

Computational Sciences





Committees and contact

Joint Commission (gemeinsame Kommission, GK):

- Deliberates board decisions concerning the programme
- Current head: Prof. Dr. Beate Paulus

Examination Board (Prüfungsausschuss, PA)

- · Admission, approval of credit points, examination-related stuff
- Current head: Prof. Dr. Felix Höfling

Education and Training Committee (Ausbildungskommission)

- Mainly led by students
- Currently slightly underrepresented ...

Programme Office (Studiengangsbüro)

- Support of both students and lecturers
- Coordination, organisation, ...
- Current head: Dr. Jan Felix Witte







Programme overview: Modules

Module: combination of various "studying units", e.g.,

- lecture + exercise
- lecture + (project)seminar
- lecture + exercise + seminar
- research project in a work group

• ...

Register for Computational Sciences course via Campus Management!

| Teaching and learning units | Contact hours (Semester hours per week = SH) | Forms of active participation | Workload (hours) | | | | |
|--------------------------------|--|---|---|----------------------|--|--|--|
| Lecture | 4 | - | Lecture contact hours Lecture preparation and follow-up | 60 80 | | | |
| Practice seminar | 2 | written completion of the work sheets two oral presentations, each showing the solution of one practice task in the practice seminar | S contact hours S preparation and follow-up Prac.S contact hours Prac. S preparation and | 30 60 30 60 | | | |
| Seminar | 2 | Preparation and presentation of a research topic | follow-up Written practice tasks Preparation for examination Examination | 70 | | | |
| Module examination | | Written examination (90 minutes), which may also be carried out an electronic examination, or oral examination (approx. 30 minute or term paper (approx. 15 pages); the module examination is r evaluated in detail. | | | | | |
| Module language | | German | | | | | |
| Compulsory regular att | endance | Attendance recommended | | | | | |
| Workload, total hours | | 450 hours 15 CP | | | | | |
| Duration of module | | One or two semesters | | | | | |
| Module offered | | At least once per academic year | | | | | |
| Applicability | | Master's program Computational Sciences | | | | | |

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Module: combination of various "studying units", e.g.,

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| Duration of module | | One or two semesters | | | | | | |
| Module offered | | At least once per academic year | | | | | | |
| Applicability | | Master's program Computational Sciences | | | | | | |

One seminar may be part of several modules, be careful when choosing modules and seminars!

Programme overview: Modules

Module: combination of various "studying units", e.g.,

- lecture + exercise
- lecture + (project)seminar
- lecture + exercise + seminar
- research project in a work group

• ...

Register for other courses using the form:

https://www.imp.fu-berlin.de/fbv/pruefungsbuero/ Formulare/PDFs/Modul-Anmeldung.pdf

and submit it to the examination office!

