Programme for students of Master Studies in English
applicable from the academic year 2020/2021

During the second degree chemistry studies student is obliged to obtained: (a) at least 6 ECTS and not more than 8 ECTS for subjects that are not related to the field of studies (general courses), including general university subjects from the areas of humanities or social sciences minimum 5 ECTS.
Each year a student is expected to accumulate 60 ECTS credits (however, minimum 30 ECTS credits per a semester).

**Semestr 1.**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours</th>
<th>Lecture</th>
<th>Laboratory</th>
<th>ECTS points</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical Chemistry A**</td>
<td>60</td>
<td>30</td>
<td>30</td>
<td>5</td>
<td>Exam</td>
</tr>
<tr>
<td>Environmental Analysis</td>
<td>45</td>
<td>15</td>
<td>30</td>
<td>4.5</td>
<td>Exam</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>60</td>
<td>30</td>
<td>30</td>
<td>5</td>
<td>Exam</td>
</tr>
<tr>
<td>Nuclear Chemistry</td>
<td>60</td>
<td>30</td>
<td>30</td>
<td>5</td>
<td>Exam</td>
</tr>
<tr>
<td>Crystallography A**</td>
<td>30</td>
<td>10</td>
<td>20</td>
<td>3</td>
<td>Exam</td>
</tr>
<tr>
<td>Directional Course (PK)*</td>
<td>75</td>
<td>0</td>
<td>75</td>
<td>7.5</td>
<td>Grade</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>330</strong></td>
<td><strong>115</strong></td>
<td><strong>215</strong></td>
<td><strong>30</strong></td>
<td></td>
</tr>
</tbody>
</table>

* Elective courses selected by the student in consultation with the Scientific supervisor (laboratories from the list available in English)
** Obligatory courses for people at the undergraduate level that did not pass such course in the proper thematic size and hours. Student can choose particular course at the primary (A) or advanced (level B) level.

**Directional Course**

- Organic synthesis – laboratory; 4,0 ECTS  
  prof. dr hab. Tomasz Bauer

- Quantum chemistry A – laboratory; 4,0 ECTS  
  dr Małgorzata Jeziorska
- Instrumental analysis – lecture and laboratory; 4,5 ECTS

**Semestr 2. (courses selected by the student in consultation with the Scientific supervisor)**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours</th>
<th>Lecture</th>
<th>Laboratory</th>
<th>ECTS points</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialization Lecture no.1</td>
<td>30</td>
<td>30</td>
<td>0</td>
<td>3</td>
<td>Exam</td>
</tr>
<tr>
<td>Specialization Lecture no.2</td>
<td>30</td>
<td>30</td>
<td>0</td>
<td>3</td>
<td>Exam</td>
</tr>
<tr>
<td>Monographic Lecture no.1</td>
<td>15</td>
<td>15</td>
<td>0</td>
<td>1.5</td>
<td>Exam</td>
</tr>
<tr>
<td>Monographic Lecture no.2</td>
<td>15</td>
<td>15</td>
<td>0</td>
<td>1.5</td>
<td>Exam</td>
</tr>
<tr>
<td>Monographic Lecture no. 3</td>
<td>15</td>
<td>15</td>
<td>0</td>
<td>1.5</td>
<td>Grade</td>
</tr>
<tr>
<td>Specialization Laboratory I</td>
<td>120</td>
<td>0</td>
<td>120</td>
<td>10</td>
<td>Grade</td>
</tr>
<tr>
<td>Introduction to intellectual property management</td>
<td>15</td>
<td>15</td>
<td></td>
<td>1.5</td>
<td>Exam</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>240</strong></td>
<td><strong>120</strong></td>
<td><strong>120</strong></td>
<td><strong>22</strong></td>
<td></td>
</tr>
</tbody>
</table>

Subjects required to pass - selected by the student in consultation with the Scientific supervisor (laboratories from the list offered by the Faculty of Chemistry and available in English (English group).

**Semestr 3.**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours</th>
<th>Lecture</th>
<th>Laboratory</th>
<th>ECTS points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Seminar (oral presentation)</td>
<td>30</td>
<td>30</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>LabS II</td>
<td>250</td>
<td>0</td>
<td>250</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>280</strong></td>
<td><strong>30</strong></td>
<td><strong>250</strong></td>
<td><strong>24</strong></td>
</tr>
<tr>
<td>Subject</td>
<td>Hours</td>
<td>Lecture</td>
<td>Laboratory</td>
<td>ECTS points</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------</td>
<td>---------</td>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Master Seminar (Poster)</td>
<td>30</td>
<td>30</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>LabS III</td>
<td>200</td>
<td>0</td>
<td>200</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>230</strong></td>
<td><strong>30</strong></td>
<td><strong>200</strong></td>
<td><strong>24</strong></td>
</tr>
</tbody>
</table>

**Electives**

**Fall semester - List of classes**

♦ Chemistry of bioelements – lecture; 2,0 ECTS  
  prof. dr hab. Renata Bilewicz (bilewicz@chem.uw.edu.pl)

♦ Molecular modeling – lecture; 1,5 ECTS  
  dr hab. Dominik Gront (dgront@chem.uw.edu.pl)

♦ Trace analysis of the organic pollutants in the environment; 3,0 ECTS  
  prof. dr hab. Tomasz Gierczak (gierczak@chem.uw.edu.pl)

♦ Fundamentals of chemical technology and chemicals management – lecture and laboratory; 8,0 ECTS  
  dr Hanna Wilczura-Wachnik (wilczura@chem.uw.edu.pl)

