TUM Master‘s Days - Introduction to the Master‘s Program
Sustainable Resource Management

Dr. rer. nat. Eva Bauer

Team Student Advising

Campus Office Weihenstephan

TUM School of Life Sciences

Freising, 26 March 2025 (via Zoom)

Contact:

srm.co@ls.tum.de

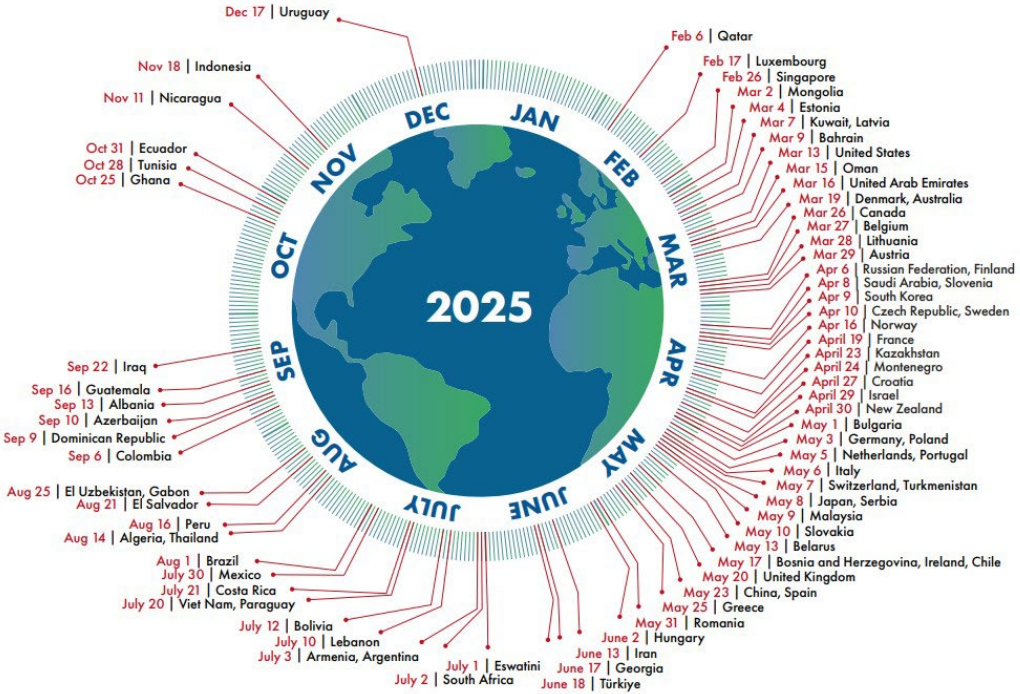
Phone: 08161 71-4464

Outline

- Introduction
- Degree program SRM – Key facts, purpose, target groups, structure, themes, career opportunities
- Application procedure – How do you apply? How does the aptitude assessment look like?
- Additional information - Tuition fees, studying abroad, accommodation / living
- Your questions

Country Overshoot Days 2025

When Earth Overshoot Day would land if all the people around the world lived like...



Every year, a **Country Overshoot Day** marks the date when the planet's annual biocapacity budget would be used up if everyone on Earth lived at the same level of consumption as the residents of that particular country.

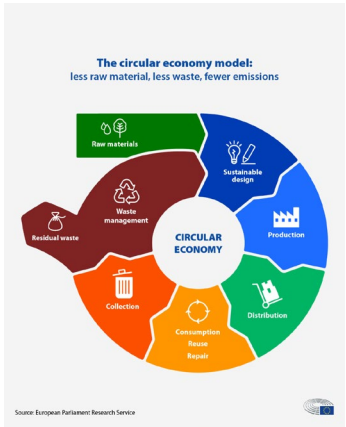
https://overshoot.footprintnetwork.org/newsroom/country-overshoot-days/

Our challenges

Current situation:
World‘s political and economic systems focus on efficiency of production and resource extraction → vulnerable and fragile resource management systems

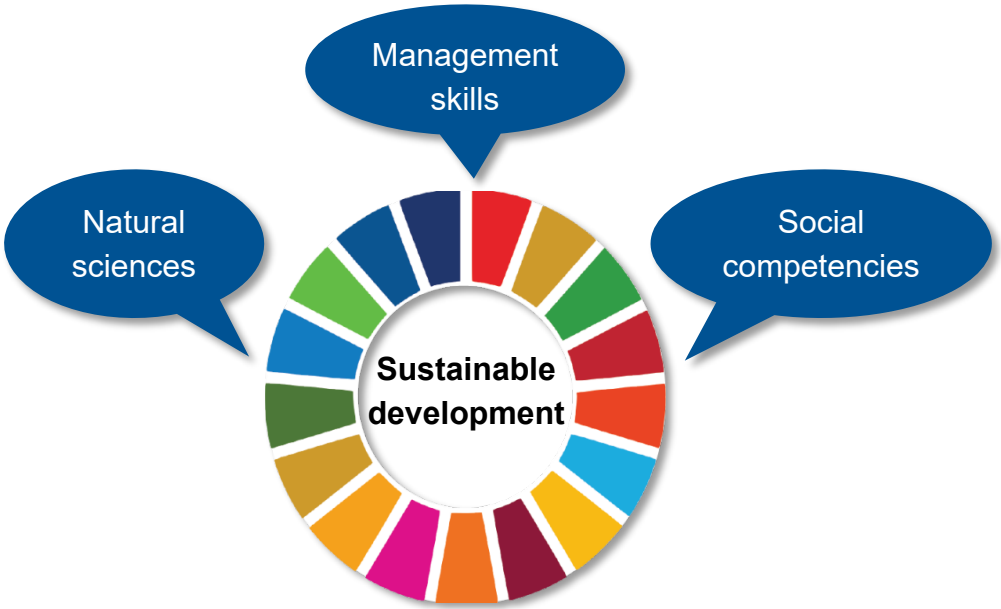
Consequences:
Among others: failure in agriculture, large-scale disturbances in temperate and tropical forests and ecosystems, food and energy insecurity, high price volatility

