2024

# STUDENT WORKLOAD ASSESSMENT

## MASTER OF SCIENCE IN PHYSICS


College of Science

Jazan University

https://jazanu.edu.sa/en

# CONTENTS

# ECTS:

## Introduction

Student workload assessment is an assessment by students to ensure that students are receiving an appropriate workload. The benefits of student workload assessment are not limited to students, but good workload management has significant benefits, both for faculty and students such as teaching efficiency, work-life balance and ensuring optimal academic sustainability. The Master of Physics Program at Jazan University is committed to conducting student workload assessment for all existing and graduating masters` students during the three batches 2020-2021, 2022-2023 and 2023-2024.

- **ECTS**

**The European Credit Transfer and Accumulation System** is the process of accumulating credits awarded for achieving learning outcomes for educational components in formal contexts (structured and accredited; e.g., attending and completing courses, writing a thesis) and for other learning activities undertaken in informal contexts (organized but flexible; e.g., attending workshops, seminars)and non-formal contexts (unstructured and unintentional; occurs outside of formal education and is often based on experiences (e.g., self-study)). One ECTS credit generally corresponds to 25 to 30 hours of total workload, which includes lectures, seminars, practical work, independent study, and examination preparation. For the Master of Science in Physics program, the learning hours (workload) is taken as 28 of each ECTS point. A student may accumulate credits towards qualifications, as required by the awarding institution and to document personal achievements for lifelong learning purposes. For Master of Science in Physis program, students complete 120 ECTS points upon completion of the program. The ECTS system is a benchmark for comparing academic achievement and student performance across the European Higher Education Area (EHEA) and making studies and courses more transparent. It helps students move between countries and gain recognition for their academic qualifications and study periods abroad. The ECTS points express the cumulative load based on the defined learning outcomes and the workload associated with them.

**Workload** is an estimate of the time an individual would normally need to complete all learning activities such as lectures, seminars, projects, practical work, internships and individual study required to achieve specified learning outcomes in formal learning environments. The typical full-time workload for a two-year full-time Master of Science in Physics is 120 credits and the workload is 3360 hours. It should be recognized that this represents an average workload and that the actual time to achieve learning outcomes for individual students will vary.

**Self-Learning Calculation**

- Multiply each contact hour by 15 (the official number of weeks in the semester) to obtain learning hours.
- Each contact hour is considered to be 50 minutes according to university rules.
- For most courses in the program, it was found through student surveys that each contact hour requires approximately 3 to 4 hours of teaching, except for the research seminar course and thesis, where each contact hour requires 5 hours.
- Add all the learning hours together with exam preparation times, homework, lab reports, case studies, etc., to obtain the total learning hours spent by the student on the course.
- Divide the learning hours (workload) by 28 to obtain ECTS points, as shown in equation 1.

**ECTS equivalent points = Total workload / 28 .....(1)**

# Curriculum

# • CURRICULUM

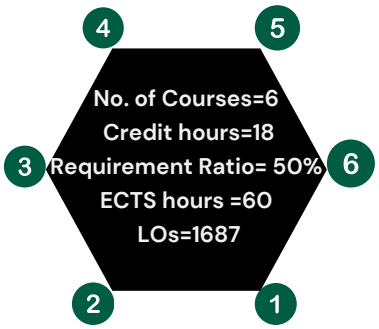
**Table 1: The curriculum of Master of Science in Physics program**

| Requirements | Credit Hours | Total Workload (Hours) | ECTS | Ratio % |
|---|---|---|---|---|
| 6 Compulsory Courses | 18 | 1687 | 60 | 50% |
| 3 Elective Courses | 9 | 840 | 30 | 25% |
| Thesis | 6 | 829 | 30 | 25% |
| Total | 33 | 3360 | 120 | 100% |

If the total ECTS hours for the three elective courses is less than 30 hours, the remaining hours can be fulfilled by attending or presenting at workshops or conferences.

**The curriculum of the Master of Science in Physics program** is designed for two years, four semesters and consists of 33 credit hours, which is equivalent to 120 ECTS points, with sixty ECTS credits for compulsory and thirty ECTS for elective courses, and thirty ECTS credits for the master's thesis. Ideally, students should take 3 courses each semester during the first 3 semesters and begin their thesis in the fourth semester while completing their studies within 2 years. In the Master of Science in Physics program, there are six compulsory courses (Mathematical Physics, Classical Mechanics, Classical Electrodynamics, Quantum Mechanics, Statistical Mechanics and Research Seminar), three elective courses out of thirteen elective courses (which can be chosen according to the students' areas of interest) and the thesis. Electives include, for example, courses such as " Computational Physics", "Quantum Optics", "Magnetism and Superconductivity ", "Particle Physics", " Selected Topics in Specialized Physics", etc.

**Compulsory and elective courses** are designed to provide students with the theoretical knowledge, practical and modelling abilities necessary for different disciplines in physics research in theoretical, experimental and modelling areas. In the first semester, students take the first three compulsory courses: Mathematical Physics, Classical Mechanics, and Classical Electrodynamics. Then, in the second semester, students take two compulsory courses: Quantum Mechanics and Statistical Mechanics, in addition to one elective course according to the students' areas of interest. Then, in the third semester, students take two more elective courses in their areas of interest and the last compulsory course, which is the research seminar course. In the research seminar course students prepare a project on a selected topic to be presented in front of a member's scientific jury at the end of the semester. In the research seminar, the research question needs to be precisely determined, followed by a literature survey, research method and a summary of the scientific knowledge on which the thesis will be based. In the fourth semester, students take the thesis. The thesis must encompass an independent scientific achievement appropriate in-depth to the intended level of education. Therefore, be associated with either experimental, theoretical or modeling study. The degree program is full-time study for two years.




## 6 Compulsory courses

| | | |
|---|---|---|
| 1 | PHYS 600-3 | Mathematical Physics |
| 2 | PHYS 601-3 | Classical Mechanics |
| 3 | PHYS 602-3 | Classical Electrodynamics |
| 4 | PHYS 603-3 | Quantum Mechanics |
| 5 | PHYS 604-3 | Statistical Mechanics |
| 6 | PHYS 695-3 | Reseach Seminar |

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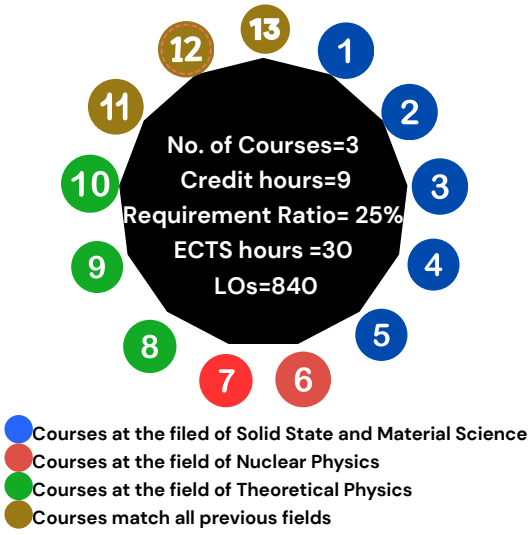
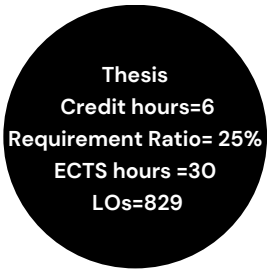



## 3 Elective courses out of 13 courses

| | | |
|---|---|---|
| 1 | PHYS620-3 | Atomic and Molecular Physics |
| 2 | PHYS622-3 | Plasma Physics |
| 3 | PHYS640-3 | Solid State Physics |
| 4 | PHYS641-3 | Materials Science |
| 5 | PHYS642-3 | Magnetism and Superconductivity |
| 6 | PHYS650-3 | Nuclear Structure and Spectroscopy |
| 7 | PHYS651-3 | Radiation Physics |
| 8 | PHYS621-3 | Quantum Optics |
| 9 | PHYS660-3 | Quantum Field Theory |
| 10 | PHYS661-3 | Particle Physics |
| 11 | PHYS665-3 | Selected Topics in Specialized Physics |
| 12 | PHYS610-3 | Computational Physics |
| 13 | PHYS611-3 | Physics Laboratory |

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| | | |
|---|---|---|
| 1 | PHYS699-6 | Thesis |

Figure 1: Program Structure of Master of Science in Physics at Jazan University

# PROGRAM STRUCTURE

- **PROGRAM STRUCTURE**

**Table 2: The compulsory courses of Master of Science in Physics program**

| # | Course Code | Course Title | Core/Compulsory Courses | | | | | Prerequisite |
|---|---|---|---|---|---|---|---|---|
| | | | Lec./ week | Ex./ week | Credit Units | Total Workload (Hours) | ECTS | |
| 1 | PHYS600 | Mathematical Physic | 3 | - | 3 | 244 | 9 | |
| 2 | PHYS601 | Classical Mechanics | 3 | - | 3 | 229 | 8 | |
| 3 | PHYS602 | Classical Electrodynamics | 3 | - | 3 | 255 | 9 | |
| 4 | PHYS603 | Quantum Mechanics | 3 | - | 3 | 309 | 11 | |
| 5 | PHYS604 | Statistical Mechanics | 3 | - | 3 | 229 | 8 | |
| 6 | PHYS695 | Research Seminar | 3 | - | 3 | 421 | 15 | |
| Total | | | 18 | - | - | 1687 | 60 | |

**Table 3: The elective courses of Master of Science in Physics program**

| # | Course Code | Course Title | Elective Courses | | | | | Prerequisite |
|---|---|---|---|---|---|---|---|---|
| | | | Lec./ week | Ex./ week | Credit Units | Total Workload (Hours) | ECTS | |
| 1 | PHYS610 | Computational Physics | 2 | 2 | 3 | 318 | 11 | |
| 2 | PHYS611 | Physics Laboratory* | 0 | 6 | 3 | 358 | 13 | |
| 3 | PHYS620 | Atomic and Molecular Physics | 3 | 0 | 3 | 241 | 9 | |
| 4 | PHYS621 | Quantum Optics | 3 | 0 | 3 | 246 | 9 | |
| 5 | PHYS622 | Plasma Physics* | 3 | 0 | 3 | 242 | 9 | |

**Table 3: Continue on the elective courses of Master of Science in Physics program**

| # | Course Code | Course Title | Elective Courses | | | | | Prerequisite |
|---|---|---|---|---|---|---|---|---|
| | | | Lec./ week | Ex./ week | Credit Units | Total Workload (Hours) | ECTS | |
| 6 | PHYS640 | Solid State Physics | 3 | 0 | 3 | 240 | 9 | |
| 7 | PHYS641 | Materials Science | 3 | 0 | 3 | 261 | 9 | |
| 8 | PHYS642 | Magnetism and Superconductivity* | 3 | 0 | 3 | 262 | 9 | |
| 9 | PHYS650 | Nuclear Structure and Spectroscopy* | 3 | 0 | 3 | 242 | 9 | |
| 10 | PHYS651 | Radiation Physics* | 3 | 0 | 3 | 242 | 9 | |
| 11 | PHYS660 | Quantum Field Theory* | 3 | 0 | 3 | 240 | 9 | |
| 12 | PHYS661 | Particle Physics | 3 | 0 | 3 | 245 | 9 | |
| 13 | PHYS665 | Selected Topics in Specialized Physics | 3 | 0 | 3 | 327 | 12 | |
| Average ECTS hours per elective course taught | | | | | | | 10 | |

(*) Asterisks indicate elective courses that have not yet been taught and the ECTS hours have been assessed by the teacher. The average ECTS hours for each elective course are calculated as the ratio of the total ECTS hours of all elective courses assessed by the students to their total number

**Table 4: The Thesis of Master of Science in physics program**

| # | Course Code | Course Title | Thesis | | | | | Prerequisite |
|---|---|---|---|---|---|---|---|---|
| | | | Lec./ week | Ex./ week | Credit Units | Total Workload (Hours) | ECTS | |
| 1 | PHYS699 | Thesis | 6 | - | 6 | 829 | 30 | |

# ECTS :

## CALCULATION MECHAISM

# Mechanism of calculation

1. **Applied equations for calculating the total hours of self-learning activities**

$$\text{Total hours of self} - \text{learning activities} = \frac{\sum_{1\le i\le 3}(AB)_i}{i} + \frac{\sum_{1\le i\le 3}(CD)_i}{i} + \frac{\sum_{1\le i\le 3}(EF)_i}{i} + \frac{\sum_{1\le i\le 3}(GH)_i}{i} \quad \text{.....(2)}$$

Where A and B are the hours of self-learning activity for class preparation and the number of repetitions during one semester, respectively, C and D are the hours of self-learning activity for homework/assignments, and the number of repetitions during one semester, respectively, E and F are the hours of self-learning activity for exam study and the number of repetitions during one semester, respectively, G and H are the hours of self-learning activity for lab work and the number of repetitions during one semester and i is the number of batches where i = 1, 2, 3 for one batch, two batches, and three batches, respectively.

**Total workload** = Total hours of self-learning activities + In-class hours .....(3)

**2. Learning Activities Hours for Self-study:**

The hours of learning activities for self-study of the thesis are determined by the students' answers to the questionnaire designed to collect the students' opinions about the actual study time of the thesis in the Master of science in Physics program and on the basis of the assessment methods established by the instructors in the course specifications.

**3.Design of Questionnaire:**

The course questionnaire includes questions covering three main learning activities for self-study: class preparation, HW/Assignments, lab work, case study, and exam study.

**4.Duration of self-learning activity:**

The duration of each self-learning activity is chosen by students from a range of 1 to 5 hours, 5 to 10 hours and 10 to 15 hours for class preparation and lab work, HW/Assignments and case study, and exam study, respectively.

# 1.
# COURSES ASSESSED BY STUDENTS

# MATHEMATICAL PHYSICS PHYS600

**Questionnaire design:**
The mathematical physics PHYS600 questionnaire includes five questions covering three main learning activities for self-study: class preparation, HW/Assignments, and exam study. Class preparation includes two activities on preparing a new lecture and/or reviewing what was taken. However, for the exam study, it includes two activities for final exam, and midterm exams. For the HW/Assignments, there is one learning activity. More details can be found in the mathematical physics questionnaire (Appendix ) and in the assessment activities of mathematical physics at Table 5.

**Self-study activity frequency:**
The study lasts for fifteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is class preparation, is implemented. The second self-learning activity, homework/assignments, is focused to be implemented during the semester, four homework, in order to raise the level of knowledge and skills. The third self-learning activity is examination study, including one final exam and two mid-term exams.

The student receives two lectures per week, each lasting an hour and a half, which is equivalent to three credit hours per week.

**Tabl**e 5 :Students Assessment Activities of Mathematical Physics

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Classroom Activities | 3,7,10,13 |
| 2 | Mid Term Exams | 6,12 |
| 3 | Final Exam | 16 |

## Mechanism of calculation

# CLASSICAL MECHANICS PHYS601

**Questionnaire design:**
The Classical Mechanics PHYS601 questionnaire includes five questions covering three main learning activities for self-study: class preparation, HW/Assignments, and exam study. Class preparation includes two activities on preparing a new lecture and/or reviewing what was taken. However, for the exam study, it includes two activities for final exam, and midterm exams. For the HW/Assignments, there is one learning activity. More details can be found in the classical mechanics questionnaire (Appendix) and in the assessment activities of mathematical physics at Table 6.

**Self-study activity frequency:**
The study lasts for fifteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is class preparation, is implemented. The second self-learning activity, homework/assignments, is focused to be implemented during the semester, four homework, in order to raise the level of knowledge and skills. The third self-learning activity is examination study, including one final exam and two mid-term exams.

The student receives two lectures per week, each lasting an hour and a half, which is equivalent to three credit hours per week.

**Table** 6 :Students Assessment Activities of Classical Mechanics

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Classroom Activities | 3,7,10,13 |
| 2 | Mid Term Exams | 6,12 |
| 3 | Final Exam | 16 |

## Mechanism of calculation

# CLASSICAL ELECTRODYNAMICS PHYS602

**Questionnaire design:**
The Classical Electrodynamics PHYS602 questionnaire includes five questions covering three main learning activities for self-study: class preparation, HW/Assignments, and exam study. Class preparation includes two activities on preparing a new lecture and/or reviewing what was taken. However, for the exam study, it includes two activities for final exam, and midterm exams. For the HW/Assignments, there is one learning activity. More details can be found in the classical electrodynamics questionnaire (Appendix ) and in the assessment activities of mathematical physics at Table 7.

**Self-study activity frequency:**
The study lasts for sixteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is class preparation, is implemented. The second self-learning activity, homework/assignments, is focused to be implemented during the semester, six homework, in order to raise the level of knowledge and skills. The third self-learning activity is examination study, including one final exam and two mid-term exams.

The student receives two lectures per week, each lasting an hour and a half, which is equivalent to three credit hours per week.

**Table** 7 :Students Assessment Activities of Classical Electrodynamics

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Discussions | 2,3,5,7,10,11 |
| 2 | Mid Term Exams | 6,12 |
| 3 | Final Exam | 16 |

## Mechanism of calculation

# QUANTUM MECHANICS PHYS603

**Questionnaire design:**
The Quantum Mechanics PHYS603 questionnaire includes six questions covering three main learning activities for self-study: class preparation, HW/Assignments, and exam study. Class preparation includes two activities on preparing a new lecture and/or reviewing what was taken. However, for the exam study, it includes two activities for final exam and midterm exams. For the HW/Assignments, there is two learning activity; homework and report. More details can be found in the quantum mechanics questionnaire (Appendix ) and in the assessment activities of mathematical physics at Table 8.

**Self-study activity frequency:**
The study lasts for sixteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is class preparation, is implemented. The second self-learning activity, homework/assignments, is focused to be implemented during the semester, five homework and one report, in order to raise the level of knowledge and skills. The third self-learning activity is examination study, including one final exam and two mid-term exams.

The student receives two lectures per week, each lasting an hour and a half, which is equivalent to three credit hours per week.

**Table** 8 :Students Assessment Activities of Quantum Mechanics

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Classroom Activities | 2,4,6,8,10 |
| 2 | Mid Term Exams | 6,12 |
| 3 | Report/Presentation | 7,11 |
| 4 | Final Exam | 16 |

## Mechanism of calculation

# STATISTICAL MECHANICS PHYS604

**Questionnaire design:**
The Statistical Mechanics PHYS604 questionnaire includes five questions covering three main learning activities for self-study: class preparation, HW/Assignments, and exam study. Class preparation includes two activities on preparing a new lecture and/or reviewing what was taken. However, for the exam study, it includes two activities for final exam, and midterm exams. For the HW/Assignments, there is one learning activity. More details can be found in the statistical mechanics questionnaire (Appendix ) and in the assessment activities of statistical mechanics at Table 9.

**Self-study activity frequency:**
The study lasts for fifteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is class preparation, is implemented. The second self-learning activity, homework/assignments, is focused to be implemented during the semester, four homework, in order to raise the level of knowledge and skills. The third self-learning activity is examination study, including one final exam and two mid-term exams.

The student receives two lectures per week, each lasting an hour and a half, which is equivalent to three credit hours per week.

**Table** 9 :Students Assessment Activities of Statistical Mechanics

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Classroom Activities | 3,5,7,13 |
| 2 | Mid Term Exams | 6,12 |
| 3 | Final Exam | 16 |

# COMPUTATIONAL PHYSICS PHYS610

**Questionnaire design:**
The Computational Physics PHYS610 questionnaire includes eight questions covering four main learning activities for self-study: class preparation, HW/Assignments, lab work and exam study. Class preparation includes two learning activities, one learning activity, three learning activities and two learning activities, respectively. More details can be found in the Computational Physics questionnaire (Appendix ) and in the assessment activities of Computational Physics at Table 10.

**Self-study activity frequency:**
The study lasts for fifteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is class preparation, is implemented. The second self-learning activity, homework/ assignments, is focused to be implemented during the semester, two homework, in order to raise the level of knowledge and skills related to the computational work. The third self-learning activity is examination study, including one final exam, and one mid-term exam. For lab work, the self learning activities including preparing and writing report for computational lab is implemented over twelve weeks and one lab exam.

The student receives one lecture and one lab per week, each lasting two hours, which is equivalent to three credit hours per week.

**Table** 10 :Students Assessment Activities of Computational Physics

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Classroom Activities | 4,8 |
| 2 | Mid-term exams | 6,12 |
| 3 | Lab. Report | 14 |
| 4 | Lab. Exam | 14 |
| 5 | Final Exam | 16 |

# ATOMIC AND MOLECULAR PHYSICS PHYS620

**Questionnaire design:**

The Atomic and molecular physics PHYS620 questionnaire includes 5 questions covering three main learning activities for self-study: class preparation, HW/Assignments, and exam study. Class preparation includes two activities on preparing a new lecture and/or reviewing what was taken. However, for the exam study, it includes two activities for final exam, and midterm exams. For the HW/Assignments, there is one learning activity. More details can be found in the Thesis questionnaire (Appendix) and in the assessment activities of Atomic and molecular physics at Table 11.

**Self-study activity frequency:**

The study lasts for sixteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is class preparation, is implemented. The second self-learning activity, homework/assignments, is focused to be implemented during the semester, four homework, in order to raise the level of knowledge and skills. The third self-learning activity is examination study, including one final exam and two mid-term exams.

The student receives two lectures per week, each lasting an hour and a half, which is equivalent to three credit hours per week.

**Table** 11 :Students Assessment Activities of Atomic and molecular physics

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Classroom Activities | 3,5,7,13 |
| 2 | Mid Term Exams | 6,12 |
| 3 | Final Exam | 16 |

## Mechanism of calculation

# QUANTUM OPTICS PHYS621

**Questionnaire design:**

The Quantum Optics PHYS621 questionnaire includes five questions covering three main learning activities for self-study: class preparation, HW/Assignments, and exam study. Class preparation includes two activities on preparing a new lecture and/or reviewing what was taken. However, for the exam study, it includes two activities for final exam, and midterm exams. For the HW/Assignments, there is one learning activity. More details can be found in the Quantum Optics questionnaire (Appendix ) and in the assessment activities of Quantum Optics at Table 12.

**Self-study activity frequency:**

The study lasts for fifteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is class preparation, is implemented. The second self-learning activity, homework/assignments, is focused to be implemented during the semester, four homework, in order to raise the level of knowledge and skills. The third self-learning activity is examination study, including one final exam and two mid-term exams.

The student receives two lectures per week, each lasting an hour and a half, which is equivalent to three credit hours per week.

**Table** 12 :Students Assessment Activities of Quantum Optics

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Classroom Activities | 3,5,7,13 |
| 2 | Mid Term Exams | 6,12 |
| 3 | Final Exam | 16 |

## Mechanism of calculation

# SOLID STATE PHYSICS PHYS640

**Questionnaire design:**

The Solid State Physics PHYS640 questionnaire includes six questions covering three main learning activities for self-study: class preparation, HW/Assignments, and exam study. Class preparation includes two activities on preparing a new lecture and/or reviewing what was taken. However, for the exam study, it includes three activities for final exam, midterm exams and quizzes. For the HW/Assignments, there is one learning activity; homework. More details can be found in the Solid State Physics questionnaire (Appendix ) and in the assessment activities of Solid State Physics at Table 13.

**Self-study activity frequency:**

The study lasts for sixteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is class preparation, is implemented. The second self-learning activity, homework/assignments, is focused to be implemented during the semester, four homework, in order to raise the level of knowledge and skills. The third self-learning activity is examination study, including one final exam, two quizzes and two mid-term exams.

The student receives two lectures per week, each lasting an hour and a half, which is equivalent to three credit hours per week.

**Table** 13 :Students Assessment Activities of Solid State Physics

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Classroom Activities | 3,5,7,13 |
| 2 | Mid Term Exams | 6,12 |
| 3 | Quizzes | 4,8 |
| 4 | Final Exam | 16 |

# MATERIALS SCIENCE PHYS641

**Questionnaire design:**
The Materials Science PHYS641 questionnaire includes seven questions covering three main learning activities for self-study: class preparation, HW/Assignments, and exam study. Class preparation includes two activities on preparing a new lecture and/or reviewing what was taken. However, for the exam study, it includes three activities for final exam, midterm exams and quizzes. For the HW/Assignments, there is two learning activity; homework and presentation. More details can be found in the Thesis questionnaire (Appendix ) and in the assessment activities of Materials Science at Table 14.

**Self-study activity frequency:**
The study lasts for sixteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is class preparation, is implemented. The second self-learning activity, homework/assignments, is focused to be implemented during the semester, four homework and a presentation, in order to raise the level of knowledge and skills. The third self-learning activity is examination study, including one final exam, two quizzes and mid-term exams.

The student receives two lectures per week, each lasting an hour and a half, which is equivalent to three credit hours per week.

**Table**14 :Students Assessment Activities of Materials Science

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Classroom Activities | 3,5,7,13 |
| 2 | Report/Presentation | 7,11 |
| 3 | Mid Term Exams | 6,12 |
| 4 | Quizzes | 4,8 |
| 5 | Final Exam | 16 |

# PARTICLE PHYSICS PHYS661

**Questionnaire design:**
The Particle Physics PHYS661 questionnaire includes six questions covering three main learning activities for self-study: class preparation, HW/Assignments, and exam study. Class preparation includes two activities on preparing a new lecture and/or reviewing what was taken. However, for the exam study, it includes two activities for final exam, and midterm exams. For the HW/Assignments, there is two learning activity; homework and report. More details can be found in the Particle Physics questionnaire (Appendix ) and in the assessment activities of Particle Physics at Table 15.

**Self-study activity frequency:**
The study lasts for fifteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is class preparation, is implemented. The second self-learning activity, homework/assignments, is focused to be implemented during the semester, six homework and a report, in order to raise the level of knowledge and skills. The third self-learning activity is examination study, including one final exam, and two mid-term exams.

The student receives two lectures per week, each lasting an hour and a half, which is equivalent to three credit hours per week.

**Table**15 :Students Assessment Activities of Materials Science

| | No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|---|
| | 1 | Assignments and Classroom Activities | 3,5,7,9,10,13 |
| | 2 | Essay/Presentation | 8 |
| | 3 | Mid Term Exams | 6,12 |
| | 4 | Quizzes/Paper reading | 4,11 |
| | 5 | Final Exam | 16 |

## Mechanism of calculation

# SPECIAL TOPICS PHYS665

**Questionnaire design:**
The Special Topics questionnaire includes seven questions covering three main learning activities for self-study: class preparation, HW/Assignments, and exam study. Class preparation includes two activities on preparing a new lecture and/or reviewing what was taken. However, for the exam study, it includes three activities for final exam, midterm exams and quizzes. For the HW/Assignments, there is two learning activity; homework and a report. More details can be found in the special topics questionnaire (Appendix ) and in the assessment activities of special topics at Table 16.

**Self-study activity frequency:**
The study lasts for fifteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is class preparation, is implemented. The Special Topics course is one of the main courses designed to support the thesis. It is an open course to suit any subject in physics. Therefore, the second self-learning activity, homework/ assignments, is focused to be implemented during the semester, four homework and a report/presentation, in order to raise the level of knowledge and skills related to the thesis topic. The third self-learning activity is examination study, including one final exam, two mid-term exams and two quizzes.

The student receives two lectures per week, each lasting an hour and a half, which is equivalent to three credit hours per week.

**Table** 16 :Students Assessment Activities of Special Topics

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Classroom Activities | 3,7,10,13 |
| 2 | Essay/Presentation | 8 |
| 3 | Quizzes | 4,11 |
| 4 | Mid Term Exams | 6,12 |
| 5 | Final Exam | 16 |

# ECTS

## Mechanism of calculation

# RESEARCH SEMINAR PHYS695

**Questionnaire design:**
The Research Seminar questionnaire includes nine questions covering three main learning activities for self-study: class preparation, case study, and exam study. The Class preparation, Case study and Exam study include five learning activities, three learning activities and one learning activities, respectively. The nine questions cover the areas of literature review and critical analysis, research proposal development and presentation and peer feedback. More details can be found in the Thesis questionnaire (Appendix) and in the assessment activities of Research Seminar at Table 17.

**Self-study activity frequency:**
The study lasts for Fifteen weeks in the semester, where the first six weeks are devoted to Literature Review and Critical analysis, followed by five weeks to study the Research Proposal Development, and the last three weeks focus on Presentation and peer feedback.

The student receives two lectures each week, each lasting an hour and a half, which is equivalent to three credit hours per week.

**Table** 17 :Students Assessment Activities of Research Seminar

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Literature Review and Critical analysis | 1- 6 |
| 2 | Research Proposal Development | 7-11 |
| 3 | Presentation and peer feedback | 12-14 |

# ECTS

## Mechanism of calculation

# THESIS PHYS699

**Questionnaire design:**

The Thesis questionnaire includes nine questions covering three main learning activities for self-study: class preparation, case study, and exam study. The Class preparation, Case study and Exam study include three learning activities, four learning activities and two learning activities, respectively. The nine questions cover the areas of research and preparation, analysis and results, theoretical/ computational/experimental studies, draft and final writing and revision and preparation for the discussion. More details can be found in the Thesis questionnaire (Appendix) and in the assessment activities of Thesis at Table 18.

**Self-study activity frequency:**

The study lasts for fifteen weeks in the semester, where the first three weeks are devoted to Research and preparation , then ten weeks to data collection and analysis and writing and finalizing the thesis and finally two weeks to prepare for the final presentation and defense of the thesis.

Each week, the student receives two lectures of three hours each, equivalent to six credit hours per week.

**Tabl**e 18 :Students Assessment Activities of Thesis

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Research and preparation | 1-3 |
| 2 | Data collection and analysis | 4-13 |
| 3 | Writing and finalizing the thesis | 4-13 |
| 4 | Thesis presentation and defense | 14-15 |

# 2.
# COURSES ASSESSED BY TEACHERS

# PHYSICS LABORATORY PHYS611

**Questionnaire design:**
The Physics Laboratory PHYS611 questionnaire includes six questions covering three main learning activities for self-study: lab work, HW/Assignments, and exam study. lab work includes four activities. However, for the exam study, it includes one activity for lab final exam. For the HW/Assignments, there is one learning activity; a presentation. More details can be found in the Physics Laboratory questionnaire (Appendix ) and in the assessment activities of Physics Laboratory at Table 19.

**Self-study activity frequency:**
The study lasts for fifteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is lab work, is implemented. The second self-learning activity, homework/assignments, is a presentation, for 2 weeks. The third self-learning activity is exam study, including one final lab exam.

The student receives two labs per week, each lasting 3 hours, which is equivalent to three credit hours per week.

**Table**19 :Students Assessment Activities of Physics Laboratory

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Classroom Activities | 1-15 |
| 2 | Lab. Report | 1-15 |
| 3 | Presentation | 13-14 |
| 4 | Final Lab. Exam | 16 |

# PLASMA PHYSICS PHYS622

**Questionnaire design:**
The Plasma Physics PHYS622 questionnaire includes seven questions covering three main learning activities for self-study: Preparation for classes, HW/Assignments, and exam study. Preparation for classes includes two activities. However, for the exam study, it includes three activity for final exam, midterm exams and quizzes. For the HW/Assignments, there is two learning activity; homework and report. More details can be found in the Plasma Physics questionnaire (Appendix ) and in the assessment activities of Plasma Physics at Table 20.

**Self-study activity frequency:**
The study lasts for fifteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is Preparation for classes, is implemented. The second self-learning activity, homework/assignments, is two homework and a report. The third self-learning activity is exam study, including one final exam, two midterms and two quizzes.

The student receives two lectures per week, each lasting one hour and a half, which is equivalent to three credit hours per week.

**Table** 20: Students Assessment Activities of Plasma Physics

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Classroom Activities | 2,7 |
| 2 | Report/Presentation | 8 |
| 3 | Mid Term Exams | 6,12 |
| 4 | Quizzes | 4,10 |
| 5 | Final Exam | 16 |

# MAGNETISM AND SUPER CONDUCTIVITY PHYS642

**Questionnaire design:**
The Magnetism and Super conductivity PHYS642 questionnaire includes six questions covering three main learning activities for self-study: Preparation for classes, HW/Assignments, and exam study. Preparation for classes includes two activity. However, for the exam study, it includes three activity for final exam, midterm exams and quizzes. For the HW/Assignments, there is one learning activity. More details can be found in the Magnetism and Super conductivity questionnaire (Appendix ) and in the assessment activities of Magnetism and Super conductivity at Table 21.

**Self-study activity frequency:**
The study lasts for fifteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is Preparation for classes, is implemented. The second self-learning activity, homework/assignments, is four homework. The third self-learning activity is exam study, including one final exam, two midterms and two quizzes.

The student receives two lectures per week, each lasting one hour and a half, which is equivalent to three credit hours per week.

**Table** 21 :Students Assessment Activities of Magnetism and Super conductivity

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Classroom Activities | 3,7,10,13 |
| 3 | Mid Term Exams | 6,12 |
| 4 | Quizzes | 4,8 |
| 5 | Final Exam | 16 |

# NUCLEAR STRUCTURE AND SPECTROSCOPY PHYS650

**Questionnaire design:**
The Nuclear Structure and Spectroscopy PHYS650 questionnaire includes six questions covering three main learning activities for self-study: Preparation for classes, HW/Assignments, and exam study. Preparation for classes includes two activity. However, for the exam study, it includes three activity for final exam, midterm exams and quizzes. For the HW/Assignments, there is one learning activity. More details can be found in the Nuclear Structure and Spectroscopy questionnaire (Appendix ) and in the assessment activities of Nuclear Structure and Spectroscopy at Table 22.

**Self-study activity frequency:**
The study lasts for fifteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is Preparation for classes, is implemented. The second self-learning activity, homework/assignments, is four homework. The third self-learning activity is exam study, including one final exam, two midterms and two quizzes.

The student receives two lectures per week, each lasting one hour and a half, which is equivalent to three credit hours per week.

**Table** 22:Students Assessment Activities of Nuclear Structure and Spectroscopy

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Classroom Activities | 3,7,10,13 |
| 3 | Mid Term Exams | 6,12 |
| 4 | Quizzes | 4,8 |
| 5 | Final Exam | 16 |

# RADIATION PHYSICS PHYS651

**Questionnaire design:**
The Radiation Physics PHYS651 questionnaire includes six questions covering three main learning activities for self-study: Preparation for classes, HW/Assignments, and exam study. Preparation for classes includes two activity. However, for the exam study, it includes three activity for final exam, midterm exams and quizzes. For the HW/Assignments, there is one learning activity. More details can be found in the Radiation Physics questionnaire (Appendix ) and in the assessment activities of Radiation Physics at Table 23.

**Self-study activity frequency:**
The study lasts for fifteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is Preparation for classes, is implemented. The second self-learning activity, homework/assignments, is four homework. The third self-learning activity is exam study, including one final exam, two midterms and two quizzes.

The student receives two lectures per week, each lasting one hour and a half, which is equivalent to three credit hours per week.

**Table** 23 :Students Assessment Activities of Radiation Physics

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Classroom Activities | 3,7,10,13 |
| 3 | Mid Term Exams | 6,12 |
| 4 | Quizzes | 5,9 |
| 5 | Final Exam | 16 |

# QUANTUM FIELD THEORY PHYS660

**Questionnaire design:**
The Quantum Field Theory PHYS660 questionnaire includes five questions covering three main learning activities for self-study: Preparation for classes, HW/Assignments, and exam study. Preparation for classes includes two activities. However, for the exam study, it includes two activity for final exam, and midterm exams. For the HW/Assignments, there is one learning activity. More details can be found in the Quantum Field Theory questionnaire (Appendix) and in the assessment activities of Quantum Field Theory at Table 24.

