University of Eastern Finland, Library

Mastering the research data! // Tutkimusaineisto haltuun!

Turning Researchers' Multidisciplinary Competence into a Functional Data Management Course

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The Mastering the research data course was held in August 2024 at the University of Eastern Finland (UEF) as a two-week classroom course at the Joensuu campus. The course was aimed at doctoral researchers in particular and was worth 5 credits. Its main idea was to link data management to the everyday research work, from the planning of a research project to its completion. As part of the UEF Summer School curriculum, the course was held in English.

From Conception to Implementation

The course was conceived, planned, and implemented in collaboration between the UEF Library and the university faculties. The library's research data management experts coordinated the planning and implementation of the course. Researchers from various fields at UEF and elsewhere played key roles in the implementation of the course. The course was organised as part of the UEF Summer School program, and the project was granted teaching development funding (€20,000) by the university. The development funding made it possible to hire a coordinator (for approximately five months) and to pay expert fees to lecturers who were unable to include the teaching hours they were asked for as part of their normal work. The people who participated in the planning and implementation of the course and their roles are listed in the List of Persons section.

The main purpose of the course was to pilot project-based methods for combining data management and discipline-specific research methodology teaching and to utilise these experiences and observations to develop teaching. The intention was not to produce a permanent course, but to gain more expertise and understanding in the teaching of different disciplines.

Promoting open science was also one of the project's objectives. This was achieved from two different perspectives. The course materials were designed to include as much open material as possible, and the lecture materials have been and will continue to be utilised in the development of other teaching and learning materials. The other aspect of openness relates to opening up teaching practices: with this publication, we are sharing tips and documentation that will help in implementing a similar type of course.

Working on Ideas

In late autumn 2022, a discussion arose in the Faculty of Social Sciences and Business Studies about the need for research methodology courses at the UEF Summer School. In this context, the teaching of research data management, which is the responsibility of the library, and the discussion of data management as generic academic skill also came up. In autumn 2023, three library research data management experts and five researchers from different faculties began planning a joint study module to be held in August 2024. This left just under a year for planning. The library naturally ended up with the leading role.

The course coordinator was responsible for communicating with lecturers, students, and the project planning group. The coordinator played an essential role in brainstorming content and producing the eLearn Moodle (hereafter Moodle) learning environment and assorted assignments for the course. The coordinator also participated in the classroom teaching that took place on the Joensuu campus. He also played a significant role in reporting and producing this publication.

Practices for Planning a Course

Meetings were held between the course planners, which involved agreeing on practical responsibilities and tasks, specifying the course content, target group, and schedule, and discussion on potential guest lecturers. The meetings were held at an increasingly frequent pace as the start of the course drew nearer. Meetings revolving around content planning in particular were held approximately every other week. In addition to these general planning meetings, there were also a few separate meetings focusing on advertising and communication.

Some of the meetings served as checkpoints without any specific agenda. They were useful in keeping everyone up to date on the issues being worked on and the progress of the project. The checkpoints made it easier to solve problems and balance the workload, for example during busy periods. Memos helped those who were unable to attend the meetings in following the discussions and decisions. Some matters, such as lecture scheduling, were handled by email.

Administrative tasks were divided between the coordinator and the head of the library's data team, who also acted as the project manager. Communication with UEF Summer School, funding monitoring, and study administration matters required the project manager's input throughout the

year. The planning work was carried out in a Microsoft Teams group, which was set up for the course and contained meeting memos and other documents that were worked on jointly, among other things.

Specifying Themes and Experts

See the message template for lecturers / request for introductions

Since the main objective of the course was to highlight the requirements and practices related to research materials in different fields of research, expert lecturers were approached with this objective in mind. The designers' own research backgrounds and expertise were considered in such a way that the library representatives were responsible for the general lectures, with an emphasis on their own backgrounds, whereas the other researchers involved focused on themes related to their own research fields. From this starting point, we considered which themes or fields would require external experts. We used our own networks to recruit them. During the spring of 2024, the guest lecturers (15 researchers from different fields) and the themes of the course were confirmed.

The lectures in the course were organised under very general headings: Research Data Management (RDM) in Practice, Open Science, (Re)using Data, Data Services and Life Cycle, Data after the Study. Under these general themes, the lecturers discussed, for example, the processing, management, and documentation of large image data sets in different research fields, research ethics and sensitive data, social media data sets, the management of different types of data within a single study, data management in data science, citizen science, administrative and registry data, and the job description of a data management expert. The topics covered by the lecturers can be found in the List of Persons.

Choosing Students

The application period was open from February 1 to June 15, 2024. By the deadline, 28 applications were received. Applicants were asked to describe the stage of their studies and their reasons for applying for this course. Some applicants were asked to clarify this information by email. The majority of applicants were students at different stages of their studies at UEF, but there were also applicants living outside Finland who had no prior connection to UEF.

Twenty-five applicants were accepted for the course, most of whom were doctoral researchers or transitioning from master's studies to postgraduate studies. The group also included a few researchers whose applications supported their acceptance onto the course. Clear basic guidelines had been agreed upon for the acceptance decisions regarding the students' stage of studies, which made it possible to accept or reject most applicants for the course in a straightforward manner. For example, doctoral students at Finnish higher education institutions and undergraduate students in the final stages of their studies could be accepted directly. For some applicants, the acceptance decision was considered jointly, for example if the study credits or degree certificate issued by a foreign higher education institution and/or the applicant's free-form letter did not provide sufficient information about the applicant's stage of studies.

14 of the accepted students confirmed their participation, and nine students ultimately participated on the course, all from the UEF. The main reason for cancellations was the classroom teaching at campus, in which some students were not able to participate.