Need for:
Sustainable management of natural resources while simultaneously considering social, ecological, and economic aspects, building and reinforcing resilience into the resource systems



MSc. Sustainable Resource Management (SRM) at TUM

Concepts and techniques for sustainable management of natural resources



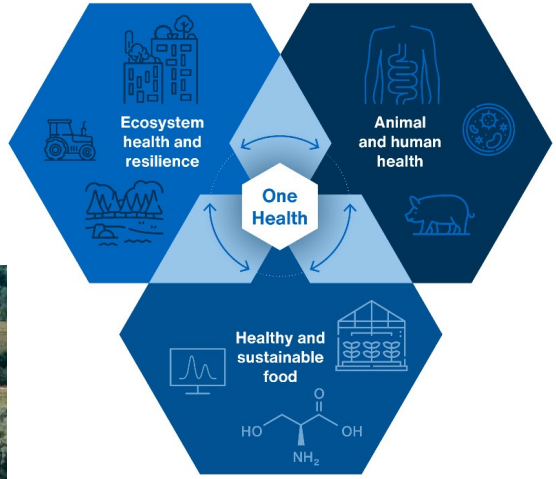
Master SRM – key facts

- Launched in 2001
- **Course duration:** 4 semesters / 2 years (120 ECTS), max. duration: 6 semesters
- **Master of Science** degree
- **Language of instruction:** English
- **Main location of courses:** TUM School of Life Sciences, Campus Weihenstephan (Freising)
  Depending on your individual choice, some courses may also be on the campuses in Garching or Munich.

- In 2006, SRM degree program became "*Official Project of the UN World Decade Education for Sustainable Development*"
- International program (~75% of students come from abroad, from over 100 countries so far)

Studying at TUM School of Life Sciences

Campus Weihenstephan in Freising, 30 km NNE of Munich



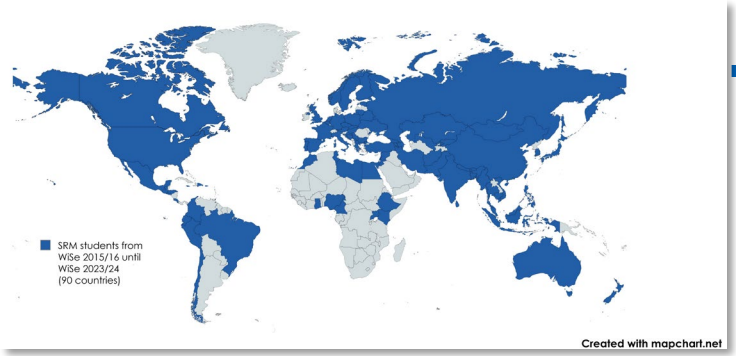
Master SRM – purpose of the degree program

- Prepares students from all over the world and from a wide range of disciplines for the diverse challenges of sustainable resource management.
- Provides profound knowledge of the various natural resources, but also comprehensive understanding of the system, extensive planning, and methodological skills.
- Gives students a modern vision of sustainable resource management based on the four pillars of ecology, socio-economics, production, and culture.
- Educates students to innovative and analytically-sharp thinking **sustainability generalists.**

✓ Graduates are able to develop comprehensive, scalable, and resilient solutions for sustainable management of our natural resources.

✓ Graduates are able to moderate between different groups of interest and their approaches to solutions.

