ENVIRONMENTAL SYSTEMS SCIENCES

AT THE UNIVERSITY OF GRAZ

Interdisciplinary Practical Training (IP)

Administrative Guide

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Coordination Office for Environmental Systems Sciences

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Important downloads for the organization and holding of Interdisciplinary Practical Training

umweltsystemwissenschaften.uni-graz.at

see „Bachelor Studies " or „Master Studies" → „Organizational Matters" → „Forms "

Website of the interest group and study representation of ESS

www.umweltsystemwissenschaften.at

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1   Introduction

Interdisciplinary Practical Training (IP) offers ESS students the opportunity to work on a topic of their own choice in a course - not only as a (passive) course participant, but also as an active organizer. The organization of an IP on the one hand means work and perseverance, on the other hand the organizers deal with a topic that they have helped to develop and further good contacts can evolve from a successful IP.

Since the courses of the curriculum are planned annually, the Interdisciplinary Practical Trainings (IP) have to be organized annually until the end of the winter term and are then selected for the entire following academic year (winter semester and summer semester) (see Fig. 1).

Picture 1: Procedure for the organisation and implementation of an IP
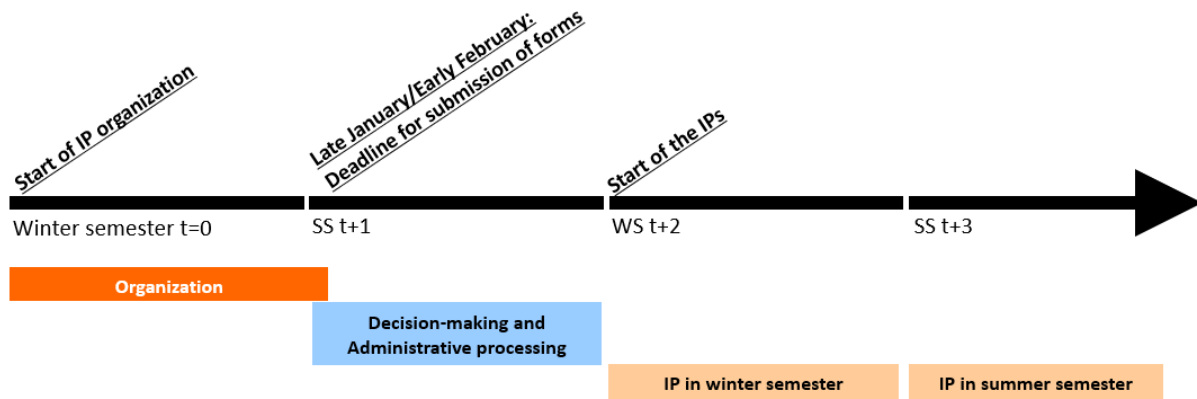
2   Preparing an IP

2.1   Information on the procedure

Each academic year, 16-18 IPs (approx. 10 four-hour Bachelor- IPs, approx. 6-8 six-hour Master- IPs) are offered to students, approx. half of them are offered by the SIS on a fixed basis for specific topics. These can be new IPs or the repeated holding of successful IPs.

In addition to this fixed offer, the remaining IPs will be proposed by the students on a topic of their choice. Together with the teachers - who are also proposed by the students - a concept and methodology for the course will be developed. The concept will be evaluated by the Interdisciplinary Practical Training Working Group (AGIP) after the submission to the ESS Coordination Office. Submissions can take place all year long until the end of a submission period (end of January/beginning of February). The final stage of the organization is the approval – sometimes with conditions - or rejection of the IP according to the AGIP proposal by the Curricula Commission ESS. The timing of the IP organization is shown in Fig. 2:

