. a historical fact (a similar problem has occurred before)
   c. a personal introduction (own experience)
   d. a quote (reference to a statement by a person or a newspaper, etc.)
   e. a question (the question is placed at the beginning, thus leading directly into the topic)

2. This is followed by the question that must always be mentioned in the introduction: (e.g., What are the advantages and disadvantages of this new parenting style for the younger generation in terms of their work and private lives?)

3. This is followed by the transition to the main section with a classic sentence: (e.g., I would like to explore this question in more detail below; I would now like to examine this question in more detail below; In the following, I will examine this question in more detail.)

4.1.4 Main part

The main section contains the actual discussion of the topic with several (at least 3) arguments for and against.

There are two ways to list pros and cons:

1. All arguments from one side, then those from the other side:
   - all pro arguments,
   - then a brief transition to the counterarguments
   - and then all counterarguments or vice versa

2. Arguments for and against alternate:
   - For
   - Against
   - For
   - Against, etc.
   - or vice versa

The most important thing in a discussion is to have convincing arguments. They consist of:

- **Claim**
- **Reasoning**
- **Example (= proof = evidence)**

At least one sentence should be allocated for each of these three aspects. The arguments should also be listed in order of their impact. Save the best for last! (= hourglass method)

4.1.5 Concluding section

The conclusion leads to an insight derived from the pros and cons, which, depending on the task at hand, can lead to the following:

- Conclusion
- Own opinion (= statement)
- Solution
- Demand (= appeal)
- Suggestion
- Consequence
- Outlook (= forecast)

4.1.6 Recommended steps

1. Read the assignment and highlight the key terms.
2. Collect and organize the most important arguments using a list of pros and cons.
3. Plan your discussion using an outline:
   - Introduction: How will you introduce the topic?
   - Main section: Will you alternate arguments or present the pros first, then the cons, or vice versa? Structure your arguments using the hourglass method.
   - Conclusion: Which conclusions could result from the pros and cons? Which solution?
4. Write the discussion based on the outline (and possibly the material collection).
5. Proofread and revise if necessary.

4.1.7 Note

Linguistic accuracy (= spelling and grammar) and expression must be adequate for a positive assessment.

4.2 Additional Exam: English

4.2.1 General Information

The English Exam is an electronic test and comprises a writing exercise plus up to 6 different parts dealing with all or some of the following topics:

Part	Main Skill Focus	Response	How can you prepare?
1	Grammatical Accuracy ***…tests your ability to express yourself accurately***	Multiple Choice Test Matching	Any practice in the grammatical and structural aspects of the language
2	Vocabulary Section ***…tests your ability to recognize clear and concise expression.***	Multiple Choice Test	Expose yourself to a wide range of texts taken from all kinds of settings
3	Reading for gist and specific information ***…tests your ability to understand the substance and logical structure of a selection of texts.***	Multiple Choice True/False Statements	Expose yourself to a wide range of texts taken from all kinds of settings You are not expected to understand every word in the text, but you should be able to pick out salient points.
4	Writing ***…tests your ability to present an argument, to explain, describe and draw conclusions in writing***	e.g. stating opinion, agreeing/disagreeing, explaining… (medium may be letter, e-mail, memo, summary, short report..)	Familiarize yourself with a variety of text types. Learn how to structure texts

4.2.2 Example Part 1

1.	Heathrow, London, ...more international traffic than any other airport.			
	A handles	B is handling	C handle	D handling
2.	If you reduce the price, we..... your offer.			
	A accept	B would accept	C will accept	D would have accepted
3.	It is .....hot today.			
	A terrible	B terribly	C too terrible	D most terrible

4.2.3 Example Part 2a

Bill Bullen had always dreamed of going 1_____Europe on a bus. As a child, he had seen Cliff Richard's film *Summer Holiday*, in which Cliff and his friends travel through southern Europe on a red double-decker bus, and he 2_____ always wanted to do the same thing. In 1998 he decided to make his dream come true, and he bought a twenty-year old bus 3_____ had been fitted with a kitchen, toilet, and a CD player.

1	A up	B over	C round
2	A has	B had	C is
3	A whose	B who	C which

4.2.4 Example Part 2b

Match the following words and descriptions:

1 **innovative**

A modern	B new	C state-of-the-art

2 **consider**

A to think about	B to wonder	C to know

3 **qualification**

A ability	B requirement	C standard

4.2.5 Example Part 3

One aspect of business life which managers are unhappy with is the need to attend meetings. Research indicates that managers will spend between a third and half of their working lives in meetings. Although most managers would agree that it is hard to think of an alternative to meetings, as a means of considering information and making collective decisions, their length and frequency can cause problems with the workload of even the best-organised executives.

What do most managers think about meetings?

A. Meetings take up most of their working life.
B. Meetings allow them to monitor decision-making.
C. Meetings prevent them from establishing a routine.
D. Meetings are the only way they know of achieving certain objectives.