Tips from Conception to Organising

1. Schedule: Start scheduling early.
2. Clear division of labour and responsibilities: Form a core group and define its tasks. Appoint other participants in the planning and implementation with their respective tasks. Remember to define the basic guidelines and process for approving and rejecting participants to the course as early as possible.
3. Meeting practices: Agree on who calls the meetings, as well as the working platforms, writing of memos, meeting participants, and schedules. In addition, remember to always consider the following question: "Could this matter have been dealt with by email?"
4. Funding and other resources: Go through and plan all the available working hours, needs for additional workforce, and funding possibilities. Do also consider the working hours necessary for funding applications, monitoring, and reporting.
5. Lecturer recruitment: Select the themes to be discussed and the necessary expert lecturers. Make use of the networks involved in the planning process when recruiting external experts.

Course Marketing and Communications

Reaching the Target Demographic for the Course

Before starting the student recruitment, it is important to define the target demographic for the course: Who would benefit from participating in the course and how would they be reached? There is a lot of course offering in the university world, so a particular course may go unnoticed by students without targeted recruitment announcements or visible advertising.

For the Mastering the Research Data course, we determined the appropriate communication channels ourselves, as UEF Summer School's communication focuses on audiences outside the university and often on undergraduate students, whereas the target group for this course consisted of doctoral researchers and master's students already in the thesis phase. Reaching a diverse group of students for a course not included in the study guides proved difficult. We received help with advertising in particular from the library's communications specialist, who reminded us to make use of the university's internal communication channels, such as communities on Viva Engage and the university's electronic notice boards.

Communicating with the Faculties

Direct and targeted contact with the faculties may be the best way to reach students. Faculty contact persons, such as the faculty's study administration specialists, are in the best position to assess how to reach students within their own units. At this stage, the benefits of comprehensive networking become very apparent. We also spread information about the course to experts working in the national data support network comprising of experts from various organisations.

Communicating on Various Channels

Viva Engage

Viva Engage is the main internal communication channel at the UEF, enabling extensive communication in both open and closed communities. While Viva Engage reaches most university students by

design, in practice, messages posted there are easily lost in the flood. It is therefore advisable to publish frequently, preferably at regular intervals.

Moodle (eLearn Moodle)

Moodle is the digital learning environment used at the UEF. It recommendable to promote the course in connection with other courses related to the subject. For example, the learning environment for the basic level course in data management could include a mention of the more advanced course that has become available.

Electronic notice boards

Visible advertising on campus can also help in reaching the demographic that doesn't actively follow announcements online. The communications experts that manage the content of electronic notice boards can provide useful instructions for creating effective advertisements. Our advertisement example can be found at the end of the guide.

Blog writing

It can also be a good idea to write a blog text about the course, which can then be shared on different communications channels. We wrote such a text for the UEF Library blog and used it to advertise the course on Viva Engage and social media: *FAIR, RDM, DMP… Mitä tekemistä näillä lyhenteillä on tutkimuksen kanssa? | FAIR, RDM, DMP… What do these abbreviations have to do with research?*

Keeping up with the Lecturers

The lecturers that were invited to teach the Mastering Research Data course had very different work tasks, so any work commitments and busy schedules had to be considered in our communications. We sent the first emails as early as February 2024, almost six months before the actual implementation of the course, and this was by no means too early. In long-term planning, it was also important to ensure that there were no significant gaps in information and that everyone knew where and when to be.

Communication was mainly handled through email. We shared a file containing schedules and detailed titles with all the lecturers, which made it easy for both us planners and the lecturers we contacted to follow the progress of the course. The final schedules and the participation of lecturers were largely confirmed before the summer.

Clarity was the most important aspect when communicating with the lecturers: what is needed and when, what are the obligations involved, why is it worth participating? Messages should be clear and concise so that it is as easy as possible for the recipient to return to the matter and review the information related to the topic. In unclear situations, it is good to keep in touch as early as possible, but at the same time, it is good to use discretion regarding the number and scope of messages. Confirmed matters, such as lecture reservations and accepted students, should be communicated as soon as possible. This also gives the lecturers enough time to prepare for the occasion.

After the course, it is good to remember all participants with a formal thank-you message. For students, this often happens naturally in connection with feedback on the final assignment, but it is also important to send a message to lecturers after the course, so that they can be assured of the significance of their contribution. This simultaneously helps maintain professional networks for possible future projects and other cooperation. If the course has been widely publicised on social media or in the organisation's internal communications, it is also worth reporting on its implementation and success on those channels. For example, posting a public thank-you message in this way would at least partially fulfill the need for follow-up communication. About a month after the end of the course, we published a blog post on the UEF library blog, in which we talked about the course in length. We shared the post on social media and also separately with the students and teachers of the course by email.

Communicating with the Students

See the Welcome message to students and Reminder to students

After the students have been selected, they must be provided with practical information about the participation on the course. The most important information includes the teaching schedule, the lo-

cation of the teaching facilities, the tasks required of the students, and any links to the learning platform and advance material. Other necessary information may include dining options, accessibility of the premises, proximity of restrooms, and various technical details and possibilities.

In addition to the specific welcome message, it may be a good idea to send a reminder or a message containing more detailed information before the start of the course, depending on the schedule. The welcome message used for the Mastering the Research Data course was quite extensive and contained a considerable amount of important information, so it was deemed important to remind our students of some of its contents. In our later message, we reminded the students about registering on the learning platform, familiarising themselves with the learning materials, and completing the pre-assignment. It might have also been worthwhile to emphasize the attendance requirement more.

It is always recommended to allow plenty of time for communication, and important information should not be left undisclosed until the last minute. As the students may well have detailed questions about the content or the practical arrangements, it is preferrable to spare time for providing answers, particularly when it comes to large student groups. In some cases, it may be necessary to make last-minute adjustments to the implementation, in which case one must prepare for additional communication and possible email discussions. As a rule, at least one of the organisers should always be available to students, and on this course, the responsibility for communication was mainly assigned to the project coordinator. The contact details of the person responsible for communication during the course should also be provided to the students so that they know who to contact when needed. Such personal communication can be particularly important in terms of special arrangements.

