

WBAI - Basics of Artificial Intelligence - BWWg015

ECTS	6
Study language	English
Module level additive	Foundation level
Lecturer(s)	Bennie Ross, Herath Savindu
Module responsibility	Bennie Ross, Herath Savindu
Short description of the module	In this module, students are introduced to artificial intelligence (AI) from both a technical and a human-centred sociotechnical perspective. Students learn the fundamental concepts behind AI systems, including data, machine learning (ML), natural language processing (NLP), computer vision, and generative AI, while also considering ethical, organisational, and business aspects of AI development and implementation. The course provides an overview of how AI is applied in practice with a specific focus on business applications. The course is designed as a general introduction and does not require prior coding experience or advanced mathematics.
Entry requirements	No specific requirements. The course is not heavily mathematics-based, but we recommend revising the concept of vectors and statistics.
Competencies upon completion	Upon completion of the module, students will have developed a sociotechnical understanding of AI, including the technical, business, and human factors in contexts in which they are applied. They will be familiar with core AI concepts such as data collection and processing, ML, NLP, computer vision, generative AI, AI implementation workflows as well as their domains of application. They have a conceptual understanding of the functioning of these methods, of their limits, and potential pitfalls that they present. Students will be able to evaluate AI use cases, assess their potential business value, and critically reflect on the conditions required for successful AI adoption in organisations.

WBAI - Basics of Artificial Intelligence - BWG015

Content

The module introduces key AI methods, including ML, NLP, computer vision, and generative AI, while also discussing their technical foundations, business relevance, ethical implications, and human factors. Students explore how AI is used in practice across domains with particular emphasis on business applications.

The course is designed for students without a strong coding background. Whenever possible, AI methods are explored through interactive toy models, online demos, Hugging Face tools, or Google Colab notebooks that do not require advanced programming knowledge. The course combines short lectures, article discussions, practical demonstrations, group exercises, and student presentations.

The module covers both conceptual and applied questions: What are the key technical ideas behind an AI method? What types of data are needed? How can AI be implemented in organisations? What ethical, social, and human challenges arise when AI systems are used in practice?

Examples of Covered Topics:

Overview of AI:

Students learn how the concept of AI has developed over time. The course discusses why AI has become increasingly important in the past decade, advances in data availability, computing power, and (deep) learning methods.

Introduction to Data:

Students are introduced to the role of data as the foundation of AI systems. The course covers basic definitions, types of data, data sources, data collection methods, data processing, data representation, and the importance of data quality so that AI models can use it effectively.

Theory and Machine Learning Concepts:

The course introduces the basic logic of ML, including how models learn from data and make predictions. Starting from regression and classification, students explore key concepts such as training and testing data, overfitting, model evaluation, neural networks, and deep learning.

Tools and MLOps:

Students gain an overview of practical AI tools and the workflows needed to move from model development to deployment. This includes basic ideas behind ML operations (MLOps), model monitoring, and responsible deployment processes in real-world contexts.

Human Factors of AI:

The course examines AI not only as a technical system but also as part of a wider human and organisational environment. Students discuss issues such as user trust, explainability, bias, fairness, accountability, privacy, and the risks of poorly designed AI applications. The course highlights why successful AI adoption depends on both technical performance and human-centred design.

AI Business Models:

Students explore how AI creates value in business contexts. The course discusses AI-enabled products, services, platforms, automation, decision support, personalisation, and data-driven business models. Students also examine how companies can identify viable AI use cases and what challenges arise.

Natural Language Processing:

Students are introduced to AI methods for working with language, including text classification, translation, summarisation, chatbots, and information retrieval. The course explains key ideas such as tokens, embeddings, and language representations.

Computer Vision:

Students learn about essential building blocks such as image data, convolutional layers, object detection, and image classification, while exploring practical applications in areas such as healthcare, manufacturing, mobility, and retail.

Generative AI:

The course introduces recent developments in generative AI, including large language models, image generation, and multimodal systems. Students learn the key ideas behind tools such as ChatGPT, including embeddings, attention, prompting, and the opportunities and limitations of generative AI in practice.

Module type

Compulsory module

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Teaching and learning methods	The course is a mix of presentations by the lecturers, applied demonstrations, interactive exploration, and article discussions.
Literature	As the range of topics covered during the course is wide, there is no single book or resource recommended. Presentation slides as well as articles read for the course are provided on Moodle. Mandatory and optional reading materials will be stated on the presentation slides.
Workload	180 hours
Contact lessons	4 lessons every week
Attendance requirement	Attendance to Module Weeks 10 (=Calendar Week 47) and 13 (=Calendar Week 50) is compulsory due to continuous assessment components happening in these 2 weeks.
Competency assessment	Week 10: Poster presentation and Q&A in class, 25% Week 13: Creation and Presentation of an ML Canvas in groups (3-4 members), 25% Official examination weeks: 90 minutes digital (PC) exam, 50%
Aids for written examination	Open book Dictionary (mother tongue <-> English) BFH pocket calculator
Mode of repetition	Repetition possible in the following semester
Degree programme, semester	BSc Digital Business & AI, 2026-2027, 1 HS, VZ, Bern

WBWL - Grundlagen BWL - BWWg008

ECTS	6
Unterrichtssprache	Deutsch
Modulniveau Zusatz	Grundstudium
Dozierende	Murmann Martin, Vogel Claudia
Modulverantwortung	Claudia Vogel
Kurzbeschreibung des Moduls	Das Modul "Grundlagen BWL" erlaubt es den Studierenden, einen grundlegenden Überblick über relevante Themenstellungen der Betriebswirtschaftslehre zu erlangen. Geleitet durch das St. Galler Managementmodell lernen Studierende grundlegende betriebswirtschaftliche Abläufe und Prinzipien, Ziele und Arten von Unternehmen, das Unternehmen im Kontext seiner Umwelt, Unternehmensstrategie und -struktur, entrepreneurship und Innovation, Managementkonzepte sowie vielseitigen Business- und Supportprozesse kennen.
Eingangskompetenz	-
Kompetenz	• Fachkompetenz: Die Studierenden sind in der Lage, die wichtigsten Fachbegriffe zu definieren, Konzepte zu erläutern, Zusammenhänge zu beschreiben und auf konkrete Fallbeispiele anzuwenden. • Unternehmertum: Die Studierenden können die wichtigsten Aspekte von Unternehmertum beschreiben und erklären. • Reflexion und kritisches Denken: Die Studierenden sind in der Lage praktische Situationen zu analysieren, theoretisches Wissen auf konkrete Fälle anzuwenden und theoretisches Wissen kritisch zu hinterfragen.
Inhalt	Geleitet durch das St. Galler Management Modell werden die folgenden Inhalte diskutiert: • Grundlagen • Unternehmensumwelt • Strategie, Struktur, Kultur • Einführung Unternehmensorganisation • Entrepreneurship • Management • Business- und Supportprozesse
Lehr- und Lernmethode	Das Modul besteht zu 50% aus Input (asynchron online) und zu 50% Klassenunterricht mit Diskussion von Praxisfällen und Übungen.
Fachliteratur	Capaul, Roman & Steingruber, Daniel (2020): Betriebswirtschaft verstehen- Das St. Galler Management Modell, Schweizer Ausgabe 4. Auflage, Berlin: Cornelsen.
Workload	6 ECTS

WBWL - Grundlagen BWL - BWWg008

Kontaktstudium	Pro Woche 90 Minuten Vorlesung (asynchron online) und 90 Minuten Diskussion von Praxisfällen und Übungen in Klassen.
Präsenzplicht	Keine, Anwesenheit in der ersten Woche wird dringend empfohlen
Kompetenznachweis	• Schriftliche Prüfung, online (bring your own device), 90 Min., am Ende des Semesters in den offiziellen Prüfungswochen (100%) • 20% der schriftlichen Prüfung können durch Teilnahme an der Global Entrepreneurship Woche ersetzt werden (Gruppenarbeit mit kollektiver Bewertung). Weitere Details folgen zu Beginn des Semesters.
Hilfsmittel bei schriftlicher Prüfung	Wörterbuch Sprache Kompetenznachweis - Muttersprache BFH - Taschenrechner ZGB / OR ohne Kommentare
Studiengang, Semester	BSc Digital Business & AI, 2026-2027, 3 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 1 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 1 HS, VZ, Bern BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern

WENG - English - BWWg002

ECTS	6
Study language	English
Module level additive	Foundation level
Lecturer(s)	Bennie Ross, Bürki Jacqueline
Module responsibility	Bennie Ross, Bürki Jacqueline
Short description of the module	This module aims to: - to develop your oral Business English language skills as well as your research skills - to expand on your business vocabulary - to develop an understanding of how to work with people from different cultural backgrounds
Entry requirements	- Vocational baccalaureate diploma - CEFR B2+ level of English
Competencies upon completion	Students - can reflect on and develop their intercultural competence development - can discuss and present theoretical foundations and practical applications from the field of culture and business topics applicable in a corporate environment. - can conduct academic research and develop an annotated bibliography - can give effective mini and longer presentations in English (structure, business vocabulary, signposts, etc) - can work efficiently and effectively in groups.
Content	This course will introduce a variety of themes from today's business working environment such as: understanding the role of culture, communicating across cultures, businesses expanding abroad, expansion strategy, looking at the 'environmental' factors, managing projects, and motivating and leading people. Skills: - preparing and developing an annotated bibliography - preparing and participating in a longer presentation - undertaking reflective writing tasks - reading and understanding business case studies Vocabulary building, grammar revision, presentations skills. Reflective writing skills will be introduced and practised.

WENG - English - BWG002

Teaching and learning methods

The course exercises all six levels of Bloom's taxonomy; for example:

- identify and recall business English vocabulary
- rewrite and paraphrase vocabulary in required course literature exercises
- activate and apply learned vocabulary in discussion, use it to solve problems, and give presentations
- compare and contrast different business approaches
- set up talking points for informal presentations

Time proportions (6 ECTS, 180 hours):

- 30% contact lessons
- 35% research and annotated bibliography
- 10% guided self study tasks
- 15% vocabulary development
- 10% presentation preparation

Literature

Course material will be found on Moodle.

Mandatory coursebook:

Bill Mascull (2017) Business Vocabulary in Use Advanced, Third Edition (with answers) Cambridge University Press, ISBN 978-1-316-62823-2

OR

print and ebook version for Android & iOS tablet users: Bill Mascull (2017) Business Vocabulary in Use Advanced, Third Edition (with answers & enhanced ebook, including audio) Cambridge University Press, ISBN 978-1-316-62822-5

Workload

180 hours (6 ECTS points)

Contact lessons

14 x 180-minute weekly classes; attendance optional, apart from:

- first week of semester
- two Moodle-based vocabulary tests (see **Attendance requirement**)
- pre-presentation coaching (see **Attendance requirement**)
- final presentation (see **Attendance requirement**)

WENG - English - BWWg002

Attendance requirement

- first class in **second** week of semester CW39
- two Moodle-based vocabulary tests (see timetable: CW42 & 46)
- pre-presentation coaching (see timetable: CW47)
- final presentation (see timetable: CW49/50)

Any organised excursions/guest lectures (as per course timetable) as well as for all assessments and the final presentations.

Absences covered under Art. 22 of the "Rahmenreglement für Kompetenznachweise an der Berner Fachhochschule (KNR)" e.g. military, accidents, illness, funerals, etc. will be exempted from this ruling. However, you must give proof of the validity of your absence (doctor's certificate, military orders etc.) to your lecturer in the first class after the absence. Note that absences related to work or problems with transport are not covered by this article.

Competency assessment

1. Annotated bibliography of presentation sources, mid-term, submitted a few weeks in advance of the presentation (see below). If this document is not completed to the satisfaction of the lecturer, the group will not be permitted to make its presentation (CW46).
2. One 25-30-minute group presentation, based on research, **integrating** cultural aspects, business topics, and presentation language (**70%** group/individual grade). In class time, towards the end of the semester (CW49/50). **To complete the module successfully, a student must achieve a grade of at least 4 for the presentation.**
3. Two 20-minute Moodle vocabulary tests (multiple-choice cloze) in class time (CW42 & 46) during the semester (2 x 15% = **30%**, individual grade).

Evaluation matrix and criteria will be available to students; assessment criteria will be discussed in class.

Aids for written examination

- No aids of any kind allowed for the vocabulary tests.
- Lernstick & Campla must be used.

Mode of repetition

- Repeat students may only repeat the presentation if they previously received a grade < 4 for it.
- Repeat students may only repeat **both** vocabulary tests if they previously received a combined grade < 4.
- Repeat students who scored < 4 for the two vocabulary tests together may: a) transfer both previous vocabulary test grades, or b) retake both vocabulary tests. Partial transfer of a single score or retaking a single test is not possible.

All of these restrictions are only possible if there is no change to the module description and the assessment format.

Follow-up modules

As the course is offered in English and is designed to foster active student engagement, it should provide students with the confidence to actively engage in further modules taught in English. The course also lays the basis for further intercultural competency development in Foundation Level modules and Advanced levels.

English language communication skills, presentation skills, academic research skills, and cultural awareness sensitivity can also be transferred to further modules.

Specialised and method modules:

YEEP summer school, which is conducted in English allows students to further develop their intercultural competency and apply the insight gained in this module.

Students interested in doing an exchange semester or doing a double degree program will benefit from this course.

Degree programme, semester

BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 1 HS, VZ, Bern

WGDB - Grundlagen Digital Business & AI - BWWg012

ECTS	6
Unterrichtssprache	Deutsch
Modulniveau Zusatz	Grundstudium
Dozierende	Fankhauser Lukas, Jarchow Thomas, Jud Reto, Raff-Heinen Stefan
Modulverantwortung	Reto Jud
Kurzbeschreibung des Moduls	Ausgehend vom persönlichen Umgang mit digitalen Hilfsmitteln bzw. dem persönlichen Informationsmanagement führt das Modul in die zentralen Begriffe und Konzepte von Digitalisierung und digitaler Wirtschaft ein. Die wichtigsten Themenbereiche sind: • Digitalisierung • Digitale Infrastrukturen (u.a. Hardware, Netzwerke, Betriebssysteme, Internet, Cloud) • Digitale Geschäftsmodelle • Persönlichkeits- und Datenschutz Diese Fachinhalte werden ergänzt um die Methoden des wissenschaftlichen Arbeitens.
Eingangskompetenz	Fachkompetenzen: • Kompetenzen der Berufsmaturität der Typen «Technik, Architektur, Life Sciences» oder «Wirtschaft und Dienstleistungen» Kompetenzen gemäss Kompetenzmodell BFH-W: • Kompetenzen der Berufsmaturität der Typen «Technik, Architektur, Life Sciences» oder «Wirtschaft und Dienstleistungen»

WGDB - Grundlagen Digital Business & AI - BWG012

Kompetenz

Fachkompetenzen: Die Studierenden können ...

