**Indywidualne studia drugiego stopnia na Wydziale Chemii UW w języku angielskim „Chemistry”**

Indywidualne studia drugiego stopnia na Wydziale Chemii w języku angielskim to studia skierowane do studentów chcących uczyć się w trybie studiów indywidualnych, mających wizję swojej edukacji opartej na współpracy z grupą badawczą rozwiązującą konkretne problemy naukowo-badawcze. Studentami tego kierunku mogą być obcokrajowcy oraz absolwenci polskich studiów I stopnia.

Idea studiów:

„Kandydat” w pierwszej kolejności nawiązuje kontakt (samodzielnie bądź poprzez dziekanat studencki) z wybranym przez siebie Pracownikiem Naukowym, który realizuje badania naukowe interesujące „Kandydata”. Pracownik ten staje się Opiekunem Naukowym. Wymogiem koniecznym do opieki nad studentem kierunku anglojęzycznego będzie posiadanie własnej grupy badawczej, co umożliwi przyszłemu studentowi pełniejszy rozwój w najbardziej go interesującej dziedzinie. Studia trwać będą 4 semestry, tak jak w przypadku studiów polskojęzycznych. Tak jak na studiach polskojęzycznych, obowiązkowe jest zaliczenie kursu Biochemii i Chemii Jądrowej. Przedmiotami obowiązkowymi stają się Chemia Teoretyczna, Krystalografia i Analiza Środowiska/Instrumentalna, w przypadku, gdy Student nie zaliczyły tych kursów w odpowiednim wymiarze tematycznym i godzinowym na studiach I stopnia. Student zobowiązany jest do zgromadzenie potrzebnych 30 punktów ECTS.

W ramach  przedmiotu kierunkowego (Directional Course) istnieje już przestrzeń do indywidualnej ścieżki edukacji Studenta. Opiekun naukowy jest zobowiązany do wskazania zajęć laboratoryjnych z oferty wydziałowej, aby Student mógł uzyskać 7,5 punktów ECTS i przygotować się do dalszych studiów i badań naukowych. Koncepcja tego semestru jest taka, aby umożliwić Studentowi adaptację na Wydziale Chemii oraz na bardziej świadomy wybór interesujących go przedmiotów. Podczas kolejnych semestrów wybór przedmiotów (wykładów specjalizacyjnych, wykładów monograficznych i pracowni) będzie zależał wyłącznie od Studenta oraz jego Opiekuna (warunek to zgromadzenie 30 ECTS w każdym semestrze). Istotne jest też, aby Student uzyskał minimum 5 ECTS w ramach przedmiotów z dziedziny humanistycznej lub społecznej. Studenci tego kierunku zachęcani będą do wybierania przedmiotów na innych Wydziałach UW oraz na Politechnice Warszawskiej.

Opiekunem Studentów z tego kierunku będzie Dr Karolina Piecyk. Pani Doktor będzie ich wspierać w wyborze Opiekunów oraz pomagać w realizowaniu programu studiów. Istotne jest, aby Student zrealizował przedmioty z dziedziny innej niż studiowana (6-8 ECTS), w tym z dziedziny nauk humanistycznej lub społecznej (5 ECTS). Dlatego tak ważne będzie koordynowanie wyboru przedmiotów i podpinanie ich pod odpowiedni cykl dydaktyczny.

**Programme Chemistry 2017/2018**

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.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Subject | Hours | Lecture | Laboratory | ECTS points |   |
| Theoretical Chemistry A\*\* | 60 | 30 | 30 | 5 | Exam |
| Environmetal/ Instrumental Analysis\*\* | 45 | 15 | 30 | 4,5 | Exam |
| Biochemistry | 60 | 30 | 30 | 5 | Exam |
| Nuclear Chemistry | 60 | 30 | 30 | 5 | Exam |
| Crystallography A\*\* | 30 | 10 | 20 | 3 | Exam |
| Directional Course (PK)\* | 75 | 0 | 75 | 7,5 | Grade |
| **Total** | **330** | 115 | 215 | **30** |   |

\* 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.

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Subject | Hours | Lecture | Laboratory | ECTS points |  |
| Specialization Lecture no.1 | 30 | 30 | 0 | 3 | Exam |
| Specialization Lecture no.2 | 30 | 30 | 0 | 3 | Exam |
| Monographic Lecture no.1 | 15 | 15 | 0 | 1,5 | Exam |
| Monographic Lecture no.2 | 15 | 15 | 0 | 1,5 | Exam |
| Specialization\*Seminar | 30 |  |  | 4 | Grade |
| Specialization Laboratory I | 120 | 0 | 120 | 10 | Grade |
| Introduction to intellectual property management | 15 | 15 |  | 1,5 | Exam |
| **Total** | **240** | 120 | 120 | **24,5** |  |

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).