In case the actual number of students on the course ends up lower than those who have registered, it is still recommendable to send a reminder of the attendance requirement at the beginning of the course. This may encourage a few more of the students to find their way to the classroom.

The timetable for the course should be finished and shared with both students and lecturers well before the first lesson. In accordance with the UEF Summer School guidelines, we announced the timetable to both the Summer School and our students approximately one month before the start of the study period, and the timetable was ultimately visible on Moodle and in the students' emails, as well as on several different applications (Tuudo and Peppi). The different options for checking the

timetable should be considered if any updates are made, as the individual changes to schedules or content must be communicated through all these channels.

Tips for Marketing and Communications

1. Planning and delegating: Define the tasks relating to communication and marketing. Plan the schedule. Remember to consider the flexibility required for communication, the availability of responsible persons, and the updating of changes to all communication channels.
2. Target demographic for the course: Define who the course is intended for and plan how best to reach them (e.g. targeted announcements, internal communication channels, other courses).
3. Contact with the students: Provide accepted students with practical information on course participation (including the teaching schedule, location of the teaching facilities, mandatory assignments, and links to the learning platform). Remember to be consistent, up-to-date, and accessible. When it comes to classroom teaching, inform students of any changes to the course content or timetable while they are physically present.
4. Contact with the lecturers: Plan what to communicate to the lecturers and when to proceed. Remember to remain accessible. Use a clear, structured document that lecturers can easily access to check essential information when preparing for their own lectures.
5. Follow-up communication: Send a thank-you message to everyone who participated on the course, report on the course's implementation on social media and/or in the organisation's internal communication channels. Request and provide feedback.

Course Implementation

Learning objectives and contents of the course

The learning objectives and content of the course were defined in the study guide as follows:

Learning objectives

After completing the course, the student is able to

- identify the special characteristics of their research data and compare it with the data from other fields of research
- explain what constitutes good data management, the use of metadata that supports research, and good scientific practices related to data at different stages of research
- apply good and responsible data management practices in all phases of the research
- write a Data Management Plan (DMP) as a part of the research plan and to update the DMP
- implement open science in data management, process and describe research data in a way that enables data reuse (sharing, archiving).

Course content

The course is based on key themes in data management. The course covers all stages of research data management and provides examples from different disciplines and data types. Data management is examined in the context of everyday research practices and from the perspective of research methods and questions. Students plan the management of their research data, identify potential difficulties related to research data management, and find suitable solutions. The course is suitable for master's and doctoral students who work with qualitative or quantitative research data and for those conducting multi-method research.

The course explores the following questions

- How do different research methods and research questions relate to managing of the data?
- How do researchers perceive their own relationship to their data (feelings, experiences, everyday challenges)?
- How and what kinds of digital tools are used in data collection, management and analysis?
- What is meant by data description and documentation, and how to carry it out in practice?
- What kind of ethical and legal issues are involved in data management?

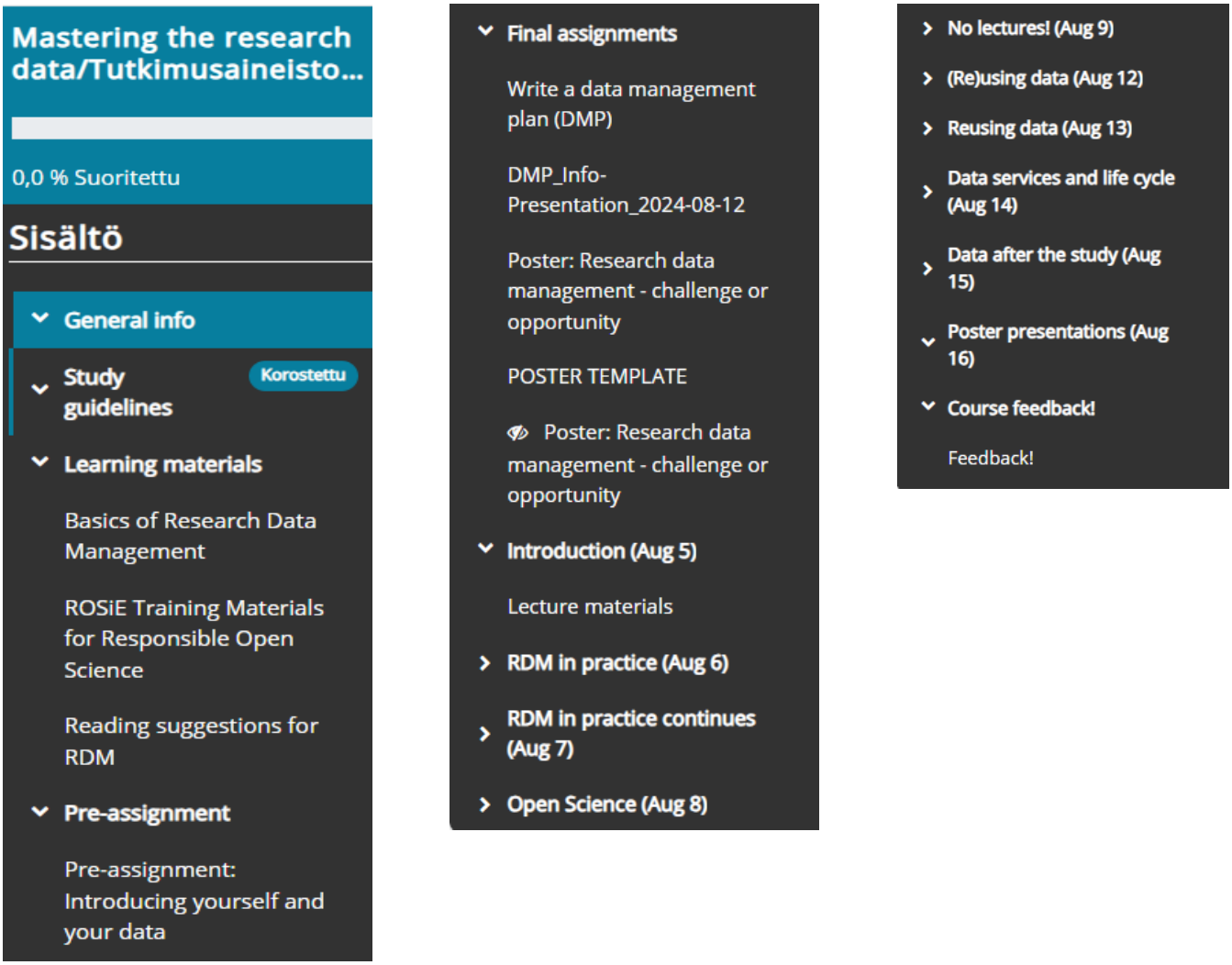
- How can open science be implemented with different kinds of research data and methods?