- die Auswirkungen von Digitalisierung, Vernetzung, Mobilität und Miniaturisierung auf das Privatleben, die Gesellschaft und den Beruf reflektieren.
- das Zusammenspiel von Menschen und Maschinen in der Informationsverarbeitung beschreiben.
- politische und gesellschaftliche Herausforderungen der Digitalisierung nennen und begründen.
- digitale Basis-Infrastrukturen analysieren und Sie einem Laienpublikum erklären.
- digitale Geschäftsmodelle analysieren und bewerten sowie einfache digitale Geschäftsmodelle entwerfen.
- anhand zu bearbeitender Literatur ihre Kenntnisse im Thema wissenschaftliches Arbeiten umsetzen
- die wesentlichen Kriterien wissenschaftlichen Arbeitens nennen und in ihren Arbeiten in Studium und Beruf anwenden
- Aufbau und Gestaltung wirtschaftswissenschaftlicher Arbeiten nennen und beurteilen
- die rechtlichen Rahmenbedingungen von Persönlichkeits- und Datenschutz erläutern und konkrete Situationen analysieren.

Kompetenzen gemäss Kompetenzmodell BFH-W

Problem Solving/Design Thinking (verwandt: Methodenkompetenz): Die Studierenden...

- erkennen, dass wissenschaftlich formale Methoden und methodisches stringentes Denken zentrale Inhalte ihres Studiums sind.
- wenden praxisrelevante und wissenschaftliche Methoden und Tools an.
- können Sachverhalte intersubjektiv nachvollziehbar darstellen, begründen und kommunizieren.
- wenden elektronische und nicht-elektronische Informationsmittel zielgerichtet an.
- können fachspezifische wissenschaftliche und nichtwissenschaftliche Quellen recherchieren, einordnen und in die eigene Argumentation einbinden sowie die Wissenschaftlichkeit von Quellen beurteilen.
- können korrekt bibliografieren und zitieren.
- können einfache wissenschaftliche Arbeiten nach wissenschaftlichen Standards verfassen (planen, aufbauen und gestalten).

Kollaboration (verwandt: Sozialkompetenzen): Die Studierenden ...

- erleben und reflektieren die Voraussetzungen für erfolgreiche, effiziente und effektive Zusammenarbeit.
- bringen ihre persönlichen Ressourcen in Teams ein.

Selbstmanagement (verwandt: Selbstkompetenzen): Die Studierenden ...

- lernen mit Autonomie und Selbstorganisation umgehen.
- lernen und arbeiten selbstständig, erkennen Kenntnislücken frühzeitig und füllen diese selbstständig.
- können ihre Denk- und Arbeitsprozesse kritisch hinterfragen und mögliche Handlungsoptionen entwickeln.
- entwickeln realistische Selbst- und Zeiteinschätzungen.

Umgang mit Komplexität: Die Studierenden ...

- reflektieren die Komplexität von Digitalisierung im Spannungsfeld von persönlichen, beruflichen und gesellschaftlichen Interessen.

WGDB - Grundlagen Digital Business & AI - BWWg012

Inhalt

In diesem Grundlagenmodul werden sowohl **Fachinhalte im Bereich Digital Business & AI** wie auch die **Methoden des wissenschaftlichen Arbeitens** vermittelt.

In einem **ersten Teil** wird ausgegangen von der persönlichen Erfahrung der Studierenden und dem persönlichen Umgang mit Digitalisierung. Darauf aufbauend wird die Bedeutung von Digitalisierung für Organisatoren / Unternehmen reflektiert.

In einem **zweiten Teil** wird die Basisinfrastruktur des digitalen Zeitalters behandelt, immer mit Bezug auf die Auswirkungen auf Privatpersonen und Unternehmen: von Hardware, Betriebssystemen, Anwendungsprogrammen, Netzwerken und Internet bis hin zu Cloud-Plattformen und Everything-as-a-Service-Konzepten. Am Ende des zweiten Teils werden digitale Geschäftsmodelle thematisiert, was eine Überleitung zu späteren Modulen wie «Digital Enterprise» bietet.

Ein **dritter Teil** sensibilisiert für den Persönlichkeits- und Datenschutz und vermittelt die berufsrelevanten Kenntnisse.

Die Fachinhalte werden begleitet durch **Veranstaltungen zum wissenschaftlichen Arbeiten**. Diese geben den Studierenden eine Toolbox, bzw. einen Werkzeugkoffer an die Hand, um im weiteren Studium methodenbasiert zu arbeiten.

Lehr- und Lernmethode

Präsenzstudium: Wissenerarbeitung, Lehrgespräch, Übungen, Coachings, Vorträge

Selbststudium: Gruppenarbeit

Fachliteratur

Pflichtlektüre

- Entsprechende Quellen werden während des Semesters zur Verfügung gestellt.

Basisliteratur

- Balzert H., Schröder M., Schäfer Ch., 2011. Wissenschaftliches Arbeiten, 2. Auflage, Berlin, Heidelberg: Springer. ISBN 978-3-86834-034-1 (wird als PDF zur Verfügung gestellt).

Workload

180 Stunden

Kontaktstudium

14 Blöcke à 4 Lektionen

Präsenzpflicht

keine

Kompetenznachweis

Teil 1: Gruppenarbeit mit individuellen Teilen (30%)
während des Semesters

Teil 2: Schlussprüfung Einzelbewertung (70%)
Digitale Prüfung mit Lernstick, 60 Minuten in den offiziellen Prüfungswochen

Hilfsmittel bei schriftlicher Prüfung

- Moodle-Test vor Ort (mit Lernstick)
- Studierende können in der Prüfung auf eigene Unterlagen zugreifen, aber nicht auf das Internet
- gedrucktes Wörterbuch Sprache Kompetenznachweis - Muttersprache
- Taschenrechner

WGDB - Grundlagen Digital Business & AI - BWWg012

Weiterführende, vertiefende Module	Digital Enterprise
Studiengang, Semester	BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern BSc Digital Business & AI, 2026-2027, 1 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 3 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 1 HS, VZ, Bern BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern

WSDV - Software Development - BWG014

ECTS	6
Unterrichtssprache	Deutsch
Modulniveau Zusatz	Grundstudium
Dozierende	Gygli Marcel, Haller Stephan, Minder Matthias, Studer Linda
Modulverantwortung	Marcel Gygli, Stephan Haller
Kurzbeschreibung des Moduls	Im Modul WSDV erlernen die Studierenden die Grundlagen der Programmierung sowie von Datenbanken. Die Grundlagen von Algorithmen und objektorientierter Programmierung werden mit Hilfe der Sprache Python eingeführt. Im Hinblick auf spätere Anwendungen in Data Science und Software Engineering wird das Schreiben von Skripten und Programmen geübt. Parallel dazu wird der Aufbau relationaler (SQL) und NoSQL-Datenbanksysteme, der Entwurf von Datenmodellen, grundlegende SQL-Konzepte und die Implementierung von Datenbanken behandelt. Gegen Ende des Semesters können die Studierenden das Erlernte kombinieren zur praktischen Realisierung einer konkreten Softwareanwendung bestehend aus Businesslogik sowie Datenbank, also den unteren beiden Schichten einer 3-Schichten-Architektur von Anwendungssystemen.
Eingangskompetenz	keine
Kompetenz	Fachkompetenzen: Die Studierenden können Python als Taschenrechner verwenden ... einfache Skripte in Python erstellen. ... Kontrollstrukturen und Datentypen erläutern. ... Funktionen und Module anwenden. ... Fehler und Ausnahmen behandeln. ... die Grundbegriffe der objektorientierten Programmierung erläutern. ... die Unterschiede zwischen verschiedenen Arten von Datenbanken erklären. ... eine relationale Datenbank erstellen und mit Daten befüllen, sowie einfache und komplexe Abfragen (Queries) ausführen. ... grundlegende Aspekte des Managements eines relationalen Datenbanksystems erklären. ... eine geeignete NoSQL-Datenbank für bestimmte Big-Data-Anwendungen auswählen. Methodenkompetenzen: Die Studierenden können die Bedeutung von Modellierung in der Softwareentwicklung erklären. ... ein relationales Modell (3NF) für die Speicherung von Daten entwickeln und in einem Entity-Relationship-Diagramm (ERD) darstellen. ... weiterführende Programmiertechniken anwenden und einfache Datenbankanwendungen in Python schreiben Selbstkompetenzen: Die Studierenden sind fähig, ihren Lernprozess selber zu gestalten und zu reflektieren.

WSDV - Software Development - BWWg014

Inhalt

Das Modul ist praxisorientiert ausgerichtet. Nach einer Einführung in die grundlegenden Begriffe der Programmierung und von Datenbanken, werden die beiden Themen separat unterrichtet, mit mehreren Synchronisationspunkten während und am Ende des Semesters.

Behandelte Themen in Bezug auf Programmierung:

- Grundlagen Python
- Bedingungen, Schleifen
- Definition eigener Funktionen
- Fehlerbehandlungen
- Datentypen
- Arrays, Listen
- Objektorientierte Programmierung

Behandelte Themen in Bezug auf Datenbanken:

- Aufbau Relationaler Datenbanksysteme
- Entwurf von relationalen Datenmodellen mittels Entity-Relationship-Diagrammen (ERD)
- Implementierung von relationalen Datenbanken mit SQL - Einfügen, ändern, löschen und abfragen von Daten
- Verwaltung eines (relationalen) Datenbanksystems
- Neuere Datenbankenmodelle (NoSQL) für Big-Data-Anwendungen

Lehr- und Lernmethode

- Frontalunterricht mit vielen Übungen
- Kurztests
- Selbststudium zum Einüben des Gelernten

Fachliteratur

- Studer, Thomas (2019). Relationale Datenbanken - Von den theoretischen Grundlagen zu Anwendungen mit PostgreSQL. 2. Auflage, Springer Vieweg. <https://doi.org/10.1007/978-3-662-58976-2>
- Kaufmann, Michael & Meier, Andreas (2023). SQL- & NoSQL-Datenbanken. 9. erweiterte und aktualisierte Auflage, Springer. <https://doi.org/10.1007/978-3-662-67092-7>
- Theis, Thomas (2024). Einstieg in Python - Ideal für Programmierneinsteiger. 8., aktualisierte Auflage, Rheinwerk Computing. ISBN 978-3-367-10123-8

Workload

180 h

Kontaktstudium

14*4 Lektionen=56 Lektionen

Präsenzpflcht

keine

Kompetenznachweis

Erfahrungsnote (40%)

4 Kurztests während des Semesters mit Lernstick

Aus den besten 3 Ergebnissen wird der Durchschnitt ermittelt

Die Kurztests finden zu Beginn des Unterrichts in folgenden Kalenderwochen statt: 42, 45, 48, 50 (Semesterwochen 5, 8, 11, 13).

Klausur (60%)

90 Minuten mit Lernstick, in den offiziellen Prüfungswochen Ende Semester

WSDV - Software Development - BWG014

Hilfsmittel bei schriftlicher Prüfung

Prüfungen und Kurztests werden mit **Lernstick** in der virtuellen **CAMPLA**-Umgebung durchgeführt:

- Bestimmte Webseiten sind zugänglich. Die Liste der zugänglichen Webseiten wird auf Moodle publiziert.
- Ausserdem können eigene Unterlagen als .pdf auf CAMPLA hochgeladen werden.
- Eine Einführung in CAMPLA erfolgt am Anfang des Semesters

Unterlagen auf **Papier unbeschränkt**.

Wiederholungsmodalitäten

Die Noten von genügenden Teilkompetenznachweisen können übernommen werden.

Weiterführende, vertiefende Module

- WSEG - Software Engineering
- WPR2 - Projekt 2
- Diverse Vertiefungsvorlesungen, die Kenntnisse in Programmierung, Datenbanken und Softwareentwicklung voraussetzen

Studiengang, Semester

BSc Digital Business & AI, 2026-2027, 1 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 1 HS, TZ, Bern

WBTH - Bachelor-Thesis - BWWh993

ECTS	15
Study language	German
Module level additive	Advanced level
Lecturer(s)	Bieser Jan
Module responsibility	Prof. Dr. Jan Bieser
Short description of the module	The students prove that they can handle an application-oriented project from the private or public sector, also in connection with other fields (interdisciplinarity), in the form of a bachelor thesis (BT) according to scientific requirements (technical, methodical, and formal) in the given time. The BT expresses the acquired scientific and methodological competencies at the Bachelor's level.
Entry requirements	The prerequisite for the bachelor's thesis is that all compulsory modules of the core and main studies have been successfully completed.

WBTH - Bachelor-Thesis - BWWh993

Competencies upon completion

Professional and Action Skills

The students

- can independently write a bachelor thesis
- independently solve a complex problem or research question within a given time frame
- apply scientifically based knowledge to the problem
- are able to work on a problem in a scientifically and methodologically correct way
- are able to understand and critically evaluate theories and models related to their field of study
- are able to understand theoretical and empirical contributions to subject-related questions and to point out their limitations
- are able to present the findings in a comprehensible written form
- reflect on problems and results from the chosen subject area in a way that goes beyond the level of common secondary literature
- draw conclusions from the results for solving similar problems

Problem-Solving/Confronting Complexity

The students are able to

- deal with a problem in a scientifically/methodologically correct way, choose the appropriate method(s), and apply them
- independently conduct literature research on the chosen topic and, if necessary, collect their own data and evaluate them in a scientifically correct manner
- formulate the question, the procedure, and the results in a linguistically correct way. In addition, it is important to present the conclusions drawn from the work orally and to comment on the questions in a well-founded manner

Collaboration

The students are able to

- realize the thesis as a group work process if necessary and respond appropriately to the demands of different stakeholders (co-author, reviewer, client/topic sponsor)
- give critical-constructive feedback to fellow students in the colloquia and receive feedback from the main supervisors and fellow students and use this feedback to optimize their own work

Self-management

The students are able to

- identify the needs and expectations of key stakeholders
- plan a written work considering the various requirements and complete it in time
- prioritize the sub-goals of their work
- organize their work independently. In particular, they set milestones for themselves, continuously check that they are being met, and, if necessary, adjust their planning so that they achieve the prioritized goals. They also plan the resources (own resources, if necessary resources of third parties, financial and material resources)
- show stress resistance, frustration tolerance, perseverance
- draw conclusions from their experiences for their future problem-solving strategy and record them
- present their thesis
- defend their technical and methodological results as well as their findings in discussion

Content

The students work independently on a self-chosen or given problem. They formulate the background and problem in a comprehensible way, conduct an in-depth analysis of the situation, and derive recommendations from it. In doing so, they apply the knowledge and methodological skills acquired during their studies and independently acquire further specialized knowledge. The bachelor thesis is written comprehensibly, stylistically, formally, and orthographically correct.

WBTH - Bachelor-Thesis - BWWh993

Teaching and learning methods

- Lectures (kickoff)
- Coachings
- Colloquia incl. presentations and discussions
- Workshops
- Final presentation and defense
- Self-study

Literature

For essential literature for the proof of competence refer to the documents on Moodle resp. your supervisor's recommendations.

