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Master's programmes Earth Sciences

MSc Research

GEO4-1520

1. Objectives

The MSc Research represents the culmination of the Earth Sciences Master's programmes. When conducting MSc research, the student demonstrates skills to pursue independent research and shows advanced knowledge in the field of the MSc programmes. These skills include:

- preparing and initiating a research project;
- analysing and processing data;
- writing and presenting a research report.

The student demonstrates the capability to apply and to integrate advanced knowledge in order to interpret scientific results and to answer research questions. The MSc research project includes a critical study of the relevant scientific literature, and application of the information collected to accomplish the research objectives.

The MSc research is mandatory for all Earth Sciences students and encompasses a credit load of a multiple of 7.5 EC between 30 EC (minimum requirement) and 45 EC (maximum). The duration should reflect the working time required for establishing the database for the project and is not associated with profundity. This implies that the same assessment criteria apply for MSc theses irrespective of duration. The MSc research encompasses a written report (MSc thesis) and an oral presentation, both obligatory in English. The thesis should – in principle – contain material of publishable quality. MSc Research projects can be carried out in collaboration with other students, but only under the condition that each student works on an individual problem statement and that the individual performance (and individual thesis) of each student can be properly judged by the supervisor.

2. Pre-requisites

The pre-requisites guarantee a competent starting level for the student on the aspects of research capabilities and general and specialist knowledge.

To start with MSc research a student should have obtained at least 30 ECTS credits of theoretical first year MSc courses (GEO4-...) from the relevant programme. Usually, the student has completed more theoretical courses within his/her personal programme, established earlier in consultation with the programme leader.

3. Finding a suitable MSc Research topic

There are different ways to find an MSc Research project. MSc Research projects offered by staff from the Department of Physical Geography are published on Blackboard and on the student website in February. Students can contact the staff member who offers the project for further information and application. For projects at the Department of Earth Sciences, students are encouraged to take the initiative in contacting academic staff members of the department about possible research topics. The topic should fit within or should have strong links with one of the Earth Sciences programmes. The topic could be theoretical or practical, could include fieldwork, laboratory work, or computer-based simulation/modelling. The Graduate School of Geosciences does not provide any financial compensation for the research components. Nevertheless, costs (e.g. fieldwork or laboratory analyses) may be reimbursed by the research group or external funds.

Together with the staff member, who is also the intended supervisor of the MSc project, the student defines and delineates the thesis topic.

4. Supervisors and assessors

Typically, the member of the permanent scientific staff of the department of Earth Sciences or Physical Geography with whom the student has defined the research topic will act as first supervisor and assessor/examiner of the MSc Research project. The daily supervision can be delegated to a qualified expert from outside the departments. For example, when the MSc research project is performed at another academic or non-academic institution, a staff member at the host institution may act as daily supervisor. Postdocs and PhD-candidates may also be involved in the daily supervision. In any case, the permanent staff member from the department of Earth Sciences or Physical Geography remains responsible as first assessor/examiner, i.e. he/she is the primary responsible for the supervision and grading of the MSc research project (thesis and oral presentation).

The thesis and presentation are assessed and graded by two assessors/examiners. If the project has only one supervisor, a second assessor must be found in consultancy with the first supervisor. The second assessor should be an employee of Utrecht University, a permanent staff member, Postdoc, or $\geq 2^{\text{nd}}$ -year PhD candidate, and an expert in the field of the research topic. In addition, researchers holding a PhD degree with a permanent position at a Dutch research institute (e.g., NIOZ, TNO, Deltares), and with proven experience in grading master theses, may also be nominated as second assessor.

If the second assessor is not a permanent staff member of the department of Earth Sciences or Physical Geography, the qualifications of the intended second assessor will be evaluated for their expertise by the Teaching Institute Earth Sciences during the registration procedure (see below). This may cause a slight delay in the approval of the MSc research project. If the Teaching institute does not give consent with regards to the second assessor, both the student and first supervisor will be informed. They will then be asked to find an alternative second supervisor.