♦ Methods of pollution control and waste management – lecture and laboratory; 8,0 ECTS  
  dr hab. Elżbieta Megiel (emegiel@chem.uw.edu.pl)

♦ Atomic spectrometry – lecture; 1,0 ECTS  
  prof. dr hab. Ewa Bulska (ebulska@chem.uw.edu.pl)

♦ Principles of stereochemistry – lecture; 2,0 ECTS  
  dr Anna Zawadzka (azawadzka@chem.uw.edu.pl)

♦ Organic chemistry – lecture; 4,5 ECTS  
  prof. dr hab. Tomasz Bauer (tbauer@chem.uw.edu.pl)

♦ Advanced organic chemistry – lecture; 3,0 ECTS  
  prof. dr hab. Tomasz Bauer (tbauer@chem.uw.edu.pl)

♦ Physical chemistry – laboratory; level A – 3,0 ECTS; level B – 6,0 ECTS  
  dr Iwona Paleska (ipaleska@chem.uw.edu.pl)

♦ Physical chemistry – lecture; 3,0 ECTS  
  prof. dr hab. Magdalena Skompska, prof. dr hab. Paweł Krysński (mskomps@chem.uw.edu.pl, pakrys@chem.uw.edu.pl)
Physicochemistry of new materials – lecture; 3,0 ECTS
dr hab. Robert Szoszkiewicz, prof. UW (rszoszkiewicz@chem.uw.edu.pl)

Practical application of Raman spectroscopy – lecture; 1,5 ECTS
dr Agata Królikowska (akrol@chem.uw.edu.pl)

Advanced techniques in infrared spectroscopy – lecture; 1,5 ECTS
dr Barbara Pałys, prof. UW (bpalys@chem.uw.edu.pl)

Marine microplastics: from the anthropogenic litter to the plastisphere – lecture; 1,5 ECTS
dr Agnieszka Dąbrowska (adabrowska@chem.uw.edu.pl)

General physics 1 – lecture and laboratory; 6,0 ECTS
dr hab. Robert Szoszkiewicz, prof. UW (rszoszkiewicz@chem.uw.edu.pl)

„Nuclear chemistry” – laboratory; 2,0 ECTS
dr Anna Makowska (milew@chem.uw.edu.pl)

Liquid Chromatography – laboratory; 3,5 ECTS
dr hab. Magdalena Biesaga (mbiesaga@chem.uw.edu.pl)

Crystallography A – lecture; 1,0 ECTS; laboratory 2,0 ECTS
prof. dr hab. Michał K. Cyrański (mkc@chem.uw.edu.pl)

Crystallography B – lecture; 3,0 ECTS; laboratory dr Anna Makal (amakal@chem.uw.edu.pl)
3,0 ECTS
prof. dr hab. Krzysztof Woźniak (kwozniak@chem.uw.edu.pl)

Spring semester – List of classes

Liquid crystals – lecture; 1,5 ECTS
dr hab. Damian Pociecha (pociu@chem.uw.edu.pl)

Ionic liquids – lecture; 1,5 ECTS
dr Anna Makowska (milew@chem.uw.edu.pl)

Chemical kinetics and catalysis – lecture; 1,5 ECTS
prof. dr hab. Marek Orlik (morlik@chem.uw.pl)

Computer aided drug design – lecture; 1,5 ECTS
prof. dr hab. Sławomir Filipek (sfilipek@chem.uw.edu.pl)

Autooxidation and antioxidants – lecture; 1,5 ECTS
prof. dr hab. Grzegorz Litwinienko (litwin@chem.uw.edu.pl)
♦ Natural compounds and their impact on drug synthesis – lecture; 1,5 ECTS
dr Anna Zawadzka (azawadzka@chem.uw.edu.pl)

♦ Thermochemistry-physico-chemical properties of emulsions containing natural compounds – lecture; 3,0 ECTS
dr Hanna Wilczura-Wachnik (wilczura@chem.uw.edu.pl)

♦ Microemulsions of biologically active compounds – lecture; 1,5 ECTS
dr Hanna Wilczura-Wachnik (wilczura@chem.uw.edu.pl)

♦ Specialization laboratory 1-inorganic and analytical chemistry – laboratory; 10,0 ECTS
dr hab. Rafał Jurczakowski (rafjur@chem.uw.edu.pl)

♦ Organic chemistry – specialization laboratory; 10,0 ECTS
dr Elżbieta Winnicka (eboroda@chem.uw.edu.pl)

♦ Metrology in chemistry – lecture; 2,0 ECTS
prof. dr hab. Ewa Bulska (ebulska@chem.uw.edu.pl)

♦ Physical chemistry – laboratory; level A – 3,0 ECTS; level B – 6,0 ECTS
dr Iwona Paleska (ipaleska@chem.uw.edu.pl)

♦ Introduction to intellectual property management – lecture; 1,5 ECTS
dr Marcin Strawski (marcin@chem.uw.edu.pl)

♦ General physics 2 – lecture and laboratory; 8,0 ECTS
dr hab. Robert Szoszkiewicz, prof.UW (rszoszkiewicz@chem.uw.edu.pl)

♦ Fundamentals of molecular spectroscopy A – laboratory; 2,0 ECTS
dr Beata Wrzosek (bwrzosek@chem.uw.edu.pl)

♦ Fundamentals of molecular spectroscopy B – laboratory; 2,0 ECTS
dr Beata Wrzosek (bwrzosek@chem.uw.edu.pl)

♦ Ionic liquid – lecture; 1,5 ECTS
dr Anna Makowska (milew@chem.uw.edu.pl)

Students can also choose subjects at other faculties of the University of Warsaw and the Warsaw University of Technology.