Workload

450 hours

Contact lessons

17 hours

- 1 kickoff - 2 hours
- coaching sessions - appr. 2 hours
- 4 workshops - 2 hours each (participation in 3 out of 4 workshops is mandatory)
- 2 colloquia - 2 hours each
- 1 final presentation and defense of the bachelor thesis - 1 hour

Attendance requirement

- Participation in 3 out of 4 workshops (on-site) is mandatory (workshop 1 and 4 are mandatory, and one of workshop 2 and 3 is mandatory; dates see study schedule)
- Participation in the two colloquia is mandatory (online; dates, see study schedule)
- The final presentation and defense is mandatory (on-site; will be scheduled during oral examination week)
- Coaching sessions with supervisors (on-site or online) will be aligned bilaterally

Failure to attend workshops and colloquia may lead to assigned compensation tasks, ensuring alignment with the intended learning objectives. Non-participation or insufficient completion of any assignments will be taken into account in the module evaluation.

Competency assessment

Written work: 70 % Oral presentation and defense: 30%

Date: end of semester (see schedule on Moodle)

Aids for written examination

Guidelines and templates for written assignments will be provided on Moodle.

Mode of repetition

If the written work is assessed with a 3.5, the assessors may provide for the possibility of rectification within 20 working days. After that, a maximum grade of 4 can be achieved. If the presentation is not passed, it is possible to repeat the presentation once after re-application.

In case of an insufficient BT evaluation, the module can be repeated one time. A new topic entry can be made. Upon topic resubmission, students will receive a personalized schedule from the module supervisor. The process is the same (time, procedure) as for the first attempt, but can be completed more quickly.

Degree programme, semester

BSc Business Information Technology, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern
BSc Business Information Technology, 2026-2027, 5 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern



Berner Fachhochschule
Haute école spécialisée bernoise
Bern University of Applied Sciences

WBTH - Bachelor-Thesis - BWWh993

WPR2 - Projekt 2 - BWWh004

ECTS	6
Unterrichtssprache	Deutsch
Modulniveau Zusatz	Hauptstudium
Dozierende	Haller Stephan, Noppeney Claus
Modulverantwortung	Haller Stephan; Noppeney Claus

Kurzbeschreibung des Moduls	Im Zentrum des Moduls steht die Nutzung agiler Methoden für das Entwickeln eines innovativen Produkts. Teams von Studierenden analysieren und bearbeiten eine relevante Challenge innerhalb einer Dachthematik, entwickeln selbständige Lösungswege und erstellen eine vorzeigbare Lösung in Form eines Produktes (z. B. Unternehmensidee, Kampagne, Dienstleistung mit Artefakten, Vision Video, Podcast, App/Prototyp etc.). Innerhalb vorgegebener Leitplanken erarbeiten die Teams mit agiler Vorgehensweise in mehreren Sprints iterativ ihre Lösung. Dabei nutzen sie selbständig Kompetenzen aus den früheren Semestern. Begleitend steht jedem Team ein Coach zur Seite, dessen Rolle beratend während des Semesters und bewertend am Semesterende ist. Am Projektende steht ein Produkt, dessen technische und betriebsökonomische Funktionalität hergeleitet und begründet dargestellt wird und in einem Pitch professionell verteidigt wird. Als Besonderheit in diesem Modul werden gemischte Teams gebildet, in denen jeweils BScDigi- und BBA-Studierende zusammenarbeiten.
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Eingangskompetenz	Für BSc BA: • Accounting, Finance, Tax • Führung, Personal, Organisation • Strategie, Innovation, Unternehmertum • Wirtschaft und Gesellschaft, Public Management • Academic & Business Skills • Marketing (insb. Marketing-Instrumente) Für BSc Digi: • Grundlagen WI (insb. quellengestütztes Arbeiten) • Grundlagen BWL • Requirements Engineering • Datenbanken & Programmierung • Kommunikation (insb. Präsentationstechniken) • Digital Enterprise (insbesondere Geschäftsmodelle) • Projekt 1 (Projektmanagement Grundlagen, SCRUM)
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Kompetenz	• Agiles Denken & Arbeiten in einer frühen Phase des Innovationszyklus • Problemorientiertes & selbständiges & Nutzen von im Studium erlernten Konzepten und Werkzeugen • Selbständiges Entwickeln einer geeigneten Lösung für eine Challenge innerhalb eines Rahmenthemas • Selbständiges Erarbeiten von Evidenzen • Interdisziplinäres Arbeiten • Effektive Zusammenarbeit in einem Team
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Inhalt	Im Zentrum des Moduls stehen Methoden für Innovation und Produktentwicklung (Agilität; Design Thinking; Problemlösung; Kreativitätstechniken). Diese Methoden werden in Gruppenarbeiten auf interdisziplinäre Fragestellungen unter einem gemeinsamen Dachthema von den Studierenden ergebnisorientiert für die Herleitung und Entwicklung eines Produkts genutzt. Das Dachthema hat Bezüge zu BBA und BScDigi und gibt den Rahmen für die Gruppenarbeiten vor. Innerhalb des Dachthemas bearbeiten die Studierenden eine selbstgewählte Fragestellung, die die Integration der Inhalte aus verschiedenen Modulen des Grundstudiums erfordert.
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WPR2 - Projekt 2 - BWWh004

Lehr- und Lernmethode

Hauptsächlich angeleitetes und im Rahmen von Coachings begleitete agile Projektarbeit und Selbststudium in nach Möglichkeit selbstgewählten interdisziplinären Gruppen. Einige wenige Präsenzveranstaltungen (Unconference, Pitching Event, sowie fachliche Input-Workshops). In den Input-Workshops werden Themen, Tools und Konzepte eingeführt, die die Studierenden in ihrer Projektarbeit unterstützen.

Coaching-Sessions im Rahmen von Sprint-Reviews und bei Bedarf.

Fachliteratur

Brauchlin E (1994) Problemlösungs- und Entscheidungsmethodik. 4., vollständig überarbeitete Auflage. Bern/Stuttgart: Haupt.

Dubs R, Euler D, Rüegg-Stürm J, et al. (eds) (2009) Einführung in die Managementlehre. Bern: Haupt.

Kuster, J; Bachmann, C; Huber, E; Hubmann, M; Lippmann, R; Schneider, E et al. (2022) Handbuch Projektmanagement. 5. Auflage. Springer Berlin Heidelberg.

Lewrick, M. (with Link, P., Leifer, L., & Langensand, N.). (2018). Das Design Thinking Playbook: Mit traditionellen, aktuellen und zukünftigen Erfolgsfaktoren (2nd ed). Franz Vahlen.

Osterwalder, A., & Pigneur, Y. (2013). Business model generation: A handbook for visionaries, game changers, and challengers. Wiley&Sons.

Preußig, J (2018) Agiles Projektmanagement. Scrum, User Stories, Task Boards & Co. 2. Auflage. Freiburg: Haufe (Haufe TaschenGuide, 270). Available online at <https://www.haufe.de/>.

Workload

180 Stunden

Kontaktstudium

Semesterwoche SW 1 (KW 38, Mo & Di): Kick-off und Unconference (vor Ort)

SW 14 (KW 51, Mo & Di): Pitching Challenges (vor Ort)

SW 2, 4, 6, 9, 12 (KW 39, 41, 43, 46, 49): Coachings (empfohlen vor Ort)

SW 3, 5, 10 (KW 40, 42, 47): Input Workshops (vor Ort).

Details s. Terminplan auf Moodle.

Präsenzpflicht

Semesterwoche SW1 (Mo & Di): Kick-off und Unconference (vor Ort)
SW 14: Pitching Challenges (vor Ort)

SW 2, 4, 6, 9, 12: Coachings (empfohlen vor Ort)

Die Teilnahme an den 3 Input-Workshop (vor Ort) wird sehr empfohlen (SW 3, SW 5, SW 10).

Die Erfüllung der Präsenzpflicht ist Voraussetzung zur Zulassung zum Kompetenznachweis. Bei einer Nichtzulassung wird der Kompetenznachweis nicht bewertet und das Modul ist bei der nächsten Durchführung nachzuholen (vgl. Artikel 9 Rahmenreglement über das Studium an der Berner Fachhochschule).

Die Abwesenheit beim Kick-off, der Unconference sowie den Pitching Challenges kann leider nicht kompensiert werden, so dass die Präsenzpflicht nicht erfüllt werden kann.

WPR2 - Projekt 2 - BWWh004

Kompetenznachweis

Für jedes Team wird eine Gruppennote vergeben:

- 50%: Produkt (basierend auf Produktbericht, Artefakten und Showroom-Beitrag)
- 35%: Gruppenjourney (Methodische Agile Arbeit etc.)
- 15%: Pitching

Beschreibung der Teilnoten s. Bewertungsraster in den Kick-off-Folien.

Auf Basis des Peer Grading erfolgt eine individuelle Bewertung jedes Gruppenmitglieds, woraus eine individuelle Modulnote berechnet wird, die von der Gruppennote nach oben oder unten abweichen kann (Details s. Kickoff Präsentation).

Weiterhin kann in begründeten Fällen, z.B. bei offensichtlich ungenügender Leistung oder mangelhaftem Einsatz Einzelner eine ungenügende Individualnote vergeben werden.

Hilfsmittel bei schriftlicher Prüfung

n.a.

Wiederholungsmodalitäten

Im Falle ungenügender Note muss das Modul wiederholt werden.

Studiengang, Semester

BSc Wirtschaftsinformatik, 2026-2027, 5 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern
BSc Wirtschaftsinformatik, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern

WPRO - Prozessmanagement - BWWh002

ECTS	6
Unterrichtssprache	Deutsch
Modulniveau Zusatz	Hauptstudium
Dozierende	Wambsganss Thiemo, Wettstein Léane Marie Klara
Modulverantwortung	Prof. Dr. Thiemo Wambsganss, Léane Wettstein, Katja Pott
Kurzbeschreibung des Moduls	Die Grundlagen der Prozessorientierung von Unternehmen werden erläutert und diskutiert. Vorgehensweisen zur Modellierung und Optimierung von Geschäftsprozessen werden eingeführt. In einer Semesterarbeit werden diese Vorgehensweisen in einem Unternehmen praktisch angewandt.
Eingangskompetenz	Fachkompetenzen: Kompetenzen der Berufsmaturität der Typen «Technik, Architektur, Life Sciences» oder «Wirtschaft und Dienstleistungen»
Kompetenz	Fachkompetenzen: Die Studierenden können... - Grundbegriffe und Herausforderungen des Prozessmanagements erklären. - Geschäftsprozesse eines Unternehmens identifizieren. - Geschäftsprozesse erheben und beschreiben. - Verfahren zur Optimierung von Geschäftsprozessen (Business Process Reengineering, Kaizen, Six Sigma) erläutern. - Prozesse mit BPMN 2.0 modellieren. - Workflowmanagementsysteme beschreiben. - Verfahren des Process Monitoring, des Process Mining und der Robotic Process Automation erläutern. Kompetenzen gemäss Kompetenzmodell BFH-W Problemsolving (verwandt: Methodenkompetenz): Die Studierenden... - erkennen, dass im Prozessmanagement eine Kombination von aus kreativ-spielerischem und logisch-stringentem Vorgehen nötig ist. Kollaboration (verwandt: Sozialkompetenzen): Die Studierenden... - erleben und reflektieren die Voraussetzungen für eine erfolgreiche, effiziente und effektive Zusammenarbeit. - bringen ihre persönlichen Ressourcen in Teams ein. Selbstmanagement (verwandt: Selbstkompetenzen): Die Studierenden... - lernen mit Autonomie und Selbstorganisation umgehen. - lernen und arbeiten selbstständig, erkennen Kenntnislücken frühzeitig und füllen diese selbstständig. - können ihre Denk- und Arbeitsprozesse kritisch hinterfragen und mögliche Handlungsoptionen entwickeln. - entwickeln realistische Selbst- und Zeiteinschätzungen. Umgang mit Komplexität: Die Studierenden... - reflektieren die Komplexität des Prozessmanagement in modernen Unternehmen.
Inhalt	Die wichtigsten Themenbereiche sind: - Vorteile und Nutzen der Prozessorientierung - Prozessidentifikation und Prozesslandkarten - Prozessmodellierung - Prozessoptimierung - Workflow Management - Process Monitoring - Process Mining - Robotic Process Automation

WPRO - Prozessmanagement - BWWh002

Lehr- und Lernmethode	Präsenzstudium Wissenserarbeitung, Lehrgespräch, Modellierungs- und Optimierungsaufgaben
	Selbststudium Literaturstudium, Einzel- und Gruppenarbeiten
Fachliteratur	Freund, J. und Rücker, B. (2019): Praxishandbuch BPMN: Mit Einführung in DMN (6., aktualisierte Aufl.). München: Hanser. ISBN: 978-3446461116. Gadatsch, A. (2020): Grundkurs Geschäftsprozess-Management: Analyse, Modellierung, Optimierung und Controlling von Prozessen (9., akt. und erw. Aufl.). Wiesbaden: Springer Vieweg. ISBN: 978-3658278113.
Workload	180 Stunden
Kontaktstudium	Block zu 4 Lektionen pro Woche, 14 Wochen
Präsenzpflicht	Zwischenpräsentation, KW43-KW44 (4h) Praktische Process Mining Workshop, KW46-KW47 (4h) Abschlusspräsentation, KW49-KW50 (4h)
Kompetenznachweis	Teil 1: Semesterarbeit (30%), Gruppenbewertung - Gruppenarbeit (drei bis vier Studierende) Teil 2 Präsentation und Verteidigung der Arbeit (40%), Einzelbewertung - Präsentation, Diskussion und Verteidigung der finalen Semesterarbeit in Gruppen, KW23-KW24 (4h) - Zwischenpräsentation der Semesterarbeit in Gruppen (erfüllt / nicht erfüllt), KW13-KW14 (4h) Teil 3: Reflexion (30%), Einzelbewertung - Regelmässige Lernreflexion über Selbstlerneinheiten (erfüllt / nicht erfüllt) - Review einer Semesterarbeit - Teilnahme Process Mining Workshop
Hilfsmittel bei schriftlicher Prüfung	n.a.
Studiengang, Semester	BSc Wirtschaftsinformatik, 2026-2027, 7 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern BSc Wirtschaftsinformatik, 2026-2027, 5 HS, VZ, Bern

WSBU - Sustainable Business - BWWh005

ECTS	3
Study language	English
Module level additive	Advanced level
Lecturer(s)	Frecè Jan Thomas, Loumeau Nicole
Module responsibility	Frecè Jan Thomas
Short description of the module	Introduction into the sustainability perspective with focus on corporations and corporate sustainability, corporate values, sustainable management, sustainability in the digital domain. The acquired theoretical knowledge is applied practically during the semester.
Entry requirements	None, this is a foundation level module
Competencies upon completion	Subject: Students - understand the most relevant basic terms, concepts, and models related to sustainable business and apply them to real-world scenarios. - recognize (current and future) global ecological, social, and economic problems and challenges and can assess their significance and their interaction with the economy. - improve their understanding of the complex interactions between different parameters of sustainability (i.e., individuals, policy, society, financial system, companies). - know economic and corporate concepts and approaches linked to sustainable development and can assess these in real-world examples. Method: Students - learn to use data to analyze sustainability topics in an evidence-based and critically reflected way - adopt an open-minded approach to sustainability issues - practice self-learning Social: Students - practice discussing and presenting arguments with lecturers and classmates to benefit from their experience and enlarge their knowledge and perspective. Self: Students - learn to reflect on the economic, environmental, and social impacts of their individual (consumer) behavior - are sensitized to the need for sustainable development
Content	- The Concept of Sustainability - Sustainable Development vs. Corporate Sustainability - Pitfalls of Sustainable Resource Management - Functional Corporate Values and Corporate Sustainability - Circular Economy and Sustainability - Social Innovation - Sustainability in the Digital Realm