The course in a nutshell

The course included lectures, group work, and independent final projects consisting of drafting a Data Management Plan, and a poster. The classroom schedule was designed to leave students time for independent work.

The numerous guest lecturers we contacted formed the heart of the implementation. Some of the lecturers were able to participate in the classroom to present their research and related data management issues, while others held their lectures remotely (Microsoft Teams). After the lectures, there was always an opportunity for joint discussion. The group work focused on topics such as the FAIR principles and their application to the students' own data, describing research data, as well as documenting using Lego bricks.

The course module was assessed on a pass/fail scale. To pass, students were required to complete all assignments, with separate evaluation criteria applied to the final DMP assignment.



Screenshot: Structure of the Moodle platform.

See below, Learning Environments.

Learning Environments

The main digital learning environment for the Mastering the Research Data course was Moodle. We began content planning in the spring and moved onto building the course environment in the summer of 2024. The Moodle contained basic information about the course content, the responsible teachers, guest lecturers, daily themes, lecture rooms, and other practical arrangements. Students were able to introduce themselves to others on the discussion platform before the start of the course.

In addition to self-study materials and instructions for the advance and final assignments, the materials for each lecture, as well as related readings and assignments, were added to the Moodle environment as soon as the teachers distributed them to us. The objective was to keep the environment up to date in real time.

The classroom teaching for the course was held in a multi-function room at the Joensuu campus. As the room was set up to also accommodate remote lectures, the students present could join in on discussions with the remote lecturers thanks to the high-quality microphone setup. The room also had several movable screens, which made it easier to follow the lecture materials and to work in groups, supported also by the table arrangement. The same space would also have enabled effective remote teaching, but this opportunity was not utilised in the implementation due to the constraints set by the UEF Summer School. The teaching space was found to be comfortable, and its cozy atmosphere enabled natural discussion even during teaching.

Remote lectures were conducted using Microsoft Teams. The responsible teachers managed the sound quality during the lectures by muting the classroom microphone for the duration of the remote lecture. The aim was to leave a 15-minute break between lectures to allow time for the following lecturer to connect to Teams and to check that the presentation and equipment were working properly.

When teaching lasts from morning to afternoon, it is also important to consider opportunities for exercise and meals. In this sense, the lives of both students and teachers were made easier by the proximity of the teaching space to the restaurant and restrooms.

Learning Materials and Student Assignments

See Assignments on the course

The promotion of open science was one of the objectives of the course, which was also reflected in the learning materials. The following openly available materials produced by the UEF Library were used as basic learning materials on the course (links to the materials can be found in the Sources and Links section): Basics of Research Data Management (doctoral students) and Research Data Management for Undergraduate Students (master's students). Various types of open materials produced by other actors were also utilised. The lecture materials of our guest lecturers were distributed on the course Moodle specifically; they were not published openly as they were.

The fact that the students ranged from various disciplines and stages of their studies set additional requirements for the content to be taught and other aspects of the course. These were met with the help of lecturers who themselves represented different disciplines – all students received some material that related to the management of data in their own studies. In addition to the advance assignment and group work carried out during the course, there were two final assignments (the drafting of a poster and a data management plan) in which students were able to apply what they had learned about data management to their own discipline and their own thesis or dissertation data. In this way, the learning assignments connected the general themes of the subject matter to the individual needs of the students. There were different templates for the poster and the data management plan for researchers and master's students in both Finnish and English.

Group work made it easier to come together as a group and supported the creation of a positive learning environment. The group assignments encouraged students to consider different themes related to data management and to share the practices of their own fields with others. For example, a task related to documenting a structure made of (see Group assignment: documenting a structure built with LEGO bricks) encouraged students to think practically through concrete construction, not only about the practices and significance of documentation and description, but also about methods of collaborating in a research group. Some of the discussion-based assignments took place outside the classroom in the form of light outdoor activity, which received positive feedback.

Tips for Course Implementation

1. Learning objectives: Define the learning objectives clearly, considering the target demographic for the course. Plan the evaluation in line with the objectives. Keep the objectives and evaluation in mind when planning the content of the course.
2. Learning materials and assignments: Differentiate the different types of materials (self-study, advance, and lecture materials) and assignments with their submission methods (submission platforms for assignments completed during the course and the final assignments, as well as feedback and discussion sections). Favor openly available learning materials, as these can be used flexibly by students even after the conclusion of the course.
3. Learning environment: Select the learning environment(s) according to the course delivery method (face-to-face/distance/hybrid). Follow your organisation's guidelines for organising distance and hybrid events. Introduce the digital learning environment as comprehensively as possible at the beginning of the course.
4. Technology and equipment: Familiarize yourself with the equipment in the physical classroom before the lesson begins. Ensure that remote connections are working as intended and that there is sufficient IT equipment present before the lesson begins. Prevent sound feedback by turning off the classroom microphone during remote lectures.
5. Lecture arrangements: Allow for short refreshment breaks and give the lecturers/teachers time to settle into the room between lectures. Keep the lecture schedule loose to allow for flexibility and relaxed discussion.

