

RESEARCH DATA MANAGEMENT POLICY FACULTY OF ENGINEERING TECHNOLOGY

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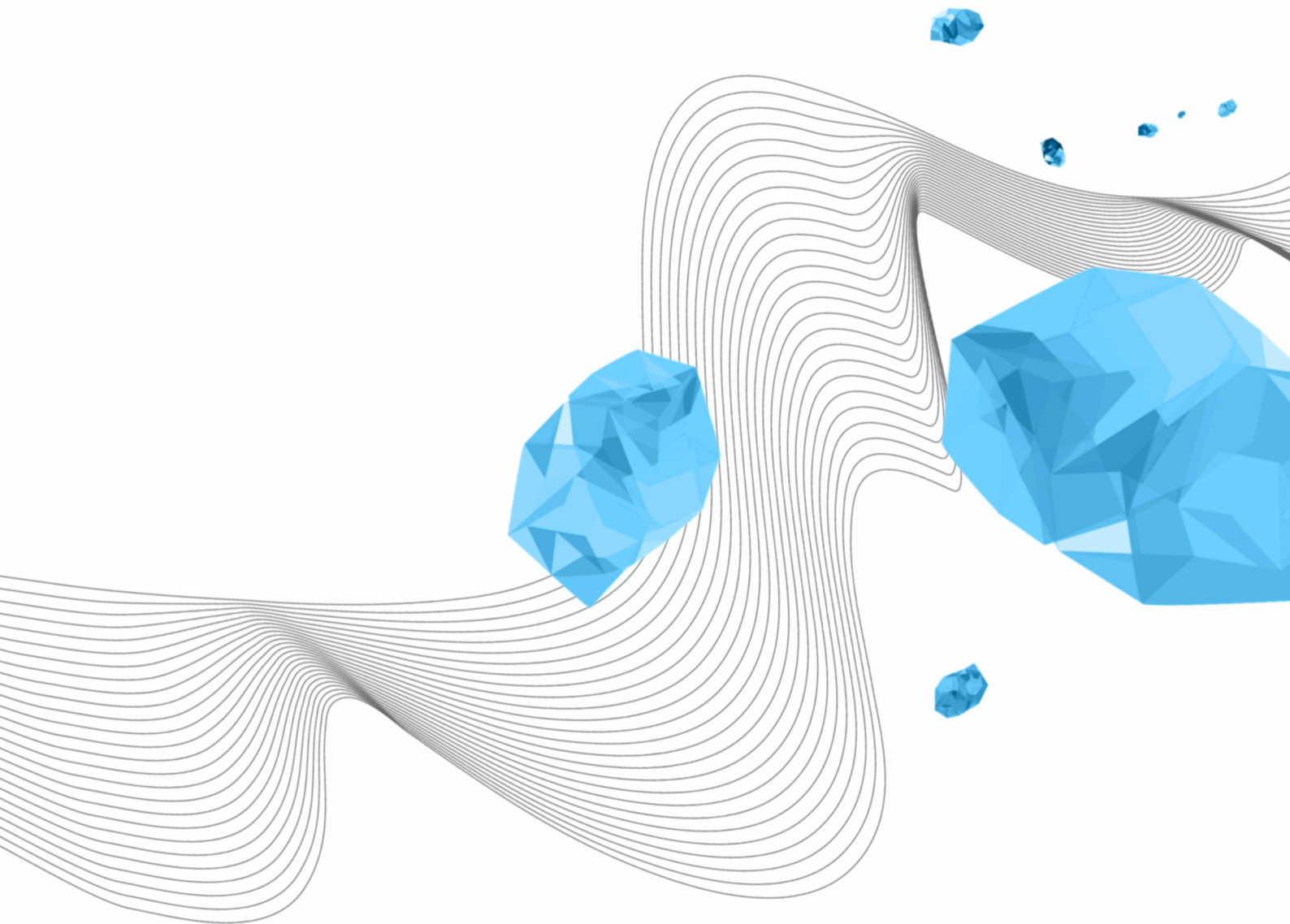


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1 INTRODUCTION

The information in this policy applies to all professionals who conduct and support research within the faculty of Engineering Technology (ET). It concerns all activities that are part of conducting research, like generating, processing, interpreting, archiving, publishing, sharing and or distributing or deleting research data. This policy aims at making concrete what is needed for ET research to achieve the main goal of good data management and is based on the [UT Research Data management \(RDM\) policy](#) that is confirmed by the Executive Board of the UT on 17 September 2018. All working rules mentioned in this policy are supplementary to the general UT policy and should be read and handled as such.