Master SRM – target groups

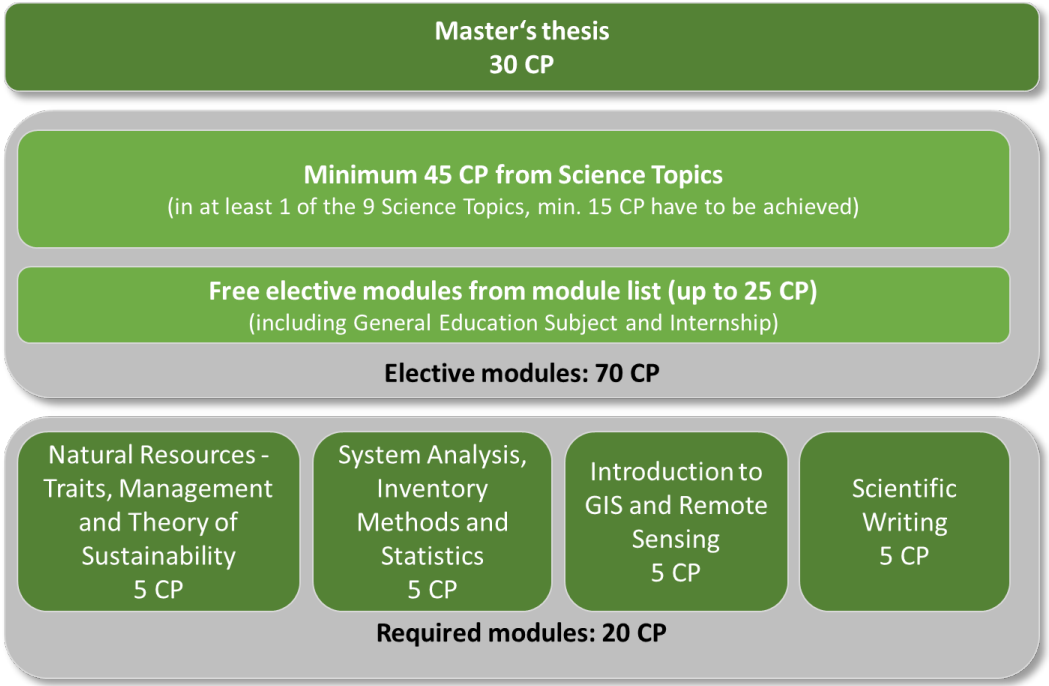


- Nationally / internationally qualified **students with scientific-technical or socio-scientific background**
- Students who want to deepen their competencies in the field of sustainable resource management
- Students who already have professional experience (optional)

Requirements:

- **Bachelor‘s degree in the fields of economics, engineering, natural, or social sciences**
- Excellent command of the English language
- Interest in the subject-specific areas (Science Topics) of the degree program
- Open-minded and able to think in a networked and analytical way
- Independent and solution-oriented way of working individually and in a team
- Good communication and presentation skills

Master SRM – degree program structure



In the 4th semester, you work on your **master's thesis**.

In the 2nd and 3rd semester, you choose **elective modules** according to your interests.

In the first semester, you have to take four **required (compulsory) modules** and you can choose two elective modules.

Master SRM – 9 Science Topics

16 754 Sustainable Resource Management (20241, Master's program, current)

Curriculum
Academic year 2024/25

Go to
Check for no overlaps
Display Refresh Show inact. nodes Course offer ch
View **Curriculum** Semester plan
Node filter **All** Exam date
Academic year 2024/25

Node filter-Name	Part of the Curriculum	rec. sem.	Credits
[20241] Sustainable Resource Management	Yes		120
Required Modules	Yes		20
Elective Modules	Yes		70
Science Topics	Yes		45
Climate, Air and Water	Yes		15
Economic and Political Dimensions of Sustainability	Yes		15
Landscape Management	Yes		15
Management and Protection of Forest Ecosystems	Yes		15
Material and Waste Management	Yes		15
Renewable Resources	Yes		15
Soils and Soil Management	Yes		15
Sustainable Agricultural Systems and Products	Yes		15
Wildlife and Protected Area Management	Yes		15
Free Elective Modules Sustainable Resource Management	Yes		25
Master's Thesis	Yes		30

For details on modules in curriculum see: Degree program website, scroll down to → module catalog

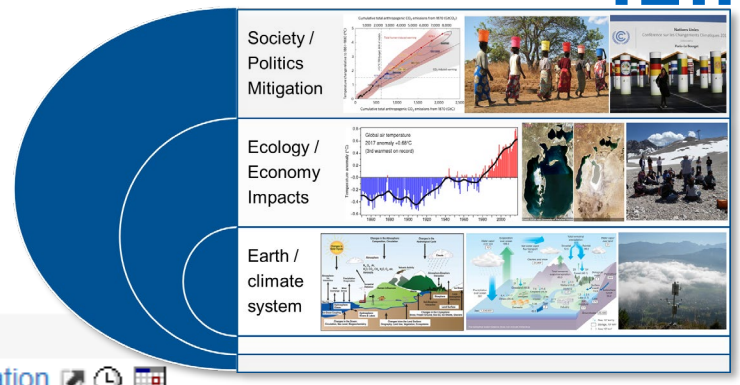
In each Science Topic: 4-7 modules

You need **≥ 45 credits from the Science Topics**.

In one of the Science Topics, you need ≥ 15 credits

→ Based on your previous qualification, you can build up and sharpen your personal professional profile.

Master SRM – Science Topics



Climate, Air and Water

- Climate, Air and Water
  - [VK] [WZ2730] Climate Change - Science, Impacts and Adaptation, Mitigation
  - [VK] [WZ2732] Environmental Monitoring and Data Analysis
  - [VK] [WZ2731] Hydrometeorology and Management of Water Resources
  - [VK] [WZ2722] Mountain Catchments under Changing Climate

- Importance of climate, water, and air in ecosystem management
- Main impacts of changing environmental conditions
- Analytical methods for quantitative and qualitative characterization of climate and water properties
- Concepts for sustainable land use in the water nexus and for climate protection

Pictures: A. Menzel

Master SRM – Science Topics

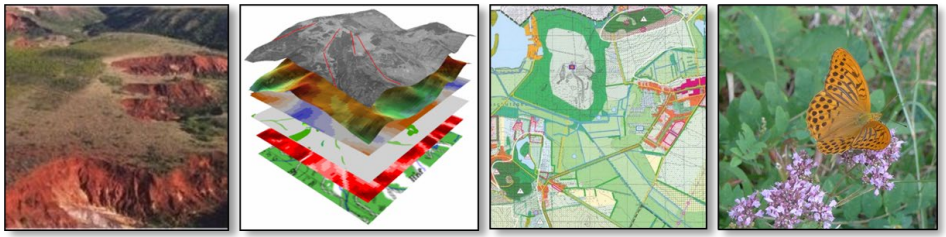
Economic and Political Dimensions of Sustainability