4.3 Additional Exam: Mathematics

4.3.1 General information

The exam comprises questions with the following answer formats, based on the standardized competence-oriented school-leaving exam:

- Open answer formats, i.e. the tasks can be processed in different ways depending on the task.
- Semi-open answer formats, i.e. the correct answer must be inserted into a given equation or function, etc.
- Multiple-choice answer formats, i.e. the answer options that apply to the corresponding question set must be ticked.
- Construction format, i.e. provided illustrations, diagrams, graphs, etc. must be supplemented by graphs, points, vectors, etc.

Exercise examples can be found at https://www.matura.gv.at

4.3.2 Mathematics sample problems

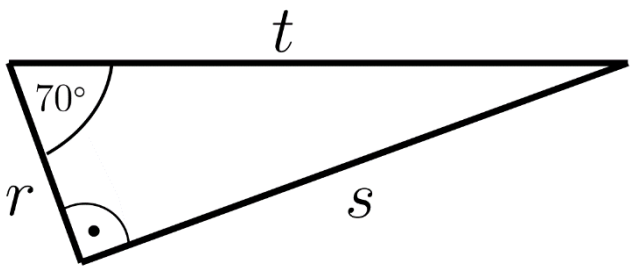
Task 1: Numbers and measures

For the two whole numbers a, b, with $a < 0$ and $b < 0$, $b = 2 \cdot a$ applies. Which of the following calculations always have a natural number as a result? Tick the correct answers.

- o $a + b$
- o $b : a$
- o $a : b$
- o $a \cdot b$
- o $b - a$

Task 2: Algebra and geometry

For the following triangle with the lengths r, s and t.



determine the relationship $\frac{r}{t}$.

Task 3: Functional dependencies

Driving school students learn the following formula to calculate the approximate stopping distance s. v is the speed of the vehicle (s in m, v in km/h).

$$s = \frac{v}{10} \cdot 3 + \left(\frac{v}{10}\right)^2$$

When driving attentively, the vehicle speed must be adapted to ensure the stopping distance does not exceed the sight distance. This ensures that the vehicle can stop in time and avoid hitting an object. "Sight distance" is the length of roadway which the driver is able to see. Calculate the maximum permissible speed at a sight distance of 25 m.

The function for the permissible speed is $v_{1,2} =$ _____ and the speed is ≈_____ km/h.

Task 4: Analysis

We have a given function $f: \mathbb{R} \to \mathbb{R}$ with $f(x) = 3 \cdot e^x$. The following statements describe properties of the function f or its derivative f'. Tick the correct statements.

- o There is a point $x \in \mathbb{R}$ with $f'(x) = 2$.
- o For all $x \in \mathbb{R}$, $f'(x) > f'(x + 1)$ applies.
- o For all $x \in \mathbb{R}$, $f'(x) = 3 \cdot f(x)$ applies.
- o There is a point $x \in \mathbb{R}$ with $f'(x) = 0$.
- o For all $x \in \mathbb{R}$, $f'(x) \geq 0$ applies.

Task 5: Stochastic processes

Pharmaceutical companies are required to indicate any known side effects of a medicine in the patient information leaflet. The frequency of any known side effects is indicated based on the following categories:

Label	**Frequency of side effects**
Very common	More than 1 in 10 patients experience side effects.
Common	Between 1 and 10 patients in 100 experience side effects.
Uncommon	Between 1 and 10 patients in 1,000 experience side effects.
Rare	Between 1 and 10 patients in 10,000 experience side effects.
Very rare	Fewer than 1 in 10,000 patients experience side effects.
Unknown	The probability of experiencing side effects cannot be determined due to the lack of relevant data.

In the patient information leaflet for a medicine, a specific side effect is categorized as "Rare". 50,000 patients are treated with the same medicine independently of one another. A specific number of patients experience the side effect in question.

Use the above frequencies as probabilities and determine the minimum number of patients expected to experience side effects.

4.3.3 Mathematics solutions

Solution 1: Numbers and measures

- o
- ✓ $b:a$
- o
- ✓ $a \cdot b$
- o

Solution 2: Algebra and geometry

$\frac{r}{t} = \cos 70° \approx 0.34$

Solution 3: Functional dependencies

The function for the permissible speed is described by $v_{1,2} = -15 \pm \sqrt{15^2 + 100 \cdot s}$ and the speed is ≈ 37.2 km/h.

Solution 4: Analysis

- ✓ There is a point $x \in \mathbb{R}$ with $f'(x) = 2$.
- o
- o
- o
- ✓ For all $x \in \mathbb{R}$, $f'(x) \geq 0$ applies.

Solution 5: Stochastic processes

$E(x) = n \cdot p = 50{,}000 \cdot \frac{1}{10{,}000} = 5$

Source: https://www.matura.gv.at