| FU Berlin – FB Mathe | ematik und Informatik | Freie Universität |
|--|--|--|
| Anmeldung | zum Modul und Lehrveransta | itung/en in Campus Management |
| Nutzen Sie zum Ausfül (Acrobat/Foxit; unter W | len das Schreibmaschinen-Werkze /erkzeuge oder Kommentare), um | ug (Typewriter) eines PDF-Readers die Lesbarkeit zu erhöhen. Vielen Dank! |
| Name: | Vorna | me: |
| Matrikelnr: | E-Mai | <u>ــــــــــــــــــــــــــــــــــــ</u> |
| Studiengang: | Telefo | n: |
| Semester (z.B. WS 202 | 20/2021): | |
| Hiermit melde ich mid | ch an zu | |
| 1. Modulname lau | t CM oder VV (z.B. Seminar zur Ma | thematik) + Leistungspunkte (LP): |
| | | LP: |
| | | |
| | | |
| 2. Name der konk | reten Lehrveranstaltung/en laut CM | 1 oder VV (z.B. Seminar zur Algebra): |
| 2. Name der konk LV-Nr: | reten Lehrveranstaltung/en laut CM | I oder VV (z.B. Seminar zur Algebra): |
| 2. Name der konk LV-Nr: LV-Titel: | reten Lehrveranstaltung/en laut CM | I oder VV (z.B. Seminar zur Algebra): |
| 2. Name der konk LV-Nr: LV-Titel: LV-Nr: | reten Lehrveranstaltung/en laut CM | f oder VV (z.B. Seminar zur Algebra): |
| 2. Name der konk LV-Nr: LV-Titel: LV-Nr: LV-Titel: | reten Lehrveranstaltung/en laut CM | f oder VV (z.B. Seminar zur Algebra): |
| 2. Name der konk LV-Nr: LV-Titel: LV-Titel: LV-Titel: | reten Lehrveranstaltung/en laut CN Lehrkraft: | t oder VV (z.B. Seminar zur Algebra): |
| 2. Name der konk LV-Nr: LV-Titel: LV-Nr: LV-Titel: Grund (bitte ankreuzen | reten Lehrveranstaltung/en laut CN Lehrkraft: Lehrkraft: | t oder VV (z.B. Seminar zur Algebra): |
| 2. Name der konk LV-Nr: LV-Titel: LV-Titel: Grund (bitte ankreuzen O LV ist in meinem St O verspätete Anmeldu | reten Lehrveranstaltung/en laut CNLehrkraft:Lehrkraft: Lehrkraft:): udengang in CM nicht verfügbar ing aus wichtigem Grund, und zwa | t oder VV (z.B. Seminar zur Algebra): |
| 2. Name der konk LV-Nr: LV-Titel: LV-Nr: LV-Titel: Grund (bitte ankreuzen O LV ist in meinem St O verspätete Anmeldu O Sonstiges: | reten Lehrveranstaltung/en laut ChLehrkraft:Lehrkraft: | r. |
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| 2. Name der konk LV-Nr: LV-Titel: LV-Titel: Grund (bitte ankreuzen O LV ist in meinem St O verspätete Anmeldu O Sonstiges: Berlin, den | reten Lehrveranstaltung/en laut ChLehrkraft: Lehrkraft: Lehrkraft: | r |
| 2. Name der konk LV-Nr: LV-Titel: LV-Titel: Grund (bitte ankreuzen O LV ist in meinem St O verspätete Anmeldu O Sonstiges: Berlin, den | reten Lehrveranstaltung/en laut Ch Lehrkraft:Lehrkraft: | t oder VV (z.B. Seminar zur Algebra): |

Programme overview: Websites

| 🛛 🔏 www.compsci.fu-berlin.de/faq/index.html | | | | … ⊠ ☆ | Q Search |
|---|--|---------|--|---|--|
| Freie Universitä | Berlin | | | | Startseite Datenschutz Barrierefreiheit DE |
| COMPUTATION | AL SCIENCES | | | | |
| | | | | | |
| Startseite ≯ Infos füi ∗ Ates eisten | Studierende Comp. | Sci. We | studien- und | | y einschließlich Modußeschreibungen |
| Startseite ≯ Infos für ∗ Ates sisten | studierende Studierende studierende studierende studierende studierende | Sci. We | ebs > Studien- und | | geinschließlich Modulbeschreibungen |
| Startsede > Infos fü≀ ∝ Ana center ∡ Anamedu | Studieren Comp. | Sci. We | Studien- und Anmeldung zu Bescheinigun Ammeldung zu | Früfungsordnung um Forschungspi g eines Forschur | y einschleitich Modulterschneibungen nijeld gegengelates |
| Startsele > Infos füi * Anerdau * Anerdau * Durtersch | nte lis Studierende Studieren Comps. m m g zu Lehveranstaltungen ed zwischen ModuleA au Modulen B centific Commutien | Sci. We | Studien- und Anmeldung zi Bescheinigun Anmeldung zi Antrag auf Sti | Prüfungsordnung um Forschungspr g eines Forschur ur Masterarbeit udienabschluss | y einschleitich Modulterschnebungen niget geprejektes |
| Startaria > Infos füi * Alex sedent * Anmeldu * Berrich S * Modul * | Into lis Studerende Studieren Composition mg zu Lehrveranstaltungen de zwischen Modulen A und Modulen B cientific Computing interfunktanatheoriet vs. Modul "Quantenchemie" | Sci. We | Studien- und Anmeldung zi Bescheinigun Anmeldung zi Antrag auf Ste | Prüfungsordnung um Forschungspr g eines Forschur ur Masterarbeit udienabschluss | y einschleitich Modulbeschnebungen nijstel geprojektes |
| Startsele > Infos füi Atte settem * Anmeldu * Bereich S * Modul * * Modul * | Inte lie Studierende Studieren COMPANIE ang zu Lehveranstaltungen ed swichen Modulen A und Modulen B cientific Computing interfunktionstheorie'vs. Modul "Quantenchemie" proschungsprojekt A, B, C, D und E" | Sci. We | Studien- und Armeldung z Bescheinigun Armeldung z Antrag auf St Antrag auf St | Prüfungsordnung um Forschungspi g eines Forschur ur Masterarbeit udienabschluss | ninsdädlich Modulbeschnebungen ninkt opprenisiese |