Picture 2: Procedure of the IP organization
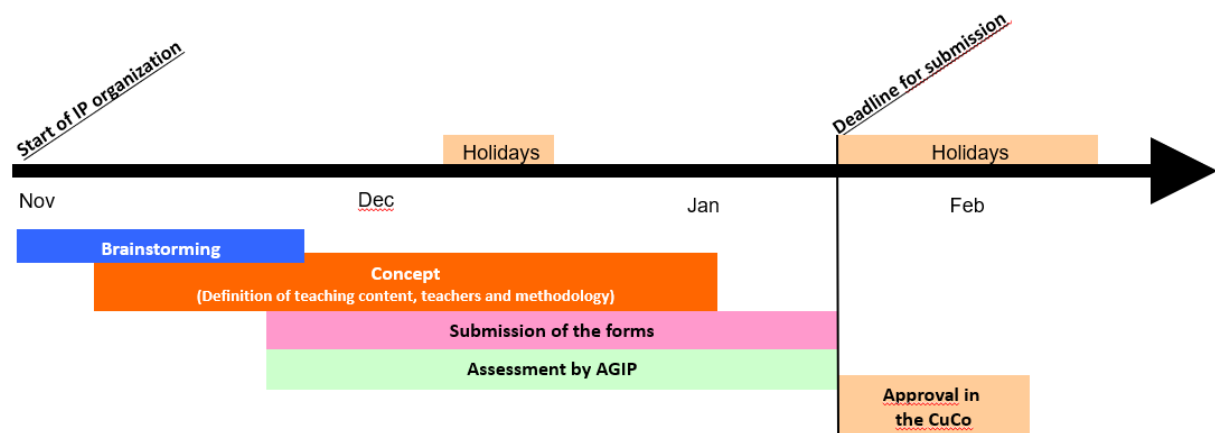
2.2   Finding ideas

Start of the organization

The organization of an Interdisciplinary Practical Training starts around one year before the actual start of the course. Since the courses of the curriculum are planned annually, Interdisciplinary Practical Trainings (IP) are selected at the end of the winter term for the entire following academic year (winter semester and summer semester).

Support and advice

In the winter term, regular meetings, the so-called 'IP organizational meetings' of the ESS interest group take place. These meetings are intended to promote coordination among the students on the one hand, and the exchange of experience on the other. The aim of these meetings is to coordinate the content, advise and support students, and provide an opportunity to exchange experiences and information. The information is further published through all ESS channels (ESS mailing list, ESS Facebook group/page, ESS homepage, homepage of the ESS coordination office).

The starting signal for the organization of IPs is the IP information event organized by the Interest Group ESS at the beginning of November (sometimes the information on IPs is embedded in other information events, like 'USW Specials- Environmentally-oriented electives, IP and Co.').

Student organizers

It is recommended to organize the IP in teams of 3-4 students. Still, there have already been IPs that have been organized by more or less students. The student organizers are guaranteed a fixed place in the IP in return for their organizational efforts.

Topic identification

Students can propose topics for the IPs they organize themselves, but the following should be noted:

- Each IP has to deal with an existing problem.
- The research question is located in thematic proximity to the ESS specializations.
- The topic is up-to-date and of significance in environmental and societal problems.
- It is desirable if the results of an IP can be used afterwards.

Further it must be possible to finish the theme of the IP in a meaningful sense within one term, as the curriculum provides one term for the IP for the students.

Possible subject areas for IP could be:

- Waste Management
- Energy
- Raw materials/materials
- Climate
- Ecology
- Regional development
- Transport
- …

2.3 Conception

In this phase, the proposed topic is discussed with one or more teachers, a concept is developed and additional teachers are organized.

In the winter term (in the year before the IP) the following must be clarified:

- Objectives and qualifications taught in the IP
- Procedure and planning of the Interdisciplinary Practical Training
- Applied methods
- Standards for formatting (incl. citation system)
- Form of the final work (paper, report, poster, ..) and filing deadline
- Grading system and criteria

In the summer term (in the year before the IP) the following must be clarified:

- If required: Presentation for the AGIP (working group IP)
- If required: Adaption of the IP as requested by the AGIP

Form of the final work: The form of the final work can be defined by the organizers of the IP. It is however recommended that the following points are taken as a guide:

- Result papers should not exceed 20 pages and should be similar in style and form to scientific publications. This is especially recommended in Bachelor IPs
- Reports have a maximum of 50 pages and should be similar to final theses (e.g. bachelor or master theses) or research reports in style and form

The main results of the IP of each semester are summarized in an experience report with a maximum of two pages and are then published on www.umweltsystemwissenschaften.uni-graz.at after the course.

Tasks of the lecturers

- **Administration and coordination of the course**

The coordination of the IP by the coordinating lecturer involves a non-negligible amount of effort. In order to take this into account, it is recommended that more than one semester hour is allocated to the coordinator. This lecturer must work at the University of Graz or have extensive experience with IP.