**Self-study activity frequency:**
The study lasts for fifteen weeks in the semester, and over the course of the fifteen weeks, the students' first self-learning activity, which is Preparation for classes, is implemented. The second self-learning activity, homework/assignments, is four homework. The third self-learning activity is exam study, including one final exam, and two midterms.

The student receives two lectures per week, each lasting one hour and a half, which is equivalent to three credit hours per week.

**Tabl**e 24: Students Assessment Activities of Quantum Field Theory

| No | Assessment activities (Questionnaire design) | Self-study activity frequency/ week |
|---|---|---|
| 1 | Assignments and Classroom Activities | 3,7,10,13 |
| 3 | Mid Term Exams | 6,12 |
| 5 | Final Exam | 16 |

# ECTS :

## STATISTICAL ANALYSIS

# 1.
# COURSES ASSESSED BY STUDENTS

# Mathematical Physics
# PHYS600

# Statistical Analysis

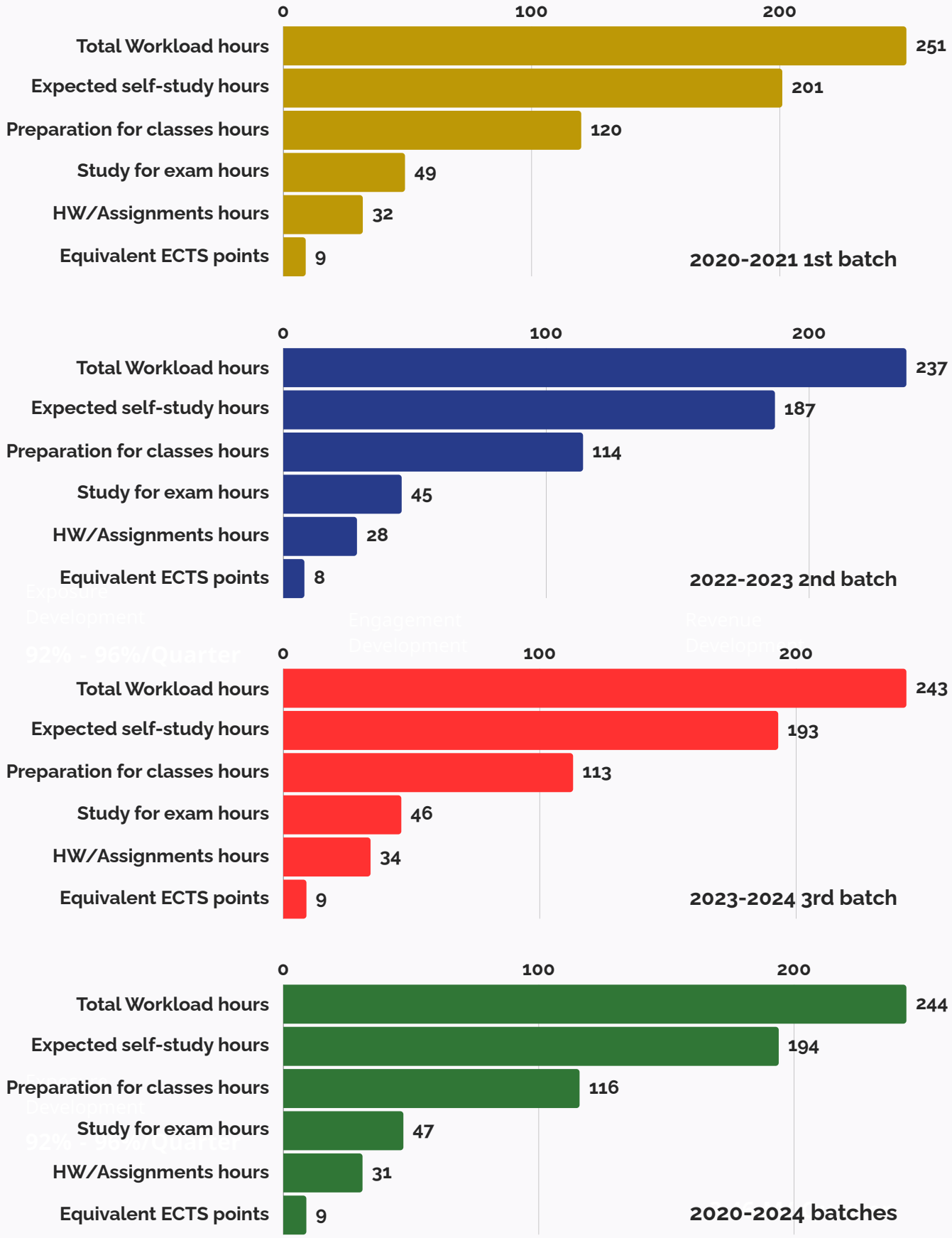
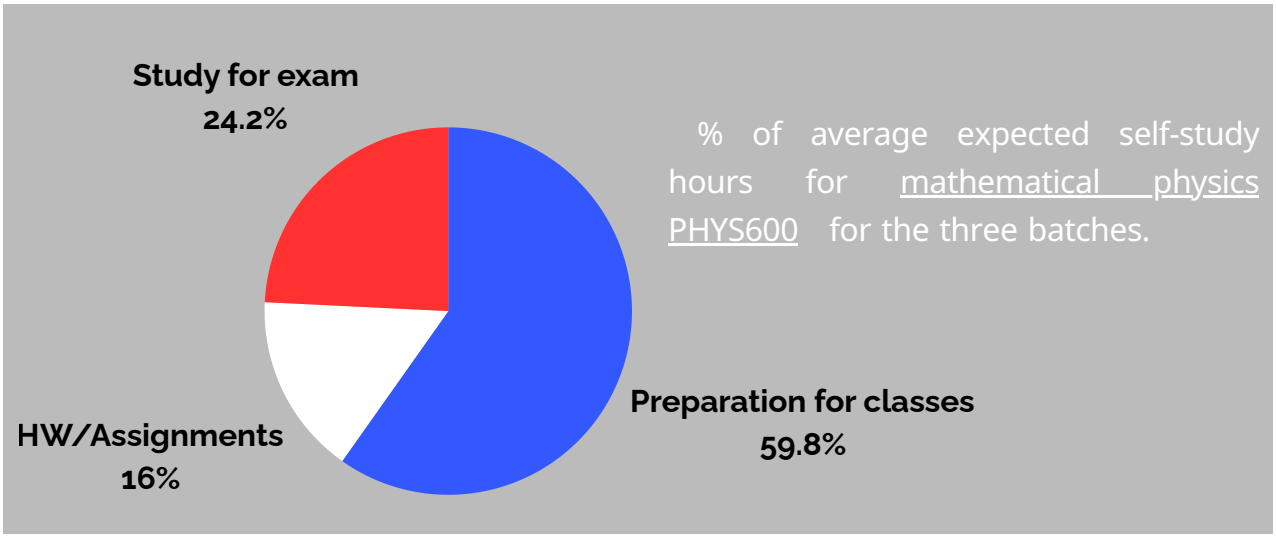
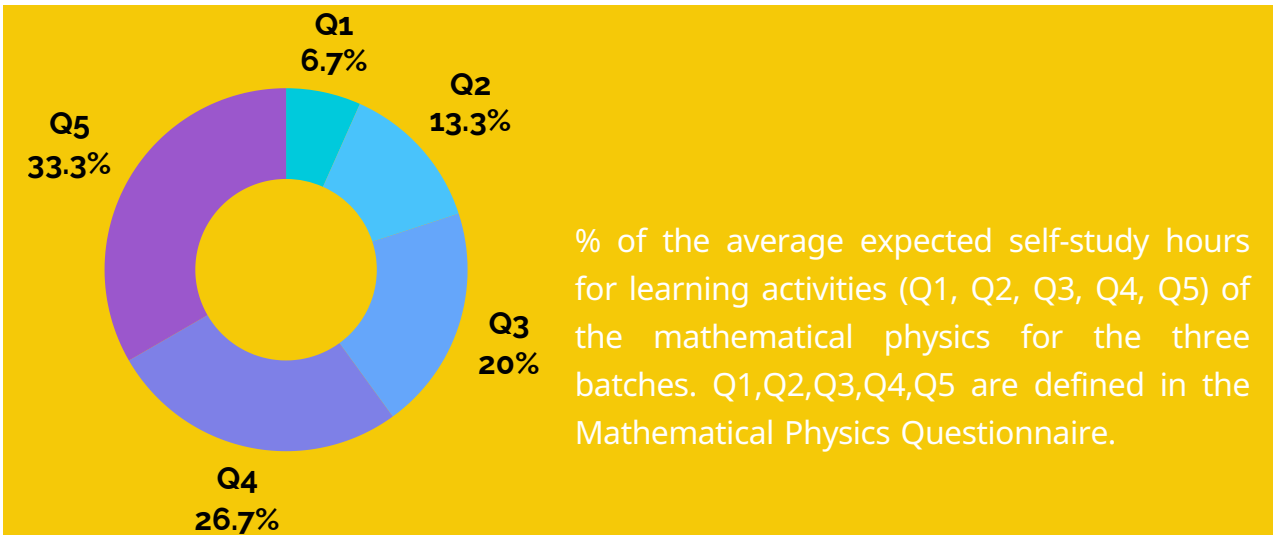



Figure 2 : The learning activities hours of mathematical physics PHYS600 for three batches and their average from the academic year 2020-2021 to the academic year 2023-2024.



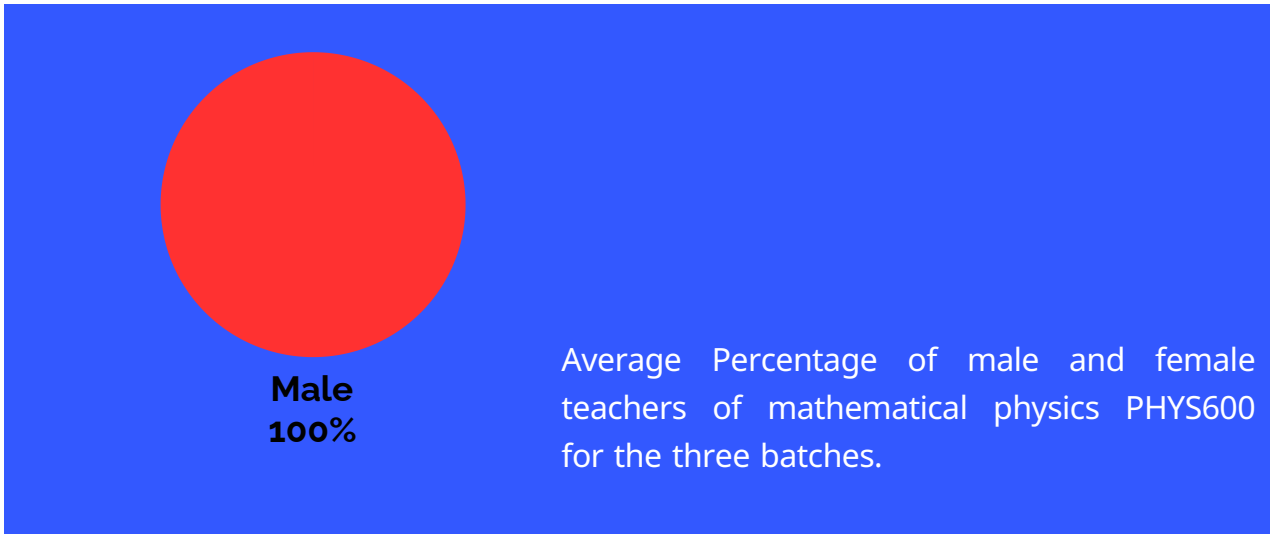




Figure 3 :The percentage of average expected self-learning hours, the percentage of average learning activities hours and average percentage of teachers of mathematical physics PHYS600 for the three batches.

- From Figure 2, the expected self-study hours for Mathematical Physics PHYS600 are quite similar for the three batches. The change in expected self-study hours between the three batches is negligible and is close to the average values of expected self-study activity hours for the three batches. It is clear from Figure 3 that the highest percentage of the average expected self-study activity hours is for classroom preparation activities (60%), followed by exam study (24%) and homework/assignments (16%). The percentage of the average expected self-study hours for learning activity is also plotted and it is shown that the highest exam study and the lowest learning activity hours are for classes preparation. From Figure 3, one can observe that Mathematical Physics is taught by male teachers only. Therefore, the role of teachers (whether male or female) in the ECTS calculations cannot be investigated as the proportion of male and female teachers is 100% and 0%, respectively..

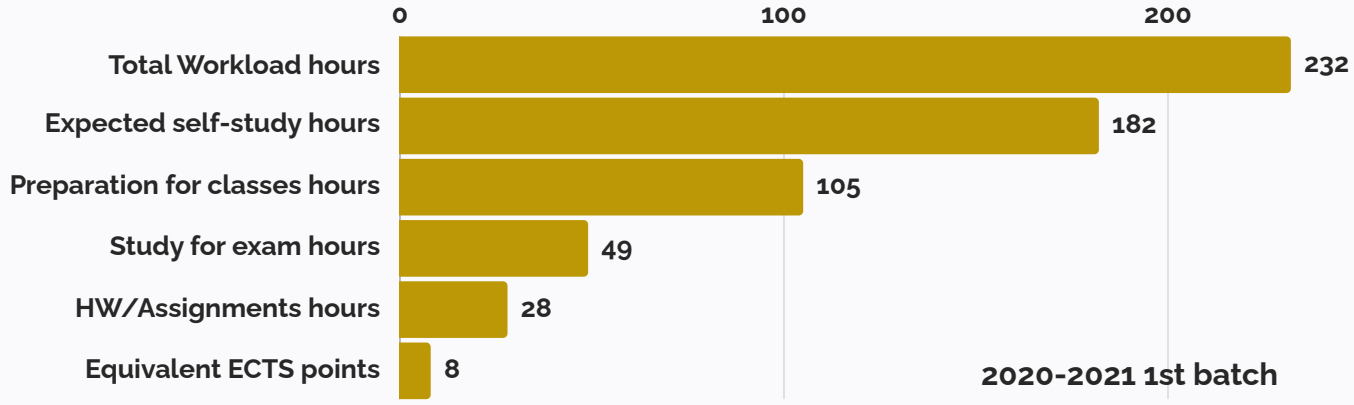
**Tabl**e 25:Contact hours, Expected Self-study hours, Workload hours and ECTS hours of Mathematical Physics

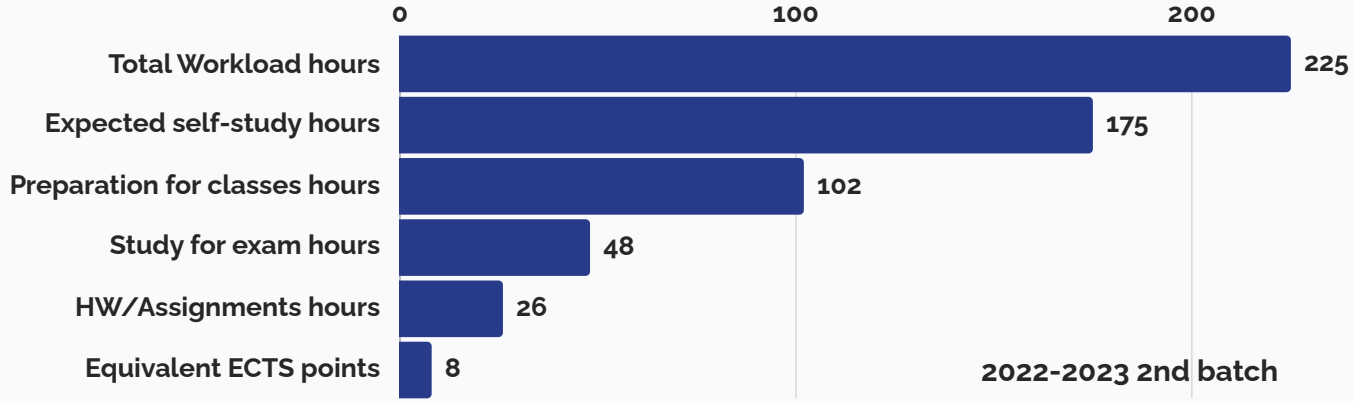
| Contact Hours | Expected Self-study Hours | Total Workload Hours | ECTS Hours |
|---|---|---|---|
| 50 | 194 | 244 | 9 |

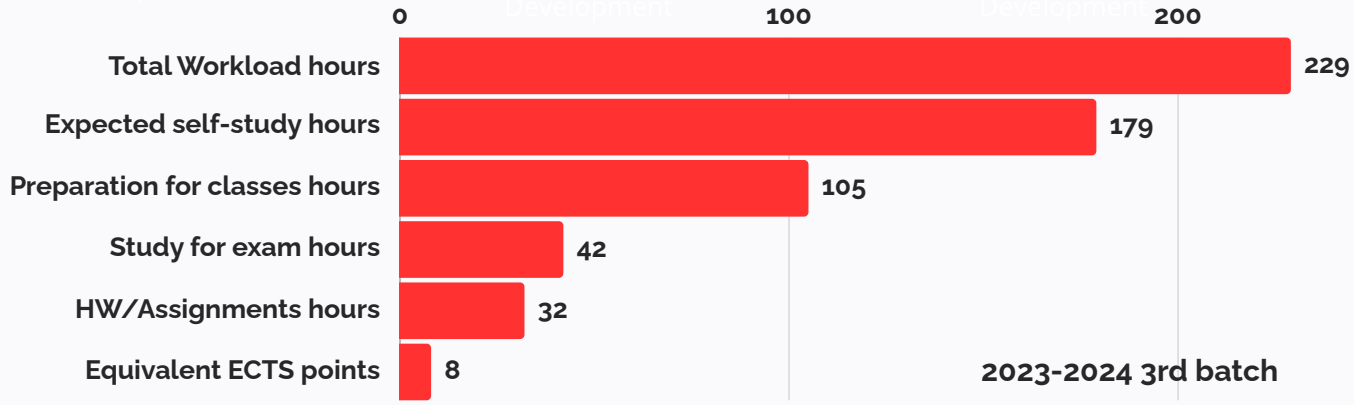
Finally, Table 25 shows that the contact hours, expected self-study hours, total workload hours and ECTS hours of mathematical physics are 50 hours, 194 hours, 244 hours and 9 hours, respectively. The 50 contact hours are the product of fifteen weeks multiplied by 3 credit hours, plus 3 hours for the final exam and 2 hours for two midterm exams. The 194 expected self-study hours is obtained using equation 2 (page 14). The 244 total workload hours is a sum of 50 contact hours and 194 expected self-study hours ( equation 3 at page 14). The 9 ECTS hours is calculated using equation 1 ( page 5). To conclude, the three credit hours of the mathematical physics are equivalent to 9 ECTS hours, which means that each credit hour is equivalent to 3 ECTS hours.

# Classical Mechanics
# PHYS601

# Statistical Analysis



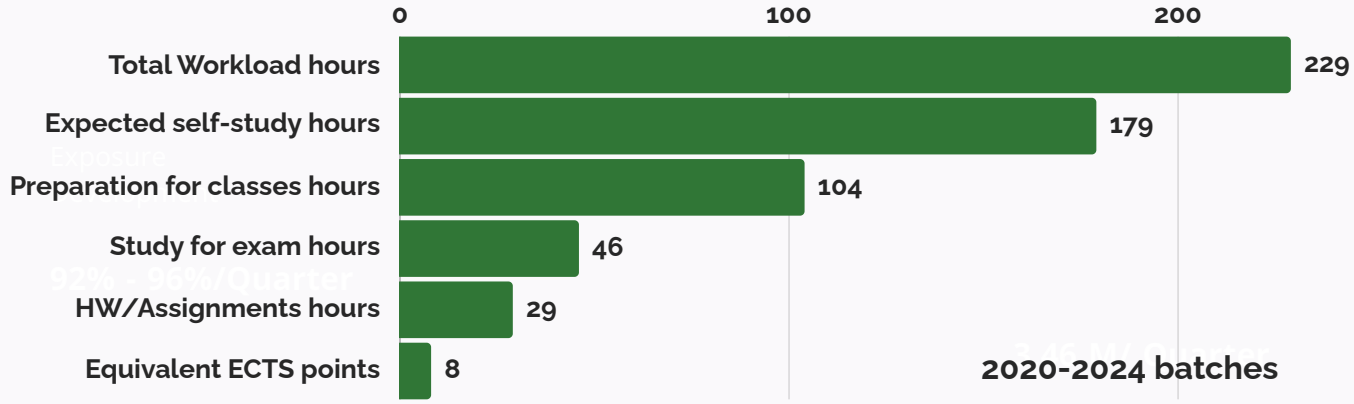
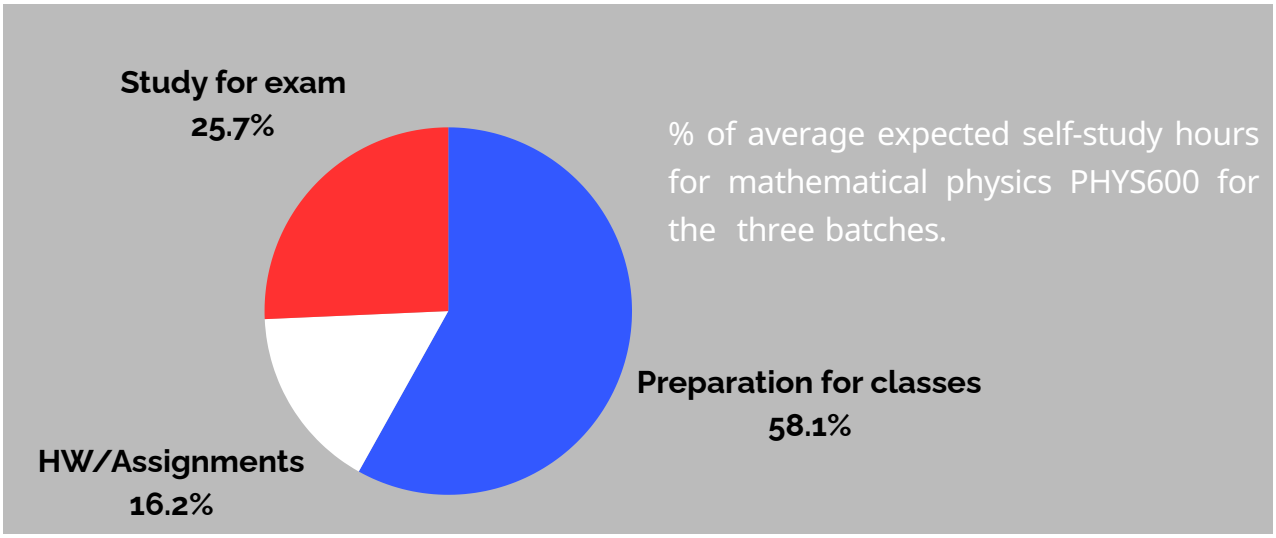
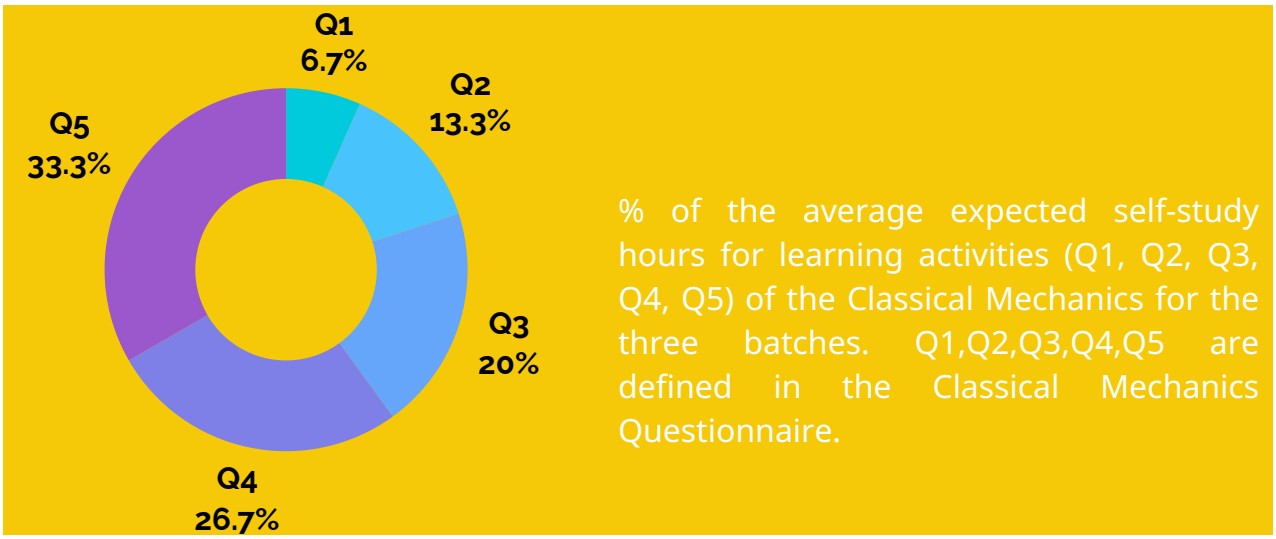




Figure 4: The learning activities hours of Classical Mechanics PHYS601 for three batches and their average from the academic year 2020-2021 to the academic year 2023-2024.



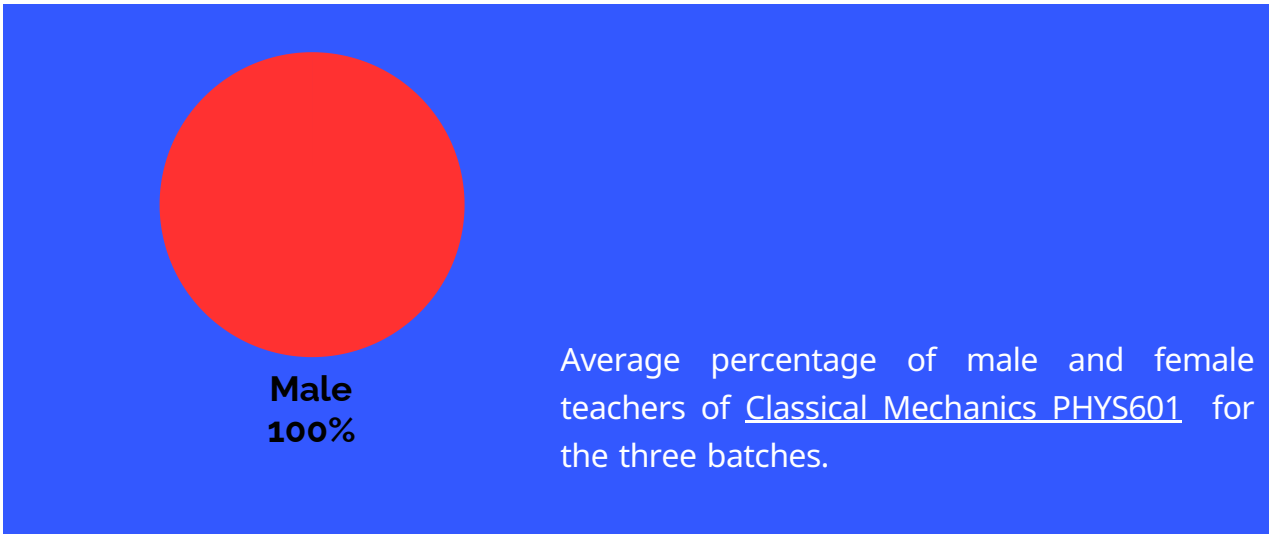




Figure 5: The percentage of average expected self-learning hours, the percentage of average learning activities hours and average percentage of teachers of Classical Mechanics for the three batches.

- From Figure 4, the expected self-study hours for Classical Mechanics are quite similar for the three batches. The change in expected self-study hours between the three batches is negligible and is close to the average values of expected self-study activity hours for the three batches. It is clear from Figure 5 that the highest percentage of the average expected self-study activity hours is for classroom preparation activities (58%), followed by exam study (26%) and homework/assignments (16%). The percentage of the average expected self-study hours for learning activity is also plotted and it is shown that the highest learning activity hours are for exam study and the lowest learning activity hours are for classes preparation. From Figure 5 one can observe that Classical Mechanics is taught by male teachers only. Therefore, the role of teachers (whether male or female) in the ECTS calculations cannot be investigated as the proportion of male and female teachers is 100% and 0%, respectively.

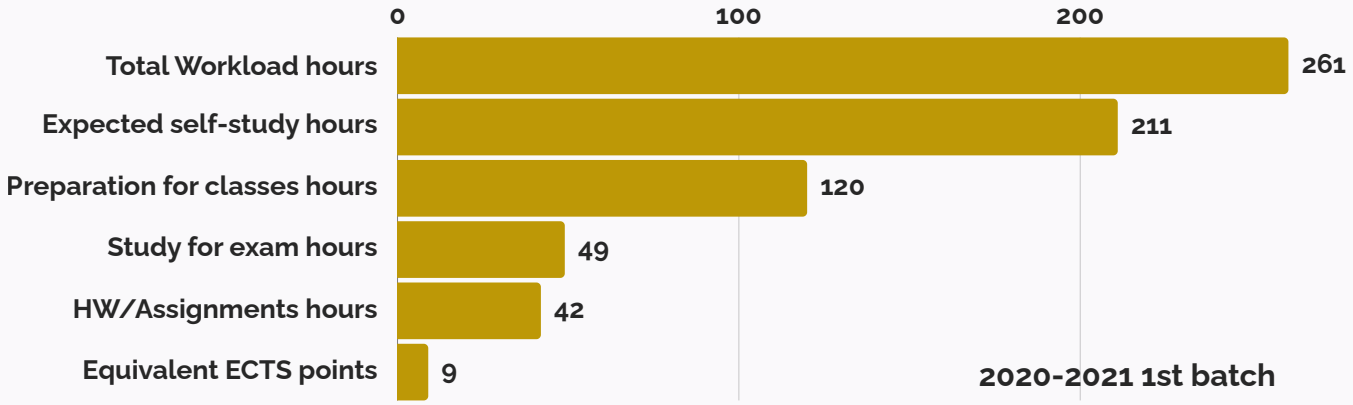
**Tabl**e 26: Contact hours, Expected Self-study hours, Workload hours and ECTS hours of Classical Mechanics PHYS601

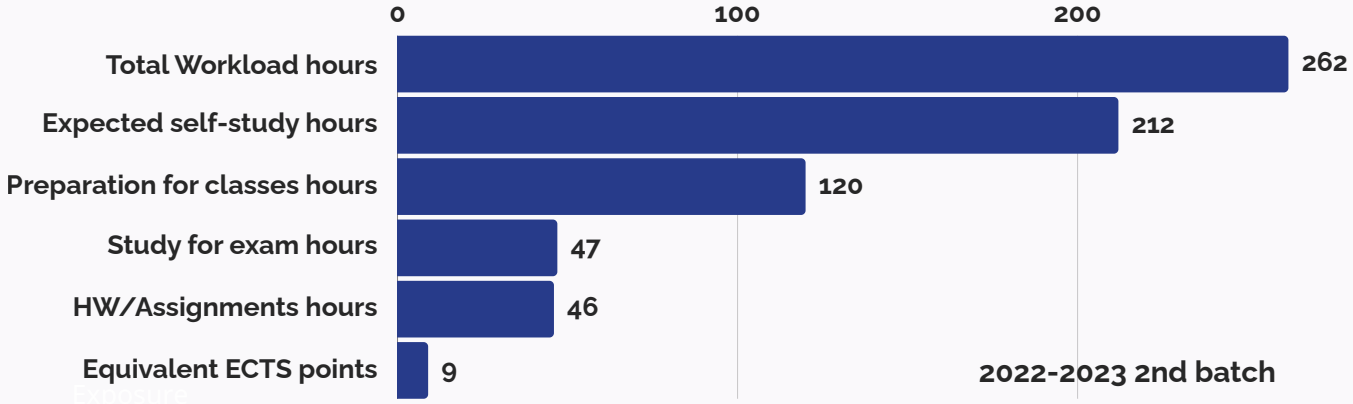
| Contact Hours | Expected Self-study Hours | Total Workload Hours | ECTS Hours |
|---|---|---|---|
| 50 | 179 | 229 | 8 |

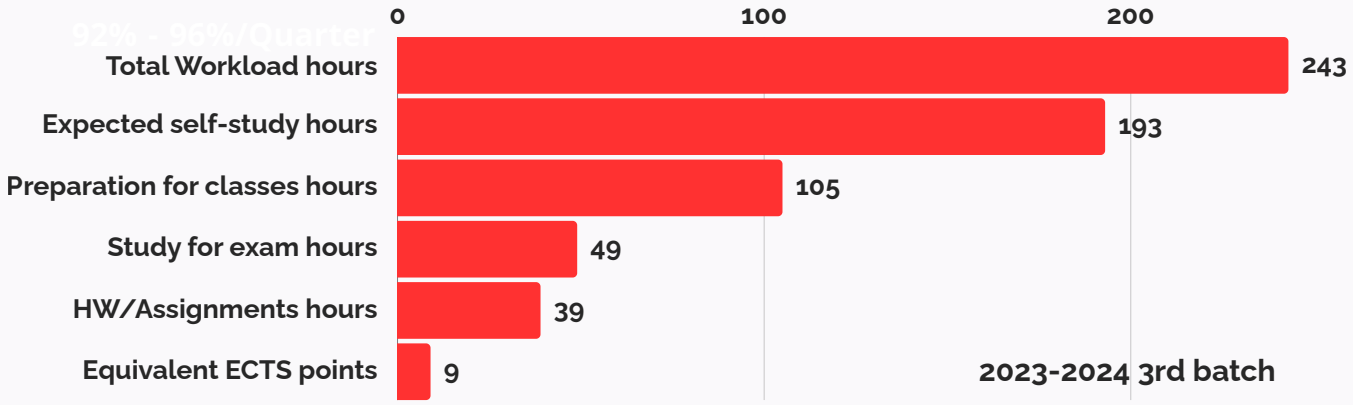
Finally, Table 26 shows that the contact hours, expected self-study hours, total workload hours and ECTS hours of mathematical physics are 50 hours, 179 hours, 229 hours and 8 hours, respectively. The 50 contact hours are the product of fifteen weeks multiplied by 3 credit hours, plus 3 hours for the final exam and 2 hours for two midterm exams. The 179 expected self-study hours is obtained using equation 2 (page 14). The 229 total workload hours is a sum of 50 contact hours and 179 expected self-study hours ( equation 3 at page 14). The 8 ECTS hours is calculated using equation 1 ( page 5). To conclude, the three credit hours of the Classical Mechanics PHYS601 are equivalent to 8 ECTS hours, which means that each credit hour is equivalent to approximately 3 ECTS hours.

