



Friedrich-Alexander-Universität
Erlangen-Nürnberg

Guidelines for implementing open science at Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

Open Science Policy

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Preamble

Open science encourages the free exchange, transparency, reusability and reproduction of data by opening up access to academic research, communication, teaching and learning processes. Open science lays the foundations for trustworthy science based on good scientific practice and accelerates the dissemination of research findings.

The term **open science** encompasses open access, open education, open data, open source, open hardware and open methodology. **Open access**¹ is part of open science, and is a groundbreaking strategy for scientific communication. In conjunction with open licenses, free, direct access to scientific publications allows research findings to be exploited fully in modern research environments, in scientific networks and in research databases, assuming the relevant rights of use are provided. **Open education** stands for open access to educational content and teaching materials. **Open data** and **open source** support the publication of scientific data and software for secondary exploitation and quality assurance purposes. **Open hardware** is a collective term for plans that are designed, published and licensed in a way that makes them available for others to use and that ideally use components that are easy to source. **Open methodology** represents the principle of documenting the methods used clearly and effectively in accordance with good scientific practice.

This *Open Science Policy* is based on the „Regulations for safeguarding good scientific practice and dealing with scientific misconduct at Friedrich-Alexander-Universität Erlangen-Nürnberg“, the „First Statute for Amending the Regulations for safeguarding good scientific practice and dealing with scientific misconduct at Friedrich-Alexander-Universität Erlangen-Nürnberg“ and the Guidelines for handling digital research data at Friedrich-Alexander-Universität Erlangen-Nürnberg. Research Data Policy“, the DFG code „Guidelines for safeguarding good research practice“, the „UNESCO Recommendation on Open Educational Resources (OER)“, the „Open Research Primers“ of the Reproducibility Network, the „San Francisco Declaration on Research Assessment (DORA)“ and the paper on „Implementing Open Science“ from the League of European Research Universities (LERU). In addition, all other guidelines at Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) such as the Intellectual Property Policy (IP Policy) and the FAU quality management procedures must be complied with.

FAU is aware that different subjects have different expectations and requirements for open science. It is therefore to be expected that different subjects will set different priorities. Nevertheless, it is crucial that we take an interdisciplinary and long-term approach to raise awareness and take sustainable action to implement open science. FAU will support this ongoing, subject-specific process with the assistance of the Open Access Officer, the Chief Information Officer (CIO) and university services (in particular the University Library, the Innovation in Learning Institute (ILI)), the Erlangen Regional Computing Center (RRZE), FAU Competence Centers) and research support services.

The intention of this *Open Science Policy* is to give FAU members guidance and recommendations for opening up academic and scientific teaching, learning, communication and research processes and to align the strategic approach of the University with open science policies of influential bodies at a national and international level such as UNESCO, EU, cOAlition S, BMBF and DFG.

¹ As defined in the „Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities“ („Berliner Erklärung über offenen Zugang zu wissenschaftlichem Wissen“), the „Joint Declaration of the German Alliance of Science Organisations in Germany on Open Access and Copyright“ („Gemeinsamen Erklärung der Wissenschaftsorganisationen zu Open Access und Urheberrecht“) and the „Commission Recommendation (EU) 2018/790 of 25 April 2018 on access to and preservation of scientific information“.

Responsibilities

This Open Science Policy is aimed at all members of FAU involved in research or teaching as well as all visiting scholars or scientists at FAU. If research is financed by third parties, all agreements with third parties concerning issues such as rights of access or re-use, archiving, and documentation will take precedence over this *Open Science Policy*.

The members of FAU and any scholars or scientists working at the university temporarily or as a guest shall also comply at all times with valid legal provisions and regulations governing ethical research. In case of doubt, the advisory services and supervisory bodies at FAU (including the Data Protection Officer, the University Administration, the University Library, the Office of Knowledge and Technology Transfer and Continuing Education or the relevant Ethics Commission) will be consulted.

FAU and, where applicable, its services and research support facilities, are responsible for:

1. Supporting and facilitating the transition to open science by providing education or training to members of FAU and raising awareness among the University community, as well as providing the necessary infrastructure for supporting this transition.
2. Providing technical, organizational and human resources for ensuring the long-term availability of research and teaching results; this includes open access and open educational resources, research data repositories, services for research data and, in the case of research, teaching and learning material published in monographs, FAU's own non-commercial open access university press (FAU University Press). The repositories, which should preferably be certified, must also meet international standards and provide progressive tools for searches, navigation and to ensure that their content will remain accessible in the long term.
3. Incorporating open science practices into recruitment, research and evaluation criteria. This may cover assessment criteria such as quality and availability of research (scientific or academic content including data and software), participation in citizen science projects, experimenting with open peer review or using OER, as far as appropriate and legally permitted.
4. Measuring progress in the area of open science, for example by comparing the content of repositories with information collected from online citation and literature databases or monitoring the annual increase in open access, open data or OER content at FAU.
5. Clearly compiling information about open science, including information on publication or archiving costs incurred and financing options.
6. Providing advice and recommendations on open licenses and copyright.