105 If the MSc Research project is graded with a final grade between 5,5 and 6.0 or
106 8.5 or higher, a third assessor will be necessary. This third assessor a) should be
107 an expert in the field of research covered by the thesis; b) should not have been
108 involved in any way in the graduation project and/or writing stage; c) must also
109 be a member of the permanent scientific staff of the department of Earth
110 Sciences or Physical Geography. Further details about the role and tasks of the
111 third assessor will be given below.
112
113

114 **5. Research activities and final products**

115

116 An MSc Research project encompasses a variety of research activities that are
117 necessary to achieve the research objectives, including literature review, data
118 collection (for example through field observations, sampling, or measurements,
119 laboratory experiments and analysis, or computer modelling), data analysis,
120 thesis writing. The nature of the research activities within the project and the
121 associated time investment are discussed and agreed upon with the first
122 supervisor before the actual project starts. Writing an extended research proposal
123 based on literature review may also be part of the research activities.
124

125 The final products of the MSc Research project include at least a written MSc
126 thesis and an oral presentation. There are no strict rules with regards to the MSc
127 thesis, except for that it must comply with the basic rules for scientific writing and
128 scientific integrity. A guide for scientific writing is available at the Earth Sciences
129 skills website (<https://skillsearthsciences.sites.uu.nl/writing/>). Furthermore, the
130 assessment criteria can be found on the rubric/assessment form available in the
131 MSc thesis Blackboard community.
132

133 The oral presentation (thesis talk or colloquium) about the MSc Research project
134 has a typical duration of 20-30 minutes (45 minutes including questions and
135 answers) and is scheduled near the end of the project in consultation with the
136 supervisors and assessors of the project and the secretary of the department of
137 the Department of Earth Sciences or Physical Geography, who will make a room
138 reservation and takes care of including the presentation in the thesis talk
139 calendar (see Thesis talks Blackboard Community). A guide for scientific writing is
140 available at the Earth Sciences skills website
141 (<https://skillsearthsciences.sites.uu.nl/presenting/>).
142

143 Apart from the written thesis and oral presentation, the final products of the MSc
144 Research product may include other relevant outcomes of the project, such as
145 datasets, computer models (scripts or executables), whether or not included as
146 appendices of the written thesis. If relevant, the delivery of these final products
147 should be discussed and agreed upon between student and the supervisors.
148
149
150

151 **6. Use of Generative artificial intelligence in MSC Research project**

152

153 During the MSc Research project, the use of Generative artificial intelligence
154 (GenAI) tools (e.g. ChatGPT, Bing Chat, or Google Gemini) is allowed in the
155 following situations or manners:

- 156 - Finding information about your topic
- 157 - Summarising, explaining or translating literature sources
- 158 - Translating self-written text

- 159 - Improving language, style, or structure of self-written text
- 160 - Debugging computer code
- 161 - Formatting of literature references

162

163 If you use a GenAI tool, please note and consider the following:

- 164 - The student remains responsible for the thesis and related end-products
- 165 with respect to both content and wording. Remain critical about and the
- 166 output of GenAI.
- 167 - The output from GenAI is not considered as a scientific source, because its
- 168 origin is not traceable nor reproducible.
- 169 - It is not allowed to generate texts of entire sentences or paragraphs using
- 170 GenAI and present them as own work. This also applies to computer code
- 171 and figures. This is considered plagiarism, and, therefore, fraud.
- 172 - It is recommended to save intermediate versions of your thesis, so that
- 173 you can trace and underpin its creation.
- 174 - Be aware that GenAI tools have an immense energy footprint (for
- 175 example, see De Vries (2023)
- 176 (<https://doi.org/10.1016/j.joule.2023.09.004>) for an estimation of energy
- 177 consumption per request for various AI-powered systems compared to a
- 178 standard Google search)

179

180 If the supervisors or assessors suspect the use of GenAI for other than the above

181 purposes, then they may invite you to explain your thesis and its origin in further

182 detail. If they suspect any form, plagiarism, fraud or other forms of scientific

183 misconduct, they will notify the Board of Examiners.