- **Number of persons in the organization team**

Bachelor IP (guide value): 3 lecturers and 3-4 students

Master IP (guide value): 4 lecturers and 4 students

This means that usually in the case of Bachelor IP, in addition to the coordinator, teaching assignments can be given to two further lecturers; and in the case of Master IP, it is recommended to give teaching assignments to around three further lecturers in addition to the coordinator.

External lecturers from other educational institutions or from the private sector, NGOs, etc. are expressly desired. Teachers not working in Graz need to consider the availability and time possibilities in the organization of the course.

- **Business partnerships and cooperation**

In order to be able to design the content of the IP with practical orientation and to work on content from external areas in a university environment, partnerships and cooperation are expressly desired. In such partnerships, it is essential to ensure that the expectations and demands of both sides are clarified.

2.4 Submission of forms

The forms for submission can be found on umweltsystemwissenschaften.uni-graz.at/de/bachelorstudien/organisatorisches/formulare/. They are to be collected, signed (LV-Beauftragungsschreiben/LV commission letter) and submitted only in digital form in the latest valid version (via e-mail to usw.koordination@uni-graz.at).

The submissions can be submitted to the USW coordination office at any time. In order to be able to hold the IP in the desired academic year, the IP must be submitted by the end of the submission deadline (end of January/beginning of February) of the previous academic year at the latest. The exact date for the submission deadline will be announced separately at umweltsystemwissenschaften.uni-graz.at.

Example (see figure 1):

WS 2022/23: *Developing the IP concept*

January/February 2023: *Submission of the forms during the stated submission period*

SS 2023: *Permission of the IP*

WS 2023/2024 or SS 2024: *Holding of the IP*

The following documents need to be submitted for every IP:

- Form for holding an IP
- Form „Giving a teaching assignment" for lecturers, that teach in an IP for the first time
- CV for every lecturer of the respective IP (only for external lecturers, not for scientific employees of University of Graz; only necessary if the teacher gets a teaching assignment for an IP for the first time)

2.5 Explanation of the individual boxes in the form for holding an IP

This chapter is meant to give assistance for filling out the form for holding an IP:

Content

Description of the course in terms of its topic, goals and research questions. The course content should be described in a way that refers to one or more special focus(es).

Previous knowledge expected

Description of possible contextual requirements such as completion of certain courses and expected knowledge such as basic knowledge in systems modeling. It is to be noted that IPs should be attended towards the end of the study. The content requirements are to be adapted respectively.

Objective; expected results of study and acquired competences

Description of the objective/expected results of study and acquired competences including the stated topics (Bachelor IP) or research-relevant aspects (Master IP), as well as the planned documentation of the results. The latter point should also include documentation on the course of the project. The acquired competences should correspond to university standards.

Teaching and learning method; delivery of skills

Under this section, a detailed explanation with justification of the teaching methods used (lecture, group work, e-learning etc.) must be given. Also used programs and software can be listed here (Vensim, Netlogo, Mathematica, MS-Project, …).

In addition to the content related competences, project-oriented IPs should focus on project management skills.

Assessment; examination method and evaluation

Here, a description of the evaluation criteria (participation, presentation, writing of a paper, final report) with a detailed key for grading is required. The exam mode must be set in such a way that a

sufficiently differentiated grading is possible. This key shall be sent to the coordination office together with the results report.

Recommended reading

Subject literature are especially scientific papers, reference books and accepted reports for the respective topic. The provision of literature to the students should be done before the start of the first lesson.

Describe the skills of the different teachers and their relevance for the IP

Description of the competences and background, why the teacher is suitable for the overall topic of the IP. Furthermore, the role of the teacher within the teachers and between teachers and participants has to be specified. The teacher's competences must be recognizable, especially with regard to the use of methods. In case of doubt the competences of the teachers can be validated.

Describe the organization of the IP

Description of the schedule of the IP (time schedule, involvement of external partners, excursion, etc.) Is the topic divided into different parts? If so, into which ones? How are the results documented (final report, podcast, discussion event, manuscript for journal (master IP), ...)? Is a further use of the results of the IP planned?