# Classical Electrodynamics
# PHYS602

# Statistical Analysis



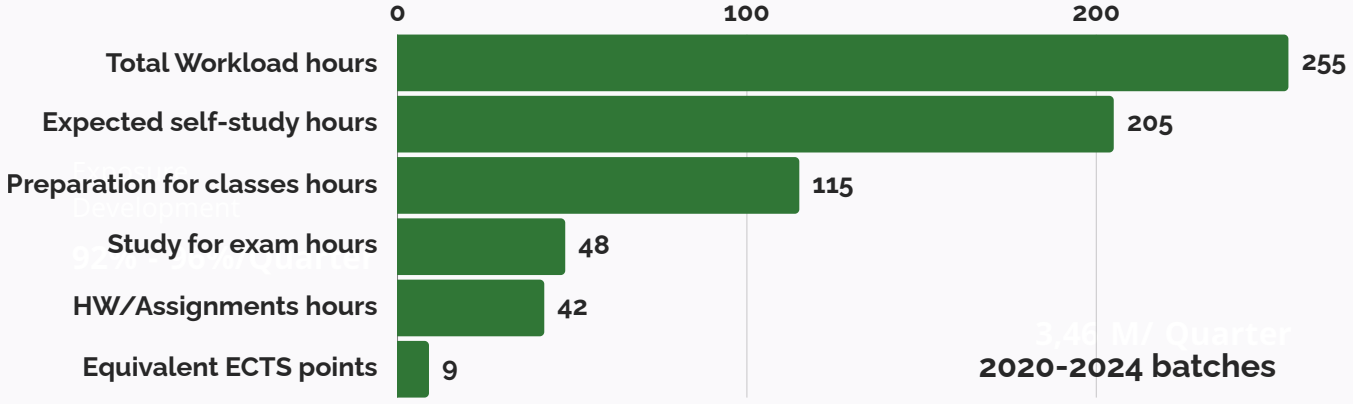
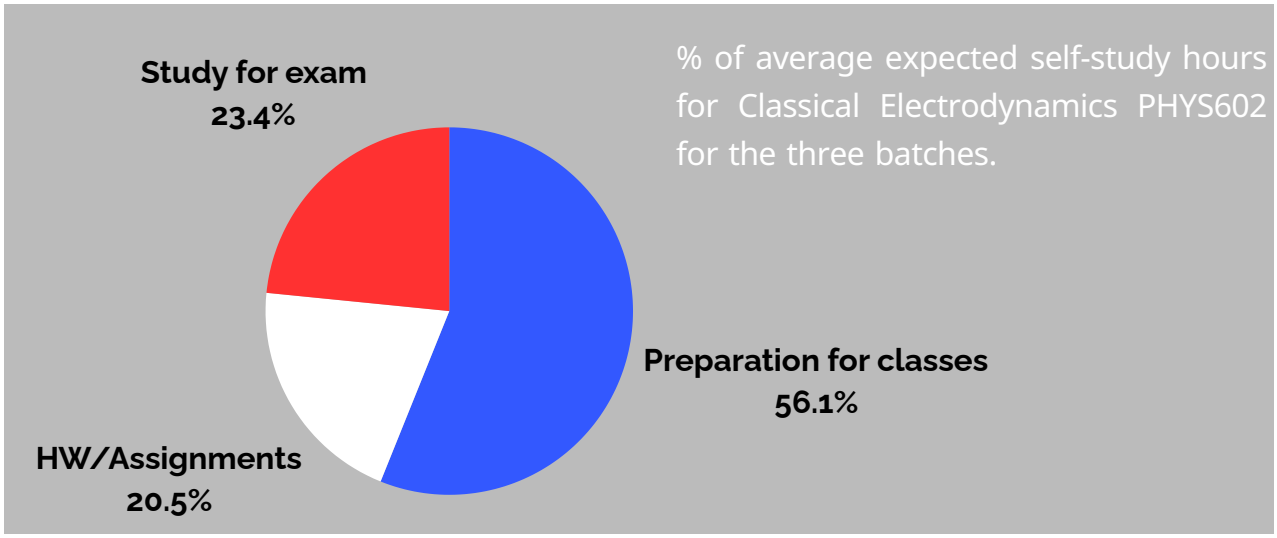
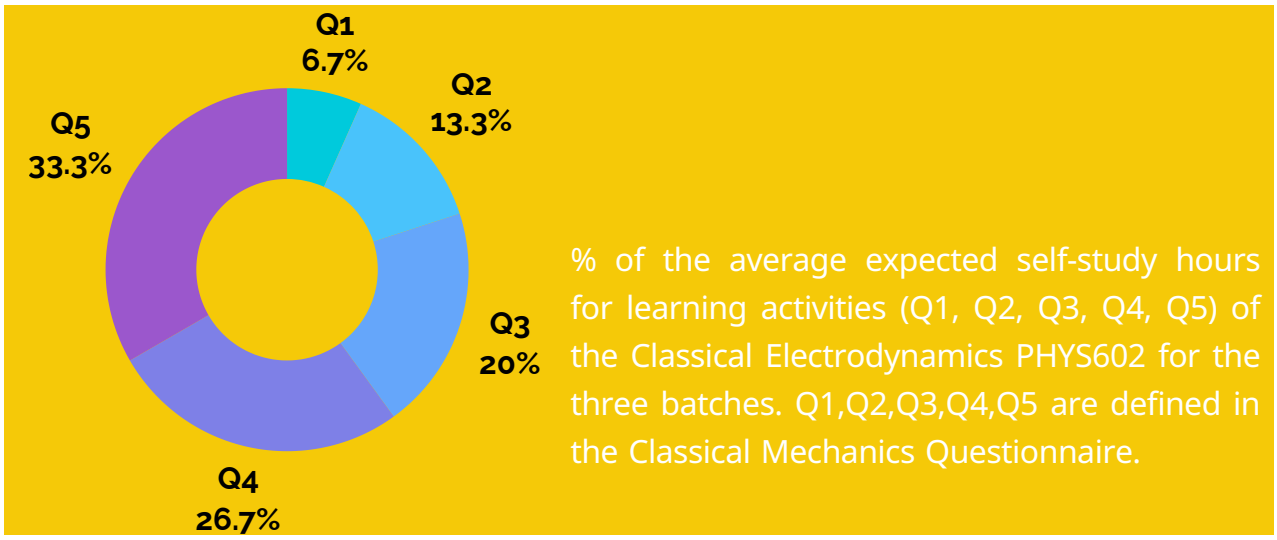




Figure 6: The learning activities hours of Classical Electrodynamics PHYS602 for the three batches and their average from the academic year 2020-2021 to the academic year 2023-2024.



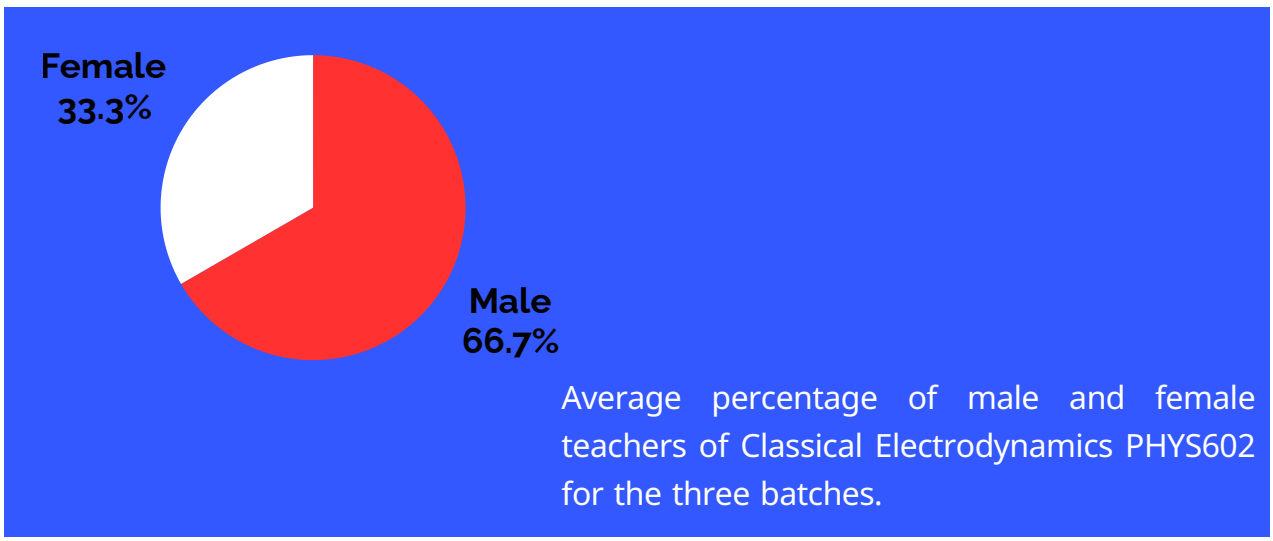




Figure 7: The percentage of average expected self-learning hours, the percentage of average learning activities hours and average percentage of teachers of Classical Electrodynamics for the three batches.

- From Figure 6, the expected self-study hours for Classical Electrodynamics are quite similar for the three batches. The change in expected self-study hours between the three batches is negligible and is close to the average values of expected self-study activity hours for the three batches. It is clear from Figure 7 that the highest percentage of the average expected self-study activity hours is for classroom preparation activities (56%), followed by exam study (23%) and homework/assignments (21%). The percentage of the average expected self-study hours for learning activity is also plotted and it is shown that the highest learning activity hours are for exam study and the lowest learning activity hours are for classes preparation. From Figure 7 one can note that the ECTS calculations are not affected by teachers (whether male or female), although the ratio of male and female teachers is 77% and 33%, respectively.

**Tabl**e 27: Contact hours, Expected Self-study hours, Workload hours and ECTS hours of Classical Electrodynamics PHYS602

| Contact Hours | Expected Self-study Hours | Total Workload Hours | ECTS Hours |
|---|---|---|---|
| **50** | **205** | 255 | 9 |

Finally, Table 27 shows that the contact hours, expected self-study hours, total workload hours and ECTS hours of Classical Electrodynamics are 50 hours, 205 hours, 255 hours and 9 hours, respectively. The 50 contact hours are the product of fifteen weeks multiplied by 3 credit hours, plus 3 hours for the final exam and 2 hours for two midterm exams. The 205 expected self-study hours is obtained using equation 2 (page 14). The 255 total workload hours is a sum of 50 contact hours and 205 expected self-study hours ( equation 3 at page 14). The 9 ECTS hours is calculated using equation 1 ( page 5). To conclude, the three credit hours of the Classical Electrodynamics PHYS602 are equivalent to 9 ECTS hours, which means that each credit hour is equivalent to 3 ECTS hours.

# Quantum Mechanics
# PHYS603

# Statistical Analysis

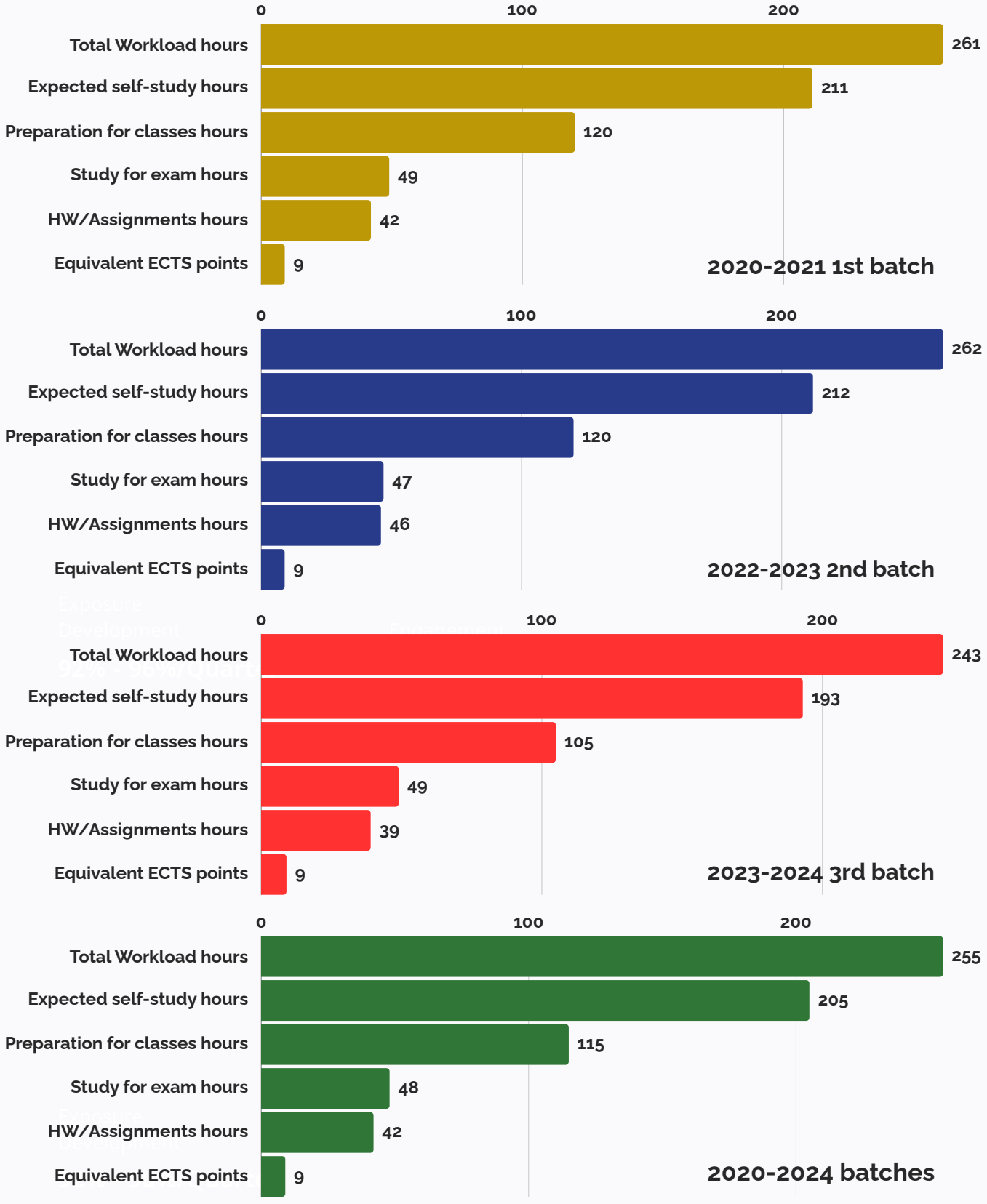
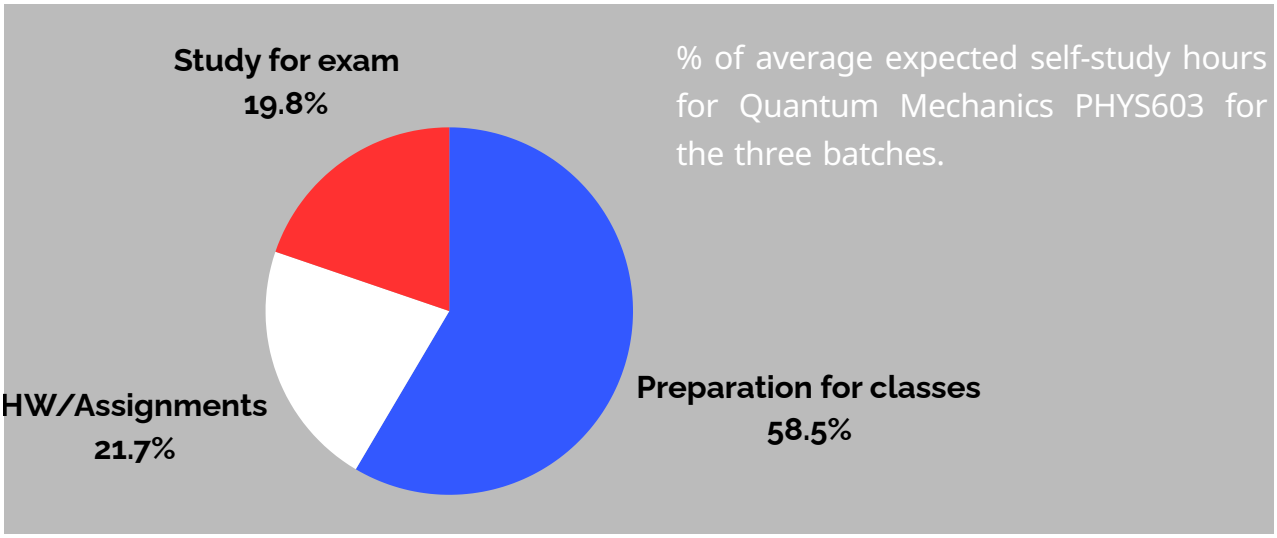
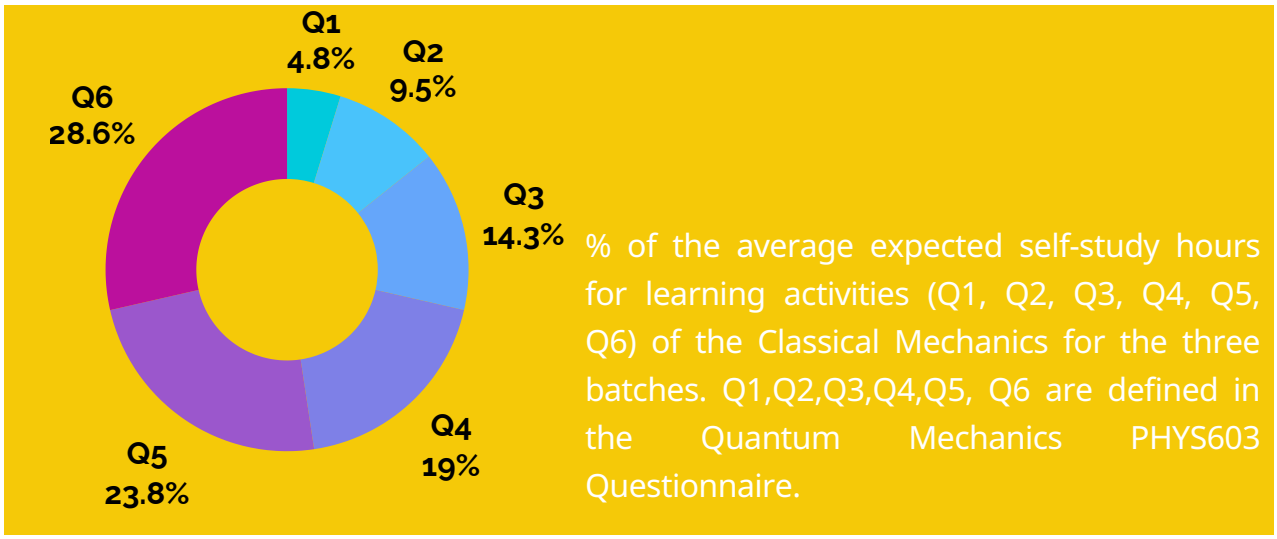



Figure 8 : The learning activities hours of Quantum Mechanics PHYS603 for the three batches and their average from the academic year 2020-2021 to the academic year 2023-2024.



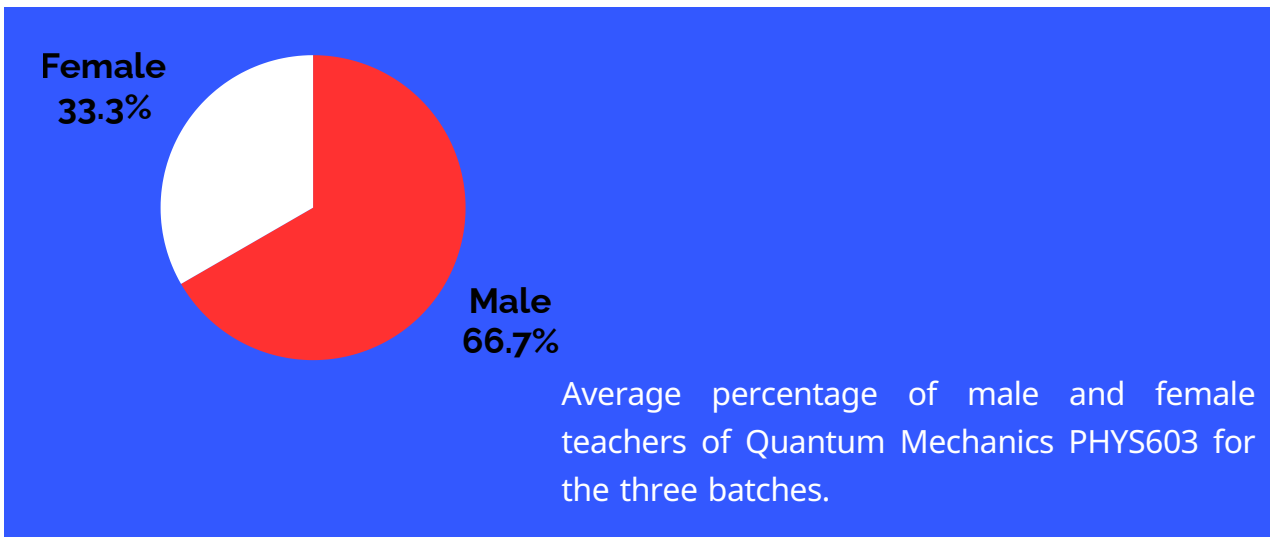




Figure 9: : The percentage of average expected self-learning hours, the percentage of average learning activities hours and average percentage of teachers of Quantum Mechanics PHYS603 for the three batches.

- From Figure 8, the expected self-study hours for Quantum Mechanics are quite similar for the three batches. The change in expected self-study hours between the three batches is negligible and is close to the average values of expected self-study activity hours for the three batches. It is clear from Figure 9 that the highest percentage of the average expected self-study activity hours is for classroom preparation activities (58%), followed by exam study (21%) and homework/assignments (22%). The percentage of the average expected self-study hours for learning activity is also plotted and it is shown that the highest learning activity hours are for exam study and the lowest learning activity hours are for classes preparation. From Figure 9 one can note that the ECTS calculations are not affected by teachers (whether male or female), although the ratio of male and female teachers is 77% and 33%, respectively.

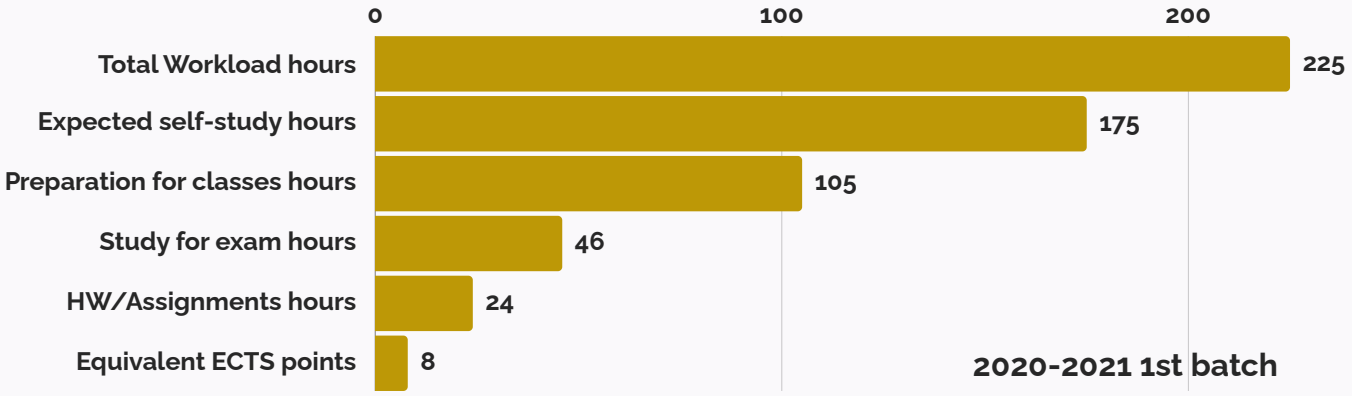
**Tabl**e 28: Contact hours, Expected Self-study hours, Workload hours and ECTS hours of Quantum Mechanics PHYS603

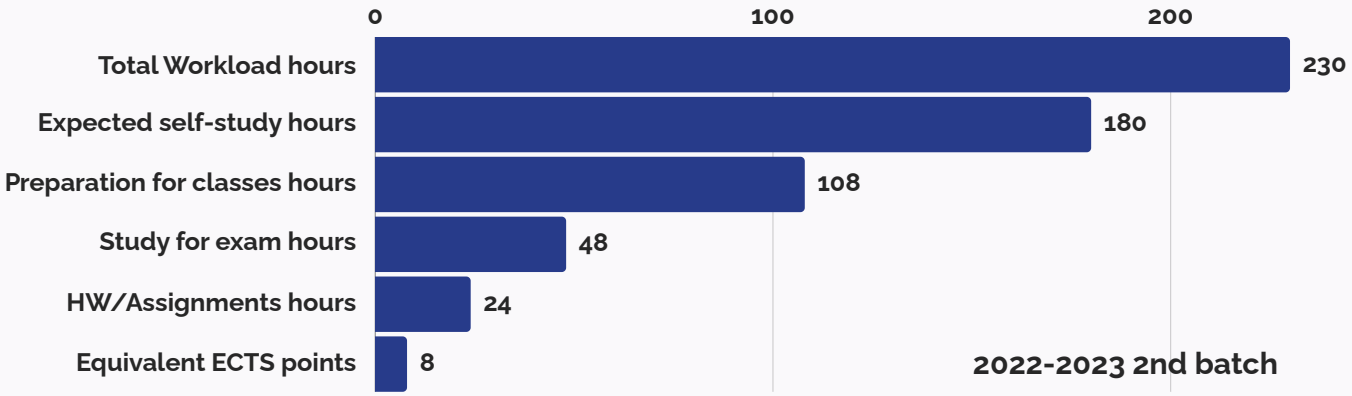
| Contact Hours | Expected Self-study Hours | Total Workload Hours | ECTS Hours |
|---|---|---|---|
| **50** | 259 | 309 | 11 |

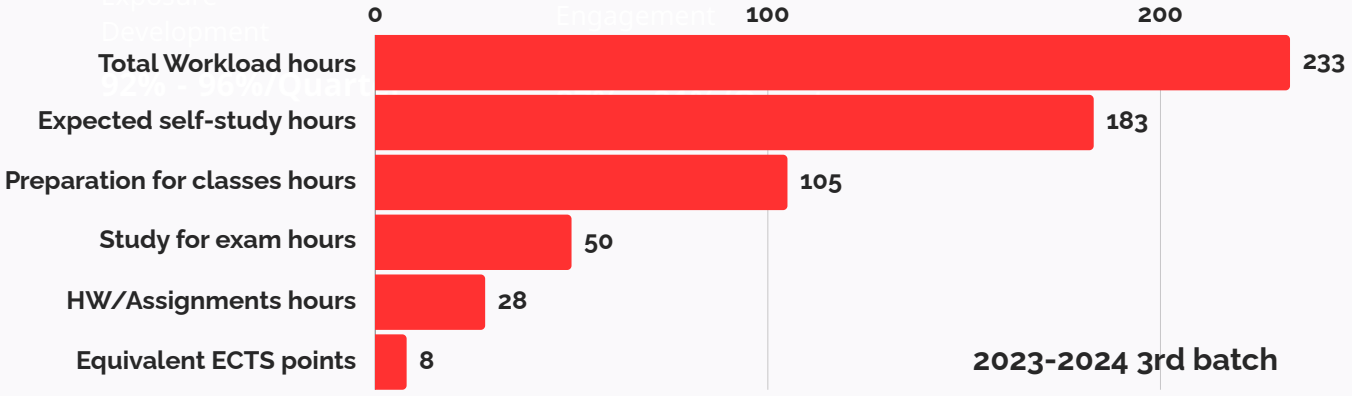
Finally, Table 28 shows that the contact hours, expected self-study hours, total workload hours and ECTS hours of Quantum Mechanics are 50 hours, 259 hours, 309 hours and 11 hours, respectively. The 50 contact hours are the product of fifteen weeks multiplied by 3 credit hours, plus 3 hours for the final exam and 2 hours for two midterm exams. The 259 expected self-study hours is obtained using equation 2 (page 14). The 309 total workload hours is a sum of 50 contact hours and 259 expected self-study hours ( equation 3 at page 14). To conclude, the 3 credit hours of the Quantum Mechanics PHYS603 are required 11 ECTS hours, which means that each credit hour is equivalent to approximately 4 ECTS hours.

# Statistical Mechanics
# PHYS604

# Statistical Analysis



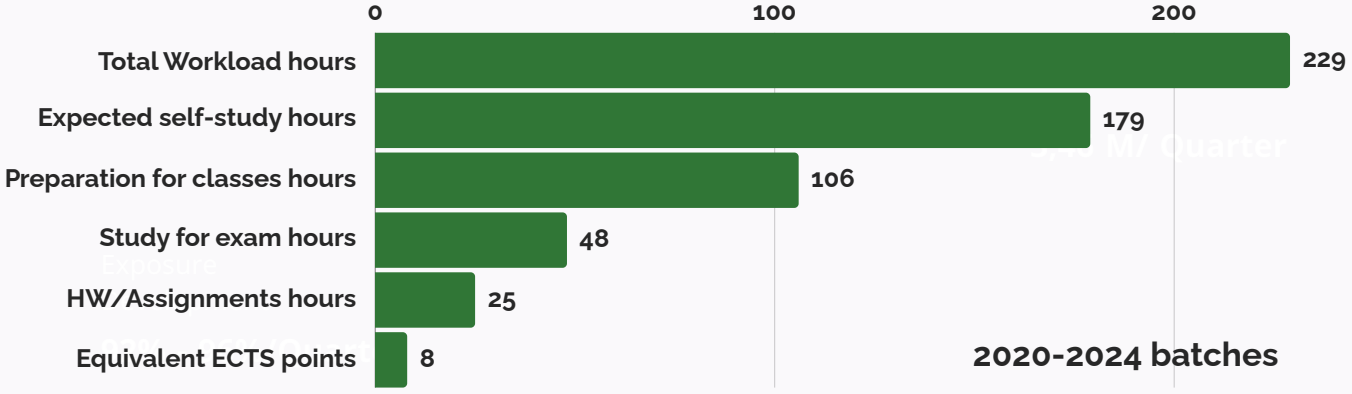
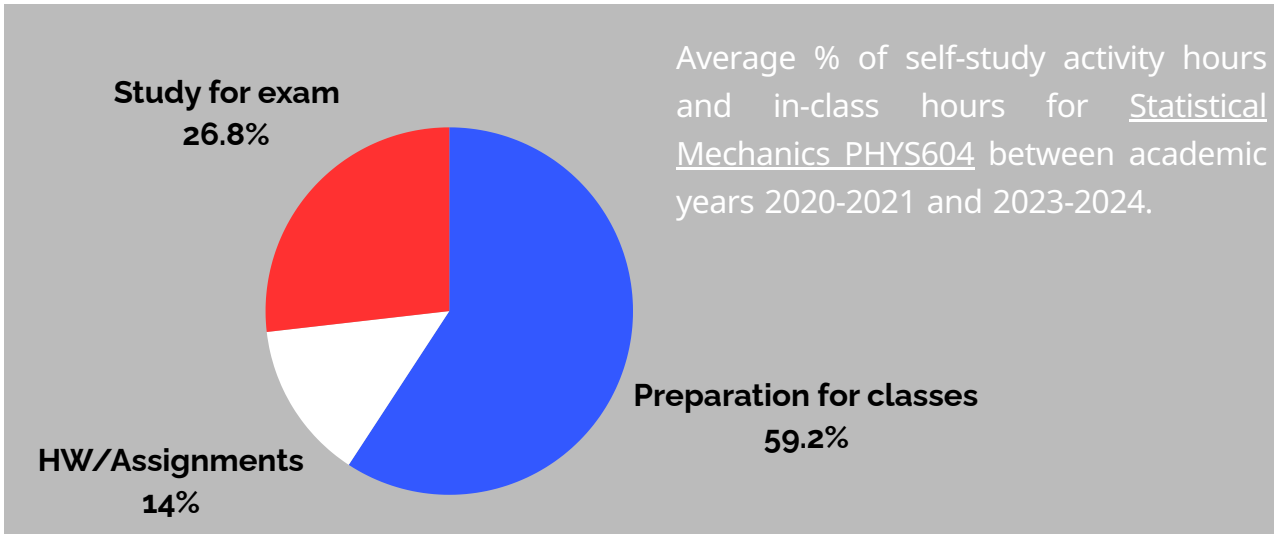
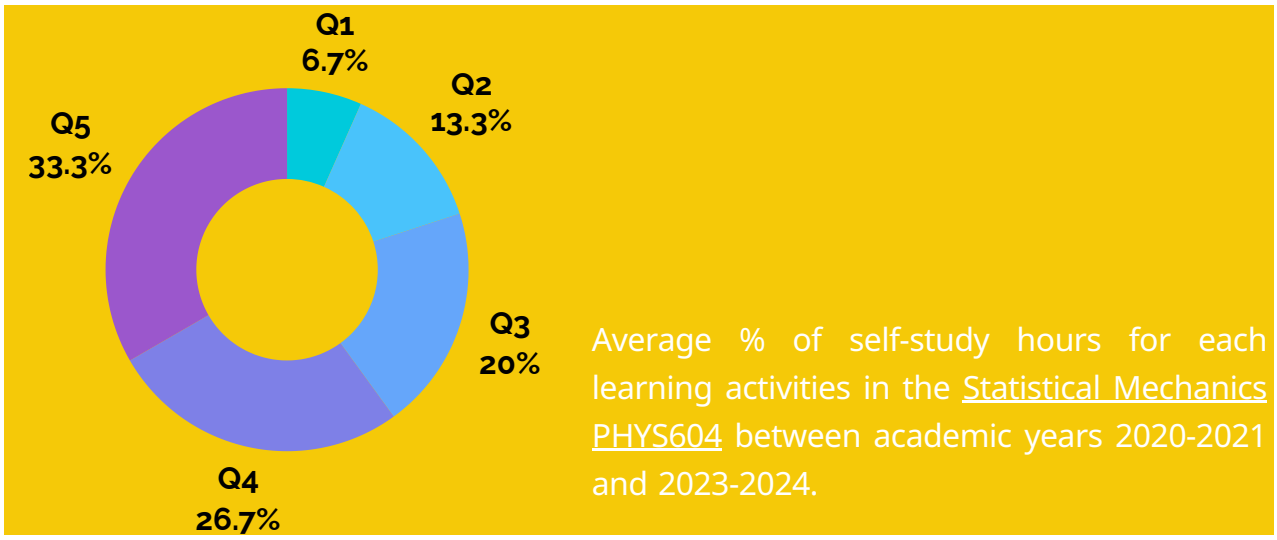




Figure 10 : The learning activities hours of self study for Statistical Mechanics PHYS604 for the batches and their average from the academic year 2020-2021 to the academic year 2023-2024.