| WHITEBOARD | | | | | | | | |
|---------------------|---|---|------|--|----------|---------|-----------------------|---|
| | | | | | | | | Thore Schedler |
| 19011720 | Kurs | Arbeits- und Lebenamethodik W21/22 | | Mon 18-29 | 18.10.21 | з | ABV | Lutz Prechelt |
| 19222301 + 19222302 | Vorlesung + Obung | Aufbaumodul. Applina II W2102 | | Tue 12-14 | 19.10.21 | 2+2 | Master | Marwan Benyoussef, Alexander Schmitt |
| 19205901 + 19205902 | Vorlesung + Obung | Aufbaumodul: Diskrete Geometrie III.W21/22 | | Thu 10-12 | 21.10.21 | 2+2 | Master | Florian Frick |
| 19206401 + 19206402 | Vorlesung + Obung | Aufbaurookul: Numerik IV/W2102 | | Mon 10-12 | 18.10.21 | 2 + 2 | Master | Volker John |
| 19202501 + 19202541 | Voriesung + Obung | Basismodul, Nyebra 1 W21/22 | | Mon 12-14 Wed 16-20 | 20.10.21 | 4+2 | Bachelor, Master | Klaus Almann, Karin Schaller |
| 19202101 + 19202102 | Voriesung + Übung | Basismodul: Numerik II W21/22 | | Mon 10-12 Mon 14-16 | 18.10.21 | 4+2 | Bachelor, Master | Lasse Hinrichsen-Bischaff, Raif Komhuber |
| 19206201 + 19206202 | Voriesung + Obung | Banismodul, Teostopie II W21/02 | | Tue 8-10 Wed 8-10 | 19.10.21 | 4+2 | Master | Pavle Blagojavic |
| 19000370 | Begrüßungs- und Abschlussveranstaltung | Beprüfungsveranstaltung für Studienanfänger der Informatik und Beinformatik W2122 | | | 18.10.21 | 0 | | Lutz Prechelt, Knut Reinert |
| 19203533 + 19203599 | Berufspraktikum + Verschiedenes | Bendsonahilikum, Mathematik, W21/22 | | | | 1+1 | ABV | Rupert Klein, Ralf Komhuber |
| /hite | 000 | ard/MyCampu | s (N | Fr1 14-16 64159 12 Tue 18-12 Wed 10-12 Thu 10-12 | 1.92 | 2 3+ | Phy | s./Inf. |
| 19203419 | Seminaristische Übung | Computeralgebra W21/22 | | daily 10-17 | 28.02.22 | 4 | Bachelor, Master, ABV | Andrea Petracci, |