184

185

186

187 **7. Administrative procedure**

188

189 Apart from the different research activities and steps to achieve the objectives of

190 the MSc Research project (e.g., literature review, fieldwork, labwork, data

191 analysis, computer modelling, thesis writing), which will be discussed with and

192 monitored by the supervisors, the MSc research project encompasses a series of

193 administrative steps for registration and monitoring purposes as part of the

194 quality assurance of the Earth Sciences master programmes. For this, the Osiris-

195 Case digital platform is used.

196

197 To formally start an MSc research project, the student starts an Osiris case by

198 taking the following steps:

- 199 • Log in to Osiris Student
- 200 • Click *Cases*
- 201 • Start a new case
- 202 • Click *Thesis and graduation*
- 203 • Click *GEO MSc Thesis Earth Sciences programmes*

204

205 The entire case encompasses the following phases from registration/application to

206 final assessment:

207

- 208 • Registration of the project
- 209 • Submission of change request (optional)
- 210 • Submission of thesis for assessment/grading
- 211 • Grading of the thesis

212

213 The role, tasks, and responsibilities of the student, the first supervisor, and
214 second assessor in these phases will be further elucidated below.

215
216
217

218 **7.1 Registration of the MSc Research project**

219

220 If the student and supervisor agree upon the MSc research project, it needs to be
221 registered and submitted for approval to the Teaching Institute, before the
222 project is started. An MSc thesis project agreement form needs to be filled out,
223 signed and submitted in Osiris Case. A template of the agreement form can be
224 found at the end of this document.

225

- 226 • Log in to *Osiris Student*
- 227 • Got to *GEO MSc Thesis Earth Sciences programmes*
- 228 • Start a new case
- 229 • Read the instructions carefully

230

231

232 The agreement form contains the following information:

233

- **Personal data of the MSc student**

234

- **Title of the project**

235

The title should reflect the topic of the study, which must be related to the
236 Earth Sciences master programme.

237

- **Name of the first supervisor (examiner).** The first supervisor (examiner)
238 must be a permanent staff member of the Department of Earth Sciences or
239 Physical Geography.

240

- **Name of the second assessor.** The second assessor should be an expert in
241 the field of the research topic.

242

- **ECTS credits**

243

The study load of project can be 30, 37.5, or 45 ECTS credits

244

- **Project description**

245

The project description briefly describes the aims and objectives of the
246 project and the approach taken / methods applied to achieve these
247 objectives.

248

- **Project schedule**

249

The time planning must be consistent with the number of ECTS credits; 1
250 week (40 working hours) corresponds to 1.43 credits. The length of the
251 project must be planned in a way that public holidays are excluded in the
252 calculation of the total number of working hours.

253

The project schedule also includes dates of meetings with the supervisor(s)
254 and should indicate when the supervisor is not accessible for longer time
255 periods.

256

Furthermore, milestones to evaluate the progress of the project, for
257 example, accomplishment of the required data set, handing in of the first
258 draft version and final version of the MSc thesis, and the grading of the
259 project etc. are defined.

260

- **No-go criteria,**

261

The no-go criteria define the minimum progress a student has to achieve
262 within about 6 weeks after the start of the project. It is strongly
263 recommended that the no-go criteria comprise a more extensive research
264 project proposal including a literature review and detailed time planning.
265 About 6 weeks after the start of the project, a meeting with the supervisor is
266 scheduled and the progress of the student is evaluated in view of the no-go

267 criteria. If the student fails to meet these criteria, the supervisor can decide
268 to discontinue the MSc Research project, implying that the student must
269 start a new MSc Research project.
270

271 Some of the above information also needs to be filled in on the Osiris Case
272 webpage for administrative and archiving purposes.
273

274 If the project involves fieldwork, a signed *Declaration regarding safety and*
275 *behavior during excursions and fieldwork* must also be uploaded. The form and
276 the related safety regulations and guidelines can be obtained/downloaded from
277 the Master Earth Sciences Thesis Blackboard community
278 (<https://uu.blackboard.com/>). Note that assessing the risks of the planned MSc
279 fieldwork and discussing these risks with the student is the task of the supervisor
280 and part of the safety procedure.
281