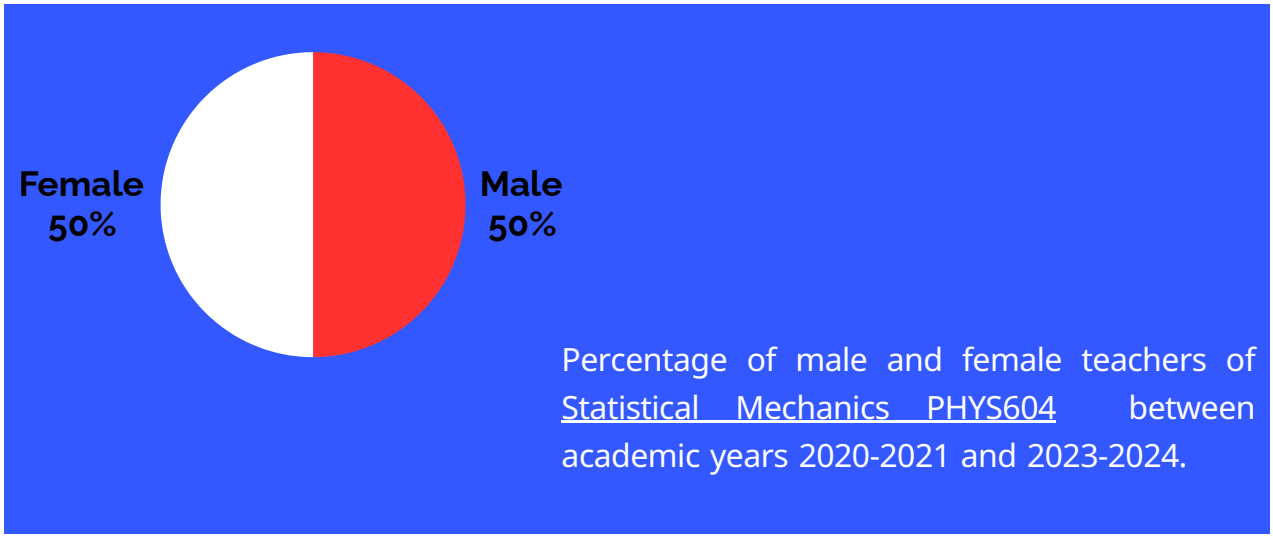




Figure 11: The average percentage of self-learning activities hours, average percentage for each self learning activities hours and percentage of teachers for Statistical Mechanics PHYS604 between academic years 2020-2021 and 2023-2024.

- From Figure 10, the expected self-study hours for statistical Mechanics PHYS604 are quite similar for the three batches. The change in expected self-study hours between the three batches is negligible and is close to the average values of expected self-study activity hours for the three batches. It is clear from Figure 11 that the highest average percentage of self study activity hours is for classes preparation activities (59%), followed by exam study (27%) and homework/assignments (14%). The percentage of the average expected self-study hours for learning activity is also plotted and it is shown that the highest learning activity hours are for exam study and the lowest learning activity hours are for classes preparation. From Figure 11 one can note that the ECTS calculations are not affected by teachers (whether male or female), where the ratio of male and female teachers is 50% and 50%, respectively.

**Tabl**e 29: Contact hours, Expected Self-study hours, Workload hours and ECTS hours of statistical Mechanics PHYS604

| Contact Hours | Expected Self-study Hours | Total Workload Hours | ECTS Hours |
|---|---|---|---|
| **50** | 179 | **229** | 8 |

Finally, Table 29 shows that the contact hours, expected self-study hours, total workload hours and ECTS hours of statistical Mechanics PHYS604 are 50 hours, 179 hours, 229 hours and 8 hours, respectively. The 50 contact hours are the product of fifteen weeks multiplied by 3 credit hours, plus 3 hours for the final exam and 2 hours for two midterm exams. The 179 expected self-study hours is obtained using equation 2 (page 14). The 309 total workload hours is a sum of 50 contact hours and 179 expected self-study hours ( equation 3 at page 14). The 8 ECTS hours is calculated using equation 1 (page 5). To conclude, the 3 credit hours of the statistical Mechanics PHYS604 are required 8 ECTS hours, which means that each credit hour is equivalent to approximately 3 ECTS hours.

# Computational Physics
# PHYS610

# Statistical Analysis

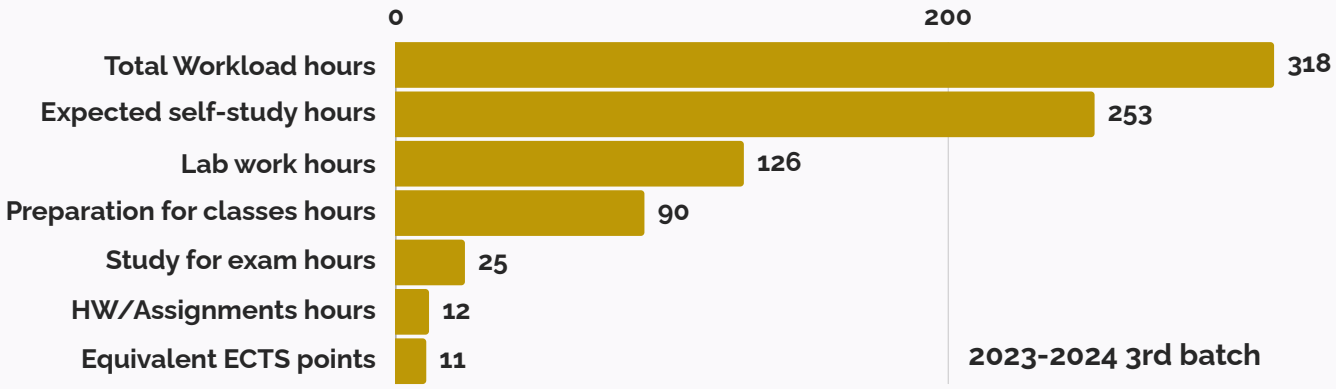
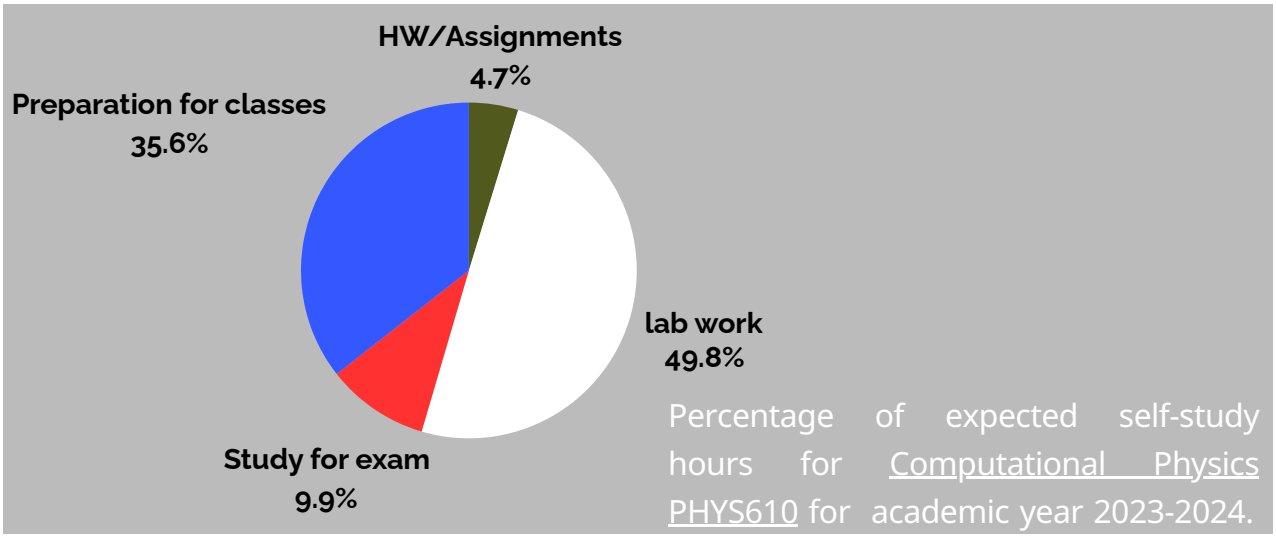
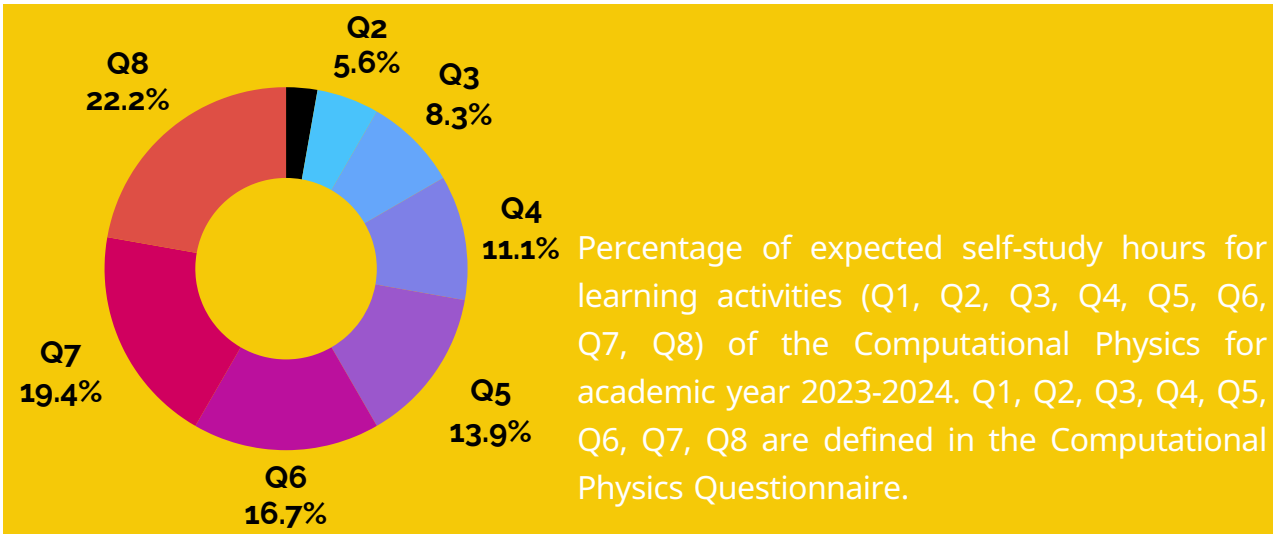



Figure 12 : The learning activities hours of Computational Physics PHYS610 for academic year 2023-2024.



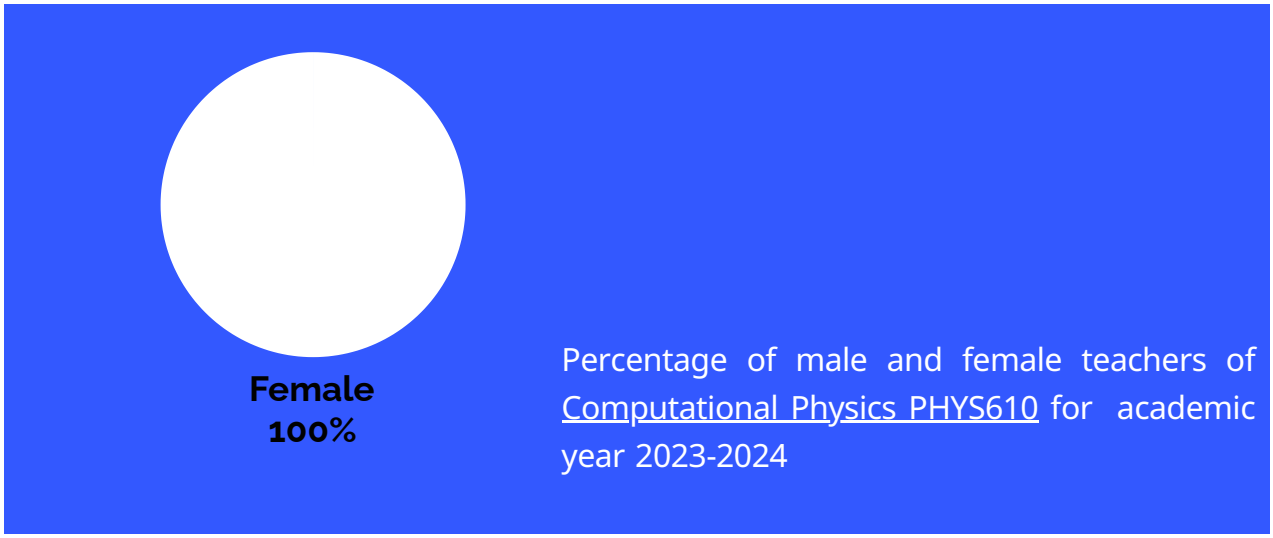




Figure 13: Percentage of male and female teachers of Computational Physics PHYS610 for academic year 2023-2024.

- The Computational Physics PHYS610 is taught for the first time in the academic year 2023-2024. Figure 12 shows the hours of expected self-study hours . It is clear from Figure 13 that the highest percentage of self-study activity hours is work lab (50%), followed by classes preparation activities (35%), then by exam study (10%) and homework/assignments (5%). The percentage of self-study hours for each learning activity was also plotted and it was found that the highest learning activity hours are for final exam and the lowest learning activity hours are for classes preparation. From Figure 13 one can note that the ECTS calculations are only determined by one academic year. Hence, one can not investigate the role of teachers (whether male or female), the ratio of male and female teachers is 0% and 100%, respectively.

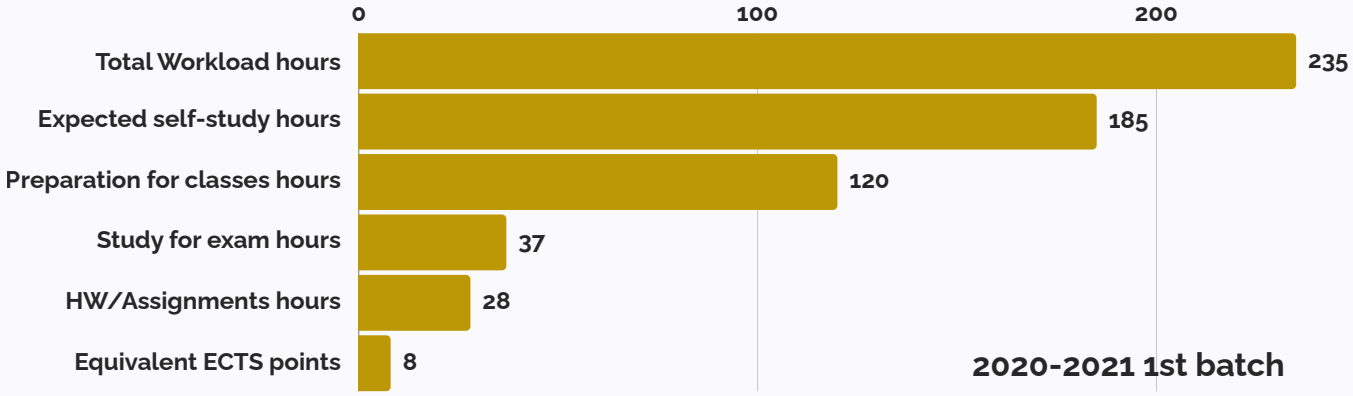
**Tabl**e 30: Contact hours, Expected Self-study hours, Workload hours and ECTS hours of computational physics PHYS610

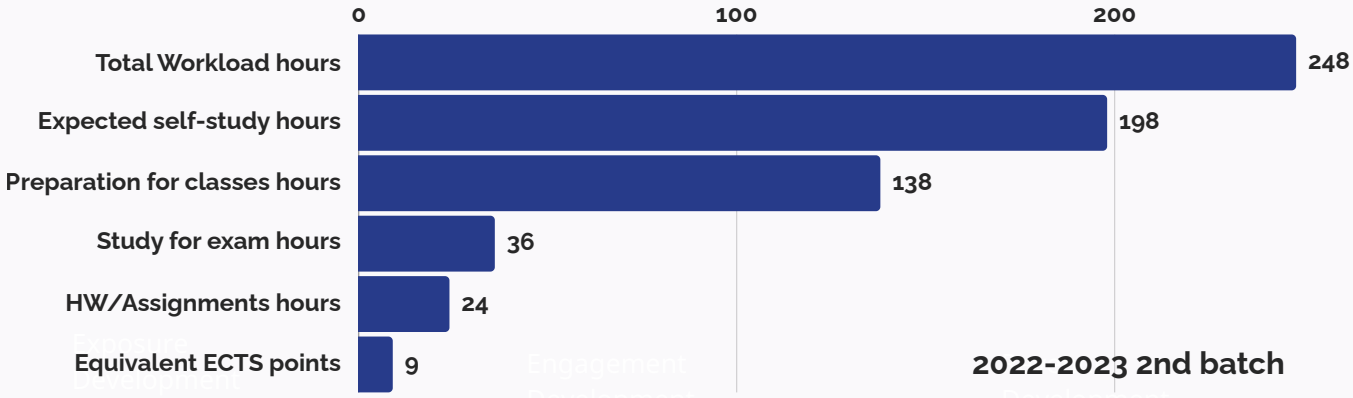
| Contact Hours | Expected Self-study Hours | Total Workload Hours | ECTS Hours |
|---|---|---|---|
| **65** | 253 | **318** | 11 |

Finally, Table 30 shows that the homework/ assignments hours, exam study hours, classes preparation hours, lab work hours, expected self-study hours, total workload hours and ECTS hours are 12 hours, 25 hours, 90 hours, 126 hours, 253 hours, 318 hours and 11 hours respectively. The 65 contact hours are the product of fifteen weeks multiplied by ( 2 theory + 2 experiment), plus 3 hours for the final exam and 2 hours for two midterm exams. The 253 expected self-study hours is obtained using equation 2 (page 14). The 318 total workload hours is a sum of 65 contact hours and 253 expected self-study hours ( equation 3 at page 14). The 11 ECTS hours is calculated using equation 1 (page 5). To conclude, the 3 credit hours of the computational physics PHYS610 are required 11 ECTS hours, which means that each credit hour is equivalent to approximately 4 ECTS hours.

# Atomic and molecular physics
# PHYS620

# Statistical Analysis



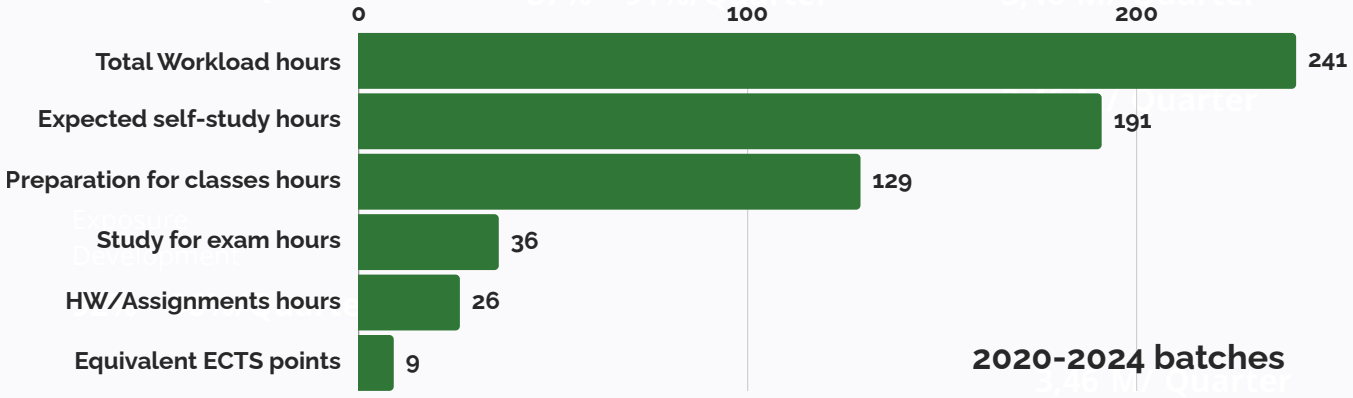
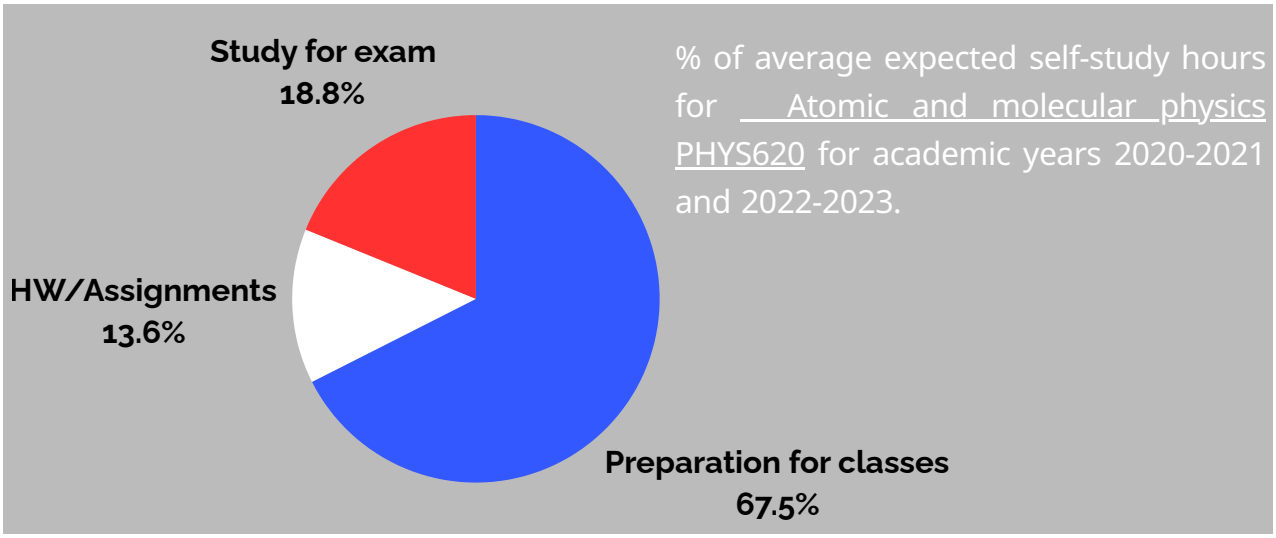
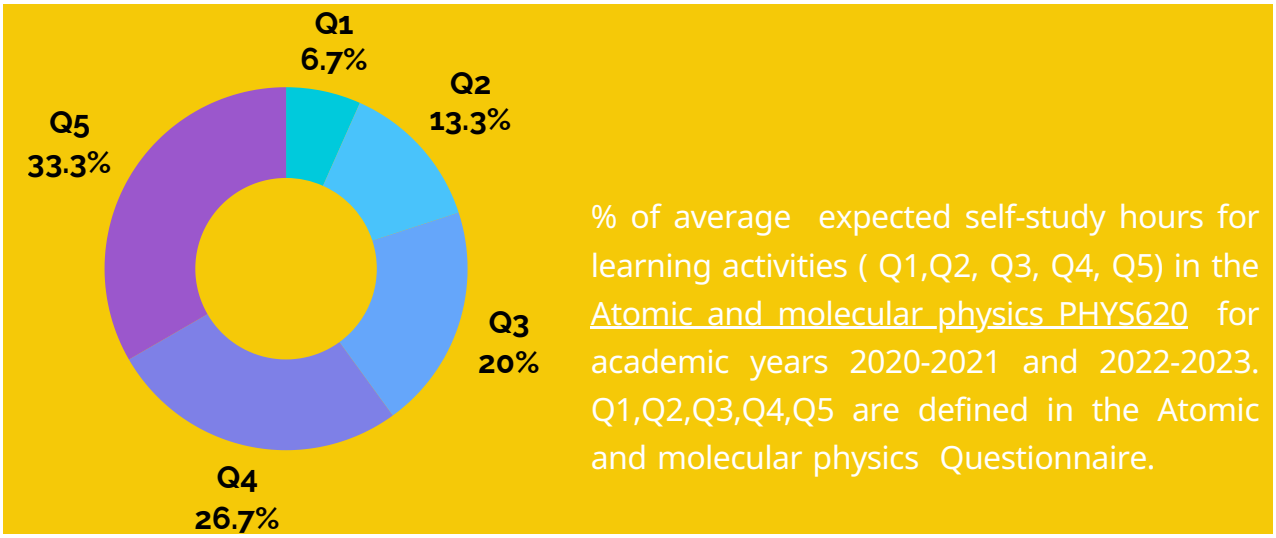




Figure 14: The learning activities hours of Atomic and molecular physics PHYS620 for the two batches and their average from the academic year 2020-2021 to the academic year 2023-2024.



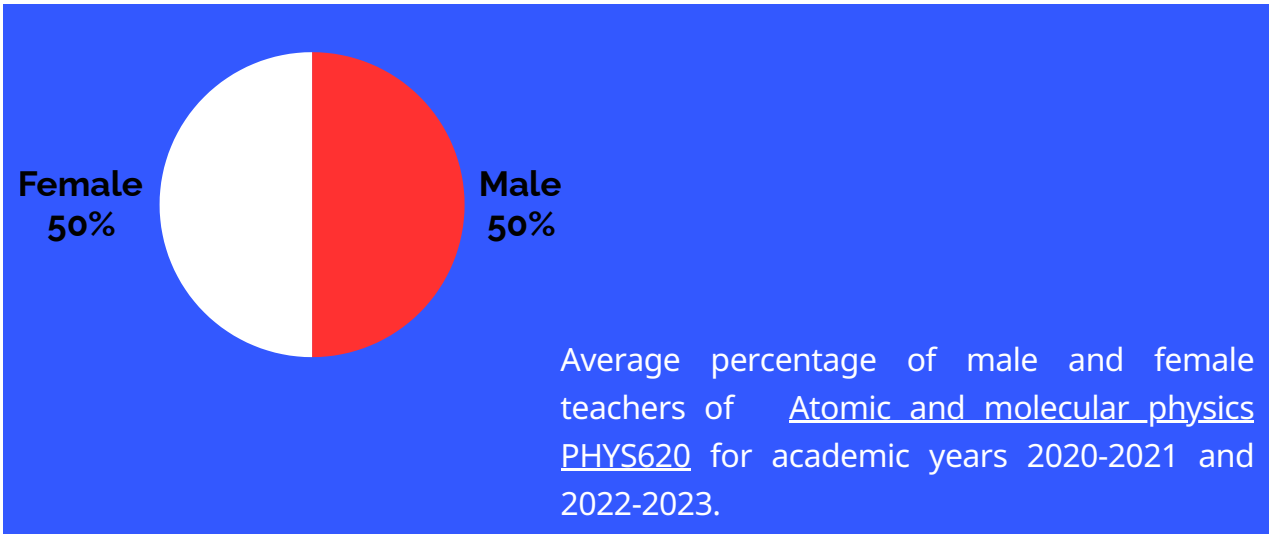




Figure 15: The average percentage of expected self-study hours, average percentage for learning activities hours and average percentage of teachers for Atomic and molecular physics PHYS620 for academic years 2020-2021 and 2022-2023.

- From Figure 14, the expected self study hours for the Atomic and molecular physics PHYS620 years 2020-2021, and 2022-2023 The change in self learning activities hours between the three batches is negligible and close to the average values of self learning activities hours over the two batches 2020 2021 and 2022-2023. It is clear from Figure 15 that the highest average percentage of self study activity hours is for classes preparation activities (68%), followed by exam study (18%) and homework/assignments (14%). The average percentage of self-study hours for each learning activity was also plotted and it was found that the highest learning activity hours are for exam study and the lowest learning activity hours are for classes preparation. From Figure 15 one can note that the ECTS calculations are not affected by teachers (whether male or female), where the ratio of male and female teachers is 50% and 50%, respectively

**Tabl**e 31: Contact hours, Expected Self-study hours, Workload hours and ECTS hours of Atomic and molecular physics PHYS620

| Contact Hours | Expected Self-study Hours | Total Workload Hours | ECTS Hours |
|---|---|---|---|
| **50** | 191 | **241** | 9 |

Finally, Table 31 shows that the contact hours, expected self-study hours, total workload hours and ECTS hours of Atomic and molecular physics are 50 hours, 191 hours, 241 hours and 9 hours, respectively. The 50 contact hours are the product of fifteen weeks multiplied by 3 credit hours, plus 3 hours for the final exam and 2 hours for two midterm exams. The 191 expected self-study hours is obtained using equation 2 (page 14). The 241 total workload hours is a sum of 50 contact hours and 191 expected self-study hours ( equation 3 at page 14). The 9 ECTS hours is calculated using equation 1 ( page 5). To conclude, the three credit hours of the Atomic and molecular physics PHYS620 are equivalent to 9 ECTS hours, which means that each credit hour is equivalent to 3 ECTS hours.

# Quantum Optics
# PHYS621

# Statistical Analysis

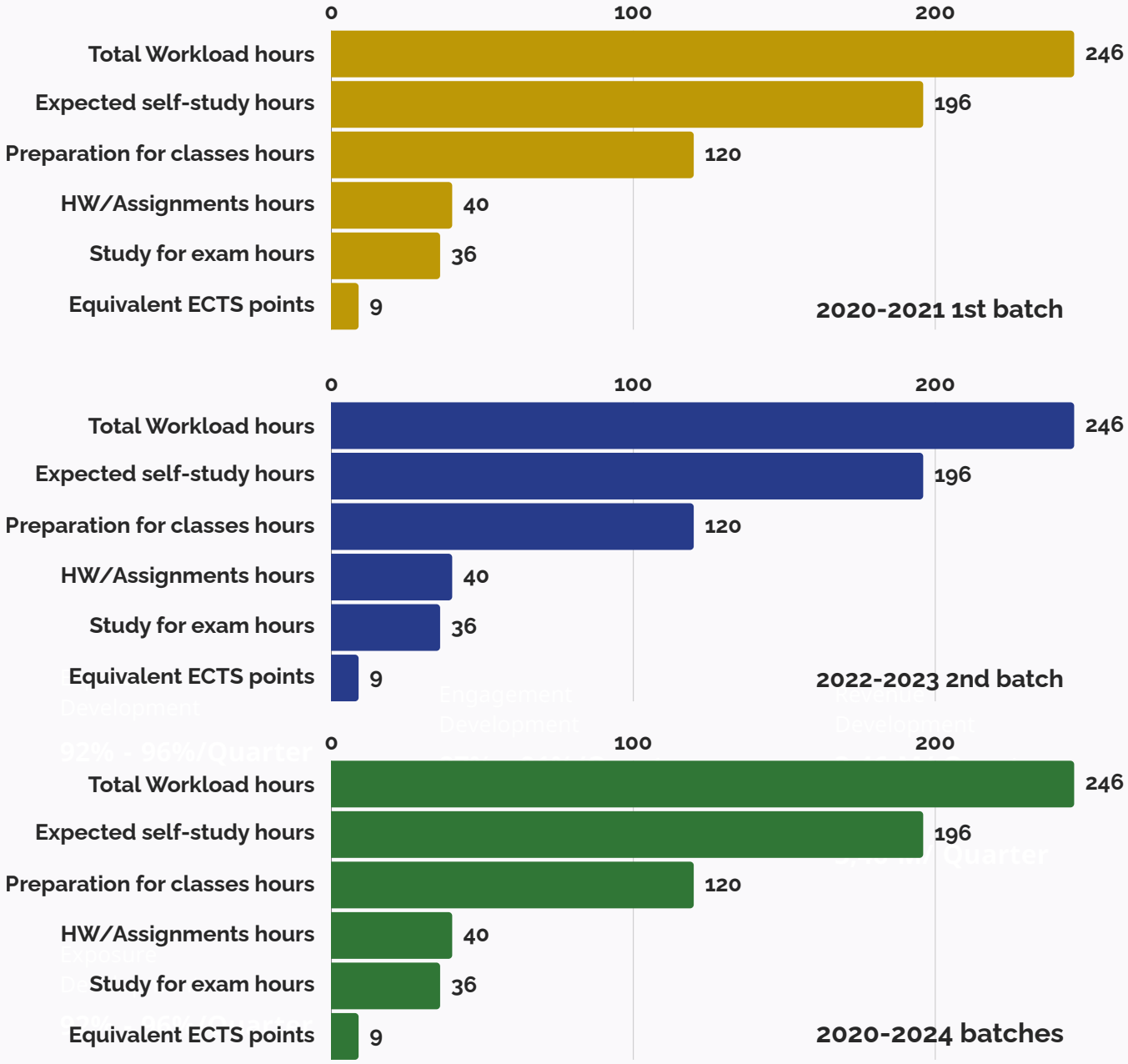
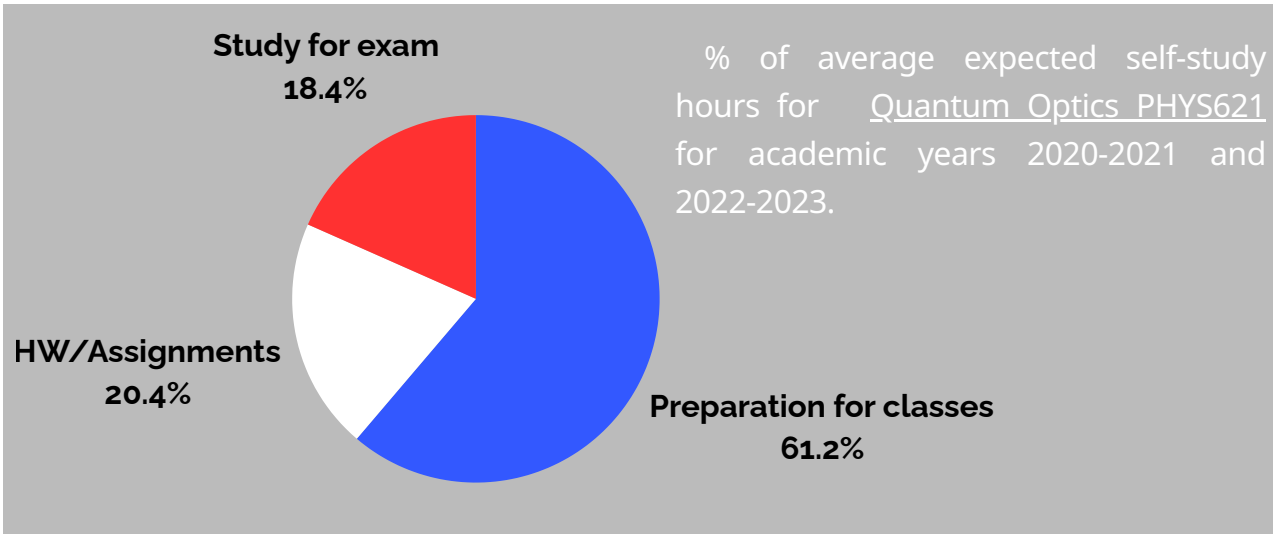
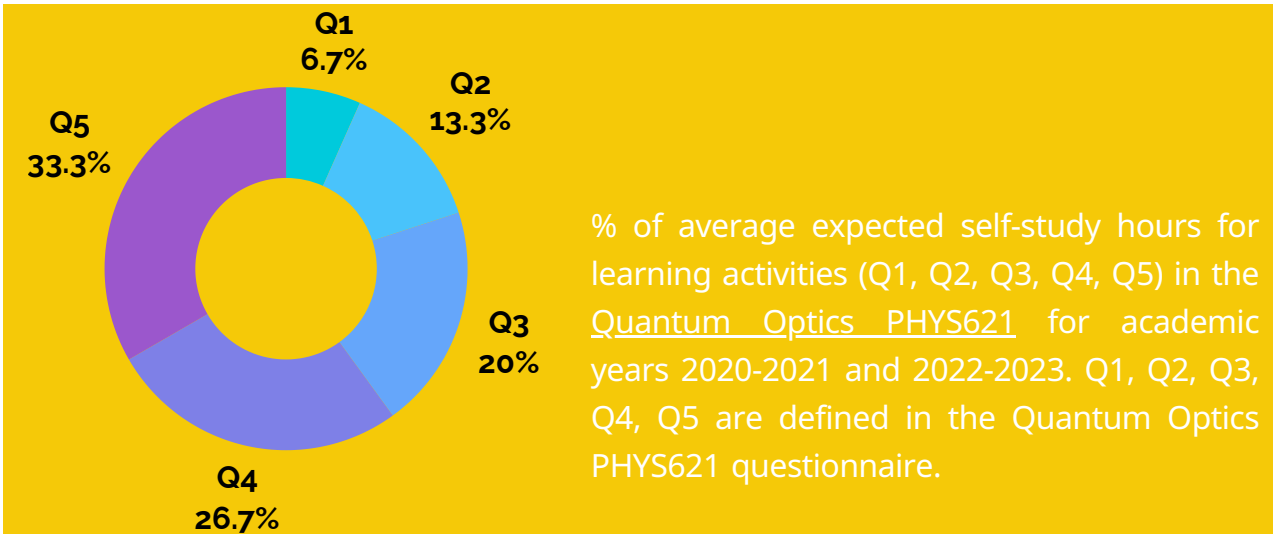


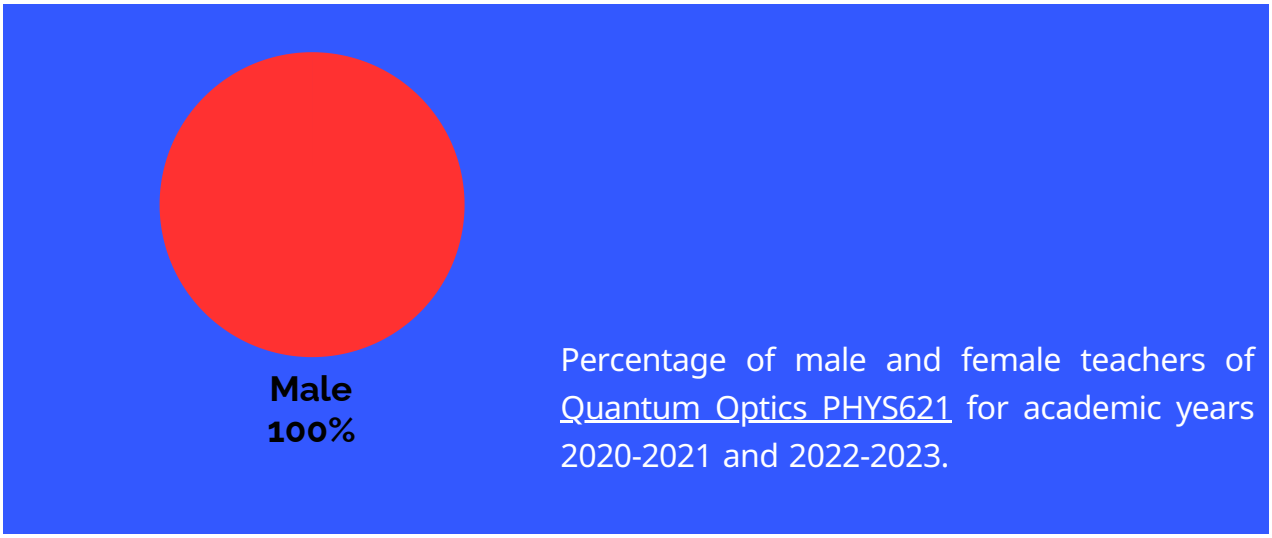

Figure 16 : The learning activities hours of expected self-study hours for Quantum Optics PHYS621 for the two batches and their average from the academic year 2020-2021 to the academic year 2023-2024.