WSBU - Sustainable Business - BWWh005

Teaching and learning methods	Methods: • Theoretical input • Case-based practical work (alone and in groups) • Group presentation
Literature	Reader "Sustainable Business": https://link.springer.com/book/10.1007/978-3-031-25397-3
Workload	90 hours in total per week: • 1.5h of presence time (total: 21) • 4.9h of self-learning, presentation group work
Contact lessons	14x2 lectures - 1.5 hours per week
Attendance requirement	• Presence in the first week of the module • Presence at guest presentation (date will be communicated, when available) • Presence at the final presentation (official oral exam week)
Competency assessment	50% - Group presentation, official oral exam week (individual marking) 50% - Individual, written, electronic test during the last week of the semester using an exam stick (45 minutes, closed book, except reader in Moodle) The students are expected to answer the exam questions with self-formulated sentences. Copy/paste of an entire sentence or another part from the reader is NOT considered a valid answer. Both, the exam and the group presentation are graded individually with 0.5 steps.
Aids for written examination	BFH-provided reader
Mode of repetition	In the event of an unsatisfactory overall grade (<4), students have the opportunity to repeat the unsatisfactory sub grade(s) (<4) in order to improve the overall grade to 4.0
Degree programme, semester	BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern BSc Business Information Technology, 2026-2027, 7 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern BSc Business Information Technology, 2026-2027, 5 HS, VZ, Bern

WSEG - Software Engineering - BWWH003

Dozierende Berkel Jörg

Modulverantwortung Jörg Berkel

Kurzbeschreibung des Moduls

Im Modul "Software Engineering" lernen die Studierenden, wie sie in einer Gruppe agil Software entwickeln. Das Modul beinhaltet theoretische Inhalte, sowie ein semesterbegleitendes Praxisprojekt pro Gruppe, an dem die Studierenden das Gelernte anwenden und selbständig vertiefen. Im Praxisprojekt geht es neben der Programmierung und dem Einsatz von standardisierten Webtechnologien darum, gemeinsam ein wertschöpfendes Produkt (bzw. Minimal Viable Product) zu gestalten und DevOps-Praktiken rund um Gitlab kennenzulernen.

Eingangskompetenz

Fachkompetenzen:

- Kompetenzen der Berufsmaturität der Typen «Technik, Architektur, Life Sciences» oder «Wirtschaft und Dienstleistungen»

Kompetenzen gemäss Kompetenzmodell BFH-W:

- Kompetenzen der Berufsmaturität der Typen «Technik, Architektur, Life Sciences» oder «Wirtschaft und Dienstleistungen»

Kompetenz

Fachkompetenzen: Die Studierenden können...

- in einer Kleingruppe aus einer eigenen Produktidee ein Konzept für eine Onlineplattform erstellen und daraus als Team während eines Semesters einen funktionalen Softwareprototypen als "Single Page Application" entwickeln.

- Grundbegriffe und Herausforderungen des modernen Software Engineerings im Bereich "Webtechnologien" erklären und Phasen und Aktivitäten in der Entwicklung von Softwareprodukten beschreiben.

- auf dem eigenen Arbeitsgerät eine lokale Entwicklungsumgebung einrichten und Werkzeuge zur arbeitsteiligen Entwicklung von Softwareprodukten einsetzen (Quellcodeverwaltung mit Git).

- die Prinzipien agiler Arbeitsweisen praktisch umsetzen und deren Ergebnisse (Review, Planning, Retrospective) in regelmässigen Kurzpräsentationen demonstrieren.

- die Dokumentationen eingesetzter Webtechnologien und -frameworks konsultieren und Probleme per Internetrecherche oder durch Einsatz von Large Language Models lösen.

- funktionale und nichtfunktionale Qualitätsmerkmale von Softwareprodukten beschreiben und Techniken zur Komplexitätsreduktion einer Software erklären.

- Projektdokumentation und -artefakte in einem Git-Repository ablegen und dazu eine Continuous-Integration-Automatisierung einrichten, welche diese für Aussenstehende sichtbar publiziert.

Kompetenzen gemäss Kompetenzmodell BFH-W:

Problemsolving/Design Thinking (verwandt: Methodenkompetenz): Die Studierenden...

- erkennen, dass im Software Engineering eine Kombination von kreativ-spielerischem und logisch-stringentem Vorgehen nötig ist.

Kollaboration (verwandt: Sozialkompetenzen): Die Studierenden...

- erleben und reflektieren die Voraussetzungen für eine erfolgreiche, effiziente und effektive Zusammenarbeit.

- bringen ihre persönlichen Ressourcen in Teams ein.

- kommunizieren als Team mit Aussenstehenden durch Präsentationen und schriftliche Beiträge

Selbstmanagement (verwandt: Selbstkompetenzen): Die Studierenden...

- lernen mit Autonomie und Selbstorganisation umzugehen.

- lernen und arbeiten selbständig, erkennen Kenntnislücken frühzeitig und füllen diese selbständig oder suchen sich Unterstützung bei Peers oder Coaches.

- können ihre Denk- und Arbeitsprozesse kritisch hinterfragen und mögliche Handlungsoptionen entwickeln.

- entwickeln realistische Selbst- und Zeiteinschätzungen.

Umgang mit Komplexität: Die Studierenden...

- reflektieren die Komplexität von modernen, verteilten Softwareanwendungen im Bereich Webtechnologien.

- reflektieren die Komplexität von arbeitsteiliger Softwareentwicklung.

WSEG - Software Engineering - BWWh003

Inhalt

Modulaufbau

wöchentlicher 4-Lektionenblock während des Semesters mit einer Durchführung pro Klasse.
Der 4-Lektionenblock besteht aus theoretischen (1/3##) und praktischen Inhalten (2/3##).

Zentrale Inhalte

- Grundlagen Softwareentwicklung
- Praxisprojekt: Entwicklung einer Web-Applikation mit Frontend und Backend (z.B. mit Vue.js und Strapi)
- Agile Softwareentwicklung im Team
- Grundlagen Objektorientierte Programmierung, Verwendung von REST APIs
- Kennenlernen und Einsatz von Werkzeugen wie z.B. GitLab zur Quellcodeverwaltung/Dokumentation und IDEs wie VSCodium (Visual Studio Code) im Zusammenspiel mit AI-Coding-Agents wie OpenCode

Methoden

- Lesen, Verstehen und Besprechen von Lehrbuchtexten, Fachartikeln und Softwaredokumentationen
- Lösen von Entwicklungsaufgaben durch die Dozierenden, durch einzelne Studierende und durch Gruppen von vier bis fünf Studierenden

Praxisfälle

aus der Arbeitserfahrung der beteiligten Dozierenden und Gäste

Forschungsbezug

aus der Forschungserfahrung der beteiligten Dozierenden und Gäste

Lehr- und Lernmethode

Präsenzstudium

Wissenserarbeitung, Entwicklungsaufgaben, Lehrgespräch, Coaching

Selbststudium

Literaturstudium, Videos, Projektarbeit: Einzel-/Gruppenarbeiten

Fachliteratur

Sommerville, I. (2020): Modernes Software-Engineering. Entwurf und Entwicklung von Softwareprodukten. Pearson Deutschland. ISBN: 978-3868943962.

Sommerville, I. (2020): Engineering Software Products: An Introduction to Modern Software Engineering, Global Edition. Pearson Education. ISBN: 978-1292376349.

Workload

6 ECTS / 180 Stunden

Kontaktstudium

Block zu 4 Lektionen pro Woche, 14 Wochen

Präsenzpflicht

keine Präsenzpflicht

WSEG - Software Engineering - BWWh003

Kompetenznachweis

Teil 1: Projektabgabe mit Zwischenergebnissen (Agile Rituale, Deliverables, Abschlusspräsentation) als Gruppenarbeit mit gemeinsamer Note (60%)

SW 5: Agiles Wrap-up und Deliverable 1

SW 8: Agiles Wrap-up und Deliverable 2

SW 11: Agiles Wrap-up und Deliverable 3

SW 14: Abschlusspräsentation: Live-Demo und Retrospektive

SW 15: Projektabgabe und Deliverable 4

Teil 2: Schlussprüfung (40%), Moodle-Prüfung und praktische Aufgaben, 90 Minuten

- In den offiziellen Prüfungswochen

- elektronische PC-Prüfung mit Lernstick und CAMPLA

Gemäss RRS Art. 11 müssen alle Teilkompetenznachweise bestanden sein.

Die Teilkompetenznachweise werden auf halbe Noten gerundet.

Hilfsmittel bei schriftlicher Prüfung

- Open Book, erweitert durch digitale Dokumente hochgeladen auf CAMPLA

- Wörterbuch Muttersprache - Sprache Kompetenznachweis

- BFH-Taschenrechner

Weiterführende Details im Dokument "Weisung zu den schriftlichen Kompetenznachweisen" für die Studiengänge BSc Wirtschaftsinformatik, BSc Betriebsökonomie, BSc International Business Administration, MSc Business Administration & MSc Digital Business Administration ergänzend zum Rahmenreglement für Kompetenznachweise an der Berner Fachhochschule (KNR).

Weiterführende, vertiefende Module

Wahlpflichtmodule mit Beispiel:

- EWEB Web Engineering, Webtechnologien
- ERAP Hackathon & Rapid Prototyping, APIs bauen/verwenden
- EOSS Open Source Software Management, Softwarelizenzen/Git
- EUID Hands-on UI Design, UX/UI Design
- ECYS Cybersecurity, Authentifikation

Vertiefung

- SDA1-3 Software Design & Architecture

Bemerkung

Sämtliche Inhalte sind unter <https://github.com/digital-sustainability/module-wseg> unter CC-BY 4.0 als OER veröffentlicht.

Studiengang, Semester

BSc Wirtschaftsinformatik, 2026-2027, 7 HS, TZ, Bern

BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern

BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern

BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern

BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern

BSc Wirtschaftsinformatik, 2026-2027, 5 HS, VZ, Bern

WWVL - Economics - BWWh027

ECTS	3
Study language	English
Module level additive	Advanced level
Lecturer(s)	Foord Daniel
Module responsibility	Daniel Foord
Short description of the module	This module will introduce you to some of the key concepts in economics. We will explore a few of the main models in economic thinking and give you an analytical basis with which you can apply to the economy, society and politics. We will look at the micro economic foundations of "the market", market failure and consumer behaviour as well as macro economic topics including economic growth, inflation, unemployment and how they are measured. Underpinning all of this, is an examination of fiscal and monetary policy and the tools available to governments and central banks when intervening in the economy. Moreover this module will constantly touch upon many other current topics.
Entry requirements	Berufsmatura - Federal Vocational Baccalaureate

WWWL - Economics - BWWh027

Competencies upon completion

Subject specific
Students should be able to

understand and explain the basis of standard economic models and thought
depict how a simple market is formed and functions using basic economic models
apply economic thought and models to current affairs
understand the logic behind government interventions in markets
identify market failure and the need for intervention
explain the implications of various government policies (price floors, ceilings, subsidies, taxes etc.)
name the macro economic objectives of a state
explain what each of these objectives are
interpret the indicators measuring these objectives
manipulate some of the real world data that Switzerland publishes
critique some of the weaknesses of these objective and indicators
postulate on the implications of digital change for the economy
identify and explain the key structural changes for the Swiss and global economy

Problem solving/critical thinking: You

are able to apply basic economic models to news and current affairs
understand the data and data collection that has gone on behind the statistics in the news.
critique some of the basic assumptions of standard economic models
identify weakness in certain economic data
interpret data in the news and start to determine its validity/veracity

Collaboration (social competences): You

can contribute to objective discussions with colleagues
can assist colleagues in understanding economic news
can evaluate and weigh up various lines of argument

self-management (self-competences): You

learn to deal with autonomy and self-organisation
learn and work independently, recognise gaps in knowledge at an early stage and fill them independently
can critically question their own and others' judgements, can discuss them and develop them further in the pursuit of knowledge

Dealing with complexity: You

learn how to deal with complexity in the context of the interconnected subject matter of economics
learn about interdependencies between different economic variables
are able to estimate the complexity of so-called spillover effects between economic sub-markets such as the goods, labour, capital, money and foreign exchange markets.

WWWL - Economics - BWWh027

Content

The module is essentially divided into two themes:

Microeconomics
Macroeconomics

Subject content taught:

Price and market mechanisms
Market failure and government intervention
Behavioural economics
Measurement of economic activity and economic well being (GDP)
Equality/Poverty
Unemployment
Inflation
Monetary policy
Fiscal policy

Teaching and learning methods

The course will be taught in essentially in a standard lecture style.
It incorporates classroom simulation/games/experiments.
Moreover it explores real economic data that can be downloaded from the BFS, SECO and the SNB.

We will make considerable use of podcasts and short videos

Literature

Literature

Mankiw, Gregory N: Volkswirtschaftslehre, 7. Auflage 2017, Schäffer-Poeschel Verlag Stuttgart, ISBN 978-3-7910-4142-1
Mankiw, Gregory N: Economics, 5th Edition 2020, Cengage, ISBN: 9781473768543 (Used for lecture slides)
Mankiw, Gregory N: Economics, 6th Edition 2023, Cengage, ISBN: 9781473786981

I also publish a list of reading, watching & listening which covers the same content of the book - however it is a little harder to keep track of these but they are "free". It is up to you.
Earlier editions of Mankiw are also available, these will contain much of the same information but the chapter and structure of the book might differ.

Workload

90 Hours

Contact lessons

14 lectures @ 90 minutes

Attendance requirement

Attendance for tests on test day is obligatory.
For normal lectures there is no attendance requirement - although it's highly recommended

WWL - Economics - BWWh027

Competency assessment

Short tests and a final exam

Short tests (30%)

3 short 15 minute tests (calendar weeks 41,46, 50) on basic terms in economics and topics that we have covered in class and in self-study in the preceding weeks. (10% each, total 30%)
The short tests must be done on-site and may not be done remotely.
Grading follows standar BFH regulations each test is graded separately.

Final exam (70%)

A final exam of 90 minutes in the official exam weeks. Consisting of a mix of multiple choice and short answer questions covering the whole semester. (70%)
Both assessments are online using Moodle.

Aids for written examination

Dictionary (mother tongue <-> English)

BFH pocket calculator

For details, see the current rules on assessments and exams in the Campus App

Mode of repetition

Short tests during the semester

Students who miss the in class tests will be required to submit a doctor's certificate.
It may be possible to catch-up the test within the same week as the test.

Final exam: Moodle exam in the standard exam window.

Repetition of the module:

Students may carry over the classroom tests that they passed from the previous semester.
The failed class tests can be resat.
Passed assessments cannot be resat.
Please inform your lecturer before the class tests if you are a resit student.
The newest class test always counts.