282 Because of insurance purposes and to get a quick overview of the students
283 abroad in emergency situations, it is required and obliged to register your stay
284 abroad in the framework of your studies. This is achieved by following the next
285 steps:

- 286 • Log in to *Osiris Student*
- 287 • Click the *Buitenland/Stay abroad* button on the Osiris homepage
288 A new tab opens in your browser; make sure pop ups are allowed
- 289 • In this new window, log in again for an overview of your Stay abroad
290 application
- 291 • Click *Contact information*
- 292 • Add the address or addresses you will be staying during your study abroad
293 period

294 After submission of the above application in Osiris Case, the Teaching Institute
295 will check whether it is complete and correct, whether the first supervisor and
296 second assessor possess the required qualifications, and whether the number of
297 EC credits corresponds to the time planning of the MSc Research project. If the
298 application does not pass these criteria, the student and supervisor will be
299 informed and receive information about the next steps to be taken to fulfil the
300 requirements. If the application passes these criteria, the Teaching Institute will
301 approve the project. The student and first supervisor will then receive a
302 confirmation message that the MSc Research project has been registered. Then
303 the student can start the actual project.
304

305 Apart from the registration of the MSc Research project through Osiris Case, the
306 student must also register for the MSc Research Project (GEO4-1520) according
307 to the regular course registration procedure using Osiris Student (see
308 <https://students.uu.nl/en/practical-information/enrolment/course-registration>).
309
310
311

312 **7.2 Submission of change request (optional)** 313

314 During the MSc project, it is expected that the student does all in his/her power
315 to fulfill the commitments agreed on in the MSc agreement and to ensure the
316 progress of the project as planned.
317

318 If a change in plans occur, the student must inform and discuss this with the first
319 supervisor. This applies to the following situations:

- 320 • The MSc research project will be extended in size (number of EC credits)

- 321 • The end date of the MSc Research project will be postponed by more than
322 four weeks due to personal circumstances.

323

324 If the first supervisor agrees, the student submits a change request in Osiris Case
325 by taking the following steps:

326

327

- Log in to *Osiris Student*
- Got to *GEO MSc Thesis Earth Sciences programmes*
- Click the *Submit a change request* tab
- Read the instructions carefully

328

329

330

331

332 The change request must be justified and an updated version of the agreement
333 form including an updated time planning, which has been signed by both the
334 student and the first supervisor, must be uploaded. The student and first
335 supervisor will be informed whether the change request has been approved by
336 the Teaching Institute. Note that delayed completion of the MSc thesis without
337 approval may lead to its rejection.

338

339

340

341 **7.3 Oral presentation**

342

343 Towards the end of the MSc Research project, the student holds an oral
344 presentation about the project. It is recommended to plan the date for this
345 presentation reasonably well in advance in consultation with the supervisor. For
346 booking a room for the presentation, please contact the appropriate secretary of
347 the department Earth Sciences (secretariaatAW.geo@uu.nl) or Physical
348 Geography (secretariaatfg.geo@uu.nl). The oral presentation will be graded and
349 count 10% toward the final grade.

350

351 Please note that it is also obligatory to hold a poster presentation about your MSc
352 Research project. Poster session will be organised three times a year and will be
353 announced by email. The poster presentation is not part of the MSc Research
354 project, but part of the portfolio. For further information about the poster, see the
355 Master Earth Sciences Talks community on Blackboard.

356

357

358

359 **7.4 Submission of first version for feedback**

360

361 When the student has finished the first version of the thesis, he/she submits the
362 document to the first supervisor by email for feedback as agreed in the
363 agreement form. Note that during this phase, communication between student
364 and supervisor takes place via email and thus not via Osiris Case.

365

366 The first supervisor provides this first version with adequate, sufficient and
367 constructive comments/feedback that helps the student to improve the quality of
368 the thesis. Feedback may also be provided by the second assessor instead of or in
369 addition to the first supervisor's review, if the second assessor has been more
370 intensely involved in the daily supervision of the project than the first supervisor.