% of average expected self-study hours for Quantum Optics PHYS621 for academic years 2020-2021 and 2022-2023.




% of average expected self-study hours for learning activities (Q1, Q2, Q3, Q4, Q5) in the Quantum Optics PHYS621 for academic years 2020-2021 and 2022-2023. Q1, Q2, Q3, Q4, Q5 are defined in the Quantum Optics PHYS621 questionnaire.




Percentage of male and female teachers of Quantum Optics PHYS621 for academic years 2020-2021 and 2022-2023.

Figure 17: The percentage of average expected self-learning hours, the percentage of average learning activities hours and average percentage of teachers of Quantum Optics PHYS621 for academic years 2020-2021 and 2022-2023.

- From Figure 16, the expected self study hours for the Quantum Optics PHYS621 years 2020-2021, and 2022-2023. It is clear from Figure 17 that the highest average percentage of self study activity hours is for classes preparation activities (61%), followed by homework/assignments (21%) and exam study (18%). The average percentage of self-study hours for each learning activity was also plotted and it was found that the highest learning activity hours are for exam study and the lowest learning activity hours are for classes preparation. From Figure 17, it can be noted that the teachers who taught the course were 100% male, and therefore, the influence of male or female teachers on the ECTS analysis cannot be concluded.

**Tabl**e 32: Contact hours, Expected Self-study hours, Workload hours and ECTS hours of Quantum Optics PHYS621

| Contact Hours | Expected Self-study Hours | Total Workload Hours | ECTS Hours |
|---|---|---|---|
| **50** | 196 | **246** | 9 |

Finally, Table 32 shows that the contact hours, expected self-study hours, total workload hours and ECTS hours of Quantum Optics PHYS621 are 50 hours, 196 hours, 246 hours and 9 hours, respectively. The 50 contact hours are the product of fifteen weeks multiplied by 3 credit hours, plus 3 hours for the final exam and 2 hours for two midterm exams. The 196 expected self-study hours is obtained using equation 6 (page 14). The 246 total workload hours is a sum of 50 contact hours and 191 expected self-study hours ( equation 3 at page 14). The 9 ECTS hours is calculated using equation 1 ( page 5). To conclude, the three credit hours of the Quantum Optics PHYS621 are equivalent to 9 ECTS hours, which means that each credit hour is equivalent to 3 ECTS hours.

# Solid State Physics
# PHYS640

# Statistical Analysis

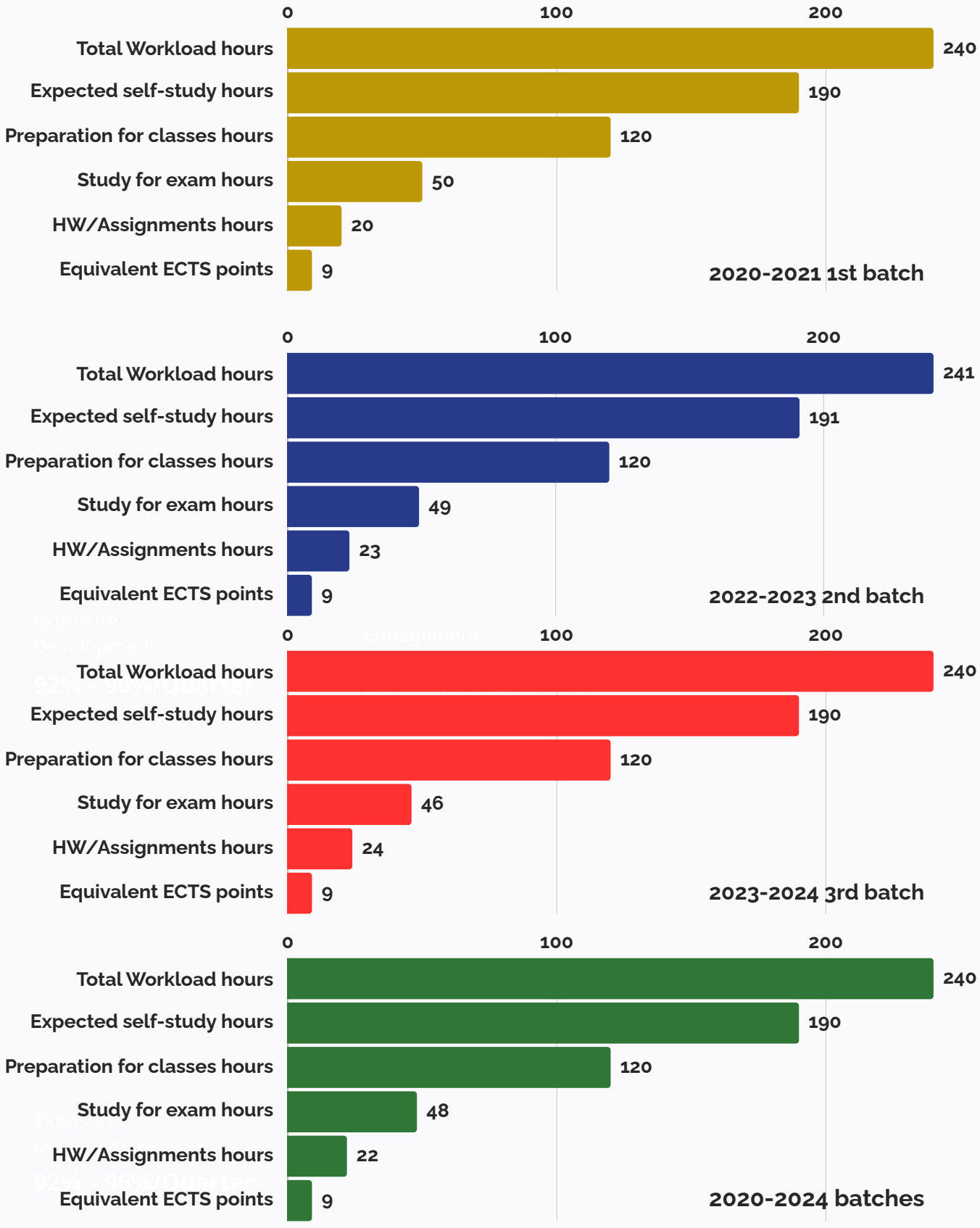
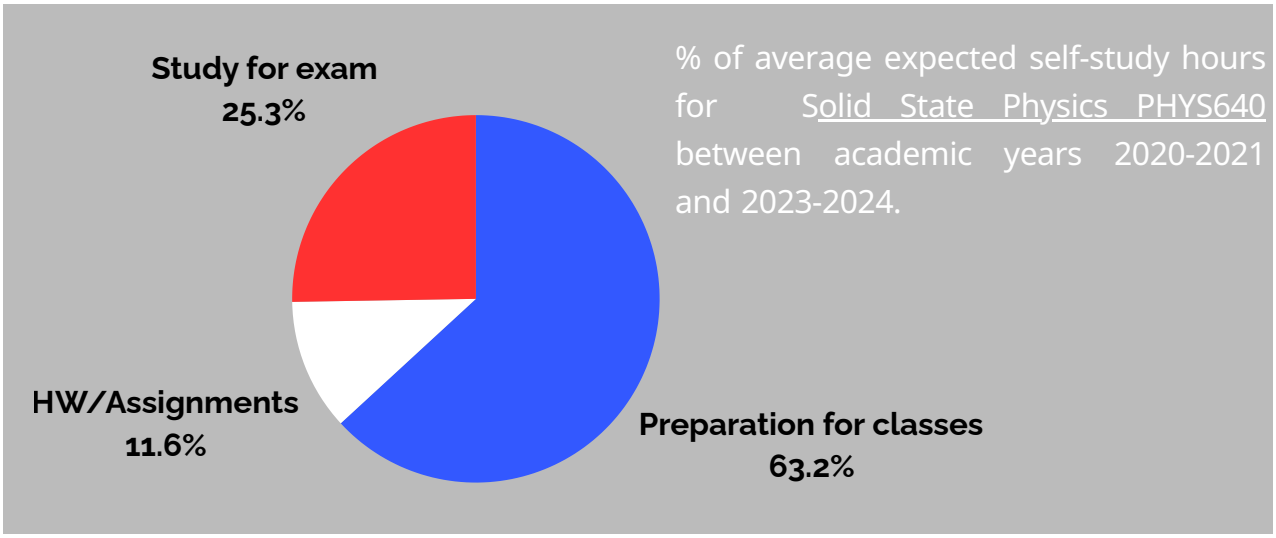
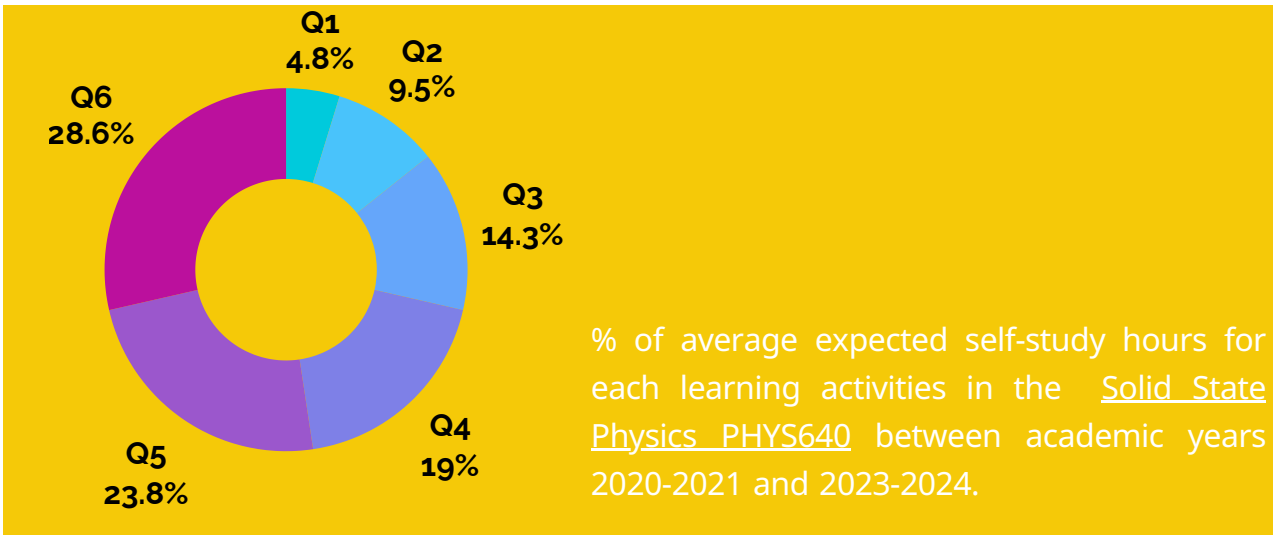



Figure 18 : The learning activities hours of Solid State Physics PHYS640 for three batches and their average from the academic year 2020-2021 to the academic year 2023-2024.



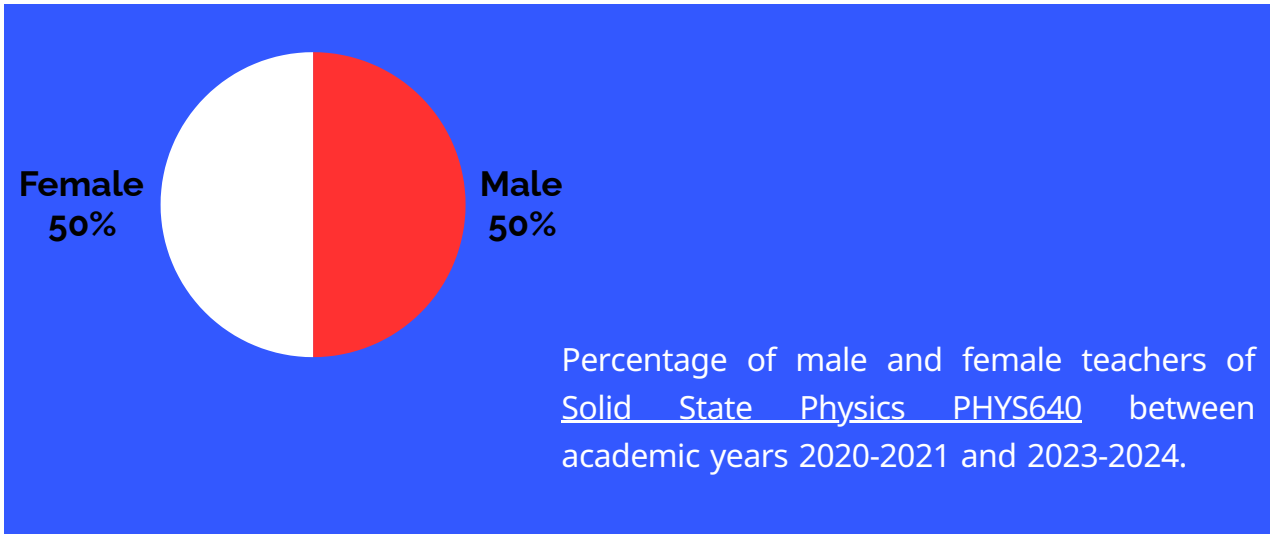




Figure 19 : The percentage of average expected self-learning hours, the percentage of average learning activities hours and average percentage of teachers of Solid State Physics PHYS640 between academic years 2020-2021 and 2023-2024.

- From Figure 18, the expected self study hours for the Solid State Physics PHYS640 between academic years 2020-2021 and 2023-2024. It is clear from Figure 19 that the change in self learning hours between the three batches is negligible and close to the average values of self learning hours over the three batches between 2020-2021 and 2023-2024. It is clear from Figure 18 that the highest average percentage of self study activity hours is for classes preparation activities (63%), followed by exam study (25%) and homework/assignments (12%). The average percentage of self-study hours for learning activity was also plotted and it was found that the highest learning activity hours are for exam study and the lowest learning activity hours are for classes preparation. From Figure 19, it can be noted that the ECTS calculations are not affected by teachers (whether male or female), with the ratio of male and female teachers being 50% and 50% respectively.

**Table** 33: Contact hours, Expected Self-study hours, Workload hours and ECTS hours of solid state physics PHYS640

| Contact Hours | Expected Self-study Hours | Total Workload Hours | ECTS Hours |
|---|---|---|---|
| **50** | 190 | **240** | 9 |

Finally, Table 34 shows that the contact hours, expected self-study hours, total workload hours and ECTS hours of solid state physics are 50 hours, 190 hours, 240 hours and 9 hours, respectively. The 50 contact hours are the product of fifteen weeks multiplied by 3 credit hours, plus 3 hours for the final exam and 2 hours for two midterm exams. The 190 expected self-study hours is obtained using equation 6 (page 14). The 240 total workload hours is a sum of 50 contact hours and 191 expected self-study hours ( equation 3 at page 14). The 9 ECTS hours is calculated using equation 1 ( page 5). To conclude, the three credit hours of the solid state physics PHYS640 are equivalent to 9 ECTS hours, which means that each credit hour is equivalent to 3 ECTS hours.

# Materials Science
# PHYS641

# Statistical Analysis

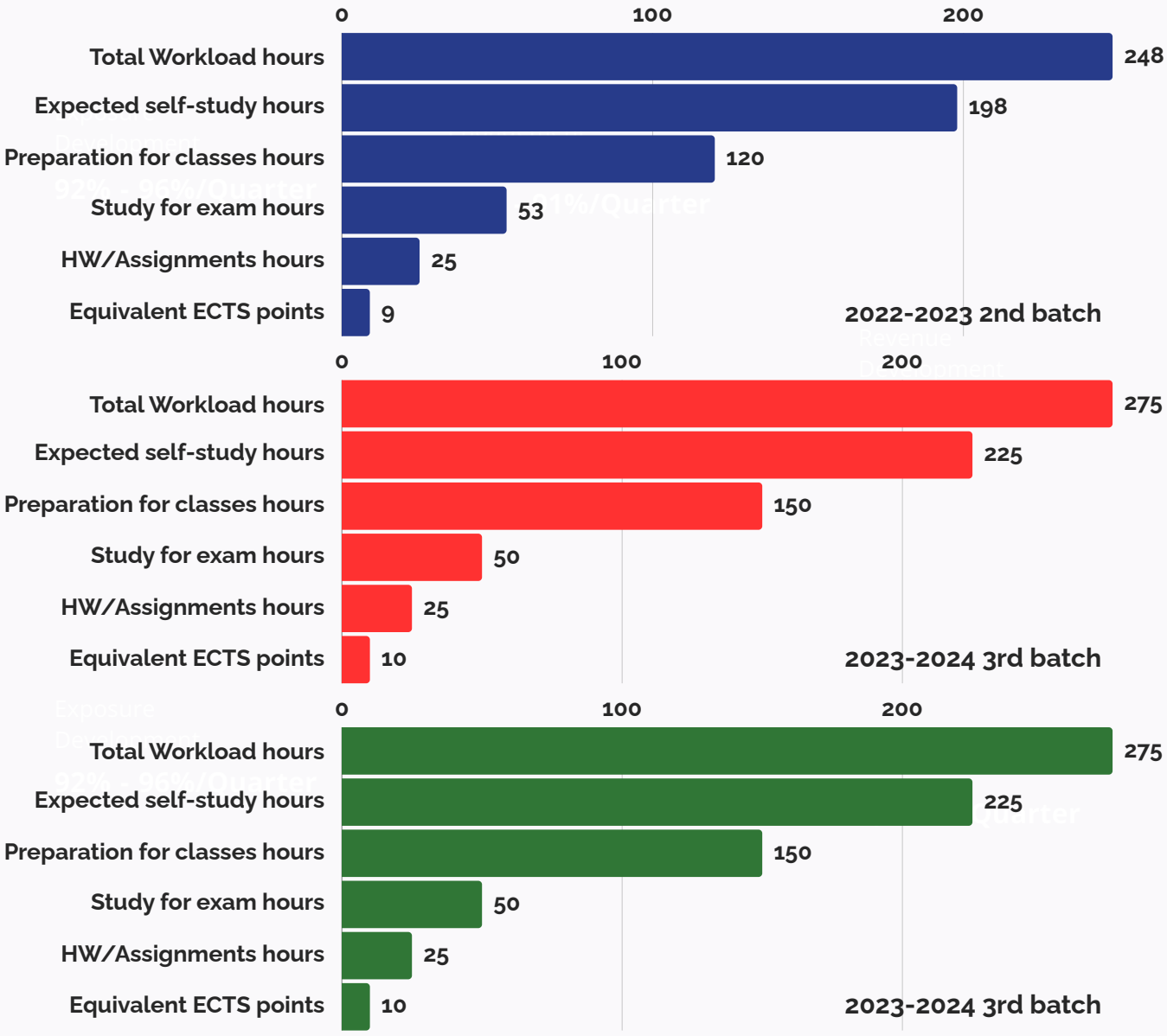
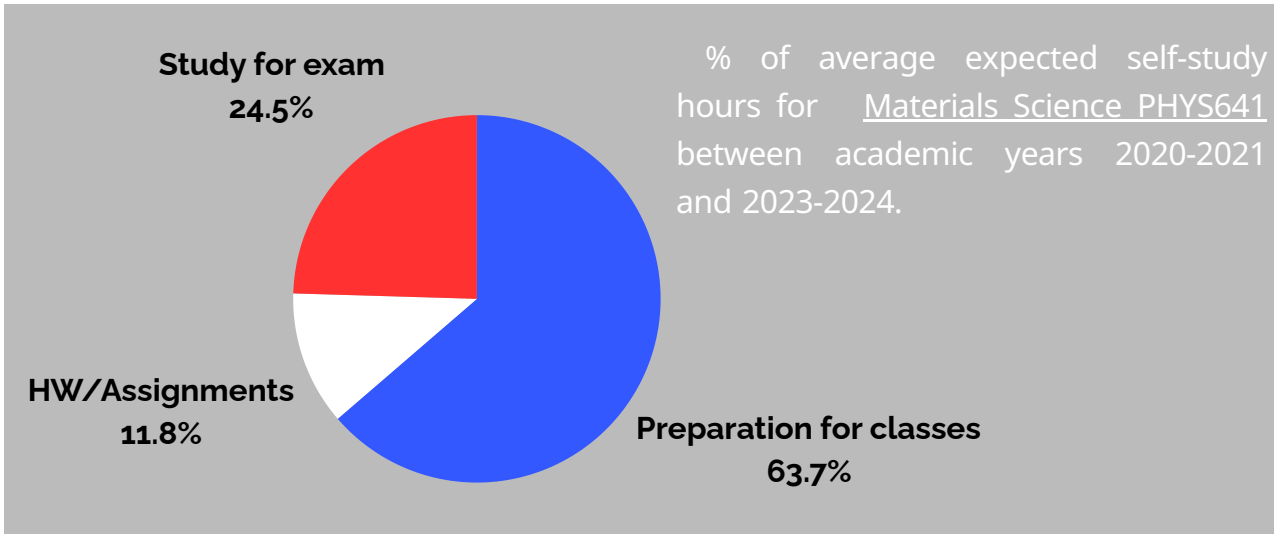
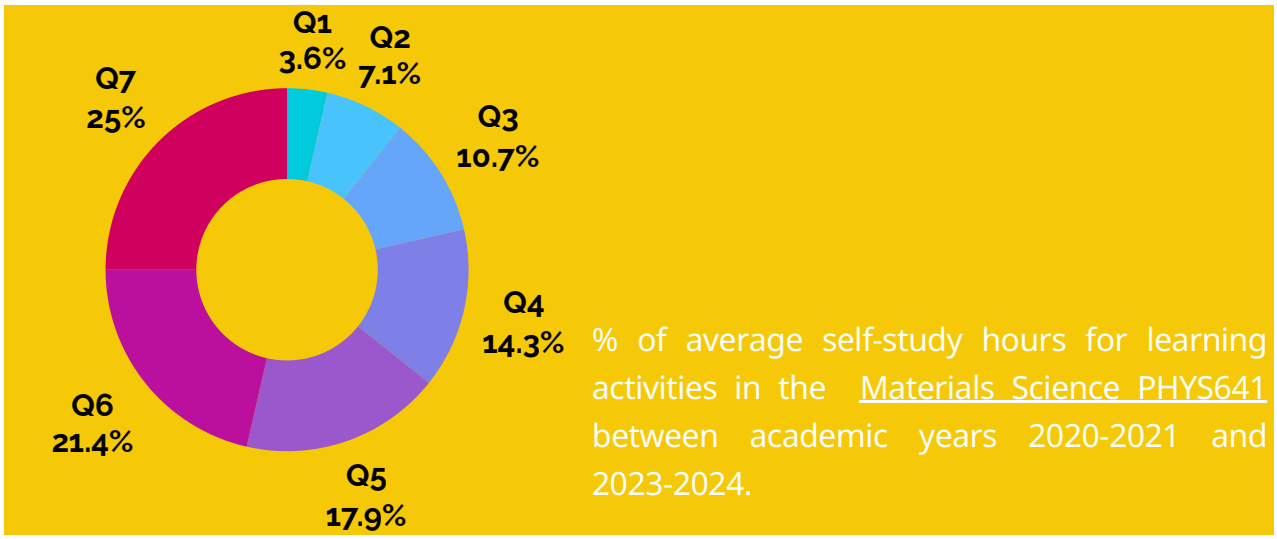


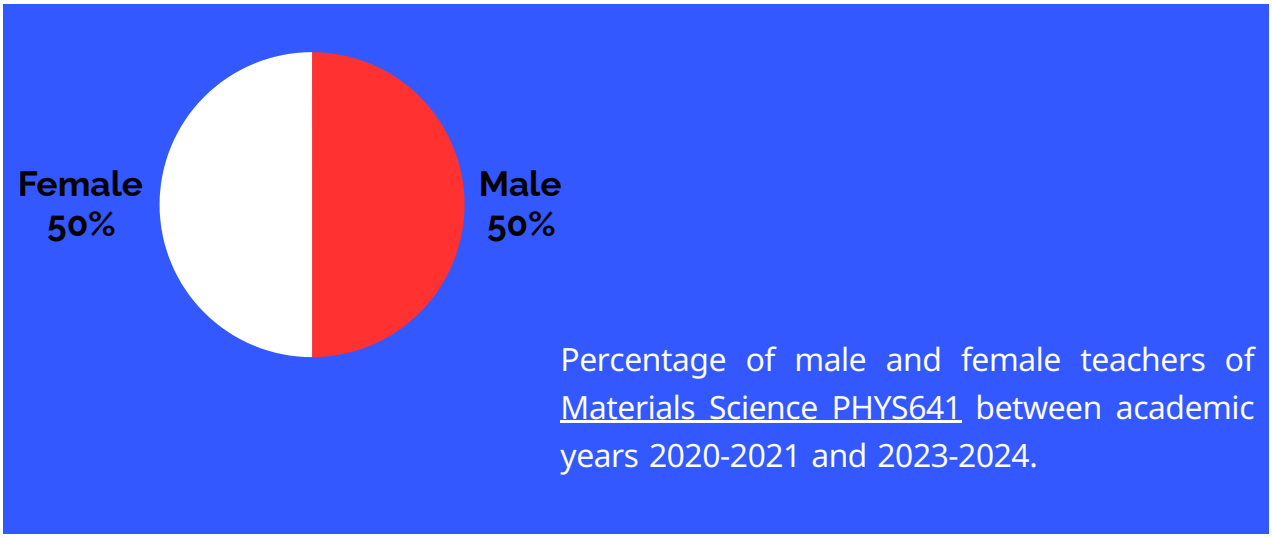

Figure 20: The learning activities hours of Materials Science PHYS641 for two batches and their average from the academic year 2020-2021 to the academic year 2023-2024.




% of average expected self-study hours for Materials Science PHYS641 between academic years 2020-2021 and 2023-2024.




% of average self-study hours for learning activities in the Materials Science PHYS641 between academic years 2020-2021 and 2023-2024.




Percentage of male and female teachers of Materials Science PHYS641 between academic years 2020-2021 and 2023-2024.

Figure 21: The average percentage of expected self-learning hours, average percentage for learning activities hours and percentage of teachers for Materials Science PHYS641 between academic years 2020-2021 and 2023-2024.

- From Figure 20, it is clear from Figure 19 that The change in self learning activities hours between the two batches is small and close to the average values of self learning activities hours over the two batches between 2022-2023 and 2023-2024. It is clear from Figure 21 that the highest average percentage of self study activity hours is for classes preparation activities (64%), followed by exam study (24%) and homework/assignments (14%). The average percentage of self-study hours for each learning activity was also plotted and it was found that the highest learning activity hours are for exam study and the lowest learning activity hours are for classes preparation. From Figure 21, it can be noted that the influence of teachers (whether male or female) on the ECTS calculations is only one ECTS, with the proportion of male and female teachers being 50% and 50% respectively.

**Table** 34: Contact hours, Expected Self-study hours, Workload hours and ECTS hours of Material Science PHYS641

| Contact Hours | Expected Self-study Hours | Total Workload Hours | ECTS Hours |
|---|---|---|---|
| **50** | **211** | **261** | 9 |

Finally, Table 34 shows that the contact hours, expected self-study hours, total workload hours and ECTS hours of solid state physics are 50 hours, 211 hours, 261 hours and 9 hours, respectively. The 50 contact hours are the product of fifteen weeks multiplied by 3 credit hours, plus 3 hours for the final exam and 2 hours for two midterm exams. The expected self-study hours is obtained using equation 6 (page 14). The 261 total workload hours is a sum of 50 contact hours and 211 expected self-study hours ( equation 3 at page 14). The 9 ECTS hours is calculated using equation 1 ( page 5). To conclude, the three credit hours of the material science PHYS641 are equivalent to 9 ECTS hours, which means that each credit hour is equivalent to 3 ECTS hours.

# Particle Physics
# PHYS661

# Statistical Analysis

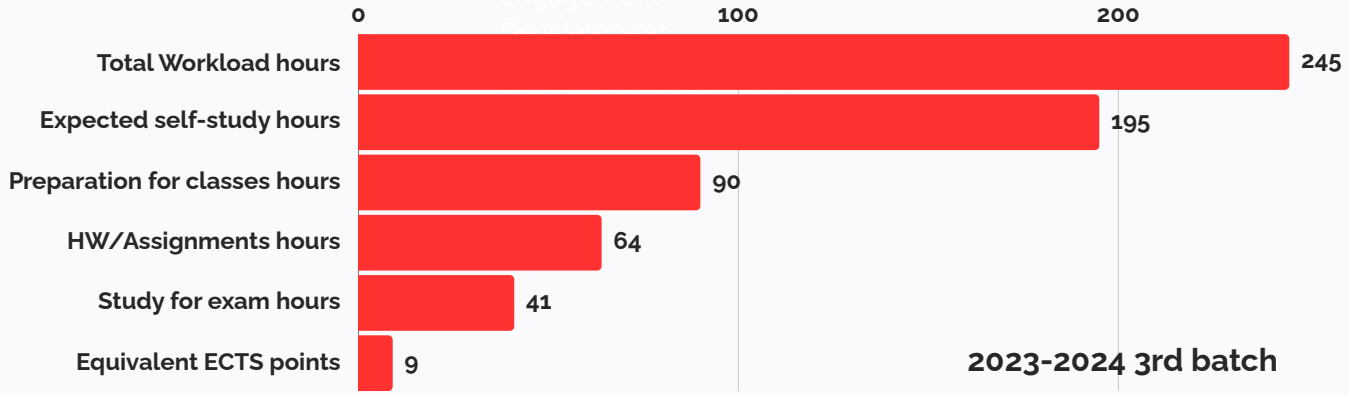
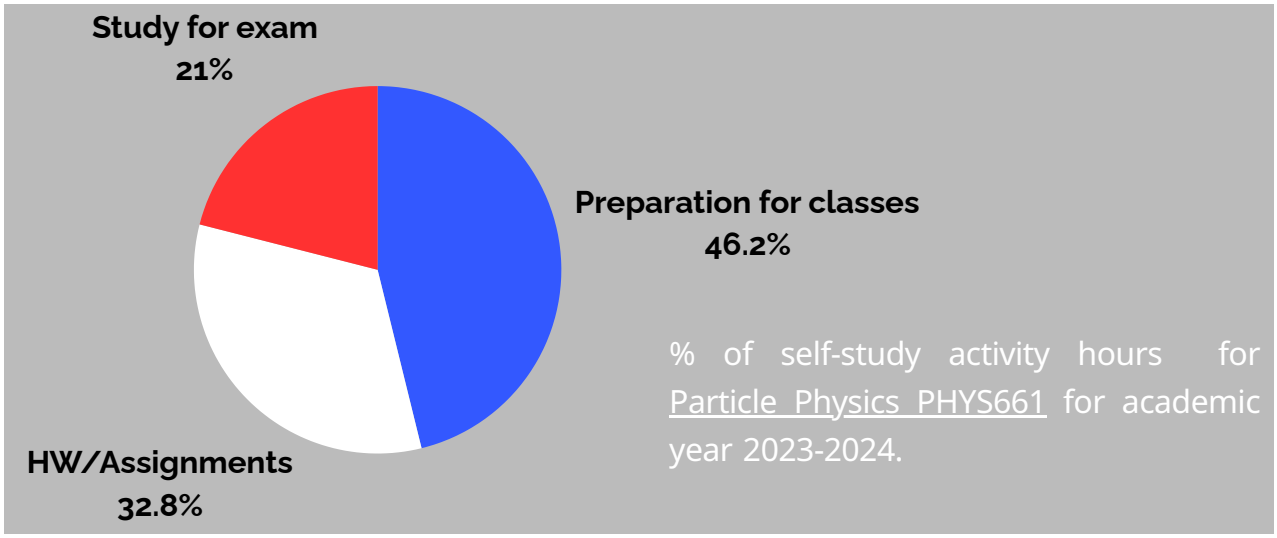
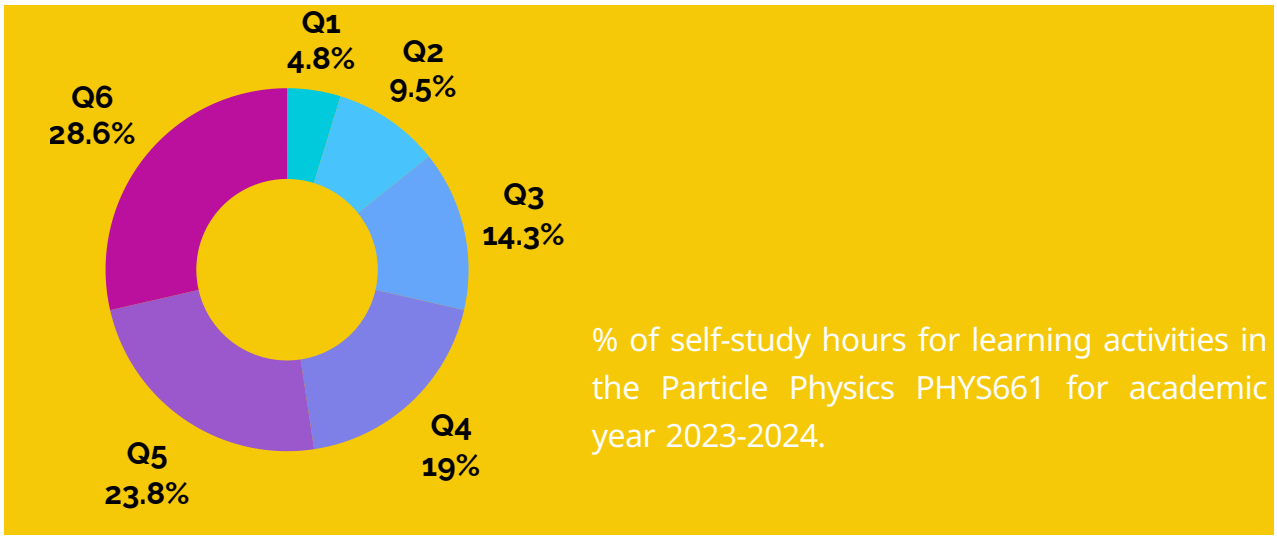



Figure 22: The learning activities hours of self study for Particle Physics PHYS661 for academic year 2023-2024.