The final exam (70% exam) is always resat.

The final grade is the calculated using the most recent grades.

Follow-up modules

Elective modules:
Real world economics
Social innovation

Degree programme, semester

BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern
BSc Business Information Technology, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern
BSc Business Information Technology, 2026-2027, 5 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern

EAAI - Applied Artificial Intelligence - BWWh021

ECTS	3
Study language	English
Module level additive	Advanced level
Lecturer(s)	Gygli Marcel, Minder Matthias
Module responsibility	Marcel Gygli
Short description of the module	In this module, students get an insight into the fields where artificial intelligence is used practically (e.g. self-driving cars, large language models) and what business considerations need to be made when developing an AI solution. Students also learn the fundamental concepts in deep learning powering these applications. The course is a general introduction to the topic and does not rely on coding.
Entry requirements	No specific requirements. The course is not heavily mathematics based but we recommend revising the concept of vectors.
Competencies upon completion	Students know the major methods of AI in Natural Language Processing, Computer Vision, Reinforcement Learning as well as their domains of application. They have a conceptual understanding of the functioning of these methods, of their limits and potential pitfalls that they present. Students have the ability to evaluate practical AI cases and their business impacts.
Content	In the Applied Artificial Intelligence module, students discover practical examples of usage of AI across various domains such as the car industry, biotechnology, advertisement, online commerce etc. The course covers different AI methods in Natural Language Processing, Computer Vision etc. and focuses on multiple aspects, both technical and conceptual: what are key technical points behind a method? In what domains does that technology have greatest impact? Are there ethical questions when using this technology? Whenever possible, methods are explored through interactive toy models available online e.g. on HuggingFace or as GoogleColab notebooks and not requiring coding knowledge. The course will be a mix between presentations, article lectures and discussions and demos. Examples of covered topics - Overview of AI: When was the concept of AI developed, and how has it evolved through until today? Why has AI emerged as an important method in the past decade? - Basics of Deep Learning: using a very simple networks example, we explore basic Deep Learning concepts such as layers, backpropagation, optimization etc. - Computer vision: this is one of the main domains where Deep Learning has revolutionized entire industries and research areas. We will learn about essential building blocks of computer vision networks such as convolutional layers and discover practical applications in industry. - Large language models: in the past few years, large deep learning methods have shown astonishing results in many areas such as translation, text summarizing, code completion etc. We will introduce key ideas such as embeddings, attention etc. powering modern tools like ChatGPT and looks at some of the many applications of these models. - Other Deep Learning networks: while computer vision and natural language processing represent the majority of applications in AI, we will also explore other types of approaches such as reinforcement learning (robotics, game development) and Graph neural Networks (used in various fields such as social network analysis, protein folding research etc.) - Ethics of AI: The power of modern AI tools and the way they are designed and trained pose a multitude of ethical questions.

EAAI - Applied Artificial Intelligence - BWWh021

Teaching and learning methods	The course is a mix between presentations by the teacher, applied demonstrations, interactive exploration, and articles discussions.
Literature	As the range of topics covered during the course is wide, there is no single book or resource recommended. Presentation slides as well as articles read for the course are provided on Moodle.
Workload	90 Hours
Contact lessons	4 lessons every 2 weeks
Attendance requirement	No requirement.
Competency assessment	Creation and Presentation of an ML Canvas in groups, group assessment 30% (KW 50/51) 90 minutes, digital (pc) exam during the official examination weeks, assessment 70%
Aids for written examination	Open Book Dictionary (mother tongue <-> English) BFH pocket calculator For details, see the current directive on proof of competence in Moodle
Degree programme, semester	BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern BSc Business Information Technology, 2026-2027, 5 HS, VZ, Bern BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern BSc Business Information Technology, 2026-2027, 7 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern

EDRS - Digital Responsibility & Sustainability - BWWh030

ECTS	3
Study language	English
Module level additive	Advanced level
Lecturer(s)	Bieser Jan, Obwegeser Nikolaus, Stürmer Matthias
Module responsibility	Coordinator: Prof. Dr. Jan Bieser Lecturers: Prof. Dr. Jan Bieser, Prof. Dr. Nikolaus Obwegeser, Prof. Dr. Matthias Stürmer
Short description of the module	The use of digital products and services has accelerated rapidly in both work and personal life in the last ten years. The digital transformation presents new opportunities and risks for creating green, socially-just, and economically prosperous societies and businesses. Students in this course will become familiar with the concept of sustainable development and its interrelation with digitalization. They will acquire the competencies needed to critically assess the societal and environmental opportunities and risks associated with digitalization, and to derive measures for aligning digital transformation with sustainable development.
Entry requirements	Technical competences • Basic knowledge in the areas of digitalization, information technology, and business IT Social competences • Ability to collaborate and work as a team • Communication skills, both written and oral Method competence • Ability to critically analyze and evaluate information • Problem-solving skills and creative thinking
Competencies upon completion	After completing the module, students will be able to: • explain the positive and negative impacts of digitalization on sustainable development and the Sustainable Development Goals (SDGs) and know current research and initiatives from the industry. • comprehend the theoretical background and know practical examples of how innovative digital applications pose opportunities and threats for environmentally friendly and socially just societies. • explain the challenges of the privatization of the digital space, know how to promote digital sovereignty, provide access to digital knowledge through open-source software, open data, and open content. • comprehend the concept of digital responsibility and apply frameworks for the ethical management of digital technologies. • Critically reflect and engage in meaningful group discussions about the broader implications of digital technologies on society and the environment.

EDRS - Digital Responsibility & Sustainability - BWWh030

Content

The use of digital products and services offers unique opportunities to create greener and more just societies. For example, streaming platforms replace the production and transport of physical media, and working from home reduces CO₂-intensive commuting. However, digital technologies are no silver bullet for achieving the Sustainable Development Goals. Their potential to contribute to greener and more just societies must be systematically exploited.

Students of this course will acquire the competencies required to critically assess the impact of innovative digital technologies (e.g. Generative AI tools, Internet of Things) on the environment and society and derive measures to align digitization with sustainable development. In particular, we will address three topics:

- *Sustainable digitalization*: The environmental and social impacts of digitalization.
- *Digital sustainability*: The long-term oriented development of digital artifacts to maximize its benefits for society.
- *Digital responsibility*: The ethical, legal, and societal obligations associated with the use and management of digital technologies.

Throughout the course, students work in teams on an applied problem in the field. Students can develop the applied problem themselves (e.g., based on their own work experience) in consultation with the lecturers or select a problem from a provided list.

Exemplary topics could be:

Sustainable digitalization:

- How much electricity is required to develop and train ChatGPT or other Generative AI models?
- Is online shopping more or less sustainable than conventional shopping?
- Will self-driving vehicles reduce or increase car travel and CO₂ emissions?

Digital sustainability:

- How can we design software tools to maximize their benefits for society?
- What are the dangers of digital platforms monopolies and how can they be remedied?
- How can open-source projects be financed?

Digital responsibility

- What are the ethical challenges in the use of AI in different domains (e.g., healthcare)?
- How can companies govern ethical practices with digital technologies?
- How can different frameworks be integrated with common software engineering practices (e.g., Scrum)?

At two lecture dates, the students present their intermediate results to each other in the form of so-called ConverStations. During ConverStations, students learn about the work of other groups and receive feedback on their work. Students of the course will also have the option to participate in the annual conference DINAc on digital sustainability (optional).

Teaching and learning methods

The competencies will be acquired through a combination of the following methods:

- Contact teaching (on-site) to learn about the theoretical background and real-life examples
- Group work and report writing to apply the content to a concrete case example
- ConverStations to present, share, and discuss the findings among students

EDRS - Digital Responsibility & Sustainability - BWWh030

Literature

Required literature

- Hilty, L.M. & Aebischer, B. (2015): ICT for Sustainability: An Emerging Research Field, Advances in Intelligent Systems and Computing. Springer International Publishing. <https://doi.org/10.5167/uzh-110001>
- Stürmer, M., Abu-Tayeh, G. & Myrach, T. (2017): Digital sustainability: basic conditions for sustainable digital artifacts and their ecosystems. Sustainability Science 12, 247â##262. <https://doi.org/10.1007/s11625-016-0412-2>

Recommended literature

- Hilty, L. & Bieser, J. (2017): Opportunities and risks of digitalization for climate protection in Switzerland. University of Zurich, Swisscom, WWF. <https://doi.org/10.5167/uzh-141128>
- Freitag, C., Berners-Lee, M., Widdicks, K., Knowles, B., Blair, G. S. & Friday, A. (2021): The real climate and transformative impact of ICT: A critique of estimates, trends, and regulations. Patterns, 2(9), 100340. <https://doi.org/10.1016/j.patter.100340>
- Stürmer, M., Tiede, M., Nussbaumer, J., & Waespi, F. (2023): On digital sustainability and digital public goods. In: Shaping digital transformation for a sustainable society. Contributions from Bits & Baeume. Technische Universitaet Berlin. <https://arxiv.org/abs/2306.09204v1>
- Digitale Gesellschaft (2021): Digitale Nachhaltigkeit - Nachhaltige Digitalisierung. <https://www.digitale-gesellschaft.ch/nachhaltigkeit/>

Workload

90 hours

- 15 hours contact teaching (weekly during the semester, 5 lectures of 4 lessons each, on-site)
- 6 hours ConverStations (2 lectures of 4 lessons each, on-site) - mandatory participation
- 10 hours ConverStation preparation (in groups)
- 54 hours group work and report writing (in groups and individually)
- 5 hours reading (individually)

Contact lessons

Contact teaching (15h) and ConverStations (6h) are on-site. All other activities are location- and time-independent self-study and group work.

Attendance requirement

The attendance at ConverStations is mandatory for successful module completion. The ConverStations take place during the calendar week 48 and 50.

Competency assessment

Grading is based on the report. The final grade is based on two components:

- Coherence and content of the whole group report: one grade per group (30%)
- Individual report sections: one grade per student (70%)

Mode of repetition

If a student receives a 3.5, in special cases, the module coordinator may provide the option for report revisions according to the coordinator's feedback within 10 working days. In this case, the maximum grade that can be obtained with the improvement is 4.0.

Follow-up modules

Practical Project, Bachelor Thesis

Degree programme, semester

BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern
BSc Business Information Technology, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern
BSc Business Information Technology, 2026-2027, 5 HS, VZ, Bern

EMPR - Modern Programming in R - BWWh024

ECTS	3
Study language	German
Module level additive	Advanced level
Lecturer(s)	Krebs Michel, Kwuida Léonard
Module responsibility	Michel Krebs, Kwuida Léonard
Short description of the module	The module is also suitable for students without prior programming knowledge and enables them to apply data science techniques in practice as quickly as possible. Students will learn how R can be used to gain knowledge and insights from raw data. The module introduces R and RStudio as well as Tidyverse, a collection of R packages that work together to solve data science problems quickly and effectively.
Entry requirements	Mathematics and statistics modules from the BSc BBA, IBA and Digital & AI degree programmes
Competencies upon completion	The module provides the skills required for the Business Analytics specialisation in the programming language R. Students will be able to analyse data exploratively and create models for forecasts. The quality of the models is checked using statistics and plots.
Content	Topics of the module are: Exploring: Exploring data, generating hypotheses and testing them quickly Preparing: Transforming data sets into a form suitable for analysis Programming: Get to know powerful R tools to solve data problems more efficiently Modelling: Create a summary of a dataset that captures real "signals" in your dataset Communicating: Learn R Markdown (aka Quarto) to present text, code and results together
Teaching and learning methods	Two face-to-face lessons per week with integrated exercises.
Literature	R for Data Science, Hadley Wickham, O'Reilly (available for free download) Moderne Datenanalyse mit R, Sebastian Sauer, FOM-Edition
Workload	90h
Attendance requirement	-

EMPR - Modern Programming in R - BWWh024

Competency assessment	Homework during the semester, weighted 100%
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Follow-up modules	Specialisation in Business Analytics
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Degree programme, semester	BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern BSc Business Information Technology, 2026-2027, 5 HS, VZ, Bern BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern BSc Business Information Technology, 2026-2027, 7 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern
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EOSS - Open Source Software Management - BWWh022

ECTS	3
Study language	English
Module level additive	Advanced level
Module responsibility	Markus Tiede
Short description of the module	This module covers the foundation and concepts for building effective open source practices in companies and organizations. The focus is on the following phases: - Using open source software - Contribute to existing open source projects - Starting new open source projects and building welcoming communities These three key stages are embedded in strategic considerations, governance processes and implementation.
Entry requirements	Professional skills - Basic know how of software engineering principles - Basic business concepts BFH-W competency model: - Competencies of vocational baccalaureate «Engineering, Architecture, Life Sciences» or «Business and Services»
Competencies upon completion	Professional skills Establish OSPOs: an open source program office (OSPO) is designed to (1) be the center of competency for an organization's open source operations and structure and (2) put a strategy and set of policies on top of an organization's open source efforts. BFH-W competency model - Problemsolving / Design Thinking Agile methods - Definition of Ready - Definition of Done Collaboration - Continuous Integration - Code Review Self Organization - Retrospectives - Shared Principles Handling complexity - Test Automation - Test Driven Development - Everything-as-Code - Docs As Code

EOSS - Open Source Software Management - BWWh022

Content

In the **first section**, you will learn the basic components of open source and open standards. You will also learn about the differences between open source and closed source software, the reasons for the use of each, and how the combination of standards and open source provides increased value to an organization.

The **second section** discusses the various open source business models and how to develop practical strategies and policies for your organization's chosen model. It also explains the value and importance of an Open Source Program Office (OSPO) as well as how the OSPO helps provide assistance in defining ROI and other open source metrics.

In the **third section**, you will learn how to build an effective OSPO and articulate the different types of roles and responsibilities needed to run it successfully.

Section 4 talks about the role of continuous integration and testing in a healthy open source project, and how you can apply open source development principles to internal projects within your organization to take best advantage of the value these principles bring.

In the **fifth section** you will learn about the importance of effective open source license compliance and how to build programs and processes to ensure safe and effective consumption of open source in the enterprise. You will also get familiar with the most common open source license types, and their major characteristics, as well as how to choose the most appropriate license for a given situation.

Section 6 discusses how to work most effectively with upstream open source projects and how to build sound contribution strategies in organizations to get the maximum benefit from working with project communities. It also describes multiple common upstream project governance models, and explains how these governance practices affect an organization's ability to make effective contributions.

Finally, the **last section** discusses the rationale and value for creating new open source projects as well as the required legal, business and development processes needed to launch new projects.