Describe any special features of the IP

In general, everything that has no relevance to the other points but is important for the IP should be listed under this point (student initiative, guest lectures, excursion (if obligatory), best practice, innovative topic, topicality...).

2.6 Evaluation by the AGIP (working group for the IPs)

The AGIP evaluates the submission on the basis of the form for holding an IP. If there are any requests for adaption, the student organizers will be contacted. The AGIP evaluates the IP in a transparent evaluation procedure according to the following criteria:

- Assignment to the different focuses
- Quality of supervision
- Organization of the IP
- Planned methodical procedure
- Proven training topics (Bachelor) or proven research-relevant aspects (Master)

- Extra points

2.7 Permission of the IP

After the organization, the correct submission of documents and evaluation by AGIP, positively evaluated IP are submitted to the CuKo USW as recommendations for curriculum planning.

However, a general feedback is only given when the Dean of Studies has also completed the curriculum planning for the coming semester. The decision on the actual teaching assignment is finally made by the Dean of Studies in accordance with the actual demand and the available resources.

3 Holding the IP

3.1 General remarks

Due to the special character of the interdisciplinary practical trainings, one focus of the supervision by the teachers is the communication and coordination of the groups or teams (it is recommended to appoint a group spokesperson for each group). The different backgrounds of the teachers and students, as well as the usually very complex questions allow for unique working and learning, but also require a lot of supervision and a good organizational structure.

Since the winter term of 2011, the lecture "Interdisciplinary Working Methods" is offered. This course is to be seen as preparatory course for the IP and is intended to provide basic knowledge in project management und the writing of scientific papers.

In order to be able to properly link the different topics of a task, common and well taught methods are of great importance. These methods allow the connection of the different disciplines and enable thematically interlinked results.

<u>In any case, the research question, the topics to be investigated and the methods that should be applied must be determined before the start of the course</u>. If there is a great variety of methods and/or contents, it is important to ensure that common contents and compatible methods are available.

The differences between Bachelor-IP (6 ECTS, 4 semester hours) and Master-IP (10 ECTS, 6 semester hours) must be clearly elaborated, not only regarding the amount of work involved or the documentation of results (see **Fehler! Verweisquelle konnte nicht gefunden werden.**): In Bachelor-IPs, the primary aim is to "train" methods learned in the course of studies (e.g. subject-specific methods or methods known from the Regulation "Interdisciplinary Working Methods") and to get to know their strengths and weaknesses. For students of a Master-IP it can be assumed that they already have in-depth knowledge of these methods, tools and instruments and are therefore able to apply them in a research-oriented way.

Moodle- Template

From autumn 2022 on, IPs will automatically be connected to a Moodle- Template, with an integrated column for the experience report and evaluation. The rest can be arranged by the teachers individually.

3.2 Course of action and project management

It is strongly recommended that a clearly structured procedure of the IP is provided for the students. This provides a sequence of tasks and the best possible usage of the scope for design within the IP.

The planning can be done in different ways: This example shows a very simple but efficient method for planning the course of action using a time matrix in Excel (a template can be found on umweltsystemwissenschaften.uni-graz.at).

Picture 3: Possible timeline of an IP at the example of the winter term 2021/23

Interdisciplinary Practice	Start	End	Type	Duration	01.09.2021	30.09.2021	01.10.2021	15.10.2021	29.10.2021	12.11.2021	26.11.2021	10.12.2021	22.12.2021	05.01.2022	21.01.2022	28.01.2022	18.02.2022	25.02.2022
Concept Phase	1.9.2021	30.9.2021	Conception		■	■												
Introductory Session	1.10.2021	1.10.2021	Event				■											
Concept Phase	1.10.2021	15.10.2021	Conception				■	■										
Groupwork 1	1.10.2021	11.11.2021	Groupwork				■	■	■									
Groupwork 2	12.11.2021	28.1.2022	Groupwork							■	■	■	■	■	■			
Progress Report 1	15.10.2021	29.10.2021	Report					■	■									
Progress Presentation 1	12.11.2021	12.11.2021	Presentation							■								
Progress Report 2	26.11.2021	21.1.2022	Report								■	■	■	■	■			
Final Presentation	28.1.2022	28.1.2022	Presentation													■		
Final Report	5.1.2022	18.2.2022	Report											■	■	■	■	
Correction of the Final Report	5.1.2022	25.2.2022	Report															■
Publication of the Final Report	5.1.2022	25.2.2022	Report															■
IP-Presentation Day	June 2022	June 2022																

3.3 Grading

Avoidance of lump-sum grading or ensuring individual grading

In groups of approx. 20 students, who often work in a strongly team-oriented manner and outside the contact hours with the teachers, individual grading is often difficult. Since a large part of the work takes place in small groups, the grading of entire groups is obvious.