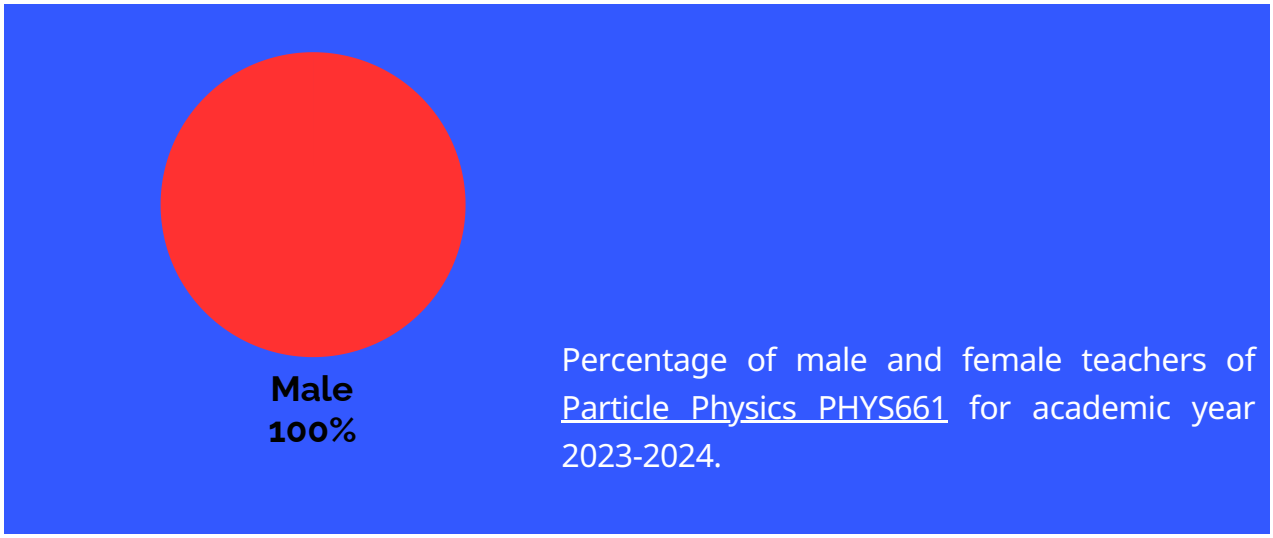




Figure 23 :The percentage of expected self-learning hours, percentage for self learning hours and percentage of teachers for Particle Physics PHYS661 for academic year 2023-2024.

- From Figure 22, it is clear that the highest average percentage of self study activity hours is for classes preparation activities (46%), followed by homework/assignments (32%) and exam study (21%). and The percentage of self-study hours for each learning activity was also plotted and it was found that the highest learning activity hours are for exam study and the lowest learning activity hours are for classes preparation. From Figure 23, it can be noted that the teachers who taught the course were 100% male, and therefore, the influence of male or female teachers on the ECTS analysis cannot be concluded.

**Table** 35: Contact hours, Expected Self-study hours, Workload hours and ECTS hours of Particle Physics PHYS661

| Contact Hours | Expected Self-study Hours | Total Workload Hours | ECTS Hours |
|---|---|---|---|
| **50** | **195** | **245** | 9 |

Finally, Table 35 shows that the contact hours, expected self-study hours, total workload hours and ECTS hours of solid state physics are 50 hours, 195 hours, 245 hours and 9 hours, respectively. The 50 contact hours are the product of fifteen weeks multiplied by 3 credit hours, plus 3 hours for the final exam and 2 hours for two midterm exams. The expected self-study hours is obtained using equation 6 (page 14). The 245 total workload hours is a sum of 50 contact hours and 195 expected self-study hours ( equation 3 at page 14). The 9 ECTS hours is calculated using equation 1 ( page 5). To conclude, the three credit hours of the Particle Physics PHYS661 are equivalent to 9 ECTS hours, which means that each credit hour is equivalent to 3 ECTS hours.

# Special Topics
# PHYS665

# Statistical Analysis

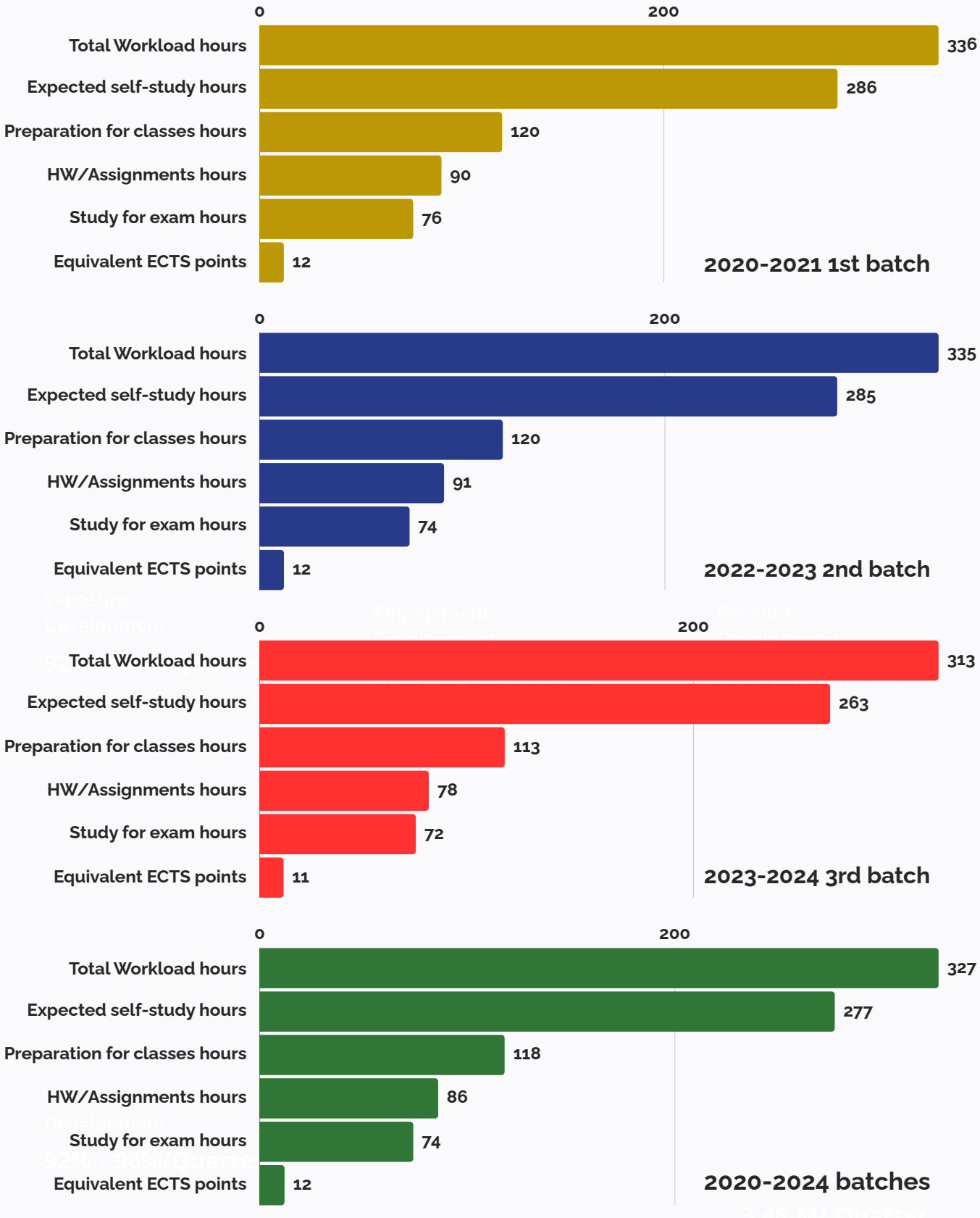
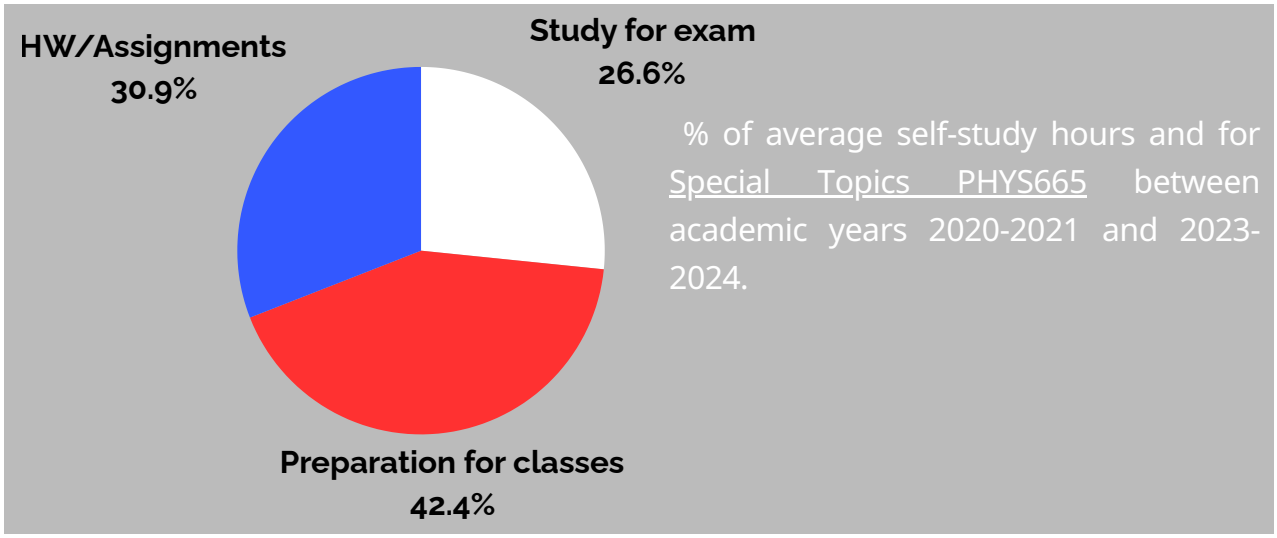
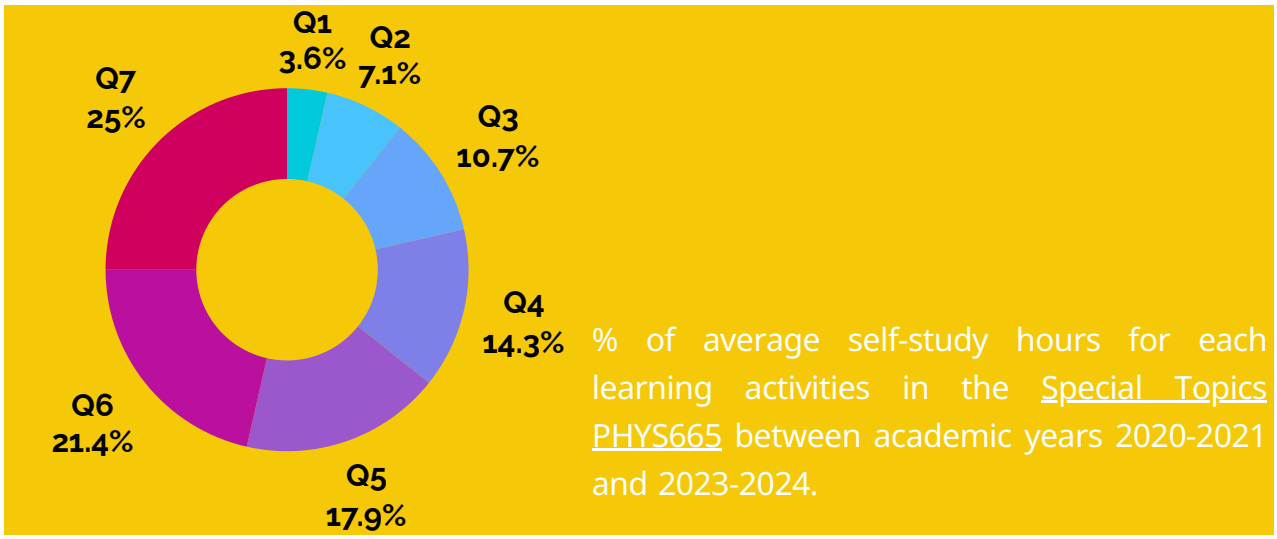


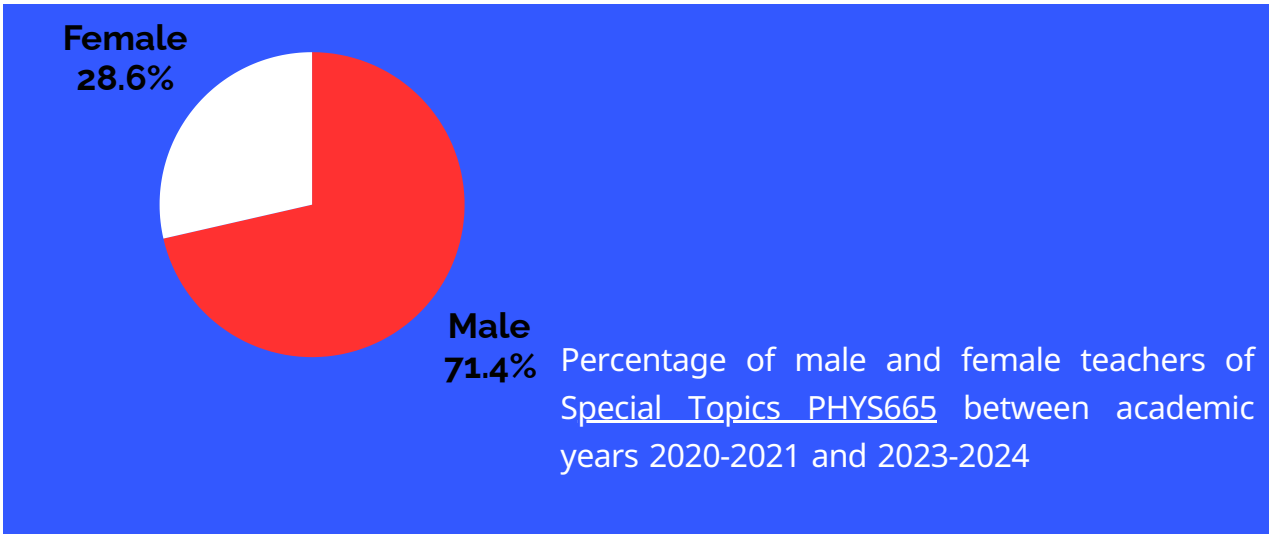

Figure 24 : The learning activities hours of Special Topics PHYS665 for the three batches and their average between academic years 2020-2021 and 2023-2024.




% of average self-study hours and for Special Topics PHYS665 between academic years 2020-2021 and 2023-2024.




% of average self-study hours for each learning activities in the Special Topics PHYS665 between academic years 2020-2021 and 2023-2024.




Percentage of male and female teachers of Special Topics PHYS665 between academic years 2020-2021 and 2023-2024

Figure 25: The average percentage of self- study hours, average percentage for learning activities hours and percentage of teachers for Special Topics PHYS665 between academic years 2020-2021 and 2023-2024.

- From Figure 24, the change in self learning hours between the three batches is negligible and close to the average values of self learning activities hours over the three batches from 2020-2021 to 2023-2024. It is clear from Figure 25 that the highest average percentage of self study activity hours is for classes preparation activities (42%), followed by homework/assignments (31%) and exam study (27%), The average percentage of self-study hours for each learning activity was also plotted and it was found that the highest learning activity hours are for exam study and the lowest learning activity hours are for classes preparation. From Figure 25, one can note that the ECTS calculations are not affected by teachers (whether male or female), although the ratio of male and female teachers is 71% and 29%, respectively

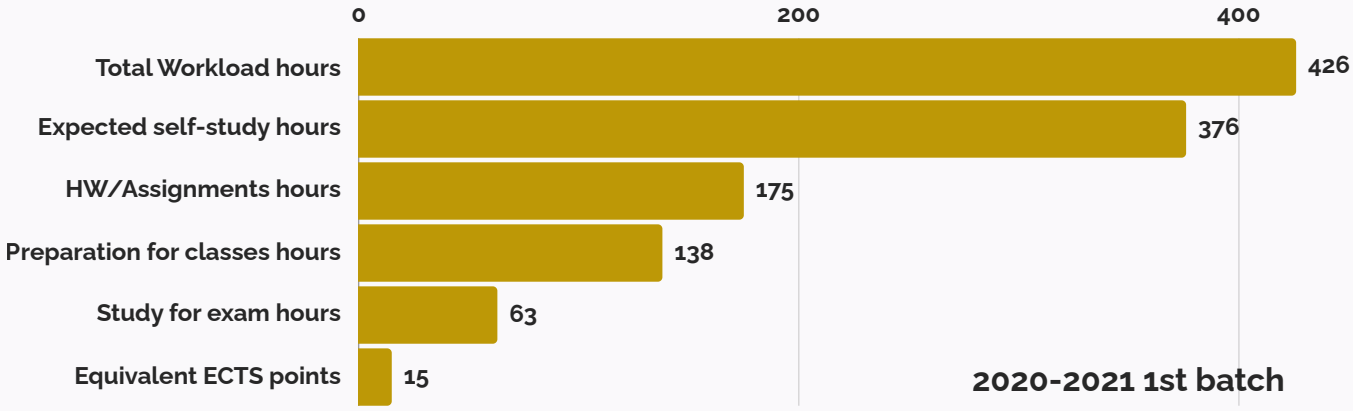
**Tabl**e 36: Contact hours, Expected Self-study hours, Workload hours and ECTS hours of Special Topics PHYS665

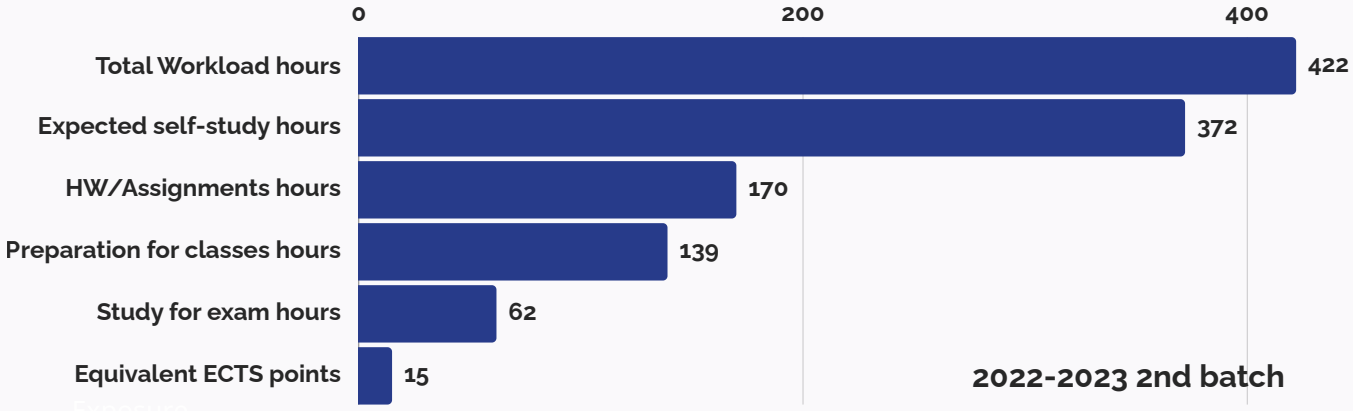
| Contact Hours | Expected Self-study Hours | Total Workload Hours | ECTS Hours |
|---|---|---|---|
| **50** | **277** | **327** | 12 |

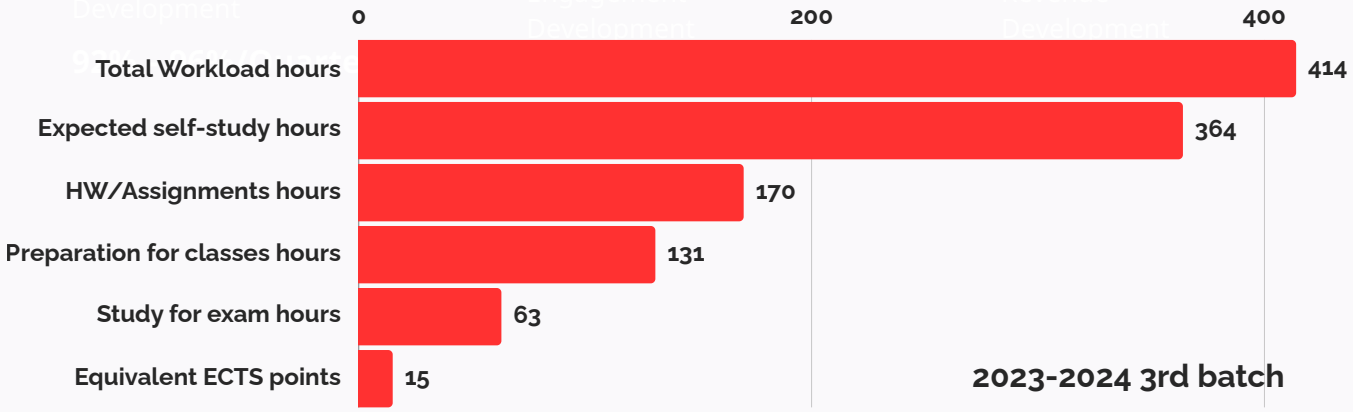
Finally, Table 36 shows that the contact hours, expected self-study hours, total workload hours and ECTS hours of solid state physics are 50 hours, 277 hours, 327 hours and 12 hours, respectively. The 50 contact hours are the product of fifteen weeks multiplied by 3 credit hours, plus 3 hours for the final exam and 2 hours for two midterm exams. The expected self-study hours is obtained using equation 6 (page 14). The 327 total workload hours is a sum of 50 contact hours and 277 expected self-study hours ( equation 3 at page 14). The 12 ECTS hours is calculated using equation 1 ( page 5). To conclude, the three credit hours of the Special Topics PHYS665 are equivalent to 12 ECTS hours, which means that each credit hour is equivalent to 4 ECTS hours.

# Research Seminar
# PHYS695

# Statistical Analysis



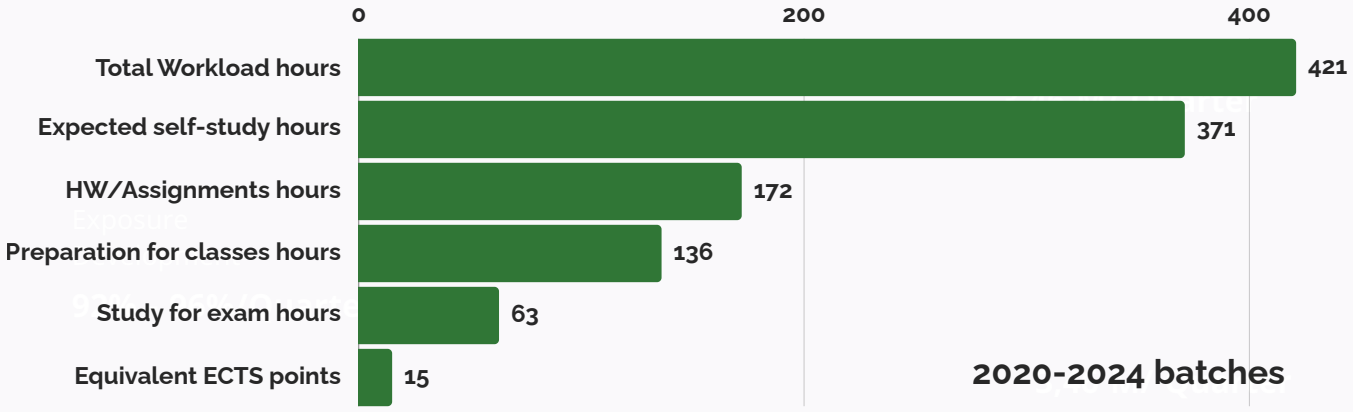
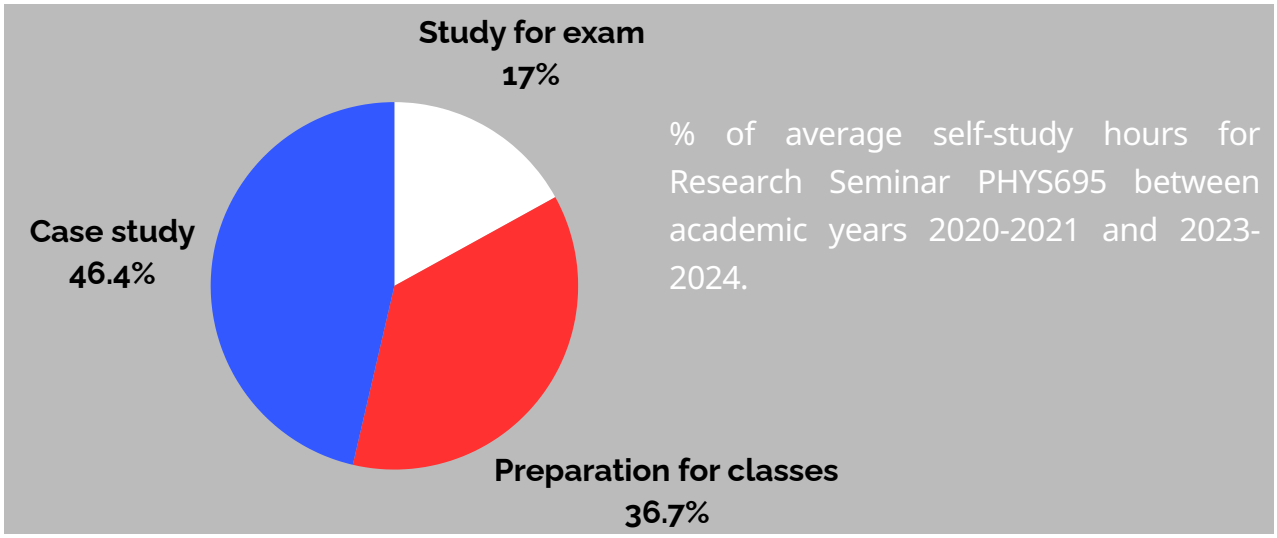
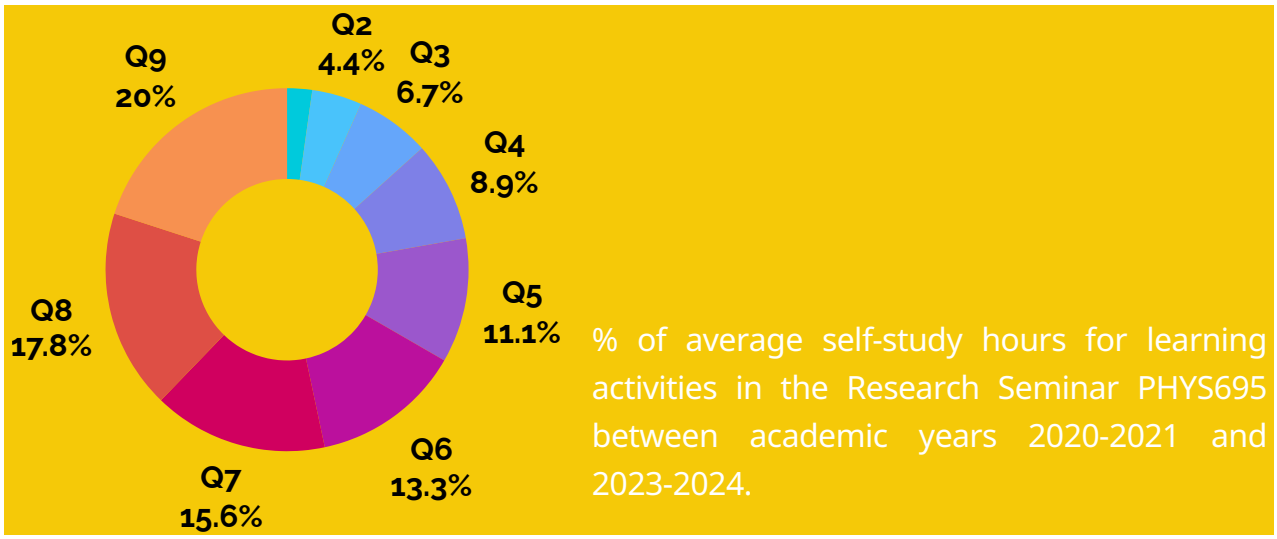



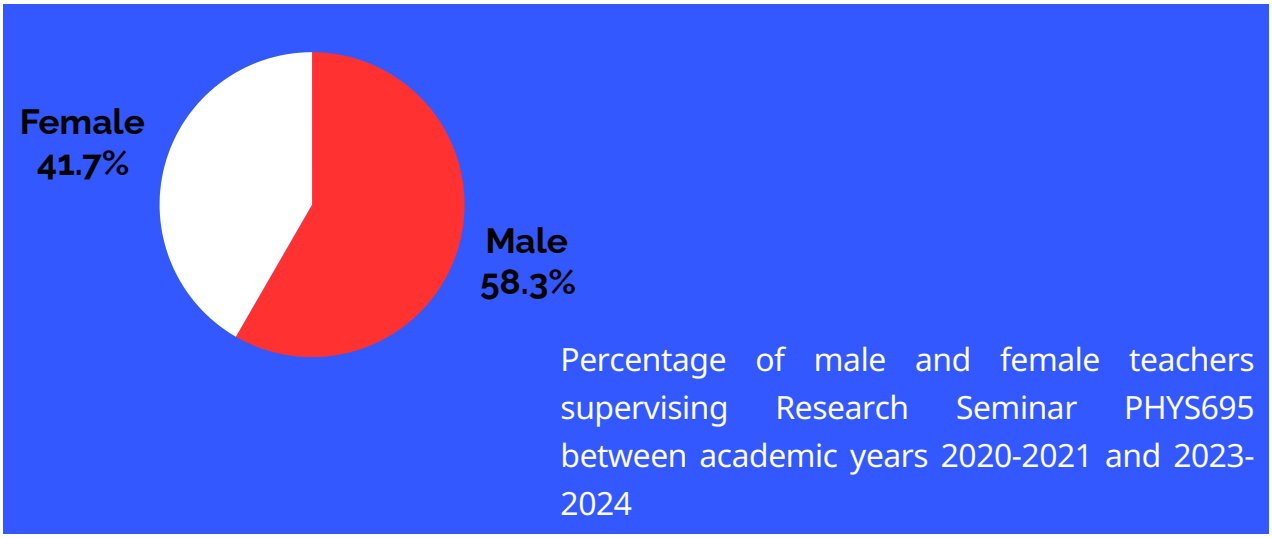

Figure 26: The learning activities hours of Research Seminar PHYS695for the three batches and their average between academic years 2020-2021 and 2023-2024.




% of average self-study hours for Research Seminar PHYS695 between academic years 2020-2021 and 2023-2024.




% of average self-study hours for learning activities in the Research Seminar PHYS695 between academic years 2020-2021 and 2023-2024.




Percentage of male and female teachers supervising Research Seminar PHYS695 between academic years 2020-2021 and 2023-2024

Figure 27 :The average percentage of self-learning activities hours, average percentage of self learning activities hours and percentage of teaches supervising Research Seminar PHYS695 between academic years 2020-2021 and 2023-2024.

- From Figure 26, the change in self learning activities hours between the three batches is small and close to the average values of self learning activities hours over the three batches from 2020-2021 to 2023-2024. It is clear from Figure 27 that the highest average percentage of self study activity hours is for case study activities (46%), followed by classes preparation (37%) and exam study (17%), The average percentage of self-study hours for each learning activity was also plotted and it was found that the highest learning activity hours are for exam study and the lowest learning activity hours are for classes preparation. From Figure 27, one can note that the ECTS calculations are not affected by supervision (whether male or female), as the ratio of male and female supervising teachers is 58% to 42%, i.e. almost equal.

**Tabl**e 37: Contact hours, Expected Self-study hours, Workload hours and ECTS hours of Research Seminar PHYS695.

| Contact Hours | Expected Self-study Hours | Total Workload Hours | ECTS Hours |
|---|---|---|---|
| 50 | 371 | 421 | 15 |

Finally, Table 37 shows that the contact hours, expected self-study hours, total workload hours and ECTS hours of solid state physics are 50 hours, 371 hours, 421 hours and 15 hours, respectively. The 50 contact hours are the product of fifteen weeks multiplied by 3 credit hours, plus 5 hours for final presentation exam. The expected self-study hours is obtained using equation 6 (page 14). The 421 total workload hours is a sum of 50 contact hours and 371 expected self-study hours ( equation 3 at page 14). The 15 ECTS hours is calculated using equation 1 ( page 5). To conclude, the three credit hours of the Research Seminar are equivalent to 15 ECTS hours, which means that each credit hour is equivalent to 5 ECTS hours.