371

372 **7.5 Submission of final version for assessment/grading**

373

374 The student implements these comments and prepares a revised, final version of
375 the MSc thesis. After implementation of the comments, the student submits
376 his/her final version of the thesis in Osiris Case for assessment. For this, log in to
377 Osiris Student, go to *GEO MSc Thesis Earth Sciences programmes*, and click the
378 appropriate tab to upload the thesis.

379

380 Since the uploaded version of the thesis will be graded, the student is urgently
381 requested to double check whether the correct version is uploaded. The uploaded
382 version will be automatically checked for plagiarism using Ouriginal. It is not
383 necessary to upload additional outcomes such as datasets or computer models in
384 Osiris Case.

385

386 The supervisor and second assessor will then assess and grade the thesis using
387 the standard MSc Thesis Rubric Earth Sciences (see the Master Earth Sciences
388 Thesis Blackboard Community for a pdf copy of this assessment form).

389

390

391

392 **8. Assessment/grading of the MSc research project**

393

394 The assessment of the MSc research project consists of three components: the
395 MSc thesis, the oral presentation, and the process. The assessment of the MSc
396 thesis counts 70% towards the final grade of the MSc Research project, whereas
397 the oral presentation counts 10% towards the final grade. The assessment of the
398 execution of the project (process) makes up the remaining part (20%) of the final
399 assessment of the MSc research project.

400

401 If the final grade is 8.5 or higher, or if the final grade is less than or equal to 6.0
402 and greater or equal than 5.5, a third assessor is required, who supports this final
403 result. This third assessor is expected to provide a short, written statement, in
404 which he/she declares that the written argumentation in the evaluation form
405 justifies the final result.

406

407 After the thesis has been graded the first supervisor uploads the signed rubric
408 form in Osiris Case. The student will then receive a message that the thesis has
409 been graded and the result and rubric form can then be viewed in Osiris Case.
410 The first supervisor ensures that the assessment and submission of the final
411 grade and assessment form in Osiris Case takes place within 10 working days
412 after the submission date of the final thesis version, as agreed in the agreement
413 form.

414

415 If the final result is less than a 4.00 (before rounding), the student has failed for
416 the MSc Research project. The Osiris Case will be closed and the student should
417 start an entirely new MSc project for graduation. If the final result is insufficient
418 (but at least a 4.00), the student will get one additional opportunity to submit a
419 revised version as a supplementary test. The first supervisor/examiner
420 determines which revisions are needed and establishes the deadline for
421 submission of the additional revised version. The student uploads the revised
422 version of the MSc thesis only when the first supervisor agrees that it can be
423 submitted for grading. If the revised version is graded as sufficient, the final
424 grade of 6.0 for the MSc Research Project will be recorded in Osiris.

425

426 If the final result is 5.50 or higher, this will be registered as final grade in Osiris.
427 As soon as the final grades have been registered in Osiris, the case will be closed,
428 but the student will receive a follow-up invitation/request to upload the final
429 version of the thesis for archiving and possible publication. For this, a new case
430 will be started. When uploading the thesis, the student may choose whether and
431 when to make the MSc thesis publicly available. If this option is selected, the
432 Utrecht University Library will take care of making the thesis publicly accessible.
433 As a result, the thesis can eventually be found in search systems such as Google
434 (Scholar) and WorldCat.

435

436

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439 Version: August, 2024

440

Template agree form

441

442

MSc Research project (GEO4-1520)

443

444 **Name:**

445

446 **Student number:**

447

448 **E-mail:**

449

450 **Telephone (optional):**

451

452

453 **1st supervisor:**

454

455

456 **2nd supervisor / assessor :**

457

458

459

460

461 **ECTS Credits:**

462

463

464 **Title:**

465

466

467 **Project description**

468

469 Aims:

470

471

472 Approach/methods:

473

474

475 **Schedule**

476

Date / Period	Activity
	Go / no go date
	First version of report submitted
	Final version of report submitted
	Final grade established

477

478 **Go / no go criteria:**

479

480 **Signatures**

481