Conclusion: What did we learn

The main objective of the course was to connect research data management to the everyday research, regardless of the field of science or data type, and this objective was achieved. Collaboration with researchers and library experts from design to implementation increased the course designers' own expertise and skills in a variety of ways. The course content can be utilised in the development of general courses and thematic training in data management, as well as in the methodology teaching of different disciplines.

From the perspective of open science, the course content can be applied e.g. in the following ways:

- Supplementing your own open learning materials by utilising the guest lecturers' materials in accordance with their terms of use.
- Open sharing of additional literature related to methods and/or data management from various disciplines.
- Collecting and open sharing practical tips. Feedback from students and teachers, as well as course assignments and discussions, can be used as a basis for this. This could be implemented, for example, as a Frequently Asked Questions section on a public website.

Naturally, there is always room for improvement. Arranging a follow-up meeting or joint discussion with the guest lecturers would have been beneficial. This would have provided an opportunity for mutual feedback. Similarly, it would have been constructive for the lecturers to be given a clear opportunity to attend each other's lectures. Since the course was conducted as classroom teaching for the students, we did not deem it fitting to open the possibility of remote teaching except for one lecturer at a time. On the other hand, we wanted to offer teachers the opportunity to give remote lectures, because we would not have been able to reimburse any travel expenses, and a one-hour lecture would have required a two-day trip with an overnight stay at worst.

A two-week course conducted as classroom teaching sets strict conditions for participants. It is likely that a hybrid course would have attracted more participants, and in that case, it would have been natural for remote teachers to attend other lectures as well. Regardless of the implementation method, clear distribution of information is of paramount importance. Systematic communication and precise demographic marketing, e.g. to the supervisors of doctoral theses is essential.

Compiled Schedules: What and When?

Before the course

What	When to do
6–4 months before	Design the course structure - Definine the course content - Organise the teaching - Choose the course format (remote/classroom/hybrid) Planning meetings - Agree on the timetable and facilities for the teaching - Agree on the selection/production of the learning materials
4–2 months before	Starting the search for students - Public marketing of the course - Communicate on various channels Planning meetings - Work on the learning materials - Construct the (digital) learning environment - Reserve the facilities
1–2 months before	Accepting student applications - Welcome message and other communications - Define the advance assignments Send participation invitations to lecturers (Teams, Zoom) Meetings and checkpoints - Finalise the materials - Agree on the final timetable and lecture content
One month before and again just before starting the course	Communicating with the students - Practices and arrangements - Remind about the advance assignments and the course format - Open the learning environment (earlier is preferrable!) Final meetings - Finalise the practical arrangements - Inform the lecturers regarding students, contents, and schedules

During the course and afterwards

What	When to do
During the course	Meet with lecturers 15 minutes before their lectures to ensure that the equipment and remote connections are working properly - Turn microphones on and off when needed - Moderate discussions and monitor chat - Take notes After the lectures, ask for feedback and presentation materials as agreed Update Moodle and guide students in completing their assignments
Within a week of the conclu-sion	Thank the lecturers for their participation Remind students to submit their final assignments Communicate on the final results of the course internally Communicate with stakeholders (e.g., UEF Summer School)
Within a month of the conclusion	Give students credits for the course Pay any fees to teachers Report on the success of the course - Public blog - Internal report

Message Examples (references in text)

Message template to the lecturers / Request for an introduction to topic

Hello!

We are currently organising a course for the UEF Summer School to be held in August 2024. The course is called Mastering the Research Data! and will examine research data management as a singular entity as well as from different viewpoints. This is a brand new and ambitious course for doctoral students in various disciplines who are in the process of writing their dissertations, as well as for master's students aiming to pursue postgraduate studies. The course is implemented as a multidisciplinary collaboration between library data management experts and representatives from different faculties/disciplines. The aim is to attract lecturers from as many different fields and stages of research data processing as possible in order to provide the most comprehensive picture of different data management practices. It would be great to have researchers from different fields share their experiences with data management practices related to their own research, as well as the difficulties they have encountered in data management. The course covers key topics in data management, such as documenting, describing, processing, and opening data.

Would you be available to give an introduction (20–30 min) or a lecture (45–60 min) one day during this course between August 5 and 16? The students will be participating at the Joensuu campus, but the introduction/lecture can be given remotely if necessary. Based on the topic introductions and lectures, the students will then discuss the themes in groups under the guidance of the course instructors. The course will be held in English. Unfortunately, we are unable to reimburse travel expenses, but we can offer a lecture fee. Below is a more detailed description of the course (the description visible to students in the Peppi system). [hyperlink]

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Research career advancement requires expertise in responsible data management, as data management skills are fundamental skills for researchers and general skills in working life. There is a pressing need for training for the development of these skills. To date, no similar study module on research data management has been available nationwide or, apparently, even internationally. In addition to UEF postgraduate students, postgraduate students from other Finnish and foreign universities can also participate in the course.

Welcome Message to the Students

Welcome to the course Mastering the Research Data on Joensuu campus (5th–16th Aug)!
We are thrilled to have you in Joensuu for a novel course that will bring together students, researchers and teachers from different backgrounds and experiences of handling a variety of data. During the course, we will explore together the interconnections of data management practices, research questions and methods, all in line with the goals and principles of open science and research integrity.