# Thesis

# Statistical Analysis

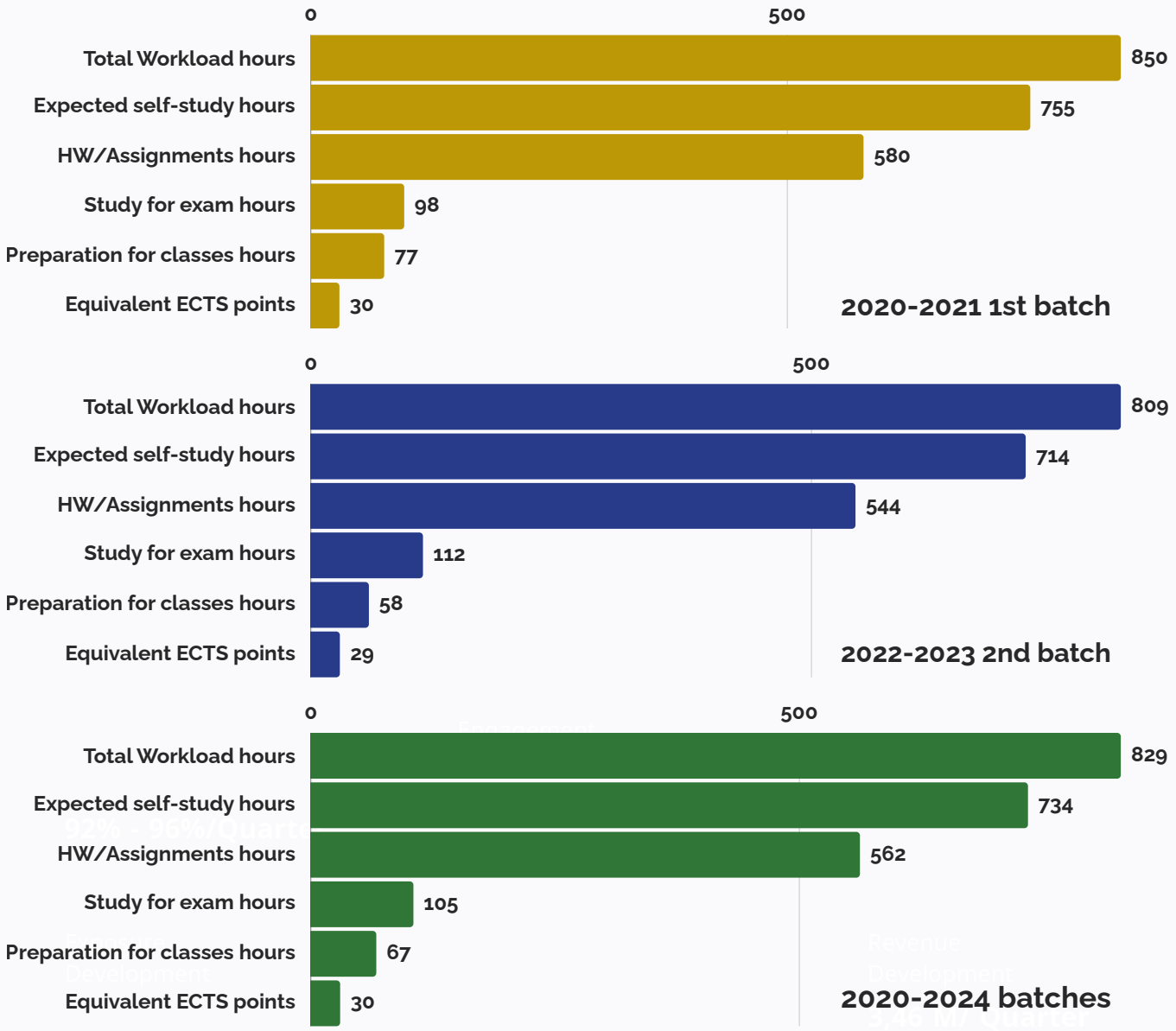
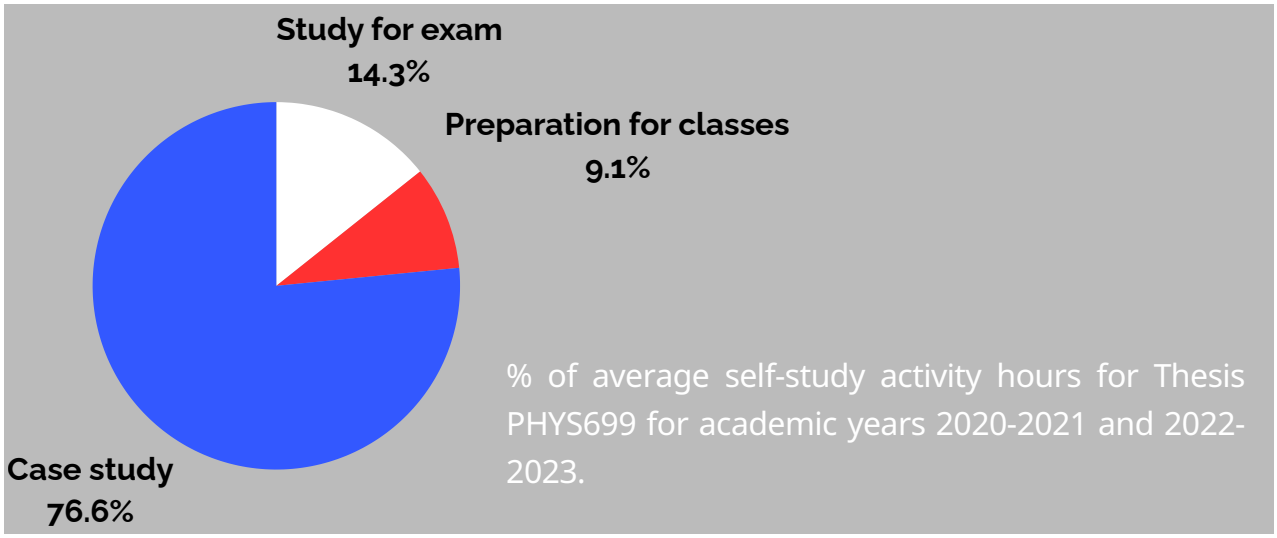
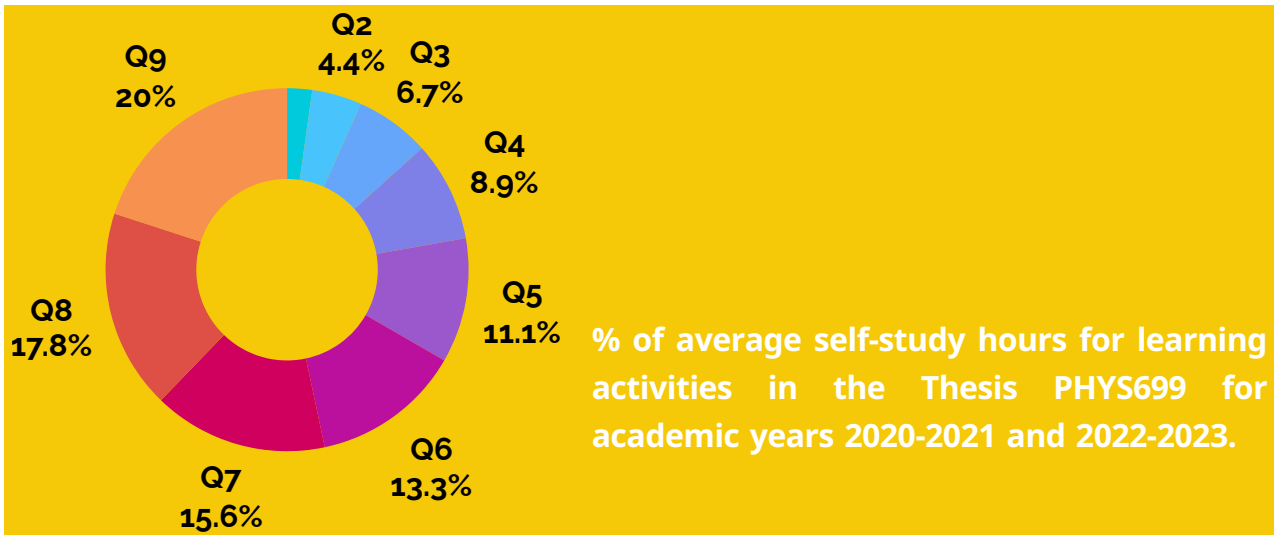



Figure 28 : The learning activities hours of Thesis PHYS699 for two batches and their average between academic years 2020-2021 and 2023-2024.



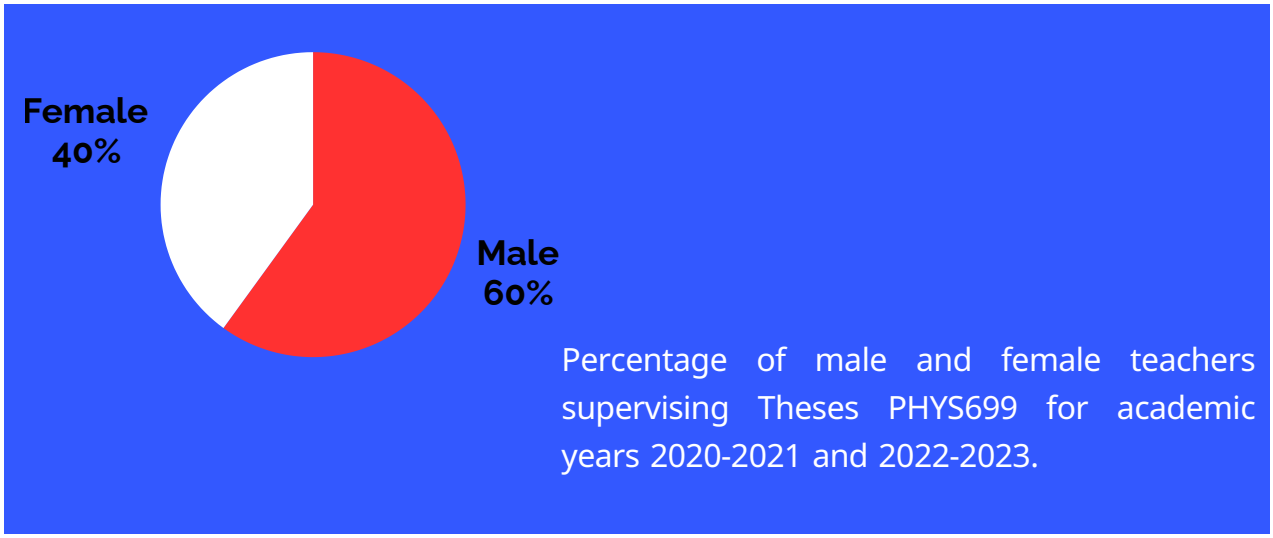




Figure 29: The average percentage of self-learning hours, average percentage of each learning activities hours and percentage of teaches supervising Thesis PHYS699 for academic years 2020-2021 and 2022-2023.

- From Figure 28, self study hours for the academic year 2020-2021 are larger than those for the academic year 2022 2023. However, the change between the two batches is small. The third batch 2023-2024 has just started its thesis and, therefore, is not included in the ECTS calculation. Therefore, the average hours of self-study learning activities are calculated for only two batches. It is clear from Figure 29 that the highest average percentage of self study activity hours is for case study activities (77%), followed by exam study (14%), and classes preparation (9%). The average percentage of self-study hours for each learning activity was also plotted and it was found that the highest learning activity hours are for exam study and the lowest learning activity hours are for classes preparation. From Figure 29, one can note that the ECTS calculations are not affected by supervision (whether male or female), as the ratio of male and female supervising teachers is 60% to 40%, i.e. almost equal.

**Table** 38: Contact hours, Expected Self-study hours, Workload hours and ECTS hours of Thesis PHYS699.

| | Contact Hours | Expected Self-study Hours | Total Workload Hours | ECTS Hours |
|---|---|---|---|---|
| | **95** | **734** | **829** | **30** |

Finally, Table 38 shows that the contact hours, expected self-study hours, total workload hours and ECTS hours of solid state physics are 95 hours, 734 hours, 829 hours and 30 hours, respectively. The 95 contact hours are the product of fifteen weeks multiplied by 6 credit hours, plus 5 hours for final presentation exam. The expected self-study hours is obtained using equation 6 (page 14). The 829 total workload hours is a sum of 95 contact hours and 734 expected self-study hours ( equation 3 at page 14). The 30 ECTS hours is calculated using equation 1 ( page 5). To conclude, the three credit hours of the Thesis are equivalent to 30 ECTS hours, which means that each credit hour is equivalent to 5 ECTS hours.

# 2.
# COURSES ASSESSED BY TEACHERS

# Statistical Analysis

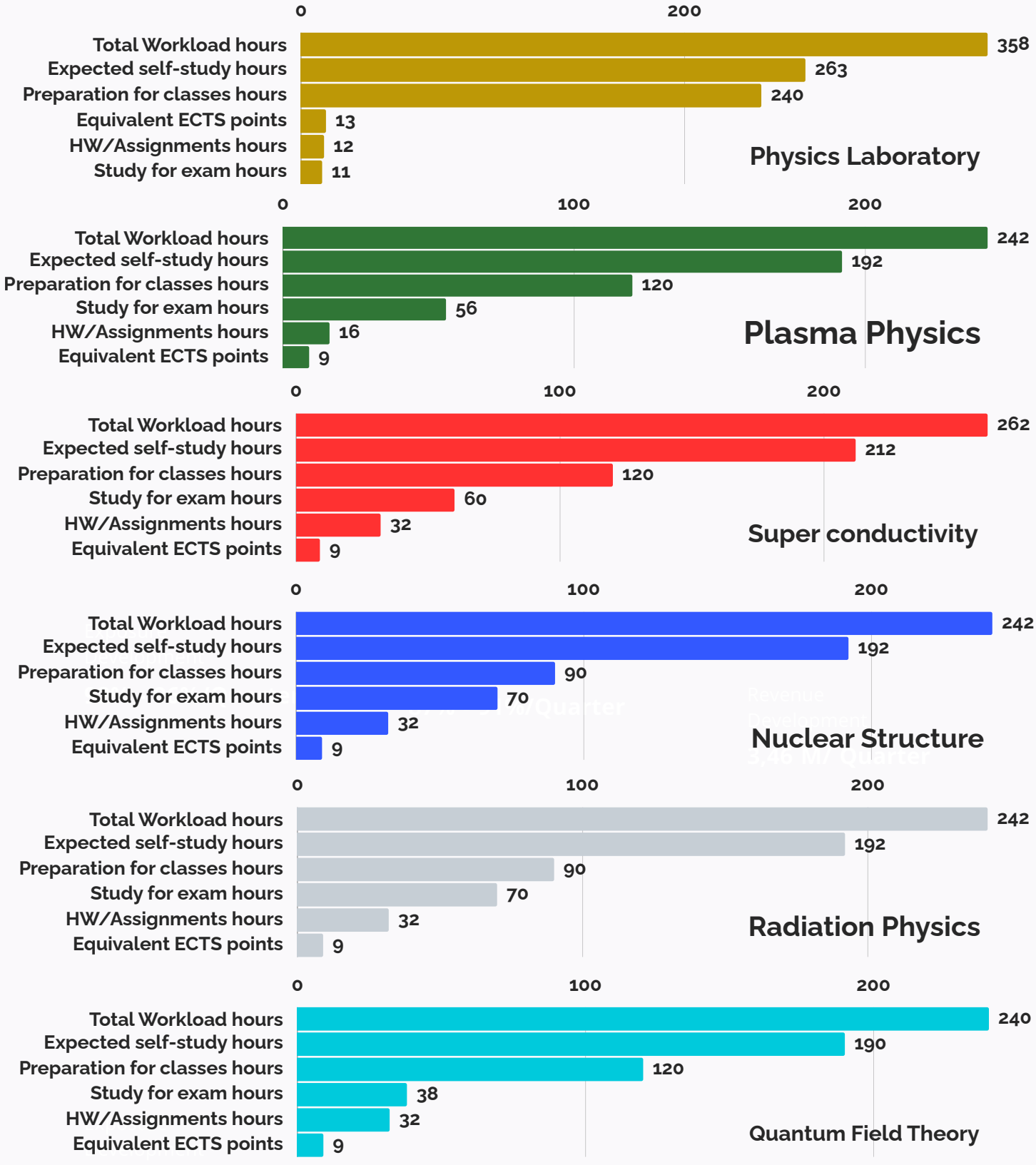



Figure 30: The learning activities hours of Physics Laboratory PHYS611, Plasma Physics PHYS622, Magnetism and Super conductivity PHYS642, Nuclear Structure and Spectroscopy PHYS650,Radiation Physics PHYS651 and Quantum Field Theory PHYS660.

**Table** 39: Contact hours, Expected Self-study hours, Workload hours and ECTS hours for Physics Laboratory PHYS611, Plasma Physics PHYS622, Magnetism and Super conductivity PHYS642, Nuclear Structure and Spectroscopy PHYS650,Radiation Physics PHYS651 and Quantum Field Theory PHYS660.

| Courses | Contact Hours | Expected Self-study Hours | Total Workload Hours | ECTS Hours |
|---|---|---|---|---|
| **Physics Laboratory PHYS611** | **95** | **263** | **358** | **13** |
| **Plasma Physics PHYS622** | **50** | **192** | **242** | **9** |
| **Magnetism and Superconductivity PHYS642** | **50** | **212** | **262** | **9** |
| **Nuclear Structure and Spectroscopy PHYS650** | **50** | **192** | **242** | **9** |
| **Radiation Physics PHYS651** | **50** | **192** | **242** | **9** |
| **Quantum Field Theory PHYS660** | **50** | **190** | **240** | **9** |

Table 39 and Figure 30 show the contact hours, expected self-study hours, total workload hours and ECTS hours for Physics Laboratory PHYS611, Plasma Physics PHYS622, Magnetism and Super conductivity PHYS642, Nuclear Structure and Spectroscopy PHYS650, Radiation Physics PHYS651 and Quantum Field Theory PHYS660. The 50 contact hours are the product of fifteen weeks multiplied by 3 credit hours, plus 5 hours for final exam and midterm exams while the 95 contact hours are the product of fifteen weeks multiplied by 6 credit hours, plus 5 hours for final exam and a presentation. The expected self-study hours is obtained using equation 6 (page 14) and and the ECTS hours is calculated using equation 1 ( page 5). To conclude, the three credit hours of the Physics PHYS622, Magnetism and Super conductivity PHYS642, Nuclear Structure and Spectroscopy PHYS650, Radiation Physics PHYS651 and Quantum Field Theory PHYS660 are equivalent to 9 ECTS hours, which means that each credit hour is equivalent to 3 ECTS hours while three credit hours of the Physics Laboratory PHYS611 is equivalent to 13 ECTS hours, which means that each credit hour is approximately equivalent to 4 ECTS hours.

# ECTS :

## CONCLUSION AND SUMMARY

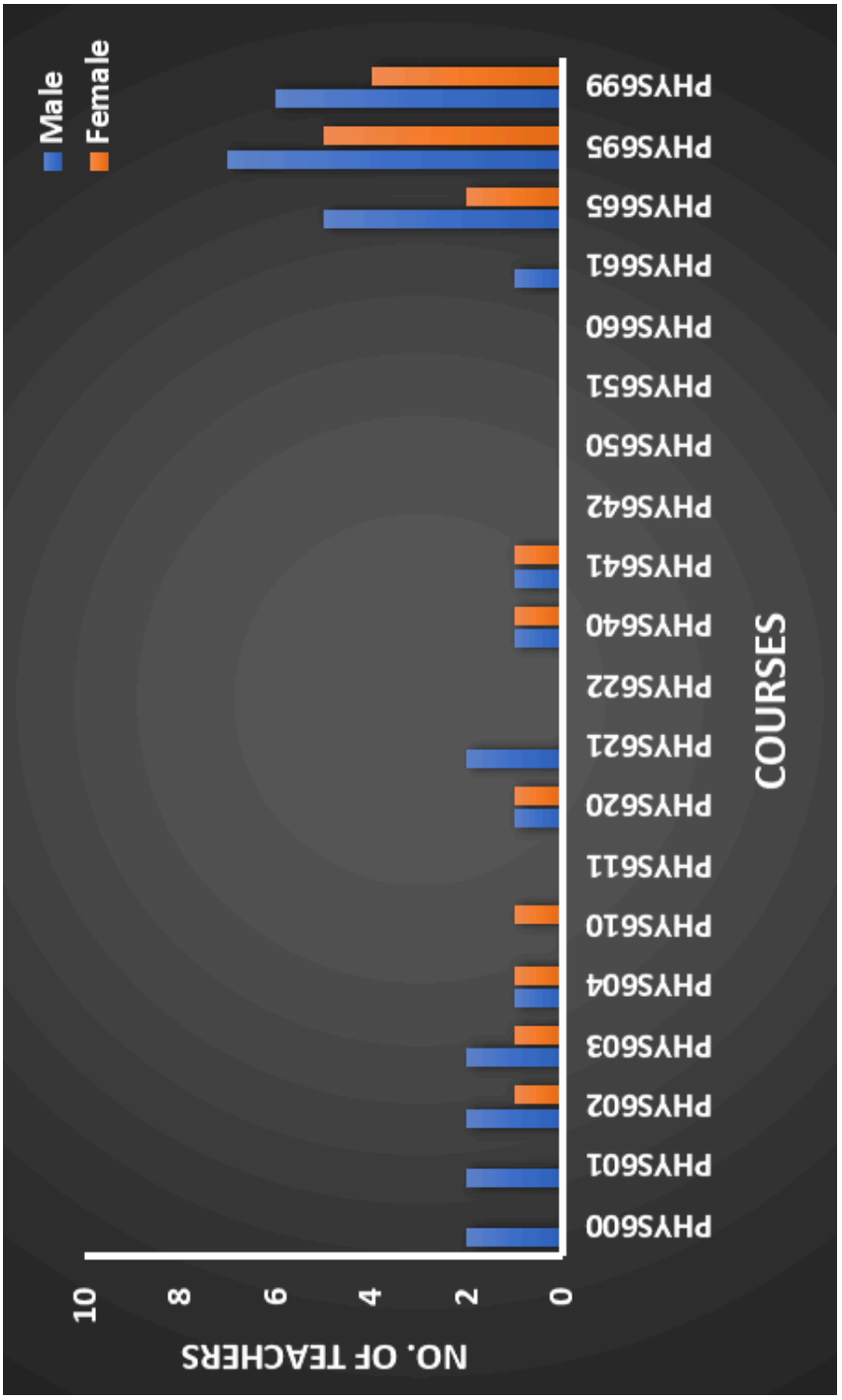



Figure 31: Number of male and female teachers in the Master of Science in Physics program.

Figure 31 shows the number of male and female teachers in the Master of Science in Physics program. It is noted that most of the courses are taught by male and female teachers, except for PHYS610 which is taught by a female teacher and PHYS600, PHYS601, PHYS621 and PHYS661 which are taught by male teachers. This indicates that the calculated ECTS points come from the participation of male or female teachers in teaching the Master of Science in Physics program.

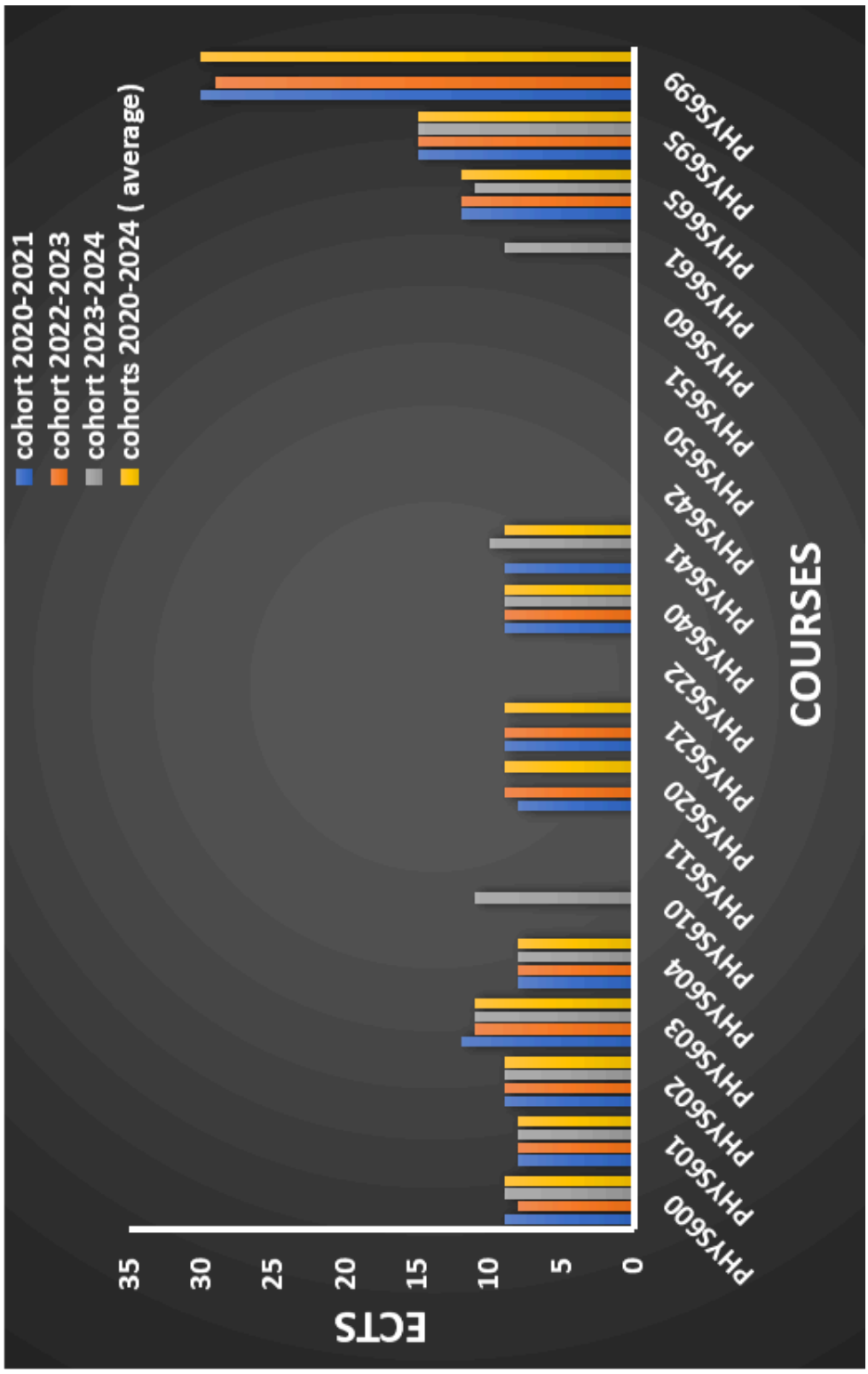
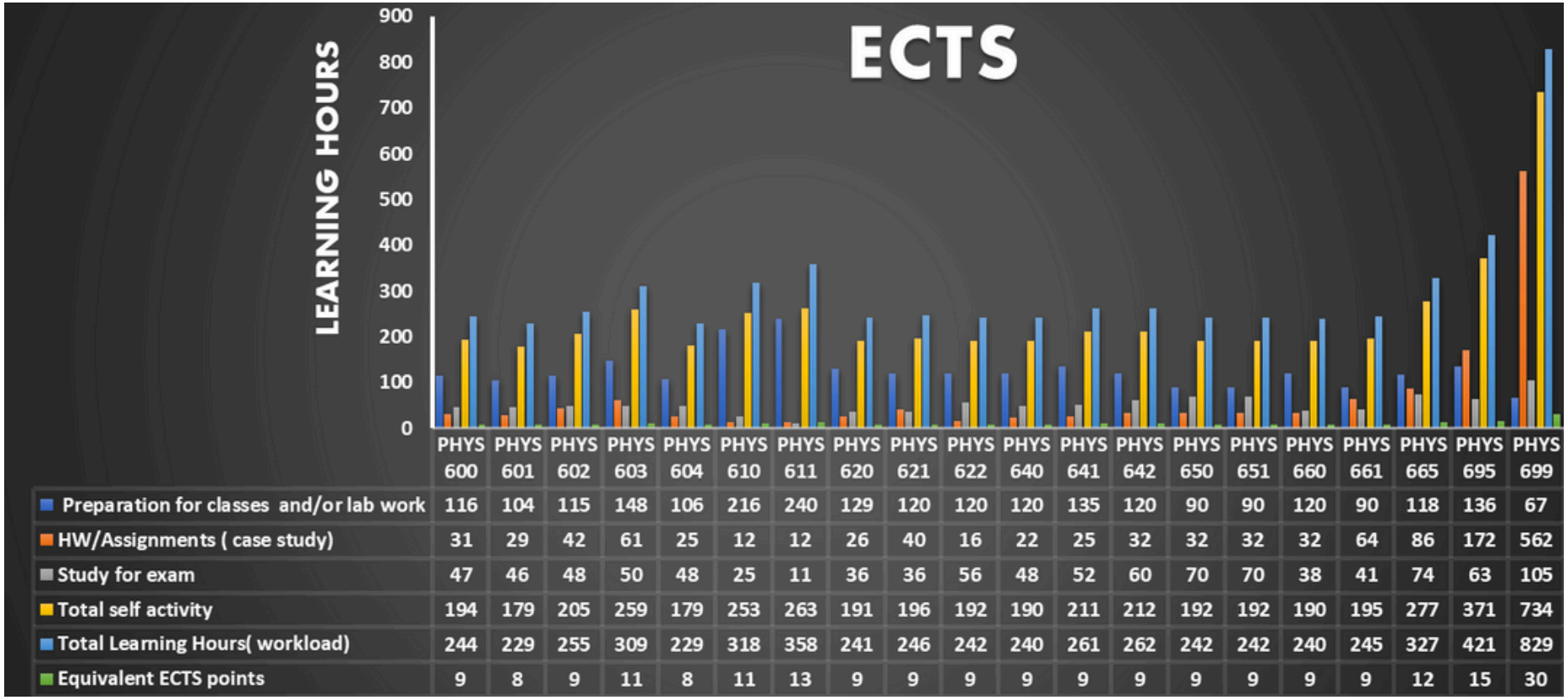



Figure 32: ECTS points obtained from student responses for three cohorts 2020-2021, 2022-2023, 2023-2024 and average over the three cohorts in the Master of Science in Physics program

Figure 32 shows the ECTS points obtained from the students' responses for the three cohorts 2020-2021, 2022-2023 and 2023-2024 and the average of the three cohorts in the Master of Science in Physics program. It is clear that the students' responses about the ECTS are mostly equal, which indicates that the workload provided to the three cohorts is nearly equal and confirms that the calculated ECTS points are correct and fair.




| | PHYS 600 | PHYS 601 | PHYS 602 | PHYS 603 | PHYS 604 | PHYS 610 | PHYS 611 | PHYS 620 | PHYS 621 | PHYS 622 | PHYS 640 | PHYS 641 | PHYS 642 | PHYS 650 | PHYS 651 | PHYS 660 | PHYS 661 | PHYS 665 | PHYS 695 | PHYS 699 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation for classes and/or lab work | 116 | 104 | 115 | 148 | 106 | 216 | 240 | 129 | 120 | 120 | 120 | 135 | 120 | 90 | 90 | 120 | 90 | 118 | 136 | 67 |
| HW/Assignments ( case study) | 31 | 29 | 42 | 61 | 25 | 12 | 12 | 26 | 40 | 16 | 22 | 25 | 32 | 32 | 32 | 32 | 64 | 86 | 172 | 562 |
| Study for exam | 47 | 46 | 48 | 50 | 48 | 25 | 11 | 36 | 36 | 56 | 48 | 52 | 60 | 70 | 70 | 38 | 41 | 74 | 63 | 105 |
| Total self activity | 194 | 179 | 205 | 259 | 179 | 253 | 263 | 191 | 196 | 192 | 190 | 211 | 212 | 192 | 192 | 190 | 195 | 277 | 371 | 734 |
| Total Learning Hours( workload) | 244 | 229 | 255 | 309 | 229 | 318 | 358 | 241 | 246 | 242 | 240 | 261 | 262 | 242 | 242 | 240 | 245 | 327 | 421 | 829 |
| Equivalent ECTS points | 9 | 8 | 9 | 11 | 8 | 11 | 13 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 12 | 15 | 30 |

Figure 33 : The learning activities hours of preparations of classes( and/or work lab), HW/assignments, total self study and total learning hours( workload), ECTS for all compulsory and elective courses for Master of Science in Physics program.

Figure 33 shows the learning activities hours of preparations of classes and/or work lab, HW/assignments, total self study and total learning hours ( total workload), ECTS for all compulsory and elective courses for Master of Science in Physics program. It is clear that most of compulsory and elective courses have 9 ECTs hours except for Thesis, Research seminar, Special topics, Physics laboratory, Computational physics and Quantum mechanics.

Finally, one can summarize the following:-

- The highest workload hours are for Thesis PHYS699 ( 829 hours) , followed by Research Seminar PHYSPHYS695 (421 hours), then the physics laboratory (358 hours), special course PHYS665 (327 hours) and the computational physics (318 hours). It can also be noted that the workload is higher for most of compulsory courses than the elective courses. The highest workload for the compulsory courses ( other than the Research Seminar course) is for Quantum mechanics PHYS603 ( 309 hours) followed by Classical Electrodynamics PHYS602 ( 255 hours). While, for the elective courses, the highest workload is for Magnetism and superconductivity (262 hours).

- The highest ECTS hours are for Thesis PHYS699 (30 hours), Research Seminar PHYS695(15 hours),Physics laboratory PHYS611 (13hours), Special Topics PHYS665 (12 hours), Computational Physics PHYS610 (11 hours) and Quantum Mechanics PHYS603 ( 11 hours). The remains ECTS is mostly equal ( 9 hours).

- The highest preparation of classes hours and/or work lab are for Physics laboratory PHYS611 (240 hours), Computational Physics PHYS610 (216 hours) and Quantum mechanics PHYS603 (148 hours).

- The Highest HW/Assignments or case study are for Thesis PHYS699 (562 hours), Research Seminar PHYS695 (172 hours), Particle Physics PHYS661 (64 hours) and Quantum Mechanics PHYS603 (61 hours).

- The highest study of exam hours are for Thesis PHYS699 (105 hours), Nuclear Structure and Spectroscopy PHYS650 (70 hours), Radiation Physics PHYS651 (70 hours), Research Seminar PHYS695 (63 hours) and Magnetism and superconductivity PHYS642 ( 60 hours).

# Benchmark

## Alignment of ECTS hours of MSc in Physics in Jazan University and LUM University

## Physics (Master of Science, M.Sc.)

Study plan for start of studies from winter semester 2023/24 onwards

| | 1st Semester | 2nd Semester | 3rd Semester | 4th Semester |
|---|---|---|---|---|
| **Experimental Physics** | EM1<br>**Advanced Solid State Physics**<br>9 ECTS / graded<br>(winter semester only) | EM2<br>**Advanced Particle Physics**<br>9 ECTS / graded<br>(summer semester only | | |
| | **or** | | | |
| **Theoretical Physics** | TM2<br>**Advanced Quantum Mechanics**<br>9 ECTS / graded<br>(winter semester only) | TM1<br>**Advanced Statistical Physics**<br>9 ECTS / graded<br>(summer semester only) | | |
| | **or** | | | |
| **Specialization** | **Elective courses**<br>36 ECTS / graded | | **Research Project in Physics**<br>Phase I<br>15 ECTS / not graded | **Master's Thesis**<br>30 ECTS / graded |
| | **Physics Seminar**<br>3 ECTS / graded | | **Research Project in Physics**<br>Phase II<br>15 ECTS / not graded | |
| **Key Qualifications** | **Key Qualifications**<br>3 ECTS / not graded | | | |

Figure 34 : The study plan of master of Science in Physics in LMU university.

**Table 40: Benchmarking; Alignment of program modules credits allocation with MSc in physics program at LUM university**

| Courses/ Modules | **Jazan university** | **LUM university** |
|---|---|---|
| **Particle Physics** | **9** | 9 |
| **Solid State Physics** | 9 | 9 |
| **Statistical Physics** | **8** | **9** |
| **Lab course** | **13** | **12** |
| **Research project** | **15** | **15** |
| **Master's Thesis** | **30** | **30** |

Table 40 shows the good alignment of the modules credits allocations between the MSc in Physics program at Jazan and LUM universities. The MSc in Physics credit allocation accurately reflect the effort required by students, contributing to better educational outcomes and student satisfaction.