FAU members are encouraged to support the principle of open science by taking the following measures:

1. Dealing with their publications, teaching materials and data in compliance with the principles and requirements expressed in this Open Science Policy, unless there are any significant reasons to the contrary, for example legal concerns.
2. Clearly marking research as originating from FAU by following standards for indicating affiliation and using unambiguous identifiers (e.g. DOI, ORCID, ROR or the like²).
3. Coordinating new research projects with the advisory bodies responsible from the planning and application stage. This helps ensure that projects receive appropriate support from the relevant institutions and reminds researchers to apply for adequate funding for open science purposes from funding providers.
4. Applying for resources specifically designated for open science in applications for third-party funding, if available from funding providers.
5. Deciding when and how to license research findings.
6. Entering or importing their research results into the Research Information System FAU CRIS with the relevant label indicating whether they are open access content.
7. Using the relevant cost types for (open access) publications.
8. Supporting open science by reviewing or publishing work as far as possible/applicable.

Open access to publications

FAU recommends, if legally possible, filing a digital copy of the full text (published article or manuscript after final review) together with the relevant metadata of a publication in the University's repository or other suitable infrastructure (e.g. subject-specific repositories). This step should also be taken with original open access publications in order to ensure that the publications are archived in the long term.

FAU encourages its members to retain exclusive rights of use to their publications³ and only to transfer the rights required for publication to publishers. Negotiations can be conducted before publication to ensure that this is the case or addenda can be added to the publisher's contract (see, for example, the Scholar's Copyright Addendum Engine provided by the Creative Commons (CC) Corporation or the SPARC Author Addendum from the Scholarly Publishing and Academic Resources Coalition).

The University supports open access publication with a central open access publication fund.

The University Library also uses other open access agreements and institutional memberships to reduce costs.

² A digital object identifier (DOI) is a unique, persistent identifier for a digital object such as a paper or research data. The Open Researcher and Contributor ID (ORCID) identifies the author, allowing the academic work to be assigned to a particular person. The Research Organization Registry (ROR) supplies an identifier for all institutions involved in the academic publication process.

³ Publication also refers in this instance to teaching materials for publication or data to be published in data journals, see the following sections.

Open data

When it comes to the accessibility of data, FAU follows the principle: „as open as possible, but as closed as necessary.“ Metadata ensuring that data can be found are provided according to the FAIR principles (findable, accessible, interoperable and re-usable).

Further details are stipulated in the „Guidelines for handling digital research data at Friedrich-Alexander-Universität Erlangen-Nürnberg. Research data policy“.

Open educational resources (OER)

FAU strives at all times to improve and assure the quality of teaching and studying. Whilst designing innovative and competitive university-level teaching in a dynamic digital environment boosts the reputation of scientists and scholars involved in teaching, it also increasingly poses a challenge for teaching staff.

Using open educational resources offers new, straightforward possibilities for collaboration aimed at designing new teaching and learning materials. Teaching staff and students can use available materials, adjust them to suit their needs and create valuable synergies with the confidence that they are not breaching any legal requirements.

In addition, open education resources give a global audience an insight into and appreciation of the excellent nature of teaching to the extent determined by those publishing the material. Teaching staff can control the extent of participation by issuing open licenses. This ensures that teaching materials are clearly attributed and access provided via the original license.

FAU therefore encourages teaching staff to provide suitable material created for teaching and tutorials, study or research projects, Bachelor's, Master's, doctoral or postdoctoral theses as OER on StudOn or the University's repository (document type: teaching material) or on other suitable OER platforms or repositories.

Open source

FAU uses open source solutions as an efficient and future-proof way to implement IT systems and also makes its own solutions available to the wider community. This helps strengthen the open source community.

FAU intends to favor alternative open source systems over proprietary systems and to give preference to open source software where solutions are comparable. Whenever FAU has to develop software for itself or other clients, an effort will be made to ensure that the code is available on open access software development web platforms in order to encourage community building.

Open hardware

FAU carries out research in the field of open hardware on developing devices, hardware, processors and systems that are not proprietary. In addition to legal and methodological issues, this also raises questions regarding the safe use of freely-available hardware, particularly with regard to security.

The FAU FabLab, µe-bauhaus erlangen-nürnberg and the central mechanical and electronics workshop at the Faculty of Engineering all provide support to FAU research and teaching staff and visiting scientists with putting a suitable open hardware philosophy into practice.

Open methodology

Time pressures or external requirements (e.g. restrictions on the number of pages, characters or words) may mean that the description of the planned or used methods has to be kept extremely concise, for example in publications, research data management plans or documentation (e.g. README) relating to research data or software. However, a detailed description of the question, methods, how to conduct the experiments or research and the hardware and software used for conducting the research or experiments or for collecting, analyzing or visualizing data is crucial in order to ensure that the results can be accurately reproduced or re-used („rich metadata“).

FAU encourages its members to document the methods they have used clearly, effectively and in accordance with good scientific practice. If there are restrictions to the number of pages, characters or words, details of the methods can be provided in a supplement. Another method is keeping electronic laboratory notebooks⁴ in which daily research is publicly documented or, for example in the field of digital humanities, using open annotation tools.

Evaluation

These principles will be evaluated regularly and adjusted to meet the latest standards at the latest every three years.

⁴ Depending on the sensitivity of the data, open laboratory notebooks are also an option („open notebook science“).