In this welcome letter, you will find everything you need before we meet in Joensuu and before the course Moodle is opened (1st Aug).

The course includes a pre-assignment, contact teaching in Joensuu (e.g. following lectures, group exercises), independent study (e.g. reading materials provided during the course), outputs/final assignments (Data Management Plan, a poster about RDM).

Contact teaching takes place in Joensuu Campus, AU112 (Aurora Building, seminar room 112). The daily program and campus map are at the end of this letter.

The learning environment is on Moodle (UEF eLearn): [hyperlink]. You can access the course Moodle from the 1st of August when you have been enrolled to the course in Peppi (done automatically by the UEF Summer School). The link to the Moodle is also in Peppi. All the practicalities of the course are found in Moodle.

The learning outcomes and passing the course

After completing the course, you can

- identify the special characteristics of your research data and compare it with data from other fields of research
- explain what constitutes good data management, the use of metadata in support of research, and good scientific practices related to data at different stages of research
- apply good and responsible data management practices in all phases of the research
- write a Data Management Plan (DMP) as a part of the research plan and continue to update the DMP
- implement open science in data management, process and describe research data in a way that enables data reuse (sharing, archiving).

To pass the course, you need to

- submit the pre-assignment

- go through the learning materials
- actively participate in the contact teaching
- pass the final assignments (poster, DMP) (the evaluation criteria for these assignments can be found on Moodle)

The schedule

A) Independent studying and the pre-assignment (8.7.–4.8.2024)

The idea is to activate and orientate you to the entire course - correct or incorrect answers are not sought here as much as your own reflection. The assignment is not evaluated, but it is mandatory.

1) Go through the basic elements of research data management by reading the study material **Basics of Research Data Management**. Reflect on your own experiences, e.g., with the help of these questions: what research data management is in everyday research, why it is worth doing, and what difficulties it may involve in your own research.

2) Pre-assignment: Introducing yourself and your data (submission 1.–4.8.) [Ks. Ennakkotehtävä: esittäytyminen ja aineiston kuvailu]

B) Contact teaching – Joensuu campus (5.–16.8.2024)

The two weeks of intensive learning consist of lectures, discussions and group work during the scheduled hours. There is also time for independent studying and assignments. The weekly schedule is attached to this welcome letter.

Participate in contact teaching (expert lectures) and group exercises on specific themes of data management.

Final assignments that are individual tasks and for which you will receive personal feedback

- Make a poster about your research data management. The posters are presented at the end of our two weeks together (15th– 16th of August), which means you will also receive feedback from your fellow students.
- Write / start writing a Data Management Plan. You will have more time to turn in the DMP so it does not have to be finished during the contact teaching period.

C) Independent studying (17.–31.8.2024)

- Finish the DMP and submit it. You will receive personal feedback from the coordinating teachers.
- Write feedback that includes reflection on the personal goals you set for the course. You will receive collective feedback from the coordinating teachers.

About the teachers and guest lecturers

The guest lecturers come from diverse research backgrounds. We have specialists, for example, in data science, linguistics, law, citizen science, biomedicine, and environmental science. Their expertise of handling data covers social media, registers, archives, medical records, genomics, and ethical questions to mention a few.

You will find the guest lecturers with the titles or themes of their lectures listed on the information site of the course [hyperlink].

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Please, don't hesitate to contact the coordinating teachers if you have any questions related to this course!

See you in August in Joensuu!

Signatures

Reminder Message to the Students

Dear all,

I am sending you this email as a follow-up to the introductory letter you received earlier this month.

The learning environment is on Moodle (UEF eLearn): [hyperlink] You can access the course Moodle from the 1st of August when you have been enrolled to the course in Peppi (done automatically by the UEF Summer School). The link to the Moodle is also in Peppi. All the practicalities of the course are found on Moodle.

The study material mentioned in the introductory letter can be found here: Basics of Research Data Management [hyperlink]. When reading, please reflect on your own experiences, e.g., with the help of these questions: what research data management is in everyday research, why it is worth doing, and what difficulties it may involve in your own research.

The guest lecturers with the titles or themes of their lectures are listed on the information site for the course: [hyperlink]

Welcome to the course!

Advertisement Example, e.g. for Internal Communications

Are you a doctoral or master's student looking for guidance on research data management? Look no further, Mastering the Research Data! is here to cover your needs!

Mastering the Research Data! brings together guest lecturers from a variety of research fields & specialists from the UEF library, providing students with a general outline and practical experience from different fields. The course introduces all phases of research data management and presents examples from various disciplines and data types.

The course includes daily participation from Monday through Friday over two weeks of intense learning.

For more information, please see Basics of RDM [hyperlink] and Mastering the Research Data! [hyperlink]

Course Timetable

	5.8.2024	6.8.2024	7.8.2024	8.8.2024	9.8.2024
9:00–10:00		Miettinen	**Working in groups**	Karhapää [Open science…]	*No contact teaching on Fri*
10:00–11:00	Satama et al.: Intro & getting to know each other	Tolppanen	Karhapää [Ethical & juridical aspects…]	Kiiskinen	
11:00–12:00	Satama [What is RDM…]	Rahnasto-Rilla [RDM during research…]	Latonen	Peltoniemi	
12:00–13:00	*Lunch*	*Lunch*	*Lunch*	*Lunch*	
13:00–14:00	**Working in groups**	Satama [Documentation…]	Pöhner	Satama ["Trad. hum."…]	
14:00–15:00	**Working in groups**				

	12.8.2024	13.8.2024	14.8.2024	15.8.2024	16.8.2024
9:00–10:00	Oinas			Karhapää (Open data)	Kainulainen
10:00–11:00	Kaislaniemi	Ristikari		Skaldina	**Posters**
11:00–12:00	Rautionaho	Laitinen		Rahnasto-Rilla (Data management…)	**Posters**
12:00–13:00	*Lunch*	*Lunch*	Keckman-Koivuniemi	*Lunch*	*Lunch*
13:00–14:00	**Working in groups**	Taipale	Hakola	**Discussion/Posters**	**Posters/Discussion**
14:00–15:00	Capra	Kilpeläinen	**Working in groups**		**Posters/Discussion**

Assignments on the Course

Advance assignment: introduction and research data description

Link to the Padlet: [hyperlink]

1) Go through the basic elements of research data management by reading the learning material Basics of Research Data Management. Reflect on your own experiences, e.g., with the help of these questions: what research data management is in everyday research, why it is worth doing, and what difficulties it may involve in your own research.