\*in the frame of chose specialization in the departament

**Semestr 3.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Subject | Hours | Lecture | Laboratory | ECTS points |
| Master Seminar I(oral presentation) | 30 | 30 | 0 | 4 |
| Specialization Laboratory II | 250 | 0 | 250 | 20 |
| **Total** | **280** | 30 | 250 | **24** |

**Semestr 4.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Subject | Hours | Lecture | Laboratory | ECTS points |
| Master Seminar II(Poster) | 30 | 30 | 0 | 4 |
| Specialization Laboratory III | 200 | 0 | 200 | 20 |
| **Total** | **230** | 30 | 200 | **24** |

|  |
| --- |
| **Electives** |
| **No** | **Subject** | **Hours** | **Lectures** | **Tutorials** | **Prosem.** | **Laborat.** | **ECTS** |
| 1. | Quantum Chemistry B  | 75 | [30 E](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/04.html) | [15 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/05.html) | [30 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/06.html) |    | 6,5 |
| 2. | Crystallography B  | 75 | [30 E](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/14.html) | [45 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/15.html) |   |   | 7,5 |
| 3. | Physical Chemistryof New Materials\*  | 60 |   |   |   | [60 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/16.html) | 4 |
| 4. | Theoretical Chemistry - Laboratory\*  | 60 |   |   |   | [60 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/17.html) | 4 |
| 5. | Organic Synthesis - Laboratory\* | 60 |   |   |   | [60 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/18.html) | 4 |
| 6. | Enviromental Analysis\*  | 90 | [30 E](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/19.html) |   |   | [60 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/20.html) | 6 |
| 7. | Crystallography - Laboratory\* | 60 |   |   |   | [60 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/21.html) | 4 |
| 8. | Industrial Wastes and Waste Management\*  | 45 | [15 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/43.html) |   |   | [30 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/46.html%22%20%5Co%20%22Click%20please) | 3 |
| 9. | Physicochemical Methods in Investigation of New Materials  | 30 | [30 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/22.html) |   |   |   | 2 |
| 10. | Chemometrics  | 30 | [30 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/23.html) |   |   |   | 2 |
| 11. | High PerformanceLiquid Chromatography (HPLC)  | 45 | [15 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/24.html) | [30 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/25.html) |   |   | 3 |
| 12. | Bioinorganic Chemistry  | 30 | [30 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/26.html) |   |   |   | 2 |
| 13. | Strategy for Organic Synthesis  | 15 | [15 E](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/27.html) |   |   |   | 1 |
| 14. | Chemistry of Natural Products  | 30 | [30 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/28.html) |   |   |   | 2 |
| 15. | Molecular Modeling  in Organic Chemistry  | 30 |   |   |   | [30 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/29.html) | 2 |
| 16. | Stereochemistry  | 45 | [30 E](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/30.html) |   | [15 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/31.html) |   | 3 |
| 17. | Analysis of Spectra  | 15 |   | [15 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/32.html) |   |   | 1 |
| 18. | Statistic and CrystallographicData Bases  | 60 | [15 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/33.html) |   |   | [45 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/34.html)  | 4 |
| 19. | Crystallochemistryand Physical Crystallography  | 60 | [30 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/44.html) | [30 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/45.html) |   |   | 4 |
| 20. | Structural Chemistry  | 30 | [30 E](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/35.html) |   |   |   | 2 |
| 21. | NMR Spectroskopy in Chemistry  | 30 | [30 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/36.html) |   |   |   | 2 |
| 22. | Structure of Polymers and Biopolymers  | 30 | [30 E](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/37.html) |   |   |   | 2 |
| 23. | Bioinformatics  | 30 | [15 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/38.html) |   |   | [15 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/39.html) | 2 |
| 24. | Programming in Fortran  | 45 | [15 E](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/40.html) |   |   | [30 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/41.html) | 3 |
| 25. | Introduction to the Chemical Reaction Theory  | 30 | [30 E](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/42.html) |   |   |   | 2 |
| 26. | Elements of Femtochemistry - Ultrafast Dynamics of Chemical Reactions in Femtosecond Laser Spectroscopy  | 30 | [30 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/47.html) |   |   |   | 2 |
| 27. | General Electives\*  | 30 |   |   |   |   | 6 - 8 |
| 28. | Polymers and Biomaterials  | 60 |   |   |   | [60 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/64.html)  | 6 |
| 29. | Theoretical Chemistry A  | 45 |   |   |   | [45 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/61.html)  | 4,5 |
| 30. | Theoretical Chemistry B  | 60 |   |   |   | [60 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_01m/62.html)  | 6 |