- Economic and Political Dimensions of Sustainability
  - [VK] [WZ2757] Advanced Environmental and Natural Resource Economics
  - [VK] [WZ1590] Climate Change Economics
  - [VK] [WI001228] Economics of Environmental and Climate Policy
  - [VK] [WI000286] Environmental and Natural Resource Economics
  - [VK] [WZ1822] Introduction to Economics and Business Ethics
  - [VK] [SOT86611] Sustainability Politics and Policy
  - [VK] [WZ2936] Sustainable and Environmental Regulations

- Introduction to economics with a focus on the environmental and welfare effects of economic activity
- Classical concepts of duty, consequentialism and management virtues in the context of corporate social responsibility and sustainable development
- Economic view of environmental and resource problems and policy options overcoming them

Picture: S. Wurster

Master SRM – Science Topics



Landscape Management

- Landscape Management
  - [VK] [WZ4094] Landscape Management - Application Study
  - [VK] [WZ2719] Landscape Planning
  - [VK] [WZ2737] Remote Sensing and Image Processing
  - [VK] [LS50026] Spatial Ecology

- Planning and implementation of measures for the development of landscape under the premise of sustainable development
- Survey, analysis, planning, and evaluation procedures, including use of graphical information systems
- Assessing the effects of interventions in the landscape, techniques for the limitation/elimination of damages

Master SRM – Science Topics

Management and Protection of Forest Ecosystems

- Management and Protection of Forest Ecosystems
  - [VK] [WZ2716] Forest Growth and Forest Operations
  - [VK] [WZ4161] Forest Management
  - [VK] [WZ2717] Genetic Resources Management and Forest Protection
  - [VK] [WZ4082] Plantation Forestry and Agroforestry

- Socio-political, economic, and ecological significance of forest ecosystems
- Basics of sustainable forest management
- Ecological interrelationships with significance for forest growth
- Sustainable use and protection of forest ecosystems
- Basic technical skills in the field of silvicultural planning, forest technology, and forest management planning

Pictures: Felbermeier/Benz

Master SRM – Science Topics

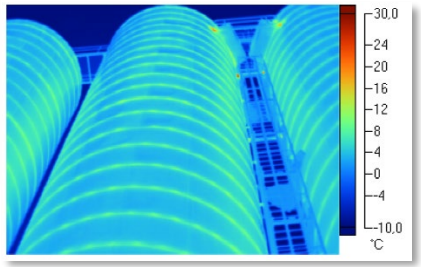
Material and Waste Management

- Material and Waste Management
  - [VK] [WZ2724] Emission Control in Land-Use and Animal Husbandry
  - [VK] [WZ4206] Material Flow Management and Applications
  - [VK] [ED160017] Sustainable Manufacturing
  - [VK] [WZ2723] Utilization and Treatment of Special Materials and Waste
  - [VK] [BGU38014] Water and Wastewater Treatment Engineering
  - [VK] [ED130092] Waste and Waste Water Treatment

- Goods, material, substance, and residue management
- Various methods of residual material disposal
- Methodological basics for systems analysis and determination of material and substance flows
- Concepts for resource and residual substance management, taking into account aspects of resource availability and environmental impact

Pictures: G. Weber-Blaschke

Master SRM – Science Topics



Renewable Resources

- Renewable Resources
  - [VK] [WIB14002] Advanced Seminar Life Sciences, Management & Policy: Sustainable Entrepreneurship - Theoretical Foundations
  - [VK] [WZ2721] Agriculture Raw Materials and their Utilization
  - [VK] [WZ4098] Forestry Raw Materials and their Utilization
  - [VK] [EI70860] Integration of Renewable Energies
  - [VK] [WZ4202] Political and Social Perspectives of Renewable Resources
  - [VK] [WZ2720] Renewable Energy Technologies

- Significance, potential, and possible applications of various renewable raw materials and regenerative energy sources
- Essential process steps of the different utilization lines with the respective (dis)advantages
- Assess potentials and risks with regard to the use of regenerative energy sources

Pictures: J.W. van de Kuilen

Master SRM – Science Topics

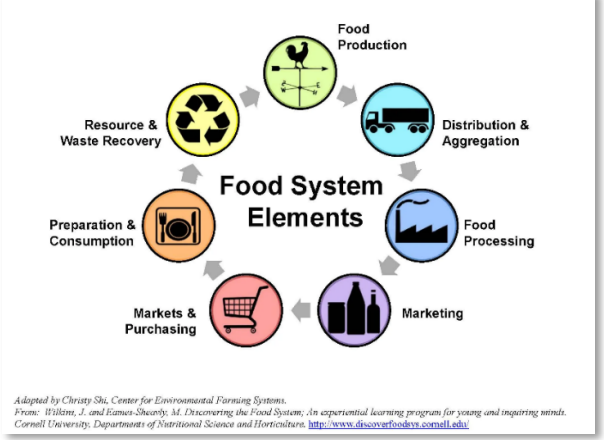
Soils and Soil Management

- Soils and Soil Management
  - [VK] [WZ2736] Analytical Characterization of Soil Resources
  - [VK] [WZ2733] Introduction to Soil Science
  - [VK] [WZ2734] Soil Protection
  - [VK] [WZ2735] World Soil Resources

- Understand the role of soils in terrestrial ecosystems
- Importance of soils in the global carbon cycle and climate change
- Physical, chemical, and biological properties of soils, their genesis, and potential of soil use
- Characterize soils in terms of their natural fertility and human-induced degradation