However, it is _necessary_ to award an individual grade based on the actual work performed. Within the framework of teamwork, it must be clearly communicated from the outset which services are decisive for the grading. Teamwork is expressly desired - it must only be ensured that the actual achievements of the students are graded. Examples of partial grades are interim reports, the final report and interim or final presentations, as well as organizational services (excursions, data acquisition).

Grading serves as an incentive for individual students to perform and thus increases the performance and quality of both individuals and groups. There must be no blanket grading, as it frustrates active students and unjustifiably helps "inactive" students to achieve a more or less good grade.

The services to be rendered must be defined at the beginning of the semester and the students are then assigned points or partial grades.

The following grid can be understood as a very rough orientation:

	interim report	interim presentation	final report	coordination tasks	power rating 5	…
Student A						
Student B						
Student C						
Student D						
…						

Consistent grading

Not only a performance-related grading in the single IPs is necessary, but also comparable grading approaches in all IPs. The aim is to achieve roughly similar levels of requirements with the same ECTS or hourly rate.

Teachers are requested to submit the documentation for the grading to the USW Coordination Office (e.g.: the above-mentioned grid completely filled out or at least the documentation with consideration of the criteria cooperation, presentation, content, etc.), which will then transfer it to Uni Graz Online.

3.4   Documentation

In any case, the documentation should correspond to the standards for scientific working and be communicated in a suitable form.

Results papers in the style of "scientific publications "

In an IP*, one or more result papers can be written*, which present and discuss the content and methodology as well as the main results. The number of pages per result paper should not exceed 20. The style and structure should be announced at the beginning of the semester and should be based on a scientific journal and its 'instructions for authors'. This is particularly recommended in *Master-IPs*. Result papers can also be written in English.

Final report

The alternative to papers on results is *a final report* that follows a thesis (Bachelor's or Master's thesis) or a research report in form and style. In any case, the report should contain a compact description of

the content and methodology as well as the main results. This report should not exceed 50 pages. This is particularly recommended in *Bachelor-IPs*.

The time needed to prepare the report, correct and supplement it must be considered in the process planning.

Experience report

In order for future IP organizers and participants to get an idea of the diversity of this LV type in terms of content and methodology, an experience report will be drawn up at the end of an IP.

For this purpose, the template from the website of the Coordination Office or from the Moodle course, should be formulated and uploaded on the Moodle page. It should describe the problem, the methods used, the essential results as well as possible stumbling blocks. For each IP one common experience report has to be sent in until the 15th of February/July. All experience reports will be published on the homepage umweltsystemwissenschaften.uni-graz.at.

Evaluation

For quality assurance purposes, students should participate in the final LimeSurvey for the IP they visited. This evaluation is activated at the end of the term on Moodle and should be filled in until the 15th of February/July. Like the experience report, this is a mandatory element for each IP.

3.5 Conclusion

The closing can be designed individually (presentation, discussion, etc.). In any case, it should be determined at the beginning of the IP how the degree will be awarded. It should also be said, that for each IP one experience report has to be handed in and that the evaluation has to be filled in.

4   Administration

4.1   Allocation of space

The allocation of places for the IPs is carried out according to the currently valid sequence procedure decided by the ESS Curricula Commission and is carried out exclusively by the ESS Coordination Office. The student organizers automatically receive a place in the IP organized by them. If an IP is rejected by the CuCo-ESS, the organizers can be assigned a fixed place in an alternative IP to reward them for their effort anyway.

Unfortunately, alternative series procedures and special preferences for the different ESS focusses cannot be considered.

4.2   Grading

The coordinator of the teachers can transmit the grades to Uni Graz Online themselves or send the overall grades of all participants to the ESS Coordination Office at the latest 4 weeks after graduation (according to § 75 Abs. 4 UG 2002).