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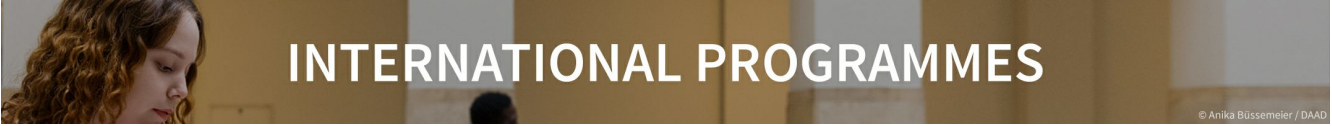
INTERNATIONAL PROGRAMMES

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Master's degree

Data Engineering and Analytics (MSc)
Technical University of Munich • Garching b. München

Overview

Degree	Master of Science in Data Engineering and Analytics
Teaching language	• English
Languages	You can complete the programme entirely in English.
Programme duration	4 semesters
Beginning	Winter and summer semester
Application deadline	Winter semester: 31 May Summer semester: 30 November
Tuition fees per semester in EUR	Varied
Additional information on tuition fees	Please refer to the following website for more information on tuition fees at TUM: https://www.tum.de/en/studies/fees/tuition.
Combined Master's degree / PhD programme	No
Joint degree / double degree programme	No
Description/content	Integrated research and degree programmes designed for the future: The**TUM School of Computation, Information and Technology (CIT)** at the Technical University of Munich (TUM) unites the disciplines of **Mathematics, Informatics, and Electrical and Computer Engineering**. Our research and teaching activities range from theoretical knowledge to its application, focussing across disciplines on the major challenges of our time, such as the digital transformation. At the same time, our expertise remains firmly embedded in our core disciplines. Handling and analysing very large amounts of data is an urgent problem in many areas of science and industry, one that requires novel approaches and techniques. The trend towards "big data" is caused by a host of developments: 1. The creation and storage of large data sets becomes feasible and economically viable, for example, due to price decreases in storage space, sensors, smart devices, social networks, and other factors. 2. Technical advances, for example, in multi-core systems and cloud computing, make it possible to examine data sets on a large scale. 3. Such amounts of data not only have their origin in the "classical" domains like business data, but are now created in many areas of life. Consider vehicles that create sensor data

and share information via intelligent networking, or consider data that is created by intelligent energy grids.

The Master's programme in Data Engineering and Analytics steps up to these developments and provides an education that on the one hand enables graduates to design and plan industry grade solutions in the area of Big Data and on the other hand creates a solid starting point for ventures into research.

The programme is divided into three areas of study: Data Analysis, Data Engineering and Data Engineering and Analytics:

- Data Analysis is concerned with the fundamentals of understanding and modelling data and the underlying relationships therein. It is also concerned with topics that require solid mathematical foundations, including the following: Fundamentals of Convex Optimisation, Computational Statistics, and more.
- Data Engineering consists of lectures about the construction of systems that perform efficient and scalable data processing, thus enabling methods of data analysis on large data sets. This area of study also contains lectures about distributed systems, distributed databases, query optimisation, database systems on modern CPU architectures, and high performance computing. The curriculum comprises mandatory courses on Data Analysis and Data Engineering.
- Data Engineering and Analytics offers lectures about machine learning, business analytics, computer vision, and scientific visualisation.

A Master's degree in Data Engineering and Analytics from TUM will enable you to work in executive positions in industry and will qualify you for a career in research (PhD).

More information here: https://www.cit.tum.de/en/cit/studies/degree-programs/master-data-engineering-and-analytics/

Course Details

Course organisation	The Master's programme in Data Engineering and Analytics is a two-year programme divided into four semesters. Although it has a strong focus on the management (acquiring, storing, retrieving, sharing, visualising) and analysis of very big data, it is nevertheless a quite flexible programme that allows you to structure your studies towards your preferred sub-areas of interest.
	You will attend lectures, practical courses, and seminars, and you will carry out research. The curriculum also includes aspects of the social and ethical impact of managing big data, both within the technical courses and also in specialised support electives.
	The Master's thesis is written in the fourth semester.
A Diploma supplement will be issued	Yes
International elements	- International guest lecturers - Language training provided - Training in intercultural skills
Integrated internships	Internships are not mandatory, but there are good possibilities during lecture-free periods.
Course-specific, integrated German language courses	Yes
Course-specific, integrated	No

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Costs / Funding

Tuition fees per semester in EUR	6,000 EUR
Additional information on tuition fees	Please refer to the following website for more information on tuition fees at TUM: https://www.tum.de/en/studies/fees/tuition.
Semester contribution	For more information, refer to: https://www.tum.de/en/studies/fees.
Costs of living	In order to cover personal expenses while studying in Munich, we recommend a budget of at least 900 EUR per month. Please refer to the following page for more information: https://www.studentenwerk-muenchen.de/en/international/international-students-in-munich/in-preparation/cost-of-living/.
Funding opportunities within the university	Yes
Description of the above-mentioned funding opportunities within the university	Many international students can have their fees waived or receive scholarships to finance them. You can find all information on waivers and scholarshipshere.

Requirements / Registration

Academic admission requirements	- Bachelor of Science in Informatics / Computer Science - Applicants must provide a statement of reasons for their programme choice and a scientific essay. - Applicants may be invited for a written test on campus. - GRE or Gate Test mandatory for applicants with a degree from Bangladesh, China, India, Iran, and Pakistan - Preliminary documentation from uni-assist for applicants who obtained their Bachelor's in a country outside of the EU/EEA For further information, see: https://www.cit.tum.de/en/cit/studies/degree-programs/master-data-engineering-and-analytics/.
Language requirements	All applicants must submit proof of sufficient English language skills. The accepted English certificates and ways to prove your English language skills can be found here: https://www.tum.de/en/studies/application/application-info-portal/admission-requirements/language-certificates Proof of German language skills is not needed for the application.
Application deadline	Winter semester: 31 May Summer semester: 30 November

| Submit application to | In order to apply at TUM, you need to open a TUMonline account: https://campus.tum.de/tumonline/webnav.ini. Our application wizard will guide you step by step through the online application procedure.

For more information, check:

https://www.tum.de/en/studies/application-and-acceptance/online-application/ |

Services

| Possibility of finding part-time employment | There are various job opportunities as teaching and research assistants at the university. Munich is also a very good place to find internships and jobs at software companies.

Please refer to the following page for more details: https://www.tum.de/en/studies/during-your-studies/living-and-working/jobs-and-internships. |
| Accommodation | It's not easy to find a place to live in Munich – but it's not impossible either! TUM does not own any student residences, but tries to support students and staff in their search for accommodation by providing personal advice, housing listings and useful information to ensure that you can find a place to call your own.

More information: https://www.tum.de/en/studies/during-your-studies/living-and-working/accommodations |
| Career advisory service | TUM has its own "Career Service", which offers application checks, career counselling and a mentoring programme. https://www.community.tum.de/en/career-service/

- Career service offered
- Support for business creation offered |
| Support for international students and doctoral candidates | - Welcome event
- Buddy programme
- Accompanying programme
- Specialist counselling
- Visa matters |

Contact

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🌐 Course website: https://www.cit.tum.de/en/cit/studies/degree-programs/master-data-engineering-and-analytics/

f https://de-de.facebook.com/TU.Muenchen

⬤ https://twitter.com/tu_muenchen

in https://www.linkedin.com/school/technische-universitat-munchen/

⬤ https://www.instagram.com/tu.muenchen/?hl=de

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International Programmes in Germany - Database

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