Teaching and learning methods

Language: Teaching; content, literature & material: **English**

7 On-site, hybrid and remote lectures combined with ~30+ tasks

Self study: literature, videos

Literature

<https://digital-sustainability.github.io/module-eoss-ospo101/>
<https://ospobook.todogroup.org>

<https://ospo101.org>
<https://todogroup.org>
<https://openpracticelibrary.com>
<https://ossbenchmark.com>

Workload

90h

Contact lessons

-

Attendance requirement

-

EOSS - Open Source Software Management - BWWh022

Competency assessment

(individual) **Exam** (60%) at the end of the module in the official exam week

- (electronic) PC exam using Safe Exam Browser / Lernstick EXAM

- 90 minutes

Tasks (40%) finished by the end of the module

- (individual) ongoing (~ 6 x 5) tasks during semester

- (small) Teamwork research, collaboration and presentation (possible from week 7 to 11)

Aids for written examination

- Summary (max 10 single or 5 double pages)
- Dictionary (printed) mother tongue <> english

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Follow-up modules

- module/wseg - Software Engineering
- CAS - Public Sector Transformation
- SDG1 - Public Sector Trends

Comment

All contents are available here <https://github.com/digital-sustainability/module-eoss> licensed under CC-BY 4.0 as OER.

Degree programme, semester

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BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern
BSc Business Information Technology, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern

EPRP - Praxisprojekt - BWWh019

ECTS	6
Unterrichtssprache	Deutsch
Modulniveau Zusatz	Hauptstudium
Dozierende	Gimeno Raúl Diego, Gygli Marcel, Haller Stephan, Sahli Matthias, Wambsganss Thiemo
Modulverantwortung	Stephan Haller
Kurzbeschreibung des Moduls	In diesem Modul sollen Kompetenzen aus früheren Semestern in einem umfassenden Projekt in einem praktischen Kontext vertieft werden. Es sollen Erfahrungen in der Zusammenarbeit mit einem Auftraggeber gesammelt und Schlussfolgerungen für die Bachelorarbeit und für die berufliche Praxis gezogen werden. Dieses Modul ist auch eine gute Vorbereitung für die Bachelorarbeit und es empfiehlt sich, ein Thema mit anschliessender Vertiefung in der Bachelor-Thesis zu wählen. Damit entfällt die sonst notwendige separate Einarbeitung. Es gibt folgende Möglichkeiten zur Themensuche: - Wissenschaftliche Arbeit mit Praxisbezug (z.B. Forschungsarbeit oder Studie). Der Auftraggeber als Themensponsor ist Mitglied eines Instituts der BFH oder einer anderen Hochschule oder aus einer F&E-Abteilung einer anderen Organisation. - Praktische Arbeit mit Themen aus einem Unternehmen, einer Organisation oder einer Verwaltung. Bei berufsbegleitend Studierenden muss eine klare Abgrenzung zum Tagesgeschäft gegeben sein, die sich in der Regel in einer fundierten Projektbeschreibung mit definierten Zielen zeigt. Die Modulunterlagen sind in englischer Sprache, die Infoveranstaltung wird in deutscher Sprache durchgeführt. Der Abschlussbericht und die Präsentation können in deutscher oder englischer Sprache verfasst werden.
Eingangskompetenz	Kompetenzen der vorangegangenen Module gemäss Curriculum

EPRP - Praxisprojekt - BWWh019

Kompetenz

Berufliche Kompetenzen: Die Studierenden

- lösen in begrenzter Zeit unter Anleitung ein abgegrenztes Problem der Wirtschaftsinformatik
- bauen zur Lösung des Problems auf wissenschaftlich fundiertes Wissen auf
- reflektieren Probleme und Ergebnisse auf der Grundlage des aktuellen Stands der Literatur
- ziehen Schlussfolgerungen aus ihren Erkenntnissen für ähnliche Problemstellungen.

Methodische Kompetenzen: Die Studierenden

- lösen ein praktisches Problem mit einer wissenschaftlich fundierten Methode oder einer Kombination von Methoden
- stellen das Ergebnis zielgruppengerecht dar

Soziale Kompetenzen: Die Studierenden

- bauen auf den Basiskompetenzen BWI auf
- berücksichtigen Besonderheiten ausländischer Partner und ggf. internationale Gegebenheiten
- nehmen Konflikte wahr und lösen sie konstruktiv, damit die Ziele der Arbeit erreicht werden

Selbstkompetenzen: Die Studierenden

- bauen auf den Basiskompetenzen BWI auf
- organisieren ihre Arbeit innerhalb des vom Auftraggeber und den beteiligten Dozenten vorgegebenen Rahmens selbständig
- setzen sich insbesondere Teilziele und Meilensteine, planen/schätzen den Aufwand und führen einen diesbezüglichen Soll-Ist-Vergleich durch
- agieren erfolgreich in einem internationalen Umfeld, sofern dies möglich ist

Inhalt

Die Studierenden finden selbständig einen geeigneten Auftraggeber und ein Thema (es wird ausgeschriebene Themen geben) und führen ihr Projekt proaktiv und selbstständig unter Anleitung durch.

Die Studierenden sind auf ihre Bachelor-Thesis vorbereitet und haben praktische Erfahrungen für ihre berufliche Laufbahn gesammelt.

Lehr- und Lernmethode

- Selbstständige Projektarbeit
- Coaching

Workload

6 ECTS (180h)

Wenn der Themensponsor ein Dozent der BFH Wirtschaft ist und das Thema mit den Forschungszielen des Instituts zusammenhängt, kann das Projekt auf 9 ECTS (270h) oder 12 ECTS (350h) erweitert werden.

Kontaktstudium

- Informationsveranstaltung (Mittwoch, 2. September 2026, 17:00-18:00 via MS-Teams)
- Coachings/Besprechungen
- Präsentation

Präsenzpflicht

Präsenzpflicht besteht für die Informationsveranstaltung , Coachings und Präsentation

EPRP - Praxisprojekt - BWWh019

Hilfsmittel bei schriftlicher Prüfung

Abschlussbericht und Präsentation am Ende des Semester, Projektmanagement während dem Semester.
Gewichtung:

- 45% Endbericht (muss mit mindestens 4.0 bewertet werden)
- 20% Projektmanagement
- 15% Präsentation
- 20% Diskussion nach der Präsentation

Weiterführende, vertiefende Module

Bachelor Thesis

Studiengang, Semester

BSc Wirtschaftsinformatik, 2026-2027, 5 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern
BSc Wirtschaftsinformatik, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern

ERAP - Hackathon und Rapid Prototyping - BWWh025

ECTS	3
Unterrichtssprache	Deutsch
Modulniveau Zusatz	Hauptstudium
Dozierende	Gygli Marcel
Modulverantwortung	Prof. Dr. Marcel Gygli
Kurzbeschreibung des Moduls	Im Modul Rapid Prototyping (WRAP) nehmen die Studierenden an einem Hackathon teil und lösen dort aktuelle Probleme aus Verwaltung und Wirtschaft. Nach dem Hackathon wird als Nachbereitung die Teilnahme reflektiert und präsentiert. So lernen die Studierenden mit diesem Modul, wie in kurzer Zeit komplexe Probleme in einfachere Teilprobleme zerlegt und diese arbeitsteilig in einer Gruppe gelöst werden.
Eingangskompetenz	Fachkompetenzen: - Kompetenzen der Module WSEG und WSEN Kompetenzen gemäss Kompetenzmodell BFH-W: - Kompetenzen der Module WSEG und WSEN

ERAP - Hackathon und Rapid Prototyping - BWWh025

Kompetenz

Fachkompetenzen:

Rapid Prototyping Techniken anwenden, um Problemstellungen zu erkunden und zu lösen

verstehen wie man verschiedene Open Source Tools bei der Produktentwicklung kombinieren und einsetzen kann.

können die Weiterentwicklung des Prototyps skizzieren und evaluieren

Kompetenzen gemäss Kompetenzmodell BFH-W

Problem Solving/Design Thinking (verwandt: Methodenkompetenz): Die Studierenden...

erkennen, dass beim Prototyping sowohl technische Fähigkeiten als konzeptionelle Fähigkeiten notwendig sind.

können verschiedene Lösungswege erkunden und evaluieren.

lernen Blogs, Foren und Produktdokumentation als effektive Informationsquellen für die Entwicklung kennen.

Kollaboration (verwandt: Sozialkompetenzen):

erleben und reflektieren die Voraussetzungen für eine erfolgreiche, effiziente und effektive Zusammenarbeit.

können innerhalb von Stunden ein Team organisieren und damit ein Prototyp erstellen.

bringen ihre persönlichen Ressourcen in Teams ein.

Selbstmanagement (verwandt: Selbstkompetenzen): Die Studierenden...

lernen mit Autonomie und Selbstorganisation umgehen.

lernen und arbeiten selbstständig, erkennen Kenntnislücken frühzeitig und füllen diese selbstständig.

können ihre Denk- und Arbeitsprozesse kritisch hinterfragen und mögliche Handlungsoptionen entwickeln.

entwickeln realistische Selbst- und Zeiteinschätzungen.

Umgang mit Komplexität: Die Studierenden

reflektieren die Komplexität und das Potential von Hackathons

Lehr- und Lernmethode

- Selbststudium
- Problem Based learning
- Gruppenarbeit
- Einzelarbeit

Workload

90h

- 60h Selbststudium und Teilnahme am Hackathon
- 30h Nachbereitung Schreiben des Berichtes & Präsentation der Resultate

ERAP - Hackathon und Rapid Prototyping - BWWh025

Kompetenznachweis

- Der Kompetenznachweis ist für alle Modulteilnehmenden einheitlich festgelegt:
- Dem Modulverantwortlichen ist nach dem Abschluss der Veranstaltung ein schriftlicher Bericht zur im Rahmen des Hackathons erbrachten Arbeitsleistung auf Basis eines vorgegebenen Berichtsrasters termingerecht abzugeben. Dieser Bericht enthält nebst den allgemeinen Anforderungen, den angedachten und umgesetzten Arbeitsergebnissen auch eine Reflexion bezüglich Anwendbarkeit der gefundenen Lösung in der Praxis.
- Die Resultate des Berichtes und des Hackathons werden dem Modulverantwortlichen in einer Präsentation (15-30min) erläutert und diskutiert.
- Die Beurteilung erfolgt mit der Qualifikation "erfüllt" (ECTS werden erworben) bzw. "nicht erfüllt" (ECTS werden nicht erworben).

Hilfsmittel bei schriftlicher Prüfung

Keine

Wiederholungsmodalitäten

Jedes FS & HS

Bemerkung

- Die Organisation und Finanzierung der Teilnahme an Hackathons ist Aufgabe der Studierenden.
- Die Studierenden werden ermutigt, sich gezielt auch in interdisziplinäre resp. hochschulexterne oder -übergreifende Teams einzubringen.
- Es findet keine reguläre Anmeldung für dieses Modul statt; Interessierte melden sich unmittelbar nach dem Abschluss einer Hackathon-Teilnahme direkt beim Modulverantwortlichen.

Studiengang, Semester

BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern
BSc Wirtschaftsinformatik, 2026-2027, 5 HS, VZ, Bern
BSc Wirtschaftsinformatik, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern

ESMA - IT Service Management - BWWh008

ECTS	3
Unterrichtssprache	Deutsch
Modulniveau Zusatz	Hauptstudium
Dozierende	Schmid Alexander
Modulverantwortung	Prof. Dr. Alexander Schmid
Kurzbeschreibung des Moduls	Enterprise Service Management (ESMA) bezeichnet die Gesamtheit von Strukturen, Massnahmen, Methoden und Techniken die notwendig sind, um die bestmögliche, wertschöpfende Unterstützung von Geschäftszielen und -prozessen durch Unterstützungsprozesse wie die IT zu erreichen. Dies erfordert spezifisches Wissen sowie individuelle und organisationale Kompetenzen, besonders in der digitalen Transformation. Im Modul ESMA wird das Verständnis der relevanten und zentralen Konzepte für die Entwicklung dieser Kompetenzen vermittelt. Dazu werden im Rahmen des Moduls die Grundlagen des Enterprise- und IT-Service Managements eingeführt und auf Basis des ITIL4 Service Management-Frameworks vertieft. Sofern der zeitliche Rahmen es zulässt, werden Vorträge von externen Fachpersonen (z.B. Software-Anbieter für Service-Management, Praxisbeispiele zu IT-Service-Management, etc.) integriert. Über den Modulrahmen hinaus haben die Studierenden die Möglichkeit, ausserhalb des Unterrichts auf freiwilliger Basis, die ITIL-Foundation-Zertifizierungsprüfung zu absolvieren. Die Kosten dafür (mit Vergünstigung) tragen die Studierenden selbst resp. deren Arbeitgeber.
Eingangskompetenz	-

ESMA - IT Service Management - BWWh008

Kompetenz

Fachkompetenzen: Die Studierenden sind in der Lage,

- Servicebeziehungen über Angebot, Relationship Management, Erbringung und Nutzung hinweg zu modellieren.
- sich durch ihr Verständnis der fachlichen Zusammenhänge zu ESMA in verschiedenen Rollen im Service-Management selbstständig zurecht zu finden.
- Zusammenhänge zwischen den verschiedenen Praktiken im ESMA & ITSM darzulegen sowie beispielhafte Ziele, Kennzahlen, kritischen Erfolgsfaktoren zu erläutern.
- sich durch das korrekte Verständnis der wichtigsten Konzepte des ESMA & ITSM inkl. generellen und spezifischen ITIL-Prinzipien und -Begrifflichkeiten in Fachdiskussionen einzubringen.
- die Relevanz von wertschöpfendem ESMA & ITSM in der Praxis der Wirtschaftsinformatik zu erkennen, zu verstehen und anspruchsgruppengerecht zu erläutern.

Methodenkompetenzen: Die Studierenden sind in der Lage,

- in ITIL als Standardwerk des ESMA & ITSM zu navigieren und spezifische Themen im Wissenskorpus einzuordnen.
- sich allgemeine Strukturen von ESMA & ITSM- sowie Governance-Prozessmodellen zu erschliessen und in Kontext zu setzen.
- ihr Fachwissen zu ESMA & ITSM sowie Governance von Unternehmens-IT durch Navigation in verwandten Rahmenwerk selbstständig zu vertiefen.

Sozialkompetenzen: Die Studierenden sind in der Lage,

- ihr Know-how zu ESMA & ITSM für die Mitarbeit in einer IT-Organisation oder verwandten Funktion anschlussfähig - fachlich und am Arbeitsmarkt - zu machen.
- eine aktive Rolle in der Gestaltung von konstruktiven Beziehungen eines Enterprise- und IT-Service-Providers mit seinen Kunden wahrzunehmen.
- Lerninhalte des ITIL-Stoffs in Relation zu anderen Rahmenwerken zu setzen und themen- sowie fachübergreifend diskursiv einzubringen und anzuwenden.

Selbstkompetenzen: Die Studierenden sind in der Lage,

- ihr eigenes Potenzial und den Grad des Interessens für die Aufgabenstellungen des ESMA sowie der Enterprise Governance of IT im Hinblick auf ihre berufliche Tätigkeit zu reflektieren.
- im Verlauf des Moduls zu erkennen, wo sie im Hinblick auf die Zertifizierung sowie die Modul-Prüfung Wissens- und Methodenlücken haben und diese zielgerichtet, selbstständig zu füllen.