Pictures: P. Schad

Master SRM – Science Topics



Sustainable Agricultural Systems and Products

- Sustainable Agricultural Systems and Products
  - [VK] [LS10016] Environment, Agriculture and Food
  - [VK] [LS10021] Livestock Production and Global Grasslands
  - [VK] [MGT001412] Sustainability Assessment of Agri-Food Supply Chains
  - [VK] [WZ1561] Value Chain Economics
  - [VK] [MGT001344] Advanced Seminar Economics, Policy & Econometrics: Food Governance, Fairness and Sustainability Literature Review and Presentation Skills
  - [VK] [MGT001345] Advanced Seminar Economics, Policy & Econometrics: Food Governance, Fairness and Sustainability Scientific Writing and Exploratory Research Methods

- Economic, environmental, and societal aspects shaping modern agri-food systems
- Interdisciplinary studies analyzing value chain economics, global trends, challenges, and regulatory frameworks influencing agricultural markets
- Assess impacts of climate change, land use, and biodiversity conservation on agricultural practices worldwide
- Scrutinize livestock production and grassland management for their ecological, societal, and economic implications

Master SRM – Science Topics

Wildlife and Protected Area Management

- Wildlife and Protected Area Management
  - [VK] [WZ4189] Fisheries and Aquatic Conservation
  - [VK] [WZ4197] Protected Areas Biodiversity and Management
  - [VK] [WZ6432] Wildlife and Conservation Biology
  - [VK] [WZ4198] Wildlife Management and Wildlife-Human Interactions

- Learn about the importance of protected areas for nature conservation and environmental protection, and concepts for the sustainable use of these areas
- Understand the relevant ecological relationships and derive essential principles of sustainable wildlife and protected area management
- Acquire skills related to the protection and management of wildlife and their habitats
- Identify possible conflicts of interest and develop appropriate solution strategies

Pictures: R. Kühn

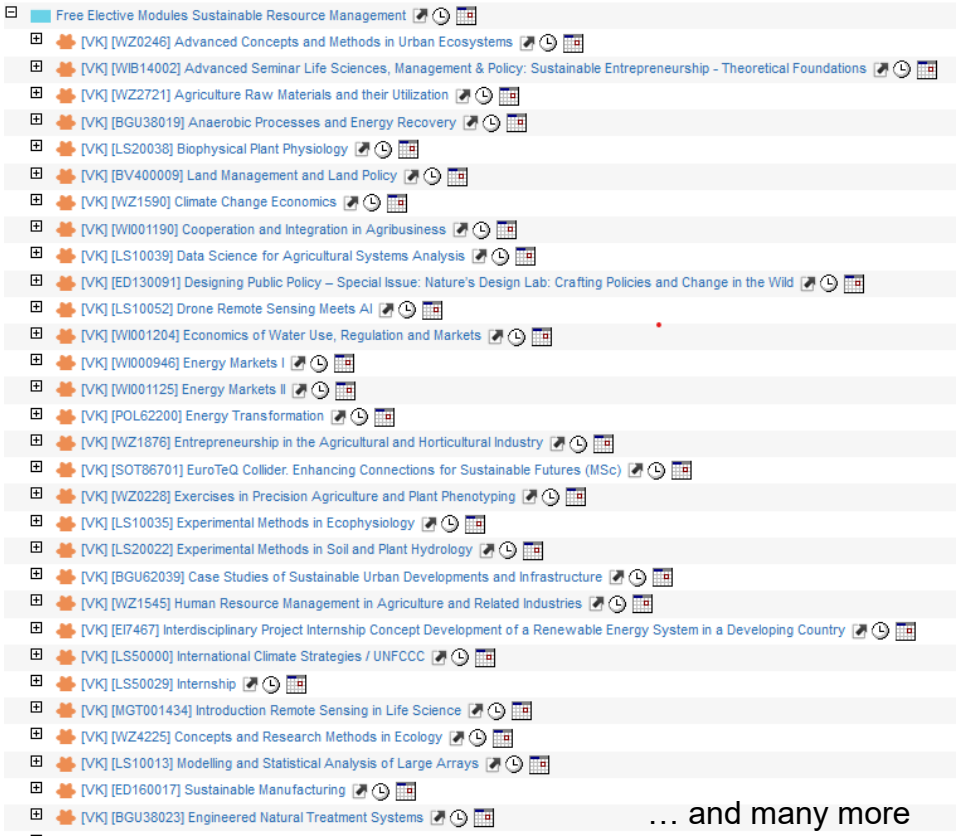
Master SRM – Free Electives

Up to 25 credit points (cp) possible in Free Electives.

Currently ~60 modules including:

- Internship (min. 7 weeks full-time, 10 cp)
- Transferable skills
  (max. 4 cp, e.g. language courses, soft skills)

On application:
Students can choose elective modules from TUM‘s overall range up to 30 cp in total (via individual approval by the Examination Board, if modules fit in the scope of the SRM program).