# Appendices

1- Student questionnaires about the actual study time for each course.
2- Meeting report from the Quality and Accreditation Committee coordinator with students to approve the calculated working hours.
3- Announcement of the student working hours report to faculty members and program leaders, and receiving their feedback.

# استبانة زمن المذاكرة

زمن المذاكرة لمقررالفيزياء الرياضية mathematical physics PHYS600

* تشير إلى أنّ السؤال مطلوب

اسم برنامج القسم:- ماجستير العلوم فى الفيزياء **Master of Science in Physics**

---

Student feedback is important for improving the quality of learning experiences in higher education institutions. This questionnaire is designed to collect students' opinions about the actual study time for each course in the Master of Physics program.

**تعتبر التغذية الراجعة من الطلبة مهمة لتحسين جودة الخبرات التعليمية في مؤسسات التعليم العالي. وهذه الاستبانة مصممة لجمع آراء الطلبة حول زمن المذاكرة الفعلى لكل مقرر من مقررات برنامج الماجستير فى الفيزياء .**

*يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة*

**Required Courses المقررات الاجبارية**

1. Year of Starting the Program*

   _____

2. Professor's name*
   اسم الاستاذ

   _____

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments

Frequency of assessment: 4 HW

5. 3- How much time do you allot to solve your homework/report?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t >10 hours

Part 3: Study for exam

Frequency of assessment: 1 final; 2 midterms

6. 4- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبار الفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

7. 5- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

Google نماذج

# استبانة زمن المذاكرة

زمن المذاكرة لمقررالميكانيكا الكلاسيكية Classical Mechanics PHYS601

* تشير إلى أنّ السؤال مطلوب

اسم برنامج القسم:- ماجستير العلوم فى الفيزياء **Master of Science in Physics**

Student feedback is important for improving the quality of learning experiences in higher education institutions. This questionnaire is designed to collect students' opinions about the actual study time for each course in the Master of Physics program.

**تعتبر التغذية الراجعة من الطلبة مهمة لتحسين جودة الخبرات التعليمية في مؤسسات التعليم العالي. وهذه الاستبانة مصممة لجمع آراء الطلبة حول زمن المذاكرة الفعلى لكل مقرر من مقررات برنامج الماجستير فى الفيزياء .**

*يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة*

**Required Courses المقررات الاجبارية**

1. Year of Starting the Program*

2. Professor's name*
   اسم الاستاذ

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments
Frequency of assessment: 4 HW

5. 3- How much time do you allot to solve your homework/report?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t >10 hours

Part 3: Study for exam

Frequency of assessment: 1 final; 2 midterms

6. 4- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبار الفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

7. 5- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

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# استبانة زمن المذاكرة

زمن المذاكرة لمقررالديناميكا الكلاسيكية Classical Electrodynamics PHYS602

* تشير إلى أنّ السؤال مطلوب

اسم برنامج القسم:- ماجستير العلوم فى الفيزياء **Master of Science in Physics**

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*يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة*

**Required Courses المقررات الاجبارية**

1. Year of Starting the Program*

2. Professor's name*
اسم الاستاذ

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments

Frequency of assessment: 6 HW

5. 3- How much time do you allot to solve your homework/report?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t >10 hours

Part 3: Study for exam

Frequency of assessment: 1 final; 2 midterms

6. 4- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبار الفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

7. 5- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

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# استبانة زمن المذاكرة

**زمن المذاكرة لمقرر** ميكانيكا الكم Quantum Mechanics 603PHYS

* تشير إلى أنّ السؤال مطلوب

**اسم برنامج القسم:- ماجستير العلوم فى الفيزياء** **Master of Science in Physics**

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***يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة***

**Required Courses المقررات الاجبارية**

1. Year of Starting the Program*

2. Professor's name*
اسم الاستاذ

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments
Frequency of assessment: 5 HW and report

5. 3- How much time do you allot to solve your homework/report?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t >10 hours

6. 4 -How much time do you allocate weekly to prepare the report/presentation? Note that this time will be multiplied by the number of weeks allowed to complete it (6 weeks). *

ما هو الوقت الذي تخصصه أسبوعيا لإعداد التقرير/العرض التقديمي؟ لاحظ أن هذا الوقت سيتم ضربه في عدد الأسابيع المسموح بها لإنهائها (4 أسابيع).

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t >10 hours

Part 3: Study for exam

Frequency of assessment: 1 final; 2 midterms

7. 5- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبار الفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

8. 6- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

نماذج Google

# استبانة زمن المذاكرة

**زمن المذاكرة** Statistical Mechanics 604 PHYS مقرر الميكانيكا الاحصائية

* تشير إلى أنّ السؤال مطلوب

**اسم برنامج القسم:- ماجستير العلوم فى الفيزياء** **Master of Science in Physics**

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***يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة***

**Required Courses المقررات الاجبارية**

1. Year of Starting the Program*

2. Professor's name*
اسم الاستاذ

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments

Frequency of assessment: 4 HW

(two lectures per week) Frequency of assessment: 30 lectures

5. 3- How much time do you allot to solve your homework/report?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t >10 hours

Part 3: Study for exam

Frequency of assessment: 1 final; 2 midterms

6. 4- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبار الفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

7. 5- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

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# Study Time Survey استبانة زمن المذاكرة

Computational Physics 610 PHYS لمقرر الفيزياء الحاسوبية

* تشير إلى أنّ السؤال مطلوب

**Master of Science in Physics program اسم برنامج القسم:- ماجستير العلوم فى الفيزياء**

_____

Student feedback is important for improving the quality of learning experiences in higher education institutions. This questionnaire is designed to collect students' opinions about the actual study time for each course in the Master of Physics program.

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***يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة***

**Elective Courses المقررات الاختيارية**

1. Year of Starting the Program*

_____

2. Professor's name*
اسم الاستاذ

_____

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments

Frequency of assessment: 2 HW

5. 3- How much time do you allot to solve your homework?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

Part 3: lab work
Frequency of assessment:  12 labs and 1 final lab

6. 4- How much time do you allot to prepare for a new experiment?*

كم الوقت الذي تخصصه للتحضير لتجربة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

7. 5- How much time do you allot to analyze your experimental results and write your report? *

كم الوقت الذي تخصصه لتحليل نتائج التجربة و كتابة التقرير؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

8. 6- How much time do you allot to prepare for the practical final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار العملي النهائي؟؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

Part 4: Study for exam
Numbers:  1 final and 1 midterm

9. 7- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبار الفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

10. 8- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

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# Study Time Survey استبانة زمن المذاكرة

زمن المذاكرة

لمقرر 611Phys_Physics Laboratory فيزياء المعامل

* تشير إلى أنّ السؤال مطلوب

**اسم برنامج القسم:- ماجستير فى الفيزياء** **Master of Science in Physics program**

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***يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة***

Year of Starting the Program

Professor's name
اسم الاستاذ

Part 1: lab work
(two labs per week) Frequency of assessment: 30 labs

1. 1- How much time do you allot to prepare for a new experiment?*

كم الوقت الذي تخصصه للتحضير لتجربة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

2. 2- How much time do you allot to revise a given experimental results and/or your experimental notes? *

كم الوقت الذي تخصصه لمراجعة نتائج التجربة و/أو ملاحظاتك التي دونتها خلال التجربة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

3. 3- How much time do you allot to analyze your experimental results ?*

كم الوقت الذي تخصصه لتحليل نتائج التجربة ؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 4- How much time do you allot to write your lab report?*

كم الوقت الذي تخصصه لكتابة تقرير المعمل؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments

Frequency of assessment: 1 presentation

5. 5- How much time do you allot to prepare a short presentation?*

كم الوقت الذي تخصصه لاعداد عرض قصير؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

Part 3: lab exam

Frequency of assessment: 1 final lab

6. 6- How much time do you allot to prepare for the practical final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار العملي النهائي؟؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

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# استبانة زمن المذاكرة

**زمن المذاكرة لمقرر** Atomic and molecular physics PHYS620

* تشير إلى أنّ السؤال مطلوب

**اسم برنامج القسم:- ماجستير العلوم فى الفيزياء** **Master of Science in Physics**

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***يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة***

**Elective Courses المقررات الاختيارية**

1. Year of Starting the Program*

2. Professor's name*
   اسم الاستاذ

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments

Frequency of assessment: 4 HW

5. 3- How much time do you allot to solve your homework/report?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t >10 hours

Part 3: Study for exam

Frequency of assessment : 1 final; 2 midterms

6. 4- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبار الفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

7. 5- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

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# استبانة زمن المذاكرة

**زمن المذاكرة لمقرر** Quantum Optics PHYS621 مقررالفيزياء البصريات الكمية

* تشير إلى أنّ السؤال مطلوب

**اسم برنامج القسم:- ماجستير العلوم فى الفيزياء** **Master of Science in Physics**

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**تعتبر التغذية الراجعة من الطلبة مهمة لتحسين جودة الخبرات التعليمية في مؤسسات التعليم العالي. وهذه الاستبانة مصممة لجمع آراء الطلبة حول زمن المذاكرة الفعلى لكل مقرر من مقررات برنامج الماجستير فى الفيزياء .**

***يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة***

**المقررات الاختيارية Elective Courses**

1. Year of Starting the Program*

2. Professor's name*
اسم الاستاذ

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments

Frequency of assessment: 4 HW

5. 3- How much time do you allot to solve your homework/report?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t >10 hours

Part 3: Study for exam

Frequency of assessment: 1 final; 2 midterms

6. 4- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبار الفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

7. 5- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

Google نماذج

# Study Time Survey استبانة زمن المذاكرة

زمن المذاكرة Plasma Physics PHYS622 مقررفيزياء البلازما

* تشير إلى أنّ السؤال مطلوب

**اسم برنامج القسم:- ماجستير العلوم فى الفيزياء** **Master of Science in Physics program**

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***يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة***

1. Year of Starting the Program*

_____

2. Professor's name*
اسم الاستاذ

_____

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments

Frequency of assessment: 2HW+ 1 report

5. 3- How much time do you allot to solve your homework?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

6. 4 -How much time do you allocate to prepare the report? *

ما هو الوقت الذي تخصصه لإعداد التقرير؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

Part 3: Study for exam

Frequency of assessment: 1 final; 2 midterms, 2quizzes

7. 5- How much time do you allot to prepare for a quiz?*

كم الوقت الذي تخصصه للتحضير للاختبار القصير (كويز)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

8. 6- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبار الفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

9. 7- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

Google نماذج

# Study Time Survey استبانة زمن المذاكرة

Solid State PHYS640 زمن المذاكرة لمقرر فيزياء الجوامد

* تشير إلى أنّ السؤال مطلوب

**اسم برنامج القسم:- ماجستير العلوم فى الفيزياء** **Master of Science in Physics program**

Student feedback is important for improving the quality of learning experiences in higher education institutions. This questionnaire is designed to collect students' opinions about the actual study time for each course in the Master of Physics program.

**تعتبر التغذية الراجعة من الطلبة مهمة لتحسين جودة الخبرات التعليمية في مؤسسات التعليم العالي. وهذه الاستبانة مصممة لجمع آراء الطلبة حول زمن المذاكرة الفعلى لكل مقرر من مقررات برنامج الماجستير فى الفيزياء .**

***يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة***

**Elective Courses المقررات الاختيارية**

1. Year of Starting the Program*

2. Professor's name*
   اسم الاستاذ

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments
Frequency of assessment: 4 HW

5. 3- How much time do you allot to solve your homework?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

Part 3: Study for exam
Frequency of assessment:  1 final; 2 midterms, 2quizzes

6. 4- How much time do you allot to prepare for a quiz?*

كم الوقت الذي تخصصه للتحضير للاختبار القصير (كويز)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

7. 5- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبار الفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

8. 6- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

نماذج Google

# Study Time Survey استبانة زمن المذاكرة

زمن المذاكرة Materials Science PHYS641 مقررفيزياء المواد

* تشير إلى أنّ السؤال مطلوب

**Master of Science in Physics program** **اسم برنامج القسم:- ماجستير العلوم فى الفيزياء**

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***يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة***

**Elective Courses المقررات الاختيارية**

1. Year of Starting the Program*

2. Professor's name*
اسم الاستاذ

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments

Frequency of assessment: 4HW+ 1 presentation

5. 3- How much time do you allot to solve your homework?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

6. 4 -How much time do you allocate to prepare the report/presentation? *

ما هو الوقت الذي تخصصه لإعداد التقرير/العرض التقديمي؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

Part 3: Study for exam
Frequency of assessment: 1 final; 2 midterms, 2quizzes

7. 5- How much time do you allot to prepare for a quiz?*

كم الوقت الذي تخصصه للتحضير للاختبارالقصير (كويز)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

8. 6- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبارالفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

9. 7- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

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Google نماذج

# Study Time Survey استبانة زمن المذاكرة

زمن المذاكرة لمقرر PHYS642 Magnetism & Super conductivity المغناطيسية والتوصيلية الفائقة

* تشير إلى أنّ السؤال مطلوب

**اسم برنامج القسم:- ماجستير العلوم فى الفيزياء** **Master of Science in Physics program**

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***يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة***

**Elective Courses المقررات الاختيارية**

1. Year of Starting the Program*

2. Professor's name*
   اسم الاستاذ

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments
Frequency of assessment: 4 HW

5. 3- How much time do you allot to solve your homework?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

Part 3: Study for exam
Frequency of assessment:  1 final; 2 midterms, 2quizzes

6. 4- How much time do you allot to prepare for a quiz?*

كم الوقت الذي تخصصه للتحضير للاختبار القصير (كويز)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

7. 5- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبار الفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

8. 6- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

نماذج Google

# Study Time Survey استبانة زمن المذاكرة

زمن المذاكرة لمقرر Nuclear Structure and Spectroscopy PHYS650 التركيب النووى والاطياف

* تشير إلى أنّ السؤال مطلوب

**اسم برنامج القسم:- ماجستير العلوم فى الفيزياء** **Master of Science in Physics program**

Student feedback is important for improving the quality of learning experiences in higher education institutions. This questionnaire is designed to collect students' opinions about the actual study time for each course in the Master of Physics program.

**تعتبر التغذية الراجعة من الطلبة مهمة لتحسين جودة الخبرات التعليمية في مؤسسات التعليم العالي. وهذه الاستبانة مصممة لجمع آراء الطلبة حول زمن المذاكرة الفعلى لكل مقرر من مقررات برنامج الماجستير فى الفيزياء .**

***يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة***

**Elective Courses المقررات الاختيارية**

1. Year of Starting the Program*

2. Professor's name*
   اسم الاستاذ

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments
Frequency of assessment: 4 HW

5. 3- How much time do you allot to solve your homework?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

Part 3: Study for exam
Frequency of assessment:  1 final; 2 midterms, 2quizzes

6. 4- How much time do you allot to prepare for a quiz?*

كم الوقت الذي تخصصه للتحضير للاختبار القصير (كويز)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

7. 5- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبار الفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

8. 6- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

نماذج Google

# Study Time Survey استبانة زمن المذاكرة

زمن المذاكرة لمقرر Radiation Physics PHYS651 الفيزياء الاشعاعية

* تشير إلى أنّ السؤال مطلوب

**اسم برنامج القسم:- ماجستير العلوم فى الفيزياء** **Master of Science in Physics program**

Student feedback is important for improving the quality of learning experiences in higher education institutions. This questionnaire is designed to collect students' opinions about the actual study time for each course in the Master of Physics program.

**تعتبر التغذية الراجعة من الطلبة مهمة لتحسين جودة الخبرات التعليمية في مؤسسات التعليم العالي. وهذه الاستبانة مصممة لجمع آراء الطلبة حول زمن المذاكرة الفعلى لكل مقرر من مقررات برنامج الماجستير فى الفيزياء .**

***يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة***

**Elective Courses المقررات الاختيارية**

1. Year of Starting the Program*

2. Professor's name*
   اسم الاستاذ

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments
Frequency of assessment: 4 HW

5. 3- How much time do you allot to solve your homework?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

Part 3: Study for exam
Frequency of assessment:  1 final; 2 midterms, 2quizzes

6. 4- How much time do you allot to prepare for a quiz?*

كم الوقت الذي تخصصه للتحضير للاختبار القصير (كويز)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

7. 5- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبار الفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

8. 6- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

نماذج Google

# Study Time Survey استبانة زمن المذاكرة

زمن المذاكرة لمقرر Quantum Field Theory PHYS660 نظرية المجال الكمى

* تشير إلى أنّ السؤال مطلوب

**اسم برنامج القسم:- ماجستير العلوم فى الفيزياء** **Master of Science in Physics program**

Student feedback is important for improving the quality of learning experiences in higher education institutions. This questionnaire is designed to collect students' opinions about the actual study time for each course in the Master of Physics program.

**تعتبر التغذية الراجعة من الطلبة مهمة لتحسين جودة الخبرات التعليمية في مؤسسات التعليم العالي. وهذه الاستبانة مصممة لجمع آراء الطلبة حول زمن المذاكرة الفعلى لكل مقرر من مقررات برنامج الماجستير فى الفيزياء .**

***يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة***

**Elective Courses المقررات الاختيارية**

1. Year of Starting the Program*

2. Professor's name*
   اسم الاستاذ

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments
Frequency of assessment: 4 HW

5. 3- How much time do you allot to solve your homework?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

Part 3: Study for exam
Frequency of assessment:  1 final; 2 midterms

6. 4- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبار الفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

7. 5- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

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# استبانة زمن المذاكرة

**زمن المذاكرة لمقرر** Particle Physics PHYS661 مقرر فيزياء الجسيمات

* تشير إلى أنّ السؤال مطلوب

**اسم برنامج القسم:- ماجستير العلوم فى الفيزياء** **Master of Science in Physics**

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***يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة***

**Elective Courses المقررات الاجبارية**

1. Year of Starting the Program*

2. Professor's name*
   اسم الاستاذ

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments

Frequency of assessment: 6HW and report

5. 3- How much time do you allot to solve your homework?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t >10 hours

6. 4 -How much time do you allocate weekly to prepare the report/presentation? Note that this time will be multiplied by the number of weeks allowed to complete it (4 weeks). *

ما هو الوقت الذي تخصصه أسبوعيا لإعداد التقرير/العرض التقديمي؟ لاحظ أن هذا الوقت سيتم ضربه في عدد الأسابيع المسموح بها لإنهائها (4 أسابيع).

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t >10 hours

Part 3: Study for exam

Frequency of assessment: 1 final; 2 midterms

7. 5- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبار الفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

8. 6- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

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# Study Time Survey استبانة زمن المذاكرة

Special Topics in Physics PHYS665 زمن المذاكرة لمقرر مواضيع خاصة في الفيزياء

* تشير إلى أنّ السؤال مطلوب

**اسم برنامج القسم:- ماجستير العلوم فى الفيزياء** **Master of Science in Physics program**

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***يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة***

**Elective Courses المقررات الاختيارية**

1. Year of Starting the Program*

2. Professor's name*
اسم الاستاذ

Part 1: Preparation for classes
(two lectures per week) Frequency of assessment: 30 lectures

3. 1- How much time do you allot to prepare for a new lecture?*

كم الوقت الذي تخصصه للتحضير لمحاضرة جديدة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. 2- How much time do you allot to revise a given lecture and/or your lecture notes?*

كم الوقت الذي تخصصه لمراجعة المحاضرة و/أو ملاحظاتك التي دونتها خلال المحاضرة؟

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: HW/Assignments
Frequency of assessment: 4 HW+ 1 report

5. 3- How much time do you allot to solve your homework?*

كم الوقت الذي تخصصه لحل واجباتك؟

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

6. 4 -How much time do you allocate weekly to prepare the report/presentation? Note that this time will be multiplied by the number of weeks allowed to complete it (6 weeks). *

ما هو الوقت الذي تخصصه أسبوعيا لإعداد التقرير/العرض التقديمي؟ لاحظ أن هذا الوقت سيتم ضربه في عدد الأسابيع المسموح بها لإنهائها (6 أسابيع).

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

Part 3: Study for exam
Frequency of assessment: 1 final; 2 midterms, 2quizzes

7. 5- How much time do you allot to prepare for a quiz?*

كم الوقت الذي تخصصه للتحضير للاختبارالقصير (كويز)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

8. 6- How much time do you allot to prepare for the midterm exam?*

كم الوقت الذي تخصصه للتحضير للاختبارالفصلي (ميدتيرم)؟

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

9. 7- How much time do you allot to prepare for the final exam?*

كم الوقت الذي تخصصه للتحضير للاختبار النهائي؟

*حدد دائرة واحدة فقط.*

- t < 15 hour
- 15 hour < t < 17 hours
- 17 hours < t < 19 hours
- t > 20 hours

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# Study Time Survey استبانة زمن المذاكرة

زمن المذاكرة لمقرر

ندوة البحث

Research Seminar PHYS695

* تشير إلى أنّ السؤال مطلوب

**Master of Science in Physics program اسم برنامج القسم:- ماجستير العلوم فى الفيزياء**

Student feedback is important for improving the quality of learning experiences in higher education institutions. This questionnaire is designed to collect students' opinions about the actual study time for each course in the Master of Physics program.

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*يُرجى وضع علامة (√) لتدل على تفضيل لأحد الخيارات أمام كل عبارة*

**Required Courses المقررات الاجبارية**

1. Year of your Starting the Program *

2. Professor's name*
اسم استاذ المقرر

Part 1: **Literature Review and Critical analysis**
Frequency of assessment: 12 lectures; one hour and half per lecture

3. Q1:How much time do you spend on selecting key articles, books, and other academic sources?*

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

4. Q2:How much time do you spend on reading key articles, books, and other academic sources?*

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

5. Q3:How much time do you spend on analyzing methodologies, findings, and theoretical frameworks from existing studies?*

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

6. Q4:How much time do you spend on synthesizing information to critique the literature?*

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

7. Q5:How much time do you spend on synthesizing information identify areas for further exploration?*

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hours < t < 5 hours
- t > 5 hours

Part 2: Case Study ( Research Proposal Development )
Frequency of assessment: 10 lectures; one hour and half per lecture

8. Q6:How much time do you spend on formulating clear and concise research questions or hypotheses?*

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

9. Q7:How much time do you spend on designing the research methodology, including data collection and analysis plans?*

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

10. Q8:How much time do you spend on writing a comprehensive proposal that includes a literature review, research design, and anticipated implications of the research? *

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

Part 3: Study for Exam
Frequency of assessment: 6 lectures; one hour and half per lecture

11. Q9:How much time do you spend on preparing and delivering presentations on your proposal?*

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

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# Study Time Survey استبانة زمن المذاكرة

زمن المذاكرة

للرسالة Thesis PHYS699

* تشير إلى أنّ السؤال مطلوب

اسم برنامج القسم:- ماجستير العلوم فى الفيزياء
**Master of Science in Physics program**

---

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**Required Courses المقررات الاجبارية**

1. Year of your Starting the Program *

---

2. Professor's name*
اسم استاذ المقرر

---

Part 1: Preparation for classes
( Research and preparation)
Frequency of assessment: 6 lectures; 3 hours per lecture

3. Q1:How much time do you spend on collecting information and data from various sources?*

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3 hour < t < 5 hours
- t > 5 hours

4. Q2:How much time do you spend on Reading scientific literature and references relevant to the topic?*

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3hours < t < 5 hours
- t > 5 hours

5. Q3:How much time do you spend on Planning and preparing the general framework of the thesis?*

*حدد دائرة واحدة فقط.*

- t < 1 hour
- 1 hour < t < 3 hours
- 3hours < t < 5 hours
- t > 5 hours

Part 2: Case Study (including the theoretical/ computational/experimental studies, the analysis and results, and the final writing and revision of thesis)
Frequency of assessment: 20 lectures; 3 hours per lecture

6. Q4:How much time do you spend on conducting Theoretical/ computational/experimental studies?*

*حدد دائرة واحدة فقط.*

- t < 5hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

7. Q5:How much time do you spend on Interpreting the results and drawing conclusions?*

*حدد دائرة واحدة فقط.*

- t < 5hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

8. Q6:How much time do you spend on writing the various drafts of the thesis?*

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

9. Q7:How much time do you allocate for the final revision of the thesis and the preparation of the final version for submission?*

*حدد دائرة واحدة فقط.*

- t < 5 hour
- 5 hour < t < 7 hours
- 7 hours < t < 9 hours
- t > 10 hours

( preparation for the discussion ) Part 3: Study for Exam
Frequency of assessment: 4 lectures; 3 hours per lecture

10. Q8:How much time do you spend on  Preparing the presentation for the thesis discussion before defending it?*

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

11. Q9:How much time do you spend on  studying and preparing to answer the questions expected during the defense?*

*حدد دائرة واحدة فقط.*

- t < 10 hour
- 10 hour < t < 12 hours
- 12 hours < t < 14 hours
- t > 15 hours

لم يتم إنشاء هذا المحتوى ولا اعتماده من قِبل Google.

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Report of the Quality Committee Meeting with Students

- The purpose of this meeting can be summarized in two elements:

1. Presenting data derived from students' responses to actual study time in the questionnaires distributed to them.
2. Discussing with students the workload hours calculated from their responses to the actual study time questionnaires that were created according to the learning outcomes assessment methods developed by the faculty members in each course.

- This report confirms students' agreement on the workload hours obtained from the actual study time survey for the MSc Physics courses.

# محضر اجتماع

**لجنة الاعتماد البرامجي لبرنامج الماجستير في الفيزياء مع الطلاب**

**لعرض نتائج ECTS**

الموافق: ٢٠٢٥/٢/٢م التاريخ: ١٤٤٦/٨/٣هـ

# تمهيد

بحمد الله تعالى والصلاة والسلام على رسوله الكريم تم استعراض المواضيع المدرجة على جدول الأعمال على النحو التالي:-

## جـدول أعمـال الاجتماع

| م | الموضـوع |
|---|---|
| ١ | عرض مبسط عن الاختلاف بين نظام الساعات ECTS وCredit Hours. |
| ٢ | عرض نتيجةاستجابات الطالبات لاستبانات زمن المذاكرة للمقررات الدراسية متضمنا كلا من in class activity و self study |
| ٣ | مناقشة واعتماد self study hours بناء على استجابات الطالبات. |

**الموضوع الأول:**

عرض مبسط عن الاختلاف بين نظام الساعات ECTS وCridt Hours.

**اوضحت منسقة لجنة الجودة والاعتماد**:

ان نظام الساعات المعتمدة( credit hours)وهو ٣ ساعات لجميع المقررات الدراسية ببرنامج الماجستير في الفيزياء ماعدا الرسالة لها ٦ ساعات معتمدة، وان عدد الساعات المعتمدة للبرنامج متضمنا الرسالة هو ٣٣

ساعة معتمدة. بينما عدد الساعات ECTS ( The European Credit Transfer and Accumulation System) يتضمن كلا من الساعات الفصلية (in class activity ) وساعات الدراسة الذاتية( self study hours)، وحسب نتيجة الاستبانات هو ١٢٠ ساعة. تم حساب عدد الساعات بناء على استجابة الطالبات في جميع الدفعات الثلاثة،٢٠٢٠-٢٠٢١ ، ٢٠٢٢-٢٠٢٣،٢٠٢٣-٢٠٢٤. تم الاعتماد في حسابات ساعات ECTS على متوسط استجابات الطالبات، ما عدا المقررات التي لم يتم تدريسها بعد فتم حسابها على حسب استجابات أعضاء هيئة التدريس. تم تقسيم أسئلة الاستبانات لحساب عدد ساعات الدراسة الذاتية على ثلاثة أنشطة تعليمية رئيسية للدراسة الذاتية: زمن التحضير للفصل الدراسي، زمن الواجبات متضما العروض والتقارير، وزمن الدراسة قبل الاختبارات، معتمدا على توصيف المقررات.

**وبعد العرض تمت تلخيص التالي:**

عدد الساعات المعتمدة للبرنامج هو٣٣ ساعة معتمدة بينما عدد ساعات ECTS هو ١٢٠ ساعة.

**الموضوع الثاني:**

عرض استجابات الطالبات لاستبانات زمن المذاكرة للمقررات الدراسية متضما كلا من in class activity و self study لجميع دفعات الماجستير في الفيزياء

**استعرضت منسقة لجنة الجودة والاعتماد:**

جداول الساعات المعتمدة للبرنامج credit hours وساعات ECTS المحسوبة من استجابات الطالبات وهى كالتالى:-

Table 1: The curriculum of Master of Science in Physics program

| Requirements | Credit Hours | Workload | ECTS | Ratio % |
|---|---|---|---|---|
| 6 Compulsory Courses | 18 | 1687 | 60 | 50% |
| 3 Elective Courses | 9 | 804 | 30 | 25% |
| Thesis | 6 | 829 | 30 | 25% |
| Total | 33 | 3320 | 120 | 100% |

The ECTS points of 3 elective courses are calculated by multiply the average ECTS points per elective course by 3.

Table 2: The compulsory courses of Master of Science in Physics program

| # | Course Code | Course Title | Compulsory Courses | | | | | Prerequisite |
|---|---|---|---|---|---|---|---|---|
| | | | Lec./ week | Ex./ week | Credit Units | Workload | ECTS | |
| 1 | PHYS600 | Mathematical Physic | 3 | - | 3 | 244 | 9 | |
| 2 | PHYS601 | Classical Mechanics | 3 | - | 3 | 229 | 8 | |
| 3 | PHYS602 | Classical Electrodynamics | 3 | - | 3 | 255 | 9 | |
| 4 | PHYS603 | Quantum Mechanics | 3 | - | 3 | 309 | 11 | |
| 5 | PHYS604 | Statistical Mechanics | 3 | - | 3 | 229 | 8 | |
| 6 | PHYS695 | Research Seminar | 3 | - | 3 | 421 | 15 | |
| Total | | | 18 | - | - | 1687 | 60 | |

Table 3: The elective courses of Master of Science in Physics program

| # | Course Code | Course Title | Elective Courses | | | | | Prerequisite |
|---|---|---|---|---|---|---|---|---|
| | | | Lec./ week | Ex./ week | Credit Units | Workload | ECTS | |
| 1 | PHYS610 | Computational Physics | 2 | 2 | 3 | 318 | 11 | |
| 2 | PHYS611 | Physics Laboratory* | 0 | 6 | 3 | 358 | 13 | |
| 3 | PHYS620 | Atomic and Molecular Physics | 3 | 0 | 3 | 241 | 9 | |
| 4 | PHYS621 | Quantum Optics | 3 | 0 | 3 | 246 | 9 | |
| 5 | PHYS622 | Plasma Physics* | 3 | 0 | 3 | 242 | 9 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6 | PHYS640 | Solid State Physics | 3 | 0 | 3 | 240 | 9 | |
| 7 | PHYS641 | Materials Science | 3 | 0 | 3 | 261 | 9 | |
| 8 | PHYS642 | Magnetism and Superconductivity* | 3 | 0 | 3 | 262 | 9 | |
| 9 | PHYS650 | Nuclear Structure and Spectroscopy* | 3 | 0 | 3 | 242 | 9 | |
| 10 | PHYS651 | Radiation Physics* | 3 | 0 | 3 | 242 | 9 | |
| 11 | PHYS660 | Quantum Field Theory* | 3 | 0 | 3 | 240 | 9 | |
| 12 | PHYS661 | Particle Physics | 3 | 0 | 3 | 245 | 9 | |
| 13 | PHYS665 | Selected Topics in Specialized Physics | 3 | 0 | 3 | 327 | 12 | |
| Average ECTS hours per elective course taught | | | | | | | 10 | |

Table 4: The Thesis of Master of Science in physics program

| # | Course Code | Course Title | Thesis | | | | | Prerequisite |
|---|---|---|---|---|---|---|---|---|
| | | | Lec./ week | Ex./ week | Credit Units | Workload | ECTS | |
| 1 | PHYS699 | Thesis | 6 | - | 6 | 829 | 30 | |

**وبعد استعراض النتائج تم توضيح التالي:**

انه يوجد اختلاف في عدد ساعات ECTS بين المقررات كما هو موضح بالجداول السابقة.

**الموضوع الثالث:**

حصر اراء الطالبات على ما تم الحصول عليه من self study hours من خلال تحليل استبانات الطالبات.

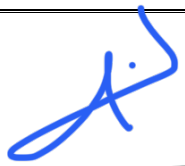
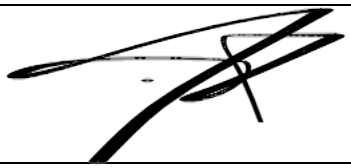
## مناقشة نتائج تحليل استبانات الطالبات:

تم استعراض ومناقشة التفاوت في حسابات ساعات الدراسة الذاتية لمقررات برنامج الماجستير في الفيزياء

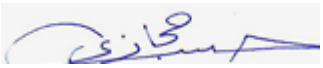
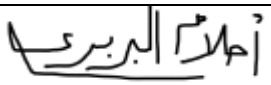
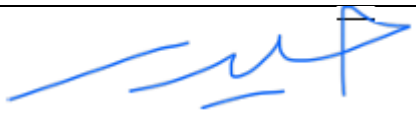
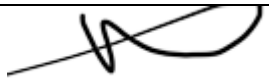
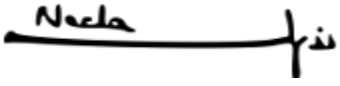
## وبعد المناقشة تمت التوصية على النحو التالي:

موافقة الطالبات على الساعات المحسوبة من تحليل الاستبانات وانها تتوافق مع الساعات الفعلية للدراسة الذاتية المبذولة في مقرراتهم.

# توقيع طالبات الدفعة ٢٠٢٣-٢٠٢٤ لبرنامج الماجستير بقسم الفيزياء

| م | الاسم | التوقيع |
|---|---|---|
| ١ | ندى عبده أحمد محزري |  |
| ٢ | ضوة عبده ادريس صميلي |  |
| ٣ | عائشة علي حسين صميلي |  |
| ٤ | حنان يحيى حسن حمدي |  |

This document is to confirm that the Master's program faculty members and program leaders have read the student workload assessment for master of science in physics program and commented on areas that need improvement or modification (if any).

| No. | Program faculty members | Signature |
|---|---|---|
| 1 | Prof. Nurdogan Can |  |
| 2 | Prof Hosam Hegazy |  |
| 3 | Prof. Mohammed Fadhali | |
| 4 | Prof. Salah Abdulrhmann |  |
| 5 | Prof. Ahlam EL-Barbary |  |
| 6 | Dr. Jabir Hakami | |
| 7 | Dr. Aysh Madkhli |  |
| 8 | Dr. Haider AlHazmi |  |
| 9 | Dr. Hind Adawi |  |
| 10 | Dr. Manal Alhazmi |  |
| 11 | Dr. Afaf Wasly | |
| 12 | Dr. Samar Ghopry |  |
| 13 | Dr. Mofareh Ghazwani |  |
| 14 | Dr. Nada A. Masmali |  |

| No. | Program leaders | Signature |
|---|---|---|
| 1 | Dr Hussein Athlawi |  |
| 2 | Dr Abeer Ageeli |  |