| 19203419 | Seminaristische Übung | Computeral/pebra IN21/22 | daily 10-17 | 28.02.22 | 4 | Bachelor, Master, ABV | Andrea Petracci, Karin Schaller |
|---------------------|--|---|------------------------|----------|-------|-----------------------|--|
| 19200501 + 19200502 | Vorlesung + Obung | Computerorientierte Mathematik 115 LP1W2122 | Fri 12-14 | 22.10.21 | 2+2 | Bachelor, Master | Andreas Bittracher |
| 19202601 + 19202602 | Vorlesung + Obung | Differentiateconstrict 1 W2132 | Tue 12-14 Thu 12-14 | 19.10.21 | 4 * 2 | Bachelor, Master | Konnad Polithier |
| 19206011 | Seminar | Discrete Mathematics Masterseminar W2102 | Wed 12-14 | 20.10.21 | 2 | Master | Tibor Szabe. Olaf Parczyk |
| 19202001 + 19202002 | Voriesung + Übung | Datante. Geometric J. W2122 | Tue 10-12 Wed 10-12 | 99,93,21 | 4+2 | Bachelor, Master | Florian Frick, Christian Haase, Sophie Rehberg |
| 19234401 + 19234402 | Voriesung + Obung | Dakrete Mathematik II - Outmiesung W2102 | Tue 12-14 Wed 12-14 | 19.10.21 | 4+2 | Master | Ralf Borndörfer, Ricardo Euler |
| 19217311 | Seminar | Doktorandenseminar "Was ist elgentlich?" / "What is?" W2122 | Fri 12-14 | 22.10.21 | 2 | Master | Holger Reich |
| 19200170 | Begrüßungs- und Abschlussveranstaßung | Enführunsoveranstellung für Studienanfleger in der Mathematik W2122 | | 18.10.21 | 0 | | Alexander Schmitt, Tibor Szabo |
| 19208601 + 19208602 | Vorlesung + Obung | Extremal Combinatorios W21/22 | Tue 14-16 Thu 10-12 | 19.10.21 | 4+2 | Master | Michael Anastos, Tibor Szabo |





Programme overview: Areas

Synchronisation

Scientific Computing

Specialisation

Master's Thesis

each contributing 30 credit points! Areas may overlap!

Scientific Computing

Specialisation

Master's Thesis

Synchronisation module (15 Cps)

- Categorisation according to Bachelor's degree
- Equip students with "missing" qualifications
- Flexible offer of modules (Bachelor's courses from multiple programmes)
- Not graded, simply "passed" or "not passed"
- Some courses taught in German (e.g. "Synchronisierung Erde")

Scientific Computing

Specialisation

Master's Thesis

Synchronisation module (15 Cps)

- Categorisation according to Bachelor's degree
- Equip students with "missing" qualifications
- Flexible offer of modules (Bachelor's courses from multiple programmes)
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- Some courses taught in German (e.g. "Synchronisierung Erde")

Mandatory Module: Computational Sciences (15 Cps)

- 4 SWS lecture: theory from multiple disciplines, mathematical methods, computational aspects, ...
- 4 SWS software project: implementation, testing, optimisation of lecture-related problems
- graded

Scientific Computing

Specialisation

Master's Thesis

Categorisation of Bachelor's degrees

1. B. Sc. in Chemistry, Geographical Sciences or Geological Sciences with focus on Chemistry and Biology:

- Module: Synchronisation Mathematics (15 CP).
- 2. B. Sc. in Mathematics, Computer Science or Engineering Sciences:
- Chemistry
- Geographical Sciences
- Geological Sciences
- Meteorology
- Physics

3. B. Sc. in Physics:

- Geographical Sciences
- Geological Sciences
- Computer Sciences
- Mathematics
- Meteorology

- 4. B. Sc. in Meteorology:
- Chemistry
- Geographical Sciences
- Geological Sciences
- Computer Sciences
- Mathematics
- Physics
- 5. B. Sc. in Geological Sciences with focus on Mathematics and Physics:
- Chemistry
- Informatics
- Mathematics
- Meteorology
- Physics

Scientific Computing

Specialisation

Master's Thesis

Scientific Computing

- Statistics, Numerics, Computer Science
- Usually lecture + exercise + seminar
- One seminar may be part of multiple modules!
- A (not graded), B (graded) each contributing 15 CPs
- One module examination!

| Teaching and learning units | Contact hours (Semester hours per week = SH) | Forms of active participation | Workload (hours) | | | | |
|--------------------------------|--|---|--|-----------------------------|--|--|--|
| Lecture | 4 | - | Lecture contact hours Lecture preparation and follow-up | 60 80 | | | |
| Practice seminar | 2 | written completion of the work sheets two oral presentations, each showing the solution of one practice task in the practice seminar | S contact hours S preparation and follow-up Prac.S contact hours Prac.S preparation and | 30 60 30 60 60 | | | |
| Seminar | 2 | Preparation and presentation of a research topic | follow-up Written practice tasks Preparation for examination Examination | 70 | | | |
| Module examination | | Written examination (90 minute an electronic examination, or o or term paper (approx. 15 pag evaluated in detail. | s), which may also be carried ral examination (approx. 30 m ges); the module examination | out as inutes) is not | | | |
| Module language | | German | | | | | |
| Compulsory regular attendance | | Attendance recommended | | | | | |
| Workload, total hours | | 450 hours 15 CP | | | | | |
| Duration of module | | One or two semesters | | | | | |
| Module offered | | At least once per academic year | once per academic year | | | | |
| Applicability | | Master's program Computational Sciences | | | | | |

