Computational Science and Engineering (CSE)

A brief presentation

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What is Computational Science and Engineering?

Computational Science and Engineering

- multi-disciplinary field
- computer-based modelling and simulation
- studying scientific phenomena and engineering designs

Your skills

- computer science
- applied mathematics
- expert in respective application → target group not IN, but MSE (and others)!
About Computational Science and Engineering at TUM

International Master’s Program
• all lectures and material in English
• students with very international background
• Established in 2001 at TUM

Multi-disciplinary cooperation of seven faculties
• Informatics
• Mathematics
• Civil Engineering
• Mechanical Engineering
• Electrical Engineering
• Physics
• Chemistry
Curriculum Overview: Required Subjects

**Computer Science** (10+15ECTS)
- Advanced Programming
- Parallel Programming
- *Computer Architecture and Networks*
- *Visual Data Analytics*
- ...

**Applied Mathematics** (21ECTS)
- Numerical Analysis I + II
- Parallel Numerics

**Scientific Computing** (21ECTS)
- Scientific Computing I + II
- Scientific Computing Lab
- Seminar

**Master Thesis** (30ECTS)
- 6 months
- university or industry
Curriculum Overview: Elective Subjects

Methods and Applications (23ECTS)

- Computational Mechanics
- Computational Fluid Dynamics
- Mathematics in Bioscience
- Computational Physics
- Computational Electronics
- Computational Chemistry
- Algorithms in Scientific Computing
- Finite Elements
- High Performance Computing
- Computational Visualisation
Bavarian Graduate School of Computational Engineering

Honours program within the Elitenetzwerk Bayern Association of three master’s programs

• Computational Engineering (FAU)
• Computational Mechanics (TUM)
• Computational Science and Engineering (TUM)

“Do more - get more!” (+30ECTS)

• Block courses and summer/winter academies
• Extensive project work
• Soft skills

Not something new, but something additional

• concurrent to CSE study program
• application after first semester of CSE
Application – Eligibility

Modules in 5th and 6th semester Engineering Science MSE

• no required modules for CSE, but your transcript should match
• see MSE Mustercurricula\textsuperscript{1} for guidance
• see Teaching at SCCS \textsuperscript{2} for courses at our chair

Seminar and practical courses at Informatics (not only CSE)

• Pay attention about the deadlines! (see \url{http://docmatching.in.tum.de})
• often already kickoff events in the previous semester exist
• actually for winter kickoffs it is already too late, but you can still register via the matching tool (opened yesterday)
• good to practice programming (C++) and teamwork (version control)

\textsuperscript{1}\url{https://www.mse.tum.de/fileadmin/w00bvc/www/Studierende/Engineering_Science/Downloads/Curriculum/Mustercurriculum_V14_WiSe_20_21.pdf}
\textsuperscript{2}\url{https://www5.in.tum.de/wiki/index.php/Teaching}
Application – Formalities

Documents

• Language certificate (recommendation: English Thesis)
• no GRE required
• no VPD required
• some more documents, but better check our webpage, when it is time

Deadline

• CSE starts only in WS; no part-time possible
• Application opens on Jan 1st
• Application closes on May 31st
Application – EFV1&2

EFV1

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EFV2

- necessary, if $\geq 50$, but $< 70$ points
- answer open question from EFV1, often motivation or skills
Further information & facts

**Coordinators** (Chair of Scientific Computing, TUM)
- Tobias Neckel
- Benjamin Rüth
- Hayden Liu Weng
- Qunsheng Huang

**Application process**
- Currently approx. 450 applications per year
- 80 - 100 admissions per year
- 40 - 60 students starting each year

→ don’t be afraid!

**More information**
- CSE website: www.cse.tum.de
- BGCE website: www.bgce.de
- contact me: coordinators@cse.tum.de
It’s not only about studying!
Questions?