… and many more

Master SRM – sample curriculum

- High flexibility for your individual study plan
  (but: given the high number of modules offered, not every desired combination may be overlap-free)
- Mobility window can be in 2nd or 3rd semester
- Credits from studying abroad can be recognized (if master-level courses are in the scope of the SRM program)

For exchange options, see
https://www.international.tum.de/en/global/going-abroad/

Semester	Modules						Credits
1.	WZ1821 Natural Resources - Traits, Management and Theory of Sustainability (required) K 5 CP	LS50032 Systems Analysis, Terrestrial Sampling and Statistics (required) K 5 CP	LS50031 Introduction to GIS and Remote Sensing (required) K 5 CP	LS50030 Scientific Writing (required) W 5 CP	WZ4202 Political and Social Perspectives of Renewable Resources (elective) W 5 CP	WZ2732 Environmental Monitoring and Data Analysis (elective) K 5 CP	30/6
2.	WZ4098 Forestry Raw Materials and their Utilization (elective) K 5 CP	WZ2720 Renewable Energy Technologies (elective) K 5 CP	WZ4206 Material Flow Management and Application (elective) W 5 CP	ED130092 Waste and Waste Water Treatment (elective) K 5 CP	WZ2731 Hydrometeorology and Management of Water Resources (elective) M 5 CP	LS50026 Spatial Ecology (elective) K 5 CP	30/6
3. Mobility window	WZ2723 Utilization and Treatment of Special Materials and Waste (elective) K 5 CP	WZ2724 Emission Control in Land-Use and Animal Husbandry (elective) M 5 CP	WZ2730 Climate Change Science, Impacts and Adaptation, Mitigation (elective) M 5 CP	WZ2936 Sustainable and Environmental Regulations (elective) PRÄ 5 CP	LS10013 Internship (7 weeks) (elective) B (SL) 10 CP		30/5
54.	WZ2754 Master's Thesis B (SL) + W 30 CP						30/2
Key	dark blue = final thesis blue = elective modules grey = required modules			CP = credit points; SL = coursework; K = klausur (written exam); M = oral exam; PRÄ = presentation; B = report; PA = project work; W = research paper			

Master SRM – teaching formats

Broad variation in teaching and examination formats:

- „Classical“ lectures
- Seminars
- Group-work
- Research projects
- Exercises
- Workshops
- Project weeks
- Individual internship outside TUM
- …

Exams:
written/oral exams, group- or individual (project) reports, presentations, learning portfolios, research papers

Master SRM – career opportunities

- Management activities in national and international governmental and non-governmental organizations
- Environmental consulting and environmental information
- Ecosystem protection and management
- Environmental assessment and certification
- Science and Education

(might also depend a bit on your previous education and chosen profile in SRM)

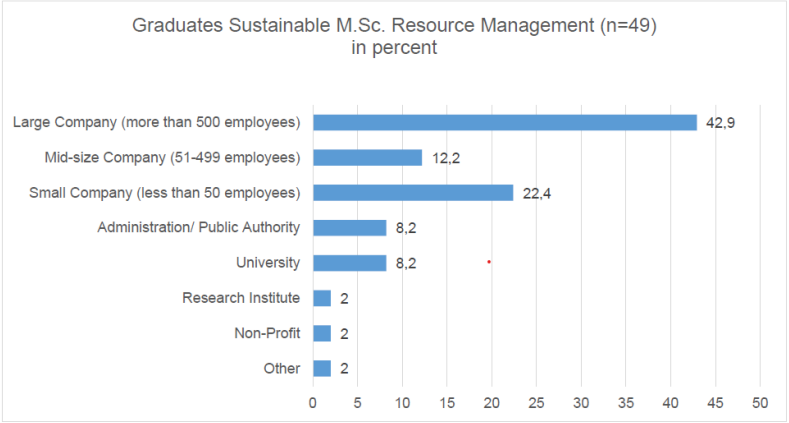


Figure 5: In which kind of company or institution are you currently employed? (Source: Graduate Survey, TUM 2023)

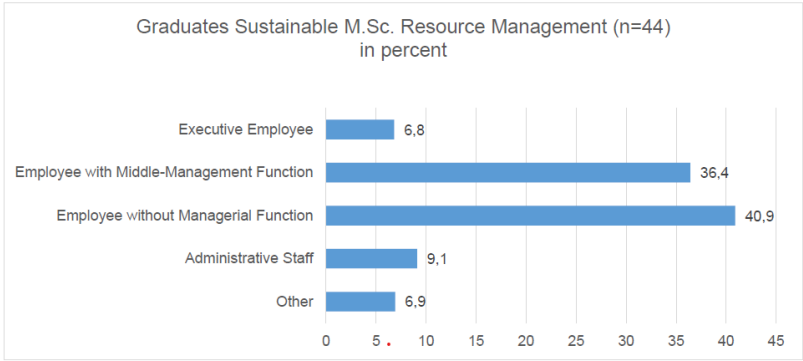


Figure 6: How would you describe your current professional status? (Source: Graduate Survey TUM 2023)

Master SRM – how to apply?

Apply via TUMonline between 01 January and **31 May** for the following winter semester.

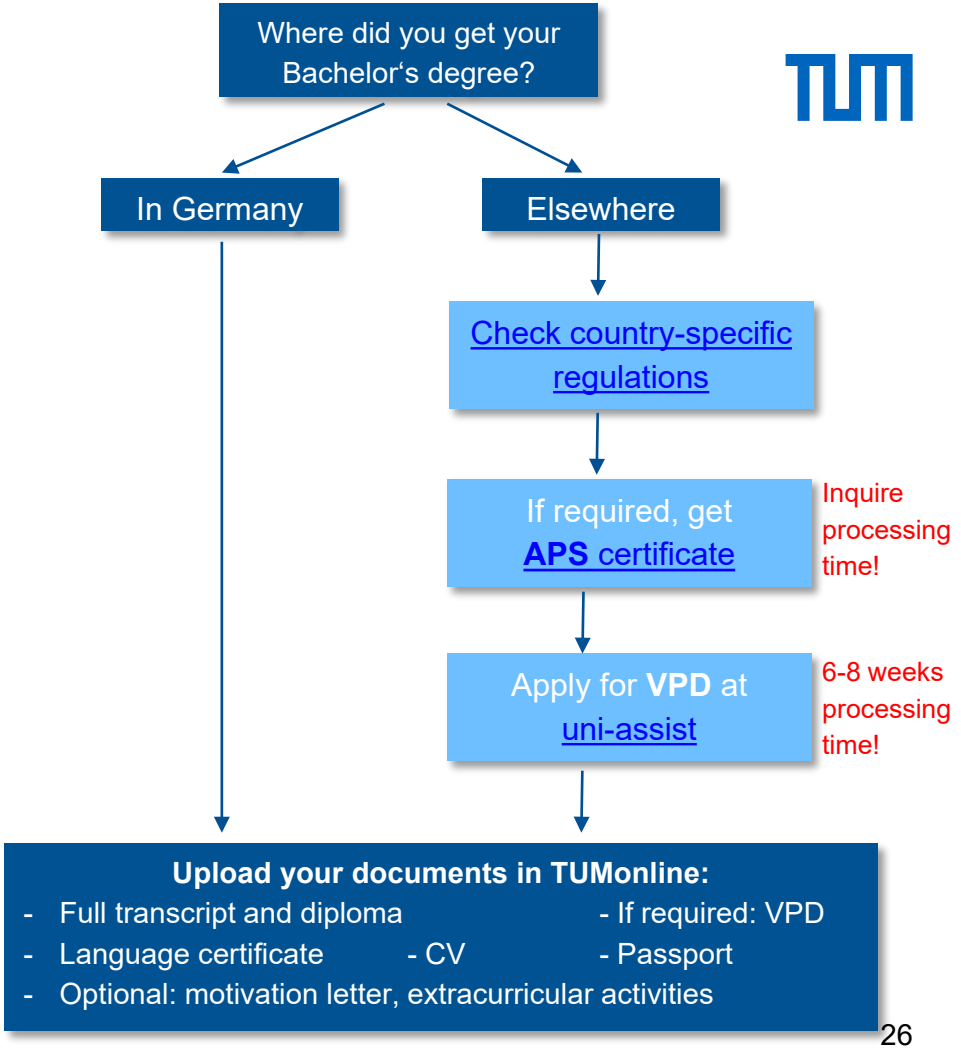
Ideally, international applicants apply until the end of March to avoid delays.

- **Prerequisite:** The bachelor's degree must already be available at the time of application and must be submitted by the end of the application deadline at the latest (31 May). Only then your application is valid. No exceptions.

Also see degree program website → How do you apply…?

Master SRM – how to apply?

- Apply for APS and/or VPD well in time!
- Check for possible visa regulations that apply for you
- Documents will be checked by TUM-CST
- Check your applicant account and emails regularly! If documents are not ok, there is a remark what is not ok. Submit correct documents within the deadline stated in your account.



Master SRM – how to apply?

Websites with important information:

- How to apply for a master‘s degree at TUM: https://www.tum.de/en/studies/application/master/application-master
- How to apply for SRM? https://www.ls.tum.de/en/ls/studies/courses-and-programs/sustainable-resource-management-msc/
- Country-specific regulations: https://www.tum.de/en/studies/application/application-info-portal/special-conditions-for-certain-countries
- APS certificate: https://www.tum.de/en/studies/application/application-info-portal/aps
- VPD / uni-assist: https://www.tum.de/en/studies/application/application-info-portal/uni-assist
- **Language certificates**: https://www.tum.de/en/studies/application/application-info-portal/admission-requirements/language-certificates
- Glossary of documents: https://www.tum.de/en/studies/application/application-info-portal/glossary-of-documents
- FAQs TUM in general: https://www.tum.de/en/studies/support-and-advice/faq
- FAQs TUM School of Life Sciences: https://www.ls.tum.de/en/ls/studies/faqs-about-studying/

Master SRM – aptitude assessment

Aptitude assessment is a 2-stage procedure.

- **Stage 1:** online aptitude assessment test
- **Stage 2:** interview (only if not already admitted or rejected in stage 1)

Application for same degree program only possible 2 times.

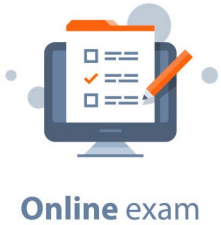
Conversion of grades: Bavarian formula

Stage 1:
Bachelor‘s grade is converted into points (0-30)
Points from online test (0-40)
Total: max. 70 points

- At least 52 points: admission
- 46-51 points: go through stage 2 → **Stage 2:** Interview (0-20) Points from stage 1 (46-51)
  - At least 59 points: admission
  - Less than 59 points: rejection
- Less than 46 points: rejection

Master SRM – stage 1: online aptitude assessment test

Test date for 2025: 11 June, 2:00 p.m. (CEST) (Check here for dates: https://www.ls.tum.de/en/ls/studies/application/)
Requires: stable internet connection, IP address must not change during session (public Wifi often problematic!)



Online test: multiple choice

- Invitation with instructions and access data comes at least 1 week before the test (including access to a testing platform for getting familiar with technical aspects)

- Two sections in the test (total max. 40 points):
  - Basic general and interdisciplinary knowledge related to global challenges of resource management, research methods, and general knowledge of sustainability (75%; 30 questions, 30 points).
  - Specific knowledge in one of the fields of engineering, natural sciences, economics, or social sciences (25%; 10 questions, 10 points). The field is freely selectable by you.

Master SRM – stage 2: interview

Interviews: take place end of June until beginning/mid of August

- 20-30 minutes via Zoom with 2 interviewers
- Invitation for interview comes at least 1 week before the assigned interview slot
- Applicants must adhere to the scheduled interview date

Aspects that are assessed in the interview:

- Exceptional motivation for the SRM degree program
- Individual aptitude parameters, e.g. presentation of previous specialist knowledge, explanation of a scientific (final) thesis from the first degree course
- Ability to communicate in English

→ Max. 20 points in each category. Scores averaged over categories and interviewers. Max. 20 points total.
→ Outcome (admission/rejection) is usually communicated within 3-4 working days.

SRM degree program website

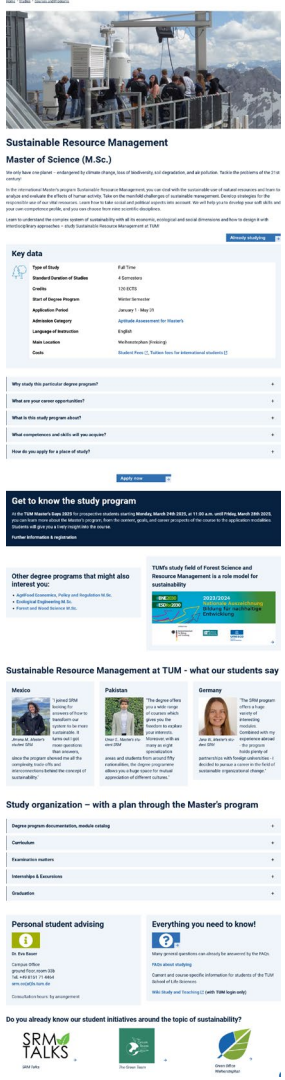
For applicants

SRM degree program website:
https://www.ls.tum.de/en/ls/studies/courses-and-programs/sustainable-resource-management-msc/
(scroll down a bit)

You will find there:

- Module catalog
- Curriculum
- Examination matters:
  - General Study Regulations at TUM („**APSO**“)
  - Specific SRM Regulations („**FPSO**“)

For applicants and during studies



TUM – semester fees and tuition fees

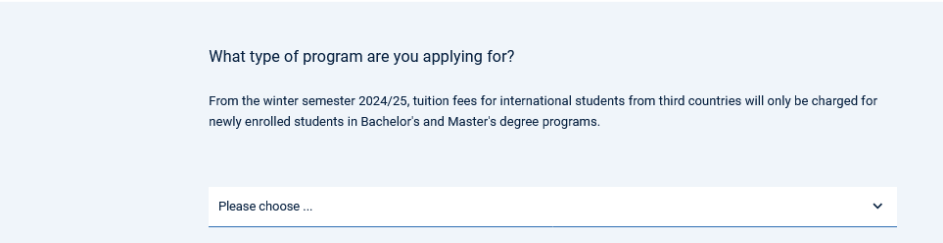
All TUM students have to pay a semester fee (usually around 85 EUR, for the Studierendenwerk München).

Tuition fees apply to TUM students outside of the EU/EWR region (if Bachelor‘s degree was not obtained in Germany).

Use the Tuition Navigator to find out if you have to pay tuition fees:

For Master SRM:
4000 EUR per semester

Tuition Navigator: Are your studies subject to tuition fees?



https://www.tum.de/en/studies/fees/tuition

TUM – tuition fees

https://www.tum.de/en/studies/fees/tuition/scholarships-and-waivers

For questions about waivers etc. please contact

TUM Center for Study and Teaching Fees and Scholarships
studium@tum.de

What waiver scholarships, exemptions and waivers are available?

Waiver Scholarships

Students may apply for merit scholarships and need-based waivers.

More

Exemption

Under certain circumstances, students are exempt from paying fees.

More

Waivers

Fees may be waived for financial, personal or social reasons.

More

→ Please check which option fits for you.

→ Check application deadlines (for some options, the deadline is already 31 May)

Misce – going abroad with TUM

Going abroad with TUM

Broaden one's horizons. Nothing makes this possible as easily as a stay abroad! Through programs such as Erasmus+, TUMexchange, and ATHENS and additional scholarships, TUM students, employees, and scientists get numerous opportunities to further their education abroad.

Study abroad →

During your studies at TUM you have the opportunity to study abroad for up to two semesters. Learn more about the programs TUM can offer you.

Internship abroad →

The TUM Global & Alumni Office supports international internships through programs like Erasmus+. Inform yourself about all your options here.

https://www.international.tum.de/en/global/going-abroad/

Misce - accommodation

- Finding a place to live is not so easy in the Greater Munich Area. It is the responsibility of the students, to take care of their **accommodation**. The following TUM websites here are helpful:
  https://www.tum.de/en/studies/during-your-studies/living-and-working
  https://www.tum.de/en/studies/during-your-studies/living-and-working/accommodations
- The majority of the **lectures / courses take place in the city of Freising** on the TUM campus Weihenstephan (about 40 km drive away from Munich, but easy to reach by train from Munich). Living in Freising is a little bit cheaper than in Munich, but in general prices in the Greater Munich Area are rather high compared to other regions in Germany.
- Accommodation in the **student dormitory**:
  If you want to apply for a room in the student dorm at the Munich Student Union (https://www.studierendenwerk-muenchen-oberbayern.de/en/accommodation/; https://www.studierendenwerk-muenchen-oberbayern.de/en/accommodation/application/), **do it soon (once you submitted your application), room numbers are very limited**.

Your questions

Contact:
SRM Student Advising
Dr. Eva Bauer
srm.co@ls.tum.de
Phone: ++49(0)8161 71-4464