This policy is intended to ensure the careful handling of research data by researchers in order to:

- demonstrate the scientific integrity of their research.
- stimulate reuse of the data.
- comply with legal requirements, codes of conduct and funding bodies' demands regarding research data management.

2 FACULTY-SPECIFIC ROLES AND RESPONSIBILITIES

The roles and responsibilities are described in Appendix A Faculty-specific roles and responsibilities.

3 DATA MANAGEMENT PLAN (DMP)

The general UT policy states that every research project must have a DMP. For every research project, including each PhD-project a DMP should be formulated. Note that most research funders also require a DMP as part of funding application or to be handed in shortly after the start of the project.

DATA MANAGEMENT PLAN | ET WORKING RULE

For every research project, including each PhD-project, a DMP should be formulated and used during the duration and finalization of the project. For research projects where no PhD-students are involved, a DMP has to be in place as soon as possible but not later than 2 months after the start of the project. A template is available in the [DMP tool](#) of the UT. This template is accepted by NWO, ZonMW and the EU (e.g. ERC).

Every PhD candidate develops a written DMP for managing research outputs within the first 9 months of the PhD and follows the [Research Data Management bootcamp](#) (1 ECTS) as a preparation of writing the DMP. Each PhD candidate adds the DMP to the documents required for the Qualifier.

The RDM policy of the group or department and the DMPs (pdf export from the UT DMP-tool) are stored directly accessible to the head of the research group and individual researchers and must be stored in the groups folder on the Project and Organization directory (P-drive), or on Teams.

4 PRIVACY REGULATIONS

ET research groups may handle **personal data**; any data about an identified or identifiable person. A name, birthdate, address, real ID-number or photograph can identify someone. Anonymization of personal data means de-identification that is not reversible: once personal data has been stripped of identifying data, it is no longer possible to trace back to natural persons. Pseudonymization means that personal data are replaced by a key, making it possible to trace back to natural persons.

DATA PRIVACY REGULATIONS | ET WORKING RULE

Personal data are handled according to [UT privacy rules](#). Informed consent forms should be used for research with human participants, and the General Data Protection Regulation (GDPR) should be followed.

Report any new processing which uses personal data to the Data Protection Officers (DPO) team. This can be done using the [UT DMP tool](#). The [Privacy Contact Person \(PCP\)](#) of this faculty is able to support you. Only anonymized data is exempt from reporting in that register since it is by law no longer personal data.

The processing of personal data in research must be proportionate to the intended purpose of the research. This means that personal data must be limited to what is necessary in relation to the purposes for which they are processed ('data minimization').

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| <p>Research data should not include identifiers which directly identify persons (such as name, birthdate or real ID-numbers). During the research, personal data must be anonymized or pseudonymized as quickly as possible, i.e. immediately when collecting data. If you receive a data set with identifying data from another party, pseudonymize or anonymize immediately after receiving the data. The basic steps of pseudonymization can be found on the website of LCRDM. Any exceptions, such as for video footage of people, are described in the group/department policy or DMP.</p> |
| <p>Research which involves interaction with, or data gathered from, human subjects is submitted by the researcher to a domain specific ethics committee (-member). In case that it is not clear whether a research project is subject to WMO (Wet medisch-wetenschappelijk onderzoek met mensen) or not, the details must be reviewed by an employee with knowledge of the WMO. Research is subject to the WMO if it concerns medical-scientific research and if the participants are subject to procedures or are required to follow rules of behavior.</p> |
| <p>For research which involves interaction with human subjects, personal data must be managed in an ICT system suitable for personal data (like the UT P-drive). It is possible to set access at folder level by LISA, or the ICT contact person within the department.</p> |
| <p>Paper informed consent forms need to be kept and archived. An option that is offered by the ET faculty (archive in the Horst building) is described in Appendix E Archiving informed consent forms.</p> |