2) Pre-assignment: Introducing yourself and your data (submission 1.–4.8.2025)

- Introduce yourself and your data. Describe your research or the field of study and what kind of research data you use and/or produce in your own research. You can explain where your material comes from and what type it is. If you do not yet have your own research data, you can also expand on what kind of material is generally handled in your research field.
- Set personal goals for this course. You can also ask direct questions about data management to which you would like answers during the course. The course teachers can thus consider these during the course and in individual and collective feedback.
- Submit your introduction and reflections directly (no attached files) on the course Moodle (pre-assignment section) that will be opened on the 1st of August. You are free to discuss there with your fellow students and get to know each other already before our meeting on Monday, August 5th.

***

The idea is to activate and orientate you to the entire course - correct or incorrect answers are not sought here as much as your own reflection.

The assignment is not evaluated, but it is mandatory.

Familiarising with the topic and the group

Before the start of the lecture period, students were asked to familiarize themselves with the basic learning materials of the course:

Go through the basic elements of research data management by reading the learning material Basics of Research Data Management at the Learning materials section.

The first day of the course was dedicated to orientation and group formation. Both students and the responsible teachers shared information about their own research and research data. The orientation activities included, among other things, the use of emotion cards, which helped participants express their expectations and hopes regarding the course.

Group assignment: documenting a structure built with LEGO bricks

Group work: LEGO® Metadata for reproducibility (Mary Donaldson (ORCID 0000-0002-1936-3499) and Matt Mahon (ORCID 0000-0001-8950-8422) University of Glasgow. CC BY 4.0)

Instructions for the group work (three groups, a, b, c, each group having a slightly different task)

Phase 1: Creating

1. Build a small vehicle (car / truck / bike / plane / train) using between 15 and 30 bricks (approximately). Feel free to make this as complex and detailed as you would like and accessorise as desired.

2. Notes

- 2.a Use the paper provided to make notes on how to replicate the build.
- 2.b Keep notes on how to replicate the build using the template provided.
- 2.c Keep notes on how to replicate the build, using the block list provided if needed.

Phase 2: Replication

1. Using the resources provided by the previous group, attempt to replicate their build.

2. Consider which information was helpful and what additional information you would have found useful in attempting to replicate the previous build.

Phase 3: Discussion

- Did you find this a simple way to document your process?
- Was there anything you found difficult to capture?
- Did you find it straightforward to follow the instructions when replicating the building?
- Did you find any ambiguity in the instructions?

Group assignment: applying FAIR principles to research data

Group work **"What you can do to make your data(set) as FAIR as possible"**

Split into four groups and discuss the following themes. You can get help from the the FAIR Cookbook website.

- What makes data findable? - What steps can you take so that others can easily discover your data?
- What makes data openly accessible? - How do you ensure that data can be retrieved and accessed by both humans and machines?
- What makes data interoperable? - How do you ensure that data can be easily interoperated with applications or workflows for analysis, storage, and processing?
- How can data reuse be supported? - How do you ensure that your data can be used for various research purposes beyond their initial collection?

Material:

- The FAIR Guiding Principles for scientific data management and stewardship
- From Planning Stage Towards FAIR Data: A Practical Metadatasheet For Biomedical Scientists
- Biomedical Data Repository Concepts and Management Principles
- Perceptions and behavior of clinical researchers and research support staff regarding data FAIRification
- The variable quality of metadata about biological samples used in biomedical experiments
- Strategizing Earth Science Data Development
- Enabling FAIR data in Earth and environmental science with community-centric (meta)data reporting formats
- Integration of ten years of daily weather, traffic, and air pollution data from Norway's six largest cities
- Biomedical Data Repository Concepts and Management Principles

Home assignment: Familiarising with the methods, data description, and openness of scientific publications

The students were given approximately one week to find a scientific publication in their own field and to use it in the examination of how research methods and data are described, and how available they are. The observations were discussed in small groups and collectively.

Instructions

Choose one scientific publication from your field (article, book, book chapter) and see how the methods and data are described and available, is it clear what are the methods and data used, how transparent and open they are?

See the repository list in UEF Open research data web page or try Re3data for searching more repositories, choose one repository that could be relevant for you/your discipline. See what kinds of data are available in the repository and choose one dataset that you inspect more closely. Think: what is the data, is it easy to access, how it could be reused, would it be easy/difficult to reuse it and why?

We will discuss your findings and thoughts in Open research data session.

Final assignment 1: Poster on research data management

Present data and data management in your research project in a poster. If you don't have a project yet, see the instructions for master's students below.

Instructions for the poster

Doctoral students/researchers

Describe the things you need to consider with data management during and after the research. What things need to be planned before starting the research, or at the very latest before the data collection begins? What happens to your data after the project? What challenges do you expect to encounter with data management and how are you planning to solve them?

Master's students

Describe what kinds of material are generally handled in your research field. Explain also the matters that are important to notice when handling the data and the challenges you may face regarding research data management.

About the posters

A poster is a visual presentation and summary of the core points of your research and material, presented in concise text mixed with tables, graphs, pictures, and other presentation formats. A good poster is simple, smooth, well-structured and punchy, providing the viewer with a clear message. The poster should also be visually appealing, allowing the viewer to understand your topic in a few minutes.