Scientific Computing

Specialisation

Master's Thesis



Specialisation area

Choose your area of specialisation by the start of the 2nd semester!

Scientific Computing

Specialisation

Master's Thesis

Molecular Sciences

a) Compulsory modules (10 CP):

- Module: Molecular Simulation I * (5 CP) and
- Module: Quantum Chemistry ** (5 CP).

b) Compulsory elective modules (20 CP):

- Module: Density Functional Theory ** (5 CP)
- Module: Research Project A (5 CP) or
- Module: Research Project E (10 CP)
- Module: Research Seminar computational sciences (5 CP)
- Module: Markov Modeling (5 CP)
- Module: Molecular Simulation II (5 CP)
- Module: Quantum Chemical Correlation Methods (5 CP)
- Module: Quantum Reaction Dynamics (5 CP)
- Module: Selected topics in applied computational sciences (5 CP) and/or
- Module: Selected topics in theoretical computational sciences (5 CP)

* It is advised to choose "Computational Statistical Physics A/B" in the Scientific Computing area to prepare for Molecular Simulation I

** Quantum Chemistry and Density Functional Theory can be interchanged as the compulsory module.

Scientific Computing

Specialisation

Master's Thesis

Geosciences

a) Compulsory modules * (12 CP):

- Module: Geophysics I (6 CP) and
- Module: Seismics II (6 CP).

b) Compulsory elective modules (18 CP):

- Module: Earth Dynamics (6 CP)
- Module: Research Project A (5 CP) or
- Module: Research Project C (7 CP)
- Module: Research Seminar computational sciences (5 CP)
- Module: Geophysics II (6 CP)
- Module: Selected topics in applied computational sciences (5 CP)
- Module: Selected topics in theoretical computational sciences (5 CP) and/or
- Module: Thermodynamics und Kinetics of Geological Processes (6 CP)

* Compulsory modules are not strict. Other modules are eligible. If unsure, contact Prof. Dr. Georg Kaufmann.

Scientific Computing

Specialisation

Master's Thesis

Atmospheric Sciences

a) Compulsory module (8 CP):

• Module: Weather and Climate Diagnosis (8 CP)

b) Compulsory elective modules (22 CP):

- Module: Research Project B (6 CP) or
- Module: Research Project D (9 CP)
- Module: Research Seminar computational sciences (5 CP)
- Module: Climate Variability and Climate Models (8 CP)
- Module: Models for Weather and the Environment (8 CP)
- Module: Satellite Meteorology (8 CP)
- Module: Selected topics in applied computational sciences (5 CP)
- Module: Selected topics in theoretical computational sciences (5 CP)
- Module: Theoretical Meteorology I (8 CP) and/or
- Module: Theoretical Meteorology II (8 CP)

Note: Some courses are only taught in German!

Scientific Computing

Specialisation

Master's Thesis

Research project

- A, B, C, D, E
- Varying degree of effort and credit points (5 10 CPs)
- Application of knowledge and acquired skills to a scientific (computation) problem
- Usually (but not necessarily) completed within an associated work group of the Computational Sciences Master's programme
- Hands-on work + research report + possibly seminar presentation

Scientific Computing

Specialisation

Master's Thesis

Master's thesis

- Supervised by a work group leader associated with the Computational Sciences Master's programme
- Admission requirement: Synchronisation area completed + 60 CPs acquired in total
- 30 80 pages, should be in English
- 30 min presentation
- Registration:

https://www.imp.fu-berlin.de/fbv/pruefungsbuero/Formulare/PDFs/Anmeldun g-zur-Masterarbeit-_StOPO-2016_496a.pdf

Sample programme schedule



Overlap possible, especially in the Computer Sciences area