5 DATA STORAGE AND TRANSFER

Data storage concern all storage during the research. After a research project the term archiving applies. During the research data should be stored in such a way to minimize risk of data loss and to maintain data integrity. Research groups take measures to avoid loss of research data during the course of a research project, due to e.g. theft of laptops, fire and water damage, or a sudden leave of a researcher without the group having access to the data.

DATA STORAGE | ET WORKING RULE

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|--|
| <p>All collected research data, including related materials (e.g. protocols, models or questionnaires), must be stored in an ISO 27001- and NEN 7510-certified directory such as the Project and Organization directory (P-drive) including backups hosted by or offered through LISA, unless exceptions apply. Exceptions must be described within the department policy to comply with the principles of the faculty policy and must always be coordinated with the ICT account manager of the faculty ET. All research data should be accessible by at least one permanent staff member of the research group besides the principal investigator.</p> |
| <p>All storage solutions offered/recommended by the UT are shown in the decision tool.</p> |
| <p>If storage for <u>group</u> use is not an option and <u>private / personal</u> storage is needed for research data, it must be ISO 27001-certified and accessible to the head of the research group or delegate. Data on personal storage are moved to group storage (in the ISO 27001- and NEN 7510-certified Project and Organization directory (P-drive) in case the researcher is no longer employed at the research group no later than 1 month before the end of the contract.</p> |
| <p>Personal cloud services must only be used for work copies, comply with legal and contractual conditions and accessible to the head of the research group or delegate. The preferred personal/private cloud service is Surfdrive in which folders should be shared with the head of the research group or delegate and can be synchronized with local storage. This service complies to the Dutch and European privacy legislation. The original data must be stored in the Project and organization directory (P-drive).</p> |
| <p>Personal, confidential or classified research data and related materials, such as consent forms, will be stored in accordance with relevant Dutch legislation and European regulation and the VSNU Conduct code for the use of personal data in scientific research, for which UT-storage mentioned above is available (e.g. P-drive). Loss of personal or confidential data must be considered as a data breach. To avoid data breach always use an encrypted data storage. For more information see: Cyber Safety.</p> |
| <p>The use of portable storage should be minimized. In case of portable storage (USB-sticks, laptops etc.) data is stored as short term as possible and backed-up regularly on non-portable storage accessible to the head of the research group or delegate. Research data on portable devices must be deleted as soon as possible and no later than ending the research task for which the data is needed.</p> |
| <p>In case of portable devices AND confidential/personal data (as a rule pseudonymized): storage must be encrypted. In case of encrypted storage, the key should be known by at least one other employee in the research group. Generally speaking, this will be the direct supervisor. More information about encryption can be found here.</p> |
| <p>Non-digital research data and related materials (all data which are the basis of published results), such a physical samples and lab notebooks, are handled according to procedures described in a department RDM policy or DMP. Digitalization is done if (technically) possible.</p> |

6 DATA DOCUMENTATION

Data documentation is 'information about the research data'. In line with the FAIR principles ([Appendix B FAIR principles](#)) data must be well documented, during the dynamic phase of the data and especially as soon as they have become static. Metadata is 'data about data'. It is standardized, structured information that describes the purpose, origin, time frame, geographic location, creator, access conditions and terms of use of a data set.

DATA DOCUMENTATION | ET WORKING RULE

Research data will be provided with metadata to ensure findability and unique identification of the data. Additional documentation must accompany the data required for correct interpretation and reuse of the data set. Metadata and documentation must be stored in a separate file in the concerned directory and must be in place before publications or reports are published. For all publications and reports a record is kept on which data it is based. These links are mentioned in the publications or stored separately with the project documentation.

The documentation should also describe which software, including version number, has been used. Self-written software/code (e.g. Python, Matlab, Labview) should contain sufficient documentation so that others (from the same research field) are able to understand it.

7 DATA SHARING

Data sharing focuses on sharing during the research. To guarantee that data can be accessed and checked during the research, digital and non-digital research data and related materials must be shared. Implementation is dependent on intellectual property and responsibilities regarding research data, and the terms of use of data suppliers.

DATA SHARING | ET WORKING RULE

During the research project, data and related materials must be shared in such a way that, apart from the researcher, it can be accessed by at least one permanent staff member of the research group. At the end of the project all research data and related materials which is needed for verification/replication and reuse, must be made available to the head of the research group or delegate.

Personal, confidential or classified research data and related materials, such as consent forms, must be shared in accordance with relevant Dutch legislation and European regulation and the VSNU Conduct code for the use of personal data in scientific research (VSNU Gedragscode voor gebruik van persoonsgegevens in wetenschappelijk onderzoek). The ISO 27001- and NEN 7510-certified Project- and Organization directory (e.g. P-drive) of the UT must be used for secure sharing of personal data. This can be arranged through an X-account. [LISA](#) can arrange this.

In case of a Non-Disclosure Agreement with third parties, arrangements must be made about sharing data during the research. Data are shared / exchanged with external partners (non-UT) according to a signed agreement between parties regarding their research cooperation. Signed agreements are drawn up by the [ET Project Calculations Office](#).

8 DATA ARCHIVING

Data archiving concern storage after a research project. In the light of open science and scientific integrity, sustainably archiving of static data and providing access is crucial. At the end of each research project, research data and metadata are stored in a sustainably administered repository. At a minimum, this applies to all data used for publications, including dissertations, that cannot in its entirety be found in the publication itself or in the 'supplementary information' accompanying the publication. This refers to both experimental data and numerical models, where e.g. entry files and result files can be stored. Publications that are highly theoretical may contain all data required for reproduction.

DATA ARCHIVING | ET WORKING RULE

Not later than 1 month after publishing, selected data (all data which are the basis of published results) are archived in group facilities (e.g. P-drive). Unless there are legal or contractual restrictions, this data should also be published openly available in a trusted repository such as [4TU.ResearchData](#) or DANS, in accordance with FAIR principles ([Appendix B FAIR principles](#)). If it is not allowed to publish the data openly available (e.g. due to collaborations with companies), if possible, data should still be made available in a trusted repository with restricted access or an embargo.

Selected research data (all data which are the basis of published results) and related materials must be archived at least for 10 years (requirement of the 'Nederlandse Gedragscode Wetenschapsbeoefening'), unless legal or contractual regulations demand another term.

Non-digital research data and related materials, such as physical samples or lab notebooks, must be archived in secure UT-storage options accompanied with clearly described access procedures.

Archived research data and related materials, both digital and non-digital, are accompanied with proper metadata for findability and good documentation for reasons of interpretation and reusability (see also data documentation and data registration).

In case of a Non-Disclosure Agreement with third parties, arrangements must be made about archiving and sharing of data for verification and replication. Non-Disclosure Agreements are drawn up by the [ET Project Calculations Office](#).

Research groups are responsible for making their research data available for third parties, considering the legal and contractual demands with respect to publicity and privacy. This holds for data which is made publicly available on beforehand, or for data made available on request. The strive is to make data sets publicly available, where appropriate.

9 DATA REGISTRATION

In addition to archiving, all digital and/or non-digital research data and related materials must be registered and described by metadata, including a link or reference to the location of the digital or non-digital objects. Because research data is becoming a valuable asset and data can also be considered as a type of scientific output, it is important to know which digital and/or non-digital research data and related materials have been created or used and where these are stored.