In terms of content, the poster should include the following things:

- headline
- author and organisation
- text and/or tables, graphs, pictures or images
- a description of data (your own or discipline-specific)
- a description of your/discipline-specific RDM and the challenges you face in data management

Submitting the poster

Submit the file to this assignment platform (word or pdf). At the end of the course, the poster will be presented to the other students, and you will also receive feedback on your poster.

The best poster will be rewarded!

Evaluation

This assignment is passed when you have created a poster according to the instructions and presented it to the others.

You can use a poster template that also guides in the creation of the poster.

For the presentations on Friday (16th Aug)

Be prepared to present your poster in less than 10 minutes so that there would be time also for discussion. I.e., each poster has ca 10 (max 15) minutes to be presented and discussed.

Final assignment 2: Data Management Plan (DMP)

Instructions for writing the DMP

Doctoral students / researchers

Write a DMP using the General Finnish DMP template or other template provided in DMPTuuli (e.g., the Research Council of Finland's template). The course material and DMPTuuli will guide you in the creation of your plan. In DMPTuuli, you can select a funder, e.g. Research Council of Finland, and follow the funder's guidelines. There are also additional instructions available for sensitive and confidential data (click to see the full list when selecting guidance). Try to answer all the relevant questions in the DMP, or in other cases explain why something is not relevant for your research data. Be sure to also include your research abstract in the cover page of the DMP. If you already have a DMP, you can update it and submit the updated document. You can either write the DMP in the DMPTuuli tool by signing in with your HAKA (UEF) credentials or download the template to your computer as a word document.

Master's students

Write a DMP for the data that you are handling in your thesis. If you do not have your own data, you can describe the characteristics of data that are typical in your discipline. There is a simpler DMP template that you can download to your computer as a word document. The course material will guide you in the creation of the DMP. Focus on the technical matters and keep your plan tight and firm. Try to answer all relevant questions in the DMP, but if the question does not apply to your data, be sure to state the reason for it.

DMP template for thesis writers

Submitting the DMP

Submit the file to this assignment platform (word or pdf).

Evaluation

The DMP is evaluated as pass/fail scale using the following evaluation scale.

Doctoral students/researchers:

DMP evaluation for doctoral students / researchers

Master's students:

DMP evaluation for master's students

The teacher will review your DMP and give you feedback about it within 3 weeks after submitting the assignment.

List of Persons

The persons who participated in the design and implementation of the course (role and faculty/department in brackets, and the lecture's title/titles after the name).

Design and responsible teachers: UEF Library

Hartikainen, Kaisa (opening the teaching practice)

Järvinen, Teemu (e.g., technical help)

Karhapää, Anne (responsible teacher): *Ethical and juridical aspects in data management (in general); Open science and data management (in general); Open research data*

Niskanen, Niko (coordinator)

Rahnasto-Rilla, Minna (responsible teacher): *RDM during research (in general); Data management close to the end of data life cycle*

Satama, Manna (responsible teacher, project leader): *What is RDM, DMP or FAIR in practice?; What is documentation and metadata (in general)?; Data management in "traditional humanities" data: a problem or not?*

Design, teaching: UEF faculties

Hakola, Outi (design, teaching, Social Sciences and Business Studies): *The relationship between data management and processing, analysis and reporting of qualitative data*

Hauta-Kasari, Markku (early design, Science, Forestry and Technology)

Kouvo, Antti-Jussi (early design, Social Sciences and Business Studies)

Oinas, Tomi (design, teaching, Social Sciences and Business Studies): *Tansformations & coding of numerical data*

Rautionaho, Paula (design, teaching, Pihlosophical Faculty): *Reproducibility and transparency (in linguistics)*

Expert lecturers

Capra, Janne: *Too much data?? Data handling in Cell and Tissue Imaging Unit*

Kainulainen, Samu: *Case example: SmartSleep databank*

Kaislaniemi, Samuli: *Working with 20,000 digital images: Pipelines and practices for archival work*

Keckman-Koivuniemi, Hannele: *SD services for opening and reusing research data*

Kiiskinen, Harri: *The role of data management and a data management specialist in a research project*

Kilpeläinen, Mia: *Research ethics, highly sensitive data*

Laitinen, Mikko: *Working with social media data*

Latonen, Leena: *Managing the plethora of data types in biomedical research*

Miettinen, Pauli: *Program Code as Data and Metadata - Data Management in Data Science*

Peltoniemi, Aaron: *Learning through citizen science*

Pöhner, Ina: *Data management in computational drug discovery and systems biology - FAIR data from two angles*

Ristikari, Tiina: *The use of administrative records (i.e. registers) for research purpose (Finnnish Birth Cohorts 1987, 1997)*

Skaldina, Oksana: *Biodiversity research data management*

Taipale, Irene: *A case study utilizing social media data (in doctoral research*

Tolppanen, Anna-Maija: *Improving the reproducibility of research plans – insights from administrative health data*

Sources and Links

Donaldson, M., & Mahon, M. (2020, February 19). Lego: Metadata for reproducibility. International Data Curation Conference 2020 (IDCC20), Dublin. Zenodo. https://doi.org/10.5281/zenodo.3685685

Fuchs, S., Immonen, P., & Rauste, P. (2024). How researchers describe their data - instructions for the workshop organizer (1.0). Zenodo. https://doi.org/10.5281/zenodo.10653228

Karhapää, A., Niskanen, N., Rahnasto-Rilla, M. & Satama, M. (2024). Tutkimusaineisto haltuun! | Mastering the research data! UEF Library blog 2.10.2024. https://blogs.uef.fi/ueflibrary/tutki-musaineisto-haltuun-mastering-the-research-data/