Inhalt

Das Modul ESMA widmet sich dem Enterprise- und IT-Service Management. Es verbindet Themen der Betriebswirtschaft und dem IT-Management. Dabei steht inhaltlich das ITIL-Rahmenwerk im Zentrum. Im Modul werden die Bedeutung und gegenseitigen Wechselwirkungen der Ressource Informationstechnologie als direkte Unterstützerin, Befähigerin und Fördererin von Unternehmens- und Geschäftsfeldstrategien beleuchtet. Dabei wird die Grundlage für das Verständnis des organisationalen Wertbeitrags durch IT-Services gelegt. Das Modul ist in sechs Blöcke gegliedert: i) Einführung in das ITSM, ii) ITIL-Grundprinzipien, iii) die Dimensionen des ITSM, iv) das Service Value System, v) Aktivitäten der Service-Wertschöpfungskette und deren Vernetzung, sowie vi) Praktiken im Management von Enterprise Services.

Lehr- und Lernmethode

- Zielorientierter Kontaktunterricht mit dialogischen Sequenzen zur Einführung und Vertiefung von ausgewählten Themen
- Fakultative Vertiefung einzelner Wahl-Themen mit eigenständigem, selbstorganisiertem Lernen und nach Möglichkeit im eigenen Praxiskontext

Fachliteratur

Literatur (Auszüge) - relevante Inhalte werden zur Verfügung gestellt:

- Vorlesungsfolien (auf Moodle bereitgestellt)
- Axelos (2019). ITIL® Foundation: ITIL 4 Edition. TSO. ISBN 9780113316151
- Axelos (2019). ITIL®: ITIL 4 Glossar. TSO.
- Auszüge: ITIL 4 Managing Professional (MP) & ITIL 4 Strategic Leader (SL)

Workload

90h

ESMA - IT Service Management - BWWh008

Kontaktstudium	• 14x2 Lektionen a 45min; Vorlesung und Diskussion, ggf. Gastvorträge • Prüfungsdurchführung
Präsenzpflicht	-
Kompetenznachweis	Schriftliche Prüfung - Offizielle Prüfungswochen am Semesterende • Einzelprüfung • Elektronische Durchführung, absolviert vor Ort • Dauer: 90 Minuten • Gewichtung: 100% Modulnote Die Gesamtbewertung des Moduls erfolgt mit Rundung gemäss SPR.
Hilfsmittel bei schriftlicher Prüfung	Keine. Erlaubt ist ein gedrucktes Wörterbuch Muttersprache-Sprache Kompetenznachweis. BFH-Taschenrechner Weitere Details zu den Hilfsmitteln finden sich in den aktuellen Weisungen der BFH zu Kompetenznachweisen auf der Campus App.
Wiederholungsmodalitäten	-
Weiterführende, vertiefende Module	Enterprise Governance of IT (EGIT)
Bemerkung	Die freiwillige ITIL Foundation-Zertifizierung wird ausserhalb des Unterrichts angeboten und online über Vouchers beim Zertifizierungsanbieter durchgeführt. Durch die Zusammenarbeit mit einem externen Partner kann die ITIL-Zertifizierung zu einem reduzierten Preis angeboten werden. Das Zertifikat ist auf dem Arbeitsmarkt international anerkannt und verbreitet.
Studiengang, Semester	BSc Wirtschaftsinformatik, 2026-2027, 5 HS, VZ, Bern BSc Wirtschaftsinformatik, 2026-2027, 7 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern BFH diagonal, 2026-2027, Herbst, -, Bern

EUID - Hands-on UI Design - BWWh026

ECTS	3
Study language	German
Module level additive	Advanced level
Lecturer(s)	Stirnemann Julia Mia
Module responsibility	Stirnemann Julia Mia
Short description of the module	The "Hands-On UI Design" module is a deep dive into user interface design. Through a practical approach, you will gain a solid foundation in visual design principles and how they relate to the laws of usability. With hands-on projects and real-world examples.
Entry requirements	Basic knowledge of a design tool like Figma is helpful.
Competencies upon completion	You will be able to judge the quality of a user interface based on established design principles, rather than just opinions. You will be able to plan, design and validate user interfaces that follow the rules of aesthetics, usability and scalability.
Content	01 Intro Project assignment Introduction and UI fundamentals (on site, highly recommended) 02 Project process, ideation & Figma I (online) 03 Style guide, corporate identity and "look and feel" & Figma II (online) 04 Imagery and icons, vector vs. pixels & Figma III (online) 05 Visual hierarchy, colour and typography selection (online) 06 Presentation and feedback Group work (on site, mandatory) 07 Presentation and feedback Individual work (on site, mandatory)
Teaching and learning methods	This module will be taught over seven mornings, 50% online, 50% on site (3 on site, 4 online). The on-site classes will not be hybrid. There will be a mix of inputs, workshop-like group work and individual coaching while you are working on a practical project.
Literature	Literature Materials will be given as necessary throughout the course.
Workload	90 Stunden / 3 ECTS
Contact lessons	As published in the schedule.

EUID - Hands-on UI Design - BWWh026

Attendance requirement

Cours A: KW 48, 50 on site, mandatory

Cours B: KW 49, 51 on site, mandatory

Competency assessment

Project Assignment: group work, 40%, Kalenderwoche 48, 49
Project Assignment: individual grade, 60%, Kalenderwoche 50, 51

Aids for written examination

No written examination.

Mode of repetition

Repetition or rework in case of insufficient project assignment

Degree programme, semester

BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern
BSc Business Information Technology, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern
BSc Business Information Technology, 2026-2027, 5 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern

EWEB - Web Engineering - BWWh023

ECTS	3
Unterrichtssprache	Deutsch
Modulniveau Zusatz	Hauptstudium
Dozierende	Hadad Syrian
Modulverantwortung	Syrian Hadad
Kurzbeschreibung des Moduls	Im Modul Web-Engineering werden Kenntnisse zur Entwicklung moderner Webanwendungen und Optimierung der Online-Präsenz von Unternehmen vermittelt. Behandelt werden die Grundlagen des Web-Designs, fortgeschrittene Web-Architekturen, Frameworks, APIs, Content-Management-Systeme, SEO, Web-Sicherheit, Testautomatisierung und neu auch GEO (Generative Engine Optimization). Der praxisorientierte Ansatz ermöglicht die direkte Anwendung und Integration aktueller Technologien.
Eingangskompetenz	Fachkompetenzen: - Kompetenzen der Module WSEG und WSEN Kompetenzen gemäss Kompetenzmodell BFH-W: - Kompetenzen der Module WSEG und WSEN

EWEB - Web Engineering - BWWh023

Kompetenz

1. Grundlagen des Webs und Web-Designs:

- Vermittlung der grundlegenden Konzepte des Webs, einschliesslich URLs, HTTP und der drei Bausteine HTML, CSS und JavaScript.
- Einführung in Web-Design und User Experience (UX), mit Fokus auf Responsive Design und Formulargestaltung.

2. Web-Architekturen und Frameworks:

- Analyse von modernen Web-Architekturen, von monolithischen Strukturen bis hin zu Microservices.
- Kennenlernen und Einsatz von Frameworks wie React, Angular, Vue.js sowie Technologien wie PWA und WebAssembly.

3. APIs und Datenintegration:

- Einführung in die Funktionsweise von APIs und deren Integration in dynamische Webanwendungen.
- Praktische Verwendung der Fetch API und Umsetzung von API-Calls zur Datenverarbeitung und -bindung.

4. Content Management Systeme (CMS) und Optimierungstechniken:

- Überblick über CMS wie WordPress, Shopify und Contentful sowie deren praktische Einsatzmöglichkeiten.
- Grundlagen der Suchmaschinenoptimierung (SEO) und Anwendung von Metriken wie Web Vitals (z. B. CLS, LCP).

5. Web-Sicherheit und Authentifizierung:

- Sensibilisierung für Sicherheitsrisiken wie HTTPS, Verschlüsselung und OAuth sowie Einführung in die OWASP Top 10.
- Praktische Anwendung sicherer Web-Praktiken, einschliesslich Validierung, "Sanitizing" und Authentifizierungsmethoden.

6. Testautomatisierung und Qualitätssicherung:

- Einführung in Testarten wie Unit Tests, Integrations-Tests und End-to-End Tests.
- Nutzung von Werkzeugen wie Microsoft Playwright zur Testautomatisierung und Sicherstellung der Codequalität.

Lehr- und Lernmethode

Präsenzstudium
Wissenserarbeitung, Lehrgespräch, Entwicklungs-Aufgaben

Selbststudium
Literaturstudium, Recherche, Einzelarbeiten

Fachliteratur

Diverse Fachartikel und Blogbeiträge
<https://developer.mozilla.org/>
<https://docs.nestjs.com>
<https://jamstack.org/>

EWEB - Web Engineering - BWWh023

Workload	3 ECTS-Credits
Kontaktstudium	6x4 Lek. alle zwei Wochen
Präsenzpflicht	Keine Testatbedingung
Kompetenznachweis	Teil 1: Projektarbeit (60%) • Einzelarbeit: Statische Webseite auf Github • Gruppenarbeit mit gemeinsamer Note: Konzept + Präsentation für Webauftritt mit Technologieüberblick • Deadline: 18. Dezember 2026 Teil 2: Schlussprüfung (40%), Moodle-Prüfung, Dauer 45 Minuten - In den offiziellen Prüfungswochen
Hilfsmittel bei schriftlicher Prüfung	Keine
Studiengang, Semester	BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern BSc Wirtschaftsinformatik, 2026-2027, 5 HS, VZ, Bern BSc Wirtschaftsinformatik, 2026-2027, 7 HS, TZ, Bern

SAI1 - AI Applications in Industry - BWWh261

ECTS	6
Study language	English
Module level additive	Advanced level
Lecturer(s)	Gomez Teijeiro Lucia, Hadji Misheva Branka, Kooistra Julius
Module responsibility	Gomez Teijeiro Lucia, Hadji Misheva Branka, Kooistra Julius

Short description of the module	In the <i>AI Applications in Industry</i> module, students acquire and act on the set of capabilities needed to design and critically evaluate AI-driven solutions to open world problems. The course is structured around three complementary components: (i) foundational concepts and methods in modern AI (including supervised and unsupervised learning, explainable AI, generative AI, agentic AI, and deployment), (ii) the analysis of how existing business have leveraged AI to generate value, and (iii) continuously coached both by technical and business experts, the conceptualization, development and deployment of a team-based AI-driven minimum viable product (MVP) for their AI-driven business idea. Course evaluation considers both student individual learning (on fundamentals covered in dedicated lecture blocks), soft skills, and team-work production. This course adopts an innovative, mainly hands-on format that emphasizes learning from real-world AI-business case studies, and encourages students to creatively apply AI technologies to address societal needs. Throughout the semester, student groups design their MVP, continuously supported by two dedicated coaching teams who guide them in both technology development and entrepreneurial thinking. The module culminates in a final pitching session, where each team presents their MVP and defend their technical and business decisions in a critical discussion format.
Entry requirements	It is required to understand, speak and write in English, as all lectures, materials, communications, and course outputs will be in this language. Students are expected to arrive with an initial idea for a potential AI application, or to be able to contribute to ideation during the first session, as course opens with an ideation hackathon. It is advisable, though not required, to have followed other data science, AI, and business-oriented courses before. Specifically, (i) it will be necessary to navigate the universe of data technologies and write R and/or Python code, the use of AI code assistants will be encouraged; and (ii) the course project requires familiarity with the identification of societal needs and the formulation of innovative business value propositions around them. The envisioned format, counting with personalized coaching coupled with group work, ensures that students will get the support and complementarity in skills needed to go from value proposition to MVP.
Competencies upon completion	Upon completion, the students will be equipped with the transversal skillset to be able to integrate foundational AI knowledge in applied problem-solving with a business mindset (create value with AI). This includes: - Identify a societal need (challenge) that can benefit from an AI-driven solution and formulate a business value proposition around it. - Demonstrate conceptual understanding of AI core paradigms and techniques, capability for making an informed selection of an appropriate paradigm and technique for the group project challenge, and apply it generating a functional MVP generating value around the identified challenge. - Design, implement, and iteratively refine a functional MVP leveraging AI to deliver its core value proposition. - Explore and question the ethical, legal, and implementation aspects relevant to the feasibility of their MVPs and deployment solutions in real world settings. - Collaborate effectively in multidisciplinary teams, engage with colleagues from other teams for P2P feedback, and communicate in a compelling manner business models and MVPs to sharks.

SAI1 - AI Applications in Industry - BWWh261

Content

The module is organized in two main phases, combining a structured introduction to core AI paradigms and methods, with iterative, project-based application of these.

Phase 1: From idea to Project and Foundations.

- Ideation hackathon towards identification of social need, group formation and narrowing down MVP project.
- Traditional lectures on AI paradigms and methods, data management, app deployment. See it in case-studies.

Phase 2: Project development, iterative improvement, and critical reflection on applicability.

- Hands-on, self-paced, group work on project.
- Coaching sessions: technical and business aspects.
- Pitching and communicating business ideas and products.

Teaching and learning methods

- Lectures (theoretical and applied through case studies).
- Training formative assessments on fundamentals followed by an integrated individual test.
- Pitch sessions and coaching / feedback rounds.
- Group work and peer learning.
- Expert coaching.
- Project-based learning.

Literature

Readings, case studies, and online resources will be provided via the course platform.

Optional resources (for inspiration):

- Khamis, R., & Buallay, A. (Eds.). (2024). *AI in Business: Opportunities and Limitations*. Springer. <https://doi.org/10.1007/978-3-031-48479-7> (access provided by Bern University of Applied Sciences)
- MITOpenCourseWare: <https://ocw.mit.edu/>
- <https://huggingface.co/learn>

Workload

180h

Contact lessons

14 weekly sessions of 3 hours and 30 minutes each (equivalent to 14x4 classes of 45min each including teaching + exercise sessions).

Attendance requirement

Onsite attendance is not required for all sessions. However, for sessions of ideation and team formation (n=2), attendance is highly recommended. For sessions of group project pitching and individual formative assessment (n=3), attendance is mandatory.

Competency assessment

- Individual assessment (40%):
- 30% - Evaluation of foundational knowledge (ML, AI, genAI, agenticAI, data management, deployment). Quiz in calendar week 42.
- 10% - Evaluation of soft skills (P2P engagement, communication, critical thinking, motivation, proactivity and ability to reply questions during pitches). Continuous grading across the semester.
- Group assessment (60%): evaluation of the team-based AI MVP project (technical and business aspects). Project hand-out material + presentation -> calendar week 51.

SAI1 - AI Applications in Industry - BWWh261

Aids for written examination

For the group work output, all types of aids are allowed, even AI (the evaluation will emphasize aspects that cannot be merely AI generated).

For the individual foundational knowledge evaluation, all types of aids are allowed but it will be designed to require human skills.

Mode of repetition

The module can be repeated in the next available semester.

Degree programme, semester

BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern
BSc Business Information Technology, 2026-2027, 5 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern
BSc Business Information Technology, 2026-2027, 7 HS, TZ, Bern

SAI2 - Innovation through Generative AI - BWWh262

ECTS	6
Study language	English
Module level additive	Advanced level
Lecturer(s)	Rietsche Roman, Wambsganss Thiemo
Module responsibility	Prof. Dr. Thiemo Wambsganss, Prof. Dr. Roman Rietsche
Short description of the module	Businesses and organizations that fail to recognize and harness the potentials of generative Artificial Intelligence (AI) will increasingly face competitive disadvantages. Understanding and deploying AI systems is crucial, but integrating these systems into products and services in an intelligent and user-centered manner to drive innovation and develop future-proof solutions is equally essential. "Innovation Through Generative AI" bridges the gap between traditional machine learning and advanced generative AI techniques, particularly in natural language processing and large language models (LLMs). By strategically utilizing Prompt Engineering, specific AI outputs tailored to the needs and challenges of users, customers, and modern organizations can be generated. This course offers an in-depth introduction to the mechanisms and applications of Prompt Engineering, supported by practical examples and projects that students can directly apply to their ideas. The course starts with the basics of natural language processing, the structure, and deployment of LLMs. Participants will learn how to effectively deploy these technologies through prompt techniques to create user-centric innovations. Participants will not only acquire theoretical knowledge but also develop practical skills, enabling them to consciously and effectively utilize generative AI technologies. The goal is to empower students to fully exploit the opportunities and challenges of AI technologies for innovative business solutions through a combination of theoretical understanding and practical application.
Entry requirements	Basic programming skills in Python and an understanding of machine learning are helpful but not mandatory.
Competencies upon completion	At the end of this course... ... students will be able to explain the fundamentals of Natural Language Processing and Large Language Models. ... students will be able to apply, analyze, and evaluate methods and mechanisms of prompt engineering for business innovation. ... students will be able to explain the opportunities and risks of generative AI for different business use cases.
Content	Course Content and Methodology: Foundations and Principles of NLP and LLMs: Prompt Engineering: Application and Prototyping: Legal, Ethical, and Social Aspects of AI Use:

SAI2 - Innovation through Generative AI - BWWh262

Literature

Selected Papers:

- Training Language Models to Follow Instructions with Human Feedback (2022) by Ouyang, Wu, Jiang, Almeida, Wainwright, Mishkin, Zhang, Agarwal, Slama, Ray, Schulman, Hilton, Kelton, Miller, Simens, Askell, Welinder, Christiano, Leike, and Lowe <https://arxiv.org/pdf/2203.02155.pdf>
- Fine-Tuning Language Models from Human Preferences (2020) by Ziegler, Stiennon, Wu, Brown, Radford, Amodei, Christiano, Irving <https://arxiv.org/abs/1909.08593>
- Learning to Summarize from Human Feedback (2022) by Stiennon, Ouyang, Wu, Ziegler, Lowe, Voss, Radford, Amodei, Christiano <https://arxiv.org/abs/2009.01325>
- How Close is ChatGPT to Human Experts? Comparison Corpus, Evaluation, and Detection by Biyang Guo, Xin Zhang, Ziyuan Wang, Minqi Jiang, Jinran Nie Yuxuan Ding, Jianwei Yue, Yupeng Wu <https://arxiv.org/pdf/2301.07597v1.pdf>
- Language Models are Few-Shot Learners by Tom B. Brown et al <https://arxiv.org/pdf/2005.14165.pdf>

Workload

180h

Contact lessons

Every Friday (scheduled time according to study planer)

Attendance requirement

Required mandatory attendance will be during the following events and scheduled calendar weeks:

- KW42 (scheduled for the intermediate pitch)
- KW46 (schedule for user-centered design workshop + coaching)
- KW49 (scheduled for the final presentation)

Competency assessment

Part 1: User-Centered Prototype (30%), group assessment (individual assessment possible)

- Development of a prototype based on prompt engineering addressing a user-centered innovation
- Evaluation of both technical and conceptual aspects (user-centered design, ease-of-use, technology acceptance, problem-solution fit, as well as prompting strategies, prompting evaluation, and methodology)

Part 2: Presentations (40%), group assessment (individual assessment possible)

- Final presentation and defense of the project (15 minutes) (30%), CW49/50
- Intermediate pitch on user-centered innovation and methodology (5 minutes) (10%) CW42
- Regular reflections on the group work, presentation, and learning process (pass/fail), individual assessment

Part 3: Written Assignment (30%), group assessment (individual assessment possible)

- Scientific paper (8-12 pages) describing the motivation, problem-solution-fit, related scientific work, methodology (transparency and reproducibility!), development process, technical implementation, and user testing/ evaluation as well as discussion

Degree programme, semester

BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern
BSc Business Information Technology, 2026-2027, 5 HS, VZ, Bern
BSc Business Information Technology, 2026-2027, 7 HS, TZ, Bern

SBD2 - Data-driven visualization for decision-making - BWWh206

ECTS	6
Study language	English
Module level additive	Advanced level
Lecturer(s)	Gomez Teijeiro Lucia, Hadji Misheva Branka, Zangger Christoph
Module responsibility	Zangger Christoph
Short description of the module	Can you confidently read and interpret the message behind a complex, data-rich graphic? And just as importantly, can you create clear and compelling visualizations that communicate data-driven stories effectively? If your answer is "no" or "I'm not sure," then this module is for you. AI can help generate code, suggest a chart, summarise data or produce a first draft of a presentation. But recognizing whether the data are credible, deciding what the evidence truly means, and telling a story that leads to the right decision remain deeply human responsibilities. In a world overflowing with dashboards, charts, maps, social-media graphics and AI-generated analyses, the ability to read, question and communicate data visually has become an essential business skill. Human perception is remarkably responsive to visual patterns: we can often notice differences in colour, position, size or movement almost instantly. However, this also makes us vulnerable to misleading scales, inappropriate chart choices, missing context and compelling stories built on poor-quality data. This hands-on module invites students to become critical and creative data storytellers. Using real-world datasets and contemporary tools, students will learn how to find and assess data, identify quality problems, design meaningful, interactive visualisations, explore change over time, and communicate evidence to support sound decisions. Particular attention is given to distinguishing visualisations that inform from those that manipulate, and to presenting argument effectively. By the end of the module, students will not simply be able to produce attractive charts. They will be able to ask: <i>Is the data trustworthy? Is this visualisation honest? What story does the evidence actually support? What decision should follow?</i>
Entry requirements	Students should bring curiosity about data and a motivation to develop critical thinking and effective communication skills around data, visualisations and evidence-based decision-making. No prior knowledge of R or data visualisation is required, although previous experience with R can be an advantage.

SBD2 - Data-driven visualization for decision-making - BWWH206

Competencies upon completion Upon successful completion of the module, students will be able to:

- **Question data before trusting it** by assessing its source, quality, completeness, consistency and relevance for a given question or decision.
- **Prepare data for visual analysis** by detecting and addressing common quality problems
- Recognise when a visualisation informs, misleads or manipulates and explain how design choices can shape interpretation.
- **Apply quantitative visualisation skills** to represent distributions, comparisons, relationships and developments over time.
- **Create advanced and interactive visualisations**, including maps and network visualisations, that help audiences explore complex data, identify geographic patterns and understand relationships and connections.
- **Use R and relevant visualisation tools** to produce reproducible, well-designed analytical outputs and presentations.
- **Communicate data findings with impact and integrity** by selecting visual forms that are clear, engaging and appropriate for different audiences.
- **Build an evidence-based data story** that connects trustworthy data, meaningful visual insights and relevant context without overstating conclusions.
- **Translate visual evidence into justified decisions** and defend recommendations in business or societal contexts.
- **Use AI-supported tools critically and responsibly**, while retaining human judgement over the validity, meaning and consequences of the analysis.

Content

- Introduction to R for data visualisation.
- The role of data, visualisations and stories in decision-making.
- Finding and working with data responsibly; open-data portals, APIs, reproducibility.
- Data quality assessment including accuracy, completeness, consistency, timeliness, validity, representativeness, missing data, duplicates, invalid values and mitigation of quality issues.
- Visualising univariate and multivariate categorical and numerical data, including comparisons, rankings, proportions, distributions.
- Visualizing change. Time-series data; line charts, index charts, rolling summaries, seasonal patterns.
- Spatial and network visualisation, including maps, geographic patterns, networks, flows and relationships between connected entities.
- Coaching and practical application in data quality, preprocessing and visualisation design.
- Data storytelling for decision-making, including constructing engaging narratives.

SBD2 - Data-driven visualization for decision-making - BWWH206

Teaching and learning methods

Lectures

Lectures introduce the principles of data visualisation, data quality and data storytelling for decision-making. Students learn how to critically assess the credibility of data, select appropriate visual representations and understand how design choices can reveal, obscure or distort a message. Real-world examples of effective and misleading visualisations are used throughout the module to connect theory with practice.

Exercises

Hands-on exercises are integrated throughout the module to develop practical visualisation skills. Using R and relevant visualisation tools, students work with real datasets to assess data quality, prepare data for analysis and create visualisations for categorical, numerical, multivariate, time-series, spatial and network data. Exercises also include the development of advanced and interactive visualisations.

Continuous data storytelling project

The central assignment runs throughout the module and allows students to apply each stage of the course to a data-centric question of their own choice. Students identify a meaningful question, search for suitable data, assess its origin and quality, prepare it for analysis, explore it through appropriate visualisations and progressively develop an evidence-based data story. The project culminates in a visual narrative that communicates the findings clearly and supports a justified decision or recommendation.

Coaching sessions

Dedicated coaching sessions provide students with opportunities to receive formative feedback on data preparation, visualisation choices and the development of their data story. These sessions support students in refining both the analytical quality and communicative effectiveness of their work.

Presentations

Students present a final evidence-based data story in which visual insights are translated into a clear and justified decision or recommendation. Presentations develop students' ability to communicate findings effectively to an audience, defend their visual and analytical choices.

Literature

Slides, scripts, notes. All material will be made available via Moodle.

Additional useful material:

- Kabacoff, R. 2020. Data Visualization in R.
- Wickham, H. and Grolemund, G. 2017. R for Data Science
- Empirical research articles to be communicated during the course
- Online video tutorials on R and R markdown

Workload

180h

Contact lessons

14 x 4 Lessons (45 mins each): lectures & practicals & interactive sessions, coaching, presentations of data storytelling project

Attendance requirement

Attendance is not compulsory. However, we hope you will join us: this is not a course where all the learning happens by reading slides at home. Each week will include hands-on exploration, discussion and opportunities to build your own data story step by step. It will be useful, interactive and, we hope, genuinely fun.

SBD2 - Data-driven visualization for decision-making - BWWh206

Competency assessment

Individual data storytelling project (100%). Students investigate a data-centric question and develop an evidence-based visual story:

- **Written report (60%).** The assignment is divided into three small submissions delivered throughout the semester, enabling continuous feedback and improvement. Together, these submissions form the final report (Quatro report + html file), including the reproducible data analysis and visualisation scripts, and account for 60% of the grade.
- **Presentation of the work (40%).** In KW 51, students present their completed project; the final presentation accounts for 40% of the grade.

Mode of repetition

Written report: The report consists of three equally weighted parts; the combined score determines the written report grade. If a student receives a grade below 3.5 for Part 1 or Part 2, the respective part may be improved during the module; in this case, the maximum achievable grade for that part is 4.0. An unsatisfactory grade for Part 3, or an overall unsatisfactory written report grade, may be repeated at the next official examination date.

Oral presentation: An unsatisfactory grade for the final presentation may be repeated at the next official examination date.

Degree programme, semester

BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern
BSc Business Information Technology, 2026-2027, 5 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern
BSc Business Information Technology, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern

SDA2 - Software Architecture - BWWh222

ECTS	6
Study language	English
Module level additive	Advanced level
Lecturer(s)	Höhn Sebastian
Module responsibility	Höhn Sebastian

Short description of the module	Being a successful software architect is more than just possessing technical knowledge. Its about thinking like an architect, being a leader, and understanding the architectural elements, patterns, and styles necessary to create effective software architectures. Neil Ford Software architecture is where technical design, business context, constraints, and long-term change meet. In this module, students learn how architects reason about software systems: how they identify quality requirements, make trade-offs explicit, choose suitable architectural styles, and document decisions so that teams can build, evaluate, and evolve systems over time. The module connects architecture fundamentals with concrete engineering practice. Students work with concepts such as modularity, coupling and cohesion, architecture characteristics, APIs, domain boundaries, distributed systems, microservices, event-driven architectures, serverless computing, and data-intensive systems. They also learn that architecture rarely starts on a blank page: existing systems, legacy constraints, organizational structures, technology choices, and operational realities must be understood before meaningful design decisions can be made. A central part of the module is a set of architecture labs and applied exercised. In these labs, students design, prototype, document, and evaluate architectural solutions for realistic scenarios. Contemporary software engineering toolchains, including AI-assisted development tools, may be used where they help with exploration, implementation, documentation, or evaluation. The focus is not on using a particular tool, but on making architectural reasoning visible, testable, and defensible.
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Competencies upon completion	After successfully completing the module, students can: • explain the role of software architecture in the lifecycle of modern software systems, including, where relevant, systems that use AI components or are developed with AI-assisted toolchains, and distinguish architecture decisions from implementation or technology decisions • identify and formulate relevant architecture characteristics and quality requirements such as scalability, adaptability, maintainability, reliability, security, deployability, and the specific requirements that may arise when AI-based functionality is part of a system • analyse a given system context, including business goals, domain boundaries, legacy systems, organizational constraints, technology constraints, and opportunities or risks created by AI-assisted development and AI-enabled system capabilities • design modular software architectures using principles such as separation of concerns, information hiding, coupling and cohesion, and clear component responsibilities • compare architectural styles and patterns, including layered architectures, modular monoliths, microservices, event-driven architectures, serverless approaches, and integration patterns • design and evaluate APIs, service boundaries, data ownership, and integration strategies for distributed and data-intensive systems • apply selected Domain-Driven Design concepts to reason about domains, bounded contexts, context maps, and service boundaries • document architecture decisions using appropriate views, models, diagrams, and Architecture Decision Records (ADRs) • justify architectural trade-offs and evaluate proposed solutions against explicit scenarios, constraints, and quality requirements • use contemporary development and AI-assisted toolchains transparently and critically as part of architecture exploration, prototyping, documentation, and evaluation • communicate architecture decisions effectively in teams and reflect on the social, organizational, and leadership aspects of architecture work
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SDA2 - Software Architecture - BWWh222

Content

The following topics are planned. The exact depth and examples may vary depending on the lab scenarios and current developments in software engineering practice.

- The role of software architecture: responsibilities, architecture thinking, stakeholders, constraints, and trade-offs
- Architecture characteristics and quality attribute scenarios: scalability, adaptability, maintainability, reliability, security, performance, and deployability
- Modularity and design principles: components, cohesion, coupling, encapsulation, dependencies, and fitness for change
- Architecture documentation: views, diagrams, models, communication, and Architecture Decision Records (ADRs)
- System design and architecture evaluation: analysing scenarios, comparing alternatives, and reasoning about consequences
- Architectural styles and patterns: layered architectures, modular monoliths, microservices, event-driven architectures, serverless computing, and integration patterns
- API design and integration: service contracts, interface design, versioning, synchronous and asynchronous communication, and integration with existing systems
- Domain-Driven Design: domains, subdomains, bounded contexts, context mapping, aggregates, and domain events
- Distributed and data-intensive systems: service granularity, data ownership, consistency, transactions, messaging, and operational complexity