DATA REGISTRATION | ET WORKING RULE

The preferred system for registration of metadata of digital and/or non-digital research data and related materials is Pure [Research Information](#), which allows for relatively short and structured registration of datasets. By describing datasets and their location in Pure, the metadata can easily be found by other researchers in UT Research Information (Pure portal) and as such in search engines like Google scholar. In Pure the metadata for your datasets can be registered and, via a DOI, linked to the actual dataset which you have archived in a trusted repository. Or you can suffice with describing the dataset and where it is located if it concerns material that cannot be uploaded to a trusted repository. Moreover, in Pure these datasets and related materials can be linked to the registered UT projects and to UT publications based on them.

APPENDIX A FACULTY-SPECIFIC ROLES AND RESPONSIBILITIES

The roles and responsibilities for different stakeholders within the faculty ET are defined in this policy and described below.

THE FACULTY BOARD

- is responsible for this policy and the implementation. In particular the portfolio holder research is assigned for this task.
- ensures that the faculty policy is reviewed annually.
- oversees the creation of the department data policies.
- arranges RDM support and expertise in the faculty: ICT account manager, Information specialist, privacy contact person, coordinator research support, research data steward and ethics committee.

THE HEAD OF THE RESEARCH CHAIR

- is partly responsible for having RDM regulations and procedures on the level of his or her department and makes sure that everyone within the group knows about the department data policy.
- is responsible for proper data management within all research projects performed within the group.
- is responsible for the correct selection and persistent availability of data of all projects of the research group for the purpose of verification/replication and reuse.
- arranges the availability of the necessary resources, facilities and support for data management in the research group.

RESEARCHER

- Is responsible for the way he/she deals with research data, in some cases together with the principal investigator and develops and adopts appropriate procedures and processes for collecting, documenting, storing, processing, using, accessing and sharing of the collected or generated research data and for selecting and archiving the research data.
- Ensures that every research project starts with a data management plan (<https://webapps.utwente.nl/dmp>), which needs to be regularly updated and adhered to by all project members.

APPENDIX B FAIR PRINCIPLES

Preamble

One of the grand challenges of data-intensive science is to facilitate knowledge discovery by assisting humans and machines in their discovery of, access to, integration and analysis of, task-appropriate scientific data and their associated algorithms and workflows. Here, we describe **FAIR** - a set of guiding principles to make data **Findable, Accessible, Interoperable, and Re-usable**.

To be Findable:

- F1. (meta)data are assigned a globally unique and eternally persistent identifier.
- F2. data are described with rich metadata.
- F3. (meta)data are registered or indexed in a searchable resource.
- F4. metadata specify the data identifier.

To be Accessible:

- A1 (meta)data are retrievable by their identifier using a standardized communications protocol.
- A1.1 the protocol is open, free, and universally implementable.
- A1.2 the protocol allows for an authentication and authorization procedure, where necessary.
- A2 metadata are accessible, even when the data are no longer available.

To be Interoperable:

- I1. (meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
- I2. (meta)data use vocabularies that follow FAIR principles.
- I3. (meta)data include qualified references to other (meta)data.

To be Re-usable:

- R1. meta(data) have a plurality of accurate and relevant attributes.
- R1.1. (meta)data are released with a clear and accessible data usage license.
- R1.2. (meta)data are associated with their provenance.
- R1.3. (meta)data meet domain-relevant community standards.

Source and further information: <https://www.force11.org/group/fairgroup/fairprinciples>

