Degree Program at a Glance

Standard Duration of Study / Credits
4 semesters / 120 credits, full time
(+30 credits opt. Research Excellence Certificate)

Degree
Master of Science (M. Sc.)

Start
Winter Semester

Language of Instruction
English

Admission Requirements
Bachelor's Degree in Electrical Engineering, Computer Engineering, Computer Science, Bio-Medical Engineering, Psychology with an Engineering minor or a similar degree; proof of English proficiency; selection process

Costs per Semester

More Information
www.msne.ei.tum.de

Contact

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Master of Science
Department of Electrical and Computer Engineering
Neuroengineering
with optional Research Excellence Certificate
Objectives

The Master of Science in Neuroengineering (MSNE) program is a two-year high-level international graduate program offered by TUM and funded by the Elite Network of Bavaria.

It provides knowledge and skills, and broadens your mind, to envision and to create innovative neuro-inspired systems for an emerging interdisciplinary field that aims to translate findings in neuroscience to real-world practical engineering applications. The successful development of neuro-inspired technical approaches will lead to a new generation of smart systems which achieve complex functions in an efficient manner, and will simultaneously advance our understanding of neuroscience. Some of the main areas covered are:

- Neuroanatomy and Neurophysiology
- Computational Neuroscience
- Signal Processing and Dynamic System Modeling
- Mixed Signal Electronics
- Neuro-inspired Systems Engineering
- Ethics and Impact on Society

Recommended Prerequisites

Applicants must have excellent grades and a solid background in Electrical or Medical Engineering, Computer Science, Psychology with an engineering minor, or a related discipline. Interest in research-oriented study programs and projects is recommended.

Study Structure

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<thead>
<tr>
<th>1st Semester</th>
<th>Neuro-Recording Methods</th>
<th>Mixed Signal Electronics in Neuroengineering</th>
<th>Neuro-Anatomy and Neuro-Physiology</th>
<th>Computational Neuroscience</th>
<th>Elective (1)</th>
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<tr>
<td>Research Project (6 weeks)</td>
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<td>2nd Semester</td>
<td>Large-Scale Modeling and Large-Scale Data Analysis</td>
<td>Signal Processing &amp; Dynamic System Modeling</td>
<td>Statistics and Probability Theory</td>
<td>Literature Seminar, Scientific Debating, Colloquium 1</td>
<td>Elective (1)</td>
<td>Elective (1)</td>
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<td>Research Project (9 weeks)</td>
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<td>3rd Semester</td>
<td>Neuro-inspired Systems Engineering</td>
<td>Societal Impact, Ethics</td>
<td>Literature Seminar, Scientific Debating, Colloquium 2</td>
<td>Electives (2)</td>
<td>Elective (1)</td>
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<td>Neuroengineering Symposium</td>
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<td>4th Semester</td>
<td>Master’s Thesis</td>
<td>Elective (1)</td>
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Total ECTS (Master Program): 120
Total ECTS (Research Excellence Certificate): 30

Special Features

- Hands-on practicals in all mandatory modules with superior faculty-to-student ratio
- Mentor-approved elective modules
- Research-oriented Curriculum
- Membership in the Elite Network of Bavaria
- Optional Research Excellence Certificate

Students obtain an optional Research Excellence Certificate by taking additional elective courses, performing a second research project, and presenting the research projects at the Neuroengineering Symposium.

Occupational Profile

The MSNE program prepares you for future leadership positions in academia or research-oriented industry. Your intense exposure to ongoing research opens the possibility to work towards a doctorate (PhD) and to pursue an academic career.