



Guidelines for the practical research modules in the M.Sc. Photonics

The M.Sc. Photonics program includes the following mandatory practical modules to provide research training to all students:

Experimental Optics (1st semester, 6 ECTS = 180 hours)

This module provides a standardized training in basic optical laboratory methods. It is run as a centrally organized compact session during 4 weeks in February/March after the examinations following the first semester's teaching period.

Internship (2nd semester, 10 ECTS = 300 hours)

The aim of this module is to provide the students with a first experience of being engaged in a real research project, which they should perform under close supervision in a research laboratory of the university or at an external institution.

Research Labwork (3rd semester, 18 ECTS = 540 hours)

This module is a research project for which each student has to apply advanced methods quite independently. Usually, the project should serve as a starting phase for the *Master Project*, towards which the topic should be extended.

Master's Thesis Project (4th semester, 30 ECTS = 900 hours)

This is an extended research project on a timely topic, the results of which are documented in a formal thesis and defence. Usually, the topic should be derived from the preceding *Research Labwork*, performed in the same research group.

What is the appropriate length of a research projects?

For many students, the late finishing of practical research modules is the reason for an eventual study time, exceeding the standard schedule by far. Therefore, students and supervisors should take care to keep to the standard schedule and finish the projects in time. As an indication for the normal volume of the research project, one might consider that 1 ECTS equals about 30 hours of work. This means that 10 ECTS for the *Internship* is regarded as equivalent to 300 hours, including every related duty of the student (reading literature, actual research, preparation of report and final presentation). This is usually too much to be finished within the normal 14-15 weeks of the teaching period during the summer term and along with the lecture program, but it should be possible to be finished until the end of the semester break in September, to allow the student for a normal start in the following semester. Thus, an early start of the project is considered to be most important. Therefore, some students want to start their research project for the *Internship* already in the last part of the first semester in March and April directly after finishing the *Experimental Optics* course. Doing at least parts of the research in this lecture-free time in March and April is essential for all practical modules and the projects should be planned accordingly. Every potential supervisor should support such efforts of those students who plan their study time well in advance.

According to the specific research topic, the time for each practical module should be distributed appropriately for studying literature, actual research, preparation of the report/thesis and the final presentation. Student and supervisor should discuss this distribution early to reach a common understanding.

How does the registration for the modules work?

Registration for the *Experimental Optics* module is done by the students at the beginning of the first semester using the Friedolin system, since this module is centrally organized much like other classroom lectures. In contrast, the organizing of the other practical research modules is individually arranged between student and supervisor. After student and supervisor have found each other and agreed on a topic, they should immediately fill in the *Module Enrolment Form* for *Internship* and *Research Labwork* or the *Master Project Registration Form* for the *Master's Thesis Project*. The *Module Enrolment Form* is available for download from the websites of the Physics faculty and the Abbe School of Photonics. The *Master Project Registration Form* is available at the examination office of the Faculty of Physics and Astronomy. The forms have to be completed and signed by the student and supervisor. Regarding *Internship* and *Research Labwork*, a copy of the form should be sent to the examination office immediately after the signing. The original remains with the supervisor until the end of the project and is sent to the examination office after filling in the grade. Concerning the *Master's Thesis Project*, the signed original of the form has to be sent to the examination office before the project is actually started. This is to ensure that the examination office can confirm that the project and supervisors are accepted to fulfil the official requirements.

Additional remark: A student is not allowed to register for more than one project simultaneously, e.g. 2 *Internships*. As a general rule, only the first grade is counted in the study records. Thus, students can't choose the best grade from several completed projects.



Who can act as a supervisor for a research module?

The supervisor of any practical research module (*Internship, Research Labwork, Master's Thesis Project*) must 1) be a faculty member ("Hochschullehrer") of the Friedrich Schiller University Jena who 2) runs a research group in optics and photonics. A complete list of all faculty who are eligible to supervise these modules is given at www.asp.uni-jena.de/people_faculty.

The second supervisor of the *Master's Thesis Project* does not necessarily be a faculty member of the University, but should hold at least a PhD degree. He or she could thus also be a scientist from a company or an external research institution, if the project is done there.