APPENDIX C ET DEPARTMENTS

| DEPARTMENT | RESEARCH CHAIRS |
|---|--|
| Biomechanical Engineering (BE) | <ol style="list-style-type: none"> 1) Biomechanical Engineering 2) Biomechanical Implants 3) Biomechatronic and Rehabilitation Technology 4) Design of Biomedical Products 5) Rehabilitation Medicine and Technology 6) Surgical Robotics 7) Technology in Cardiac Surgery 8) Engineering Organ Support Technologies |
| Thermal and Fluid Engineering (TFE) | <ol style="list-style-type: none"> 1) Energy Technology 2) Engineering Fluid Dynamics 3) Multi Scale Mechanics |
| Design, Production and Management (DPM) | <ol style="list-style-type: none"> 1) Human Centred Design 2) Integrated Life Cycle Management 3) Maintenance Engineering 4) Packaging Design and Management 5) Product-Market Relations 6) Design Engineering 7) Interaction Design 8) Management of Product Development 9) Manufacturing Systems 10) Advanced Manufacturing 11) Sustainable Energy & Design 12) Systems Engineering & Multidisciplinary Design |
| Civil Engineering (CE) | <ol style="list-style-type: none"> 1) Construction Process Integration and ICT 2) Persuasive Systems Modeling for Sustainability Science 3) Market Dynamics 4) Integrated Project Delivery 5) Modelling Water Management and Climate 6) Climate Change impacts of Coastal Risk 7) Transport Engineering and Management 8) Transport Planning 9) Water Engineering and Management, in particular Watersystems 10) Design, Engineering and Innovation Management 11) Multidisciplinary Water Management 12) Planning and Development 13) Coastal Systems and Nature-Based Engineering |
| Mechanics of Solids, Surfaces and Systems (MS3) | <ol style="list-style-type: none"> 1) Applied Mechanics & Data Analysis 2) Dynamics Based Maintenance 3) Elastomer Technology and Engineering 4) Laser Processing 5) Mechanics of Polymeric Materials 6) Nonlinear Solid Mechanics 7) Precision Engineering 8) Production Technology |

| | |
|--|--|
| | <ul style="list-style-type: none">9) Skin Tribology10) Surface Technology and Tribology11) Tribology Based Maintenance12) Sustainable Elastomer Systems |
|--|--|

APPENDIX D LIST OF ABBREVIATIONS

| | |
|---------|--|
| DMP | Data Management Plan |
| DOI | Digital Object Identifier |
| DPO | Data Protection Officers |
| ERC | European Research Council |
| ET | Faculty of Engineering Technology |
| EU | European Union |
| FAIR | Findable, Accessible, Interoperable, and Re-usable |
| GDPR | General Data Protection Regulation |
| LCRDM | Landelijk Coördinatiepunt Research Data Management |
| LISA | Library, ICT-services & Archive |
| M-drive | Home directory |
| NWO | Nederlandse Organisatie voor Wetenschappelijk Onderzoek |
| PCP | Privacy Contact Person |
| P-drive | Project and Organization directory |
| RDM | Research Data Management |
| TGS | Twente Graduate School |
| UT | University of Twente |
| VSNU | The Association of Universities in the Netherlands |
| WMO | Wet medisch-wetenschappelijk onderzoek met mensen |
| ZonMW | The Netherlands Organisation for Health Research and Development |

APPENDIX E ARCHIVING INFORMED CONSENT FORMS

The following steps should be performed if you are planning to archive paper informed consent forms at the archive in the Horst building:

1. During the research the informed consent forms are stored at a secure location (e.g. locker of the researcher).
2. When (parts of) the research is finished, the researcher fills in the information below ('Format archiving informed consent forms faculty ET). This information needs to be put on the outside of a sealed envelope that contains the informed consent forms.
3. This sealed envelope can be handed in at the secretary. The secretary contacts the archive (g.f.a.m.kleinsman@utwente.nl) and stores the forms in a locker until they are picked up by the archive.
4. The archive picks up the forms and proceeds with the progress of archiving the informed consent forms in the Horst building.
5. If needed, the researcher(s) mentioned on the envelop can get access to the forms again after contacting the archive.

Format archiving informed consent forms faculty ET

Please fill in the information below and hand in the form together with the informed consent forms to the secretariat of the department / chair.

| | |
|---|------------|
| Faculty (abbreviation): | |
| Department (abbreviation): | |
| Chair (abbreviation): | |
| Name researcher: | |
| Title of the research project: | |
| Start date research project: | |
| End date research project: | |
| These documents should be destroyed at | DD-MM-YYYY |
| Reference number: <i>To be completed by the archive officer.</i> | |