Summer Semester

|  |
| --- |
| **Electives** |
| **No** | **Subject** | **Hours** | **Lectures** | **Tutorials** | **Prosem.** | **Laborat.** | **ECTS** |
| 1. | Molecular Orbitals in Chemistry  | 30 | [15 E](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_02m/16.html) |   |   | [15 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_02m/17.html) | 2 |
| 2. | Introduction to Biophysics  | 30 | [30 E](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_02m/35.html) |   |   |   | 2 |
| 3. | Introduction to Physics and Chemistry of Condensed Matter  | 60 | 30 E |    |   | 30 Z  | 4 |
| 4. | Fundamentals of Chemical Kinetics and Catalysis  | 30 | [30 Z](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_02m/20.html) |   |   |    | 2 |
| 5. | Specialization and Monographic Lectures  |    |   |   |   |    |   |
| 6. | General Electives\*  |    |   |   |   |    |   |

**Semester 2M - List of classes**

1. Specialization Laboratory I - Physical and Nuclear Chemistry
2. Specialization Seminar - Physical and Nuclear Chemistry
3. Specialization Laboratory I - Inorganic and Analytical Chemistry
4. Specialization Seminar - Inorganic and Analytical Chemistry
5. Specialization Laboratory I - Organic Chemistry and Chemical Technology
6. Specialization Seminar - Organic Chemistry and Chemical Technology
7. Specialization Laboratory I - Theoretical and Structural Chemistry
8. Specialization Seminar - Theoretical and Structural Chemistry
9. Molecular Orbitals in Chemistry - Lecture
10. Molecular Orbitals in Chemistry - Computer laboratory
11. Fundamentals of Chemical Kinetics and Catalysis - Lecture
12. Crystallochemistry and physical crystallography- Lecture
13. Crystallochemistry crystallography and physical - Seminar

14. Applied Electrochemistry - Specialization Lecture
15. Nuclear Energy and Radiochemistry - Specialization Lecture
16. Optimization Methods in Chemistry - Specialization Lecture
17. Spectroscopy of UV, VIS and IR in Chemistry - Specialization Lecture
18. Isotope Effects on the Properties of Liquid Mixtures - Monographic Lecture
19. Isotope Exchange - Monographic Lecture
20. Physicochemical Fundamentals of the Isotope Methods - Specialization Lecture
21. Trace Analysis of Organic Compounds in the Environment - Specialization Lecture
22. Electromigration Techniques - Monographic Lecture
23. Computer Simulation of Polymers and Biopolymers - Specialization Lecture
24. Biosensors - Lecture
25. Role of Metal Ions in Biologically Important Compounds - Lecture
26. Introduction to Molecular Biophysics - Lecture
27. Chemistry of Heterocyclic Compounds - Specialization Lecture
28. Natural Compounds and Their Impact on Drug Syntheses - Monographic Lecture
29. Principles of Asymmetric Transformations - Specialization Lecture
30. Microwaves in Organic Synthesis - Monographic Lecture
31. Synthesis and Application of Isotopes in Organic Chemistry, Biochemistry and Medicine - Lecture
32. Thermochemistry and Thermodynamics - Specialization Lecture
33. Autoxidation and Antioxidants - Monographic Lecture
34. Mechanisms and Kinetics of Polyreactions - Specialization Lecture
35. Free Radicals in Chemistry and Biochemistry - Specialization Lecture
36. Membrane Methods - Monographic Lecture
37. Automation in Chemical Analysis - Specialization Lecture
38. Theory of π-electron compounds - Specialization Lecture

39. Electroanalysis - Specialization Lecture
40. Fundamentals of Molecular Optics; Electrical and Optical Properties of Molecules - Specialization Lecture
41. Introduction to organometallic chemistry - Monographic Lecture
42. Functional photonic nanomaterials-synthesis, characterization and ongoing applications - Monographic Lecture
43. Presentation Skill - Monographic Lecture
44. Atmospheric Chemical Kinetics - Monographic Lecture
45. Computer Aided Drug Design - Monographic Lecture
46. Electrochemistry of organic compounds - Monographic Lecture
47. Ionic Liquids - Monographic Lecture
48. Structural information obtained by means of surface vibrational techniques - Lecture

**Semester 3M - List of classes**

1. [Electrochemical Power Sources - Monographic lecture](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_03m/01.html)
2. [Introduction to Nanotechnology - Monographic lecture](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_03m/02.html)
3. [Multidimensional and Correlation NMR Spectroscopy - Monographic lecture](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_03m/03.html)
4. [Electroanalytical Methods in Materials Chemistry - Monographic lecture](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_03m/04.html)
5. [Theoretical Structure of Biologically Important Molecules - Lecture](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_03m/05.html)
6. [Application of Enzymes in Organic Synthesis - Monographic Lecture](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_03m/06.html)
7. [Software for Organic Chemists - Monographic Lecture](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_03m/07.html)
8. [Crystallography - Light Scattering by Polymer Solutions - Monographic Lecture](http://www.chem.uw.edu.pl/people/AMyslinski/Informator_English_m_2016_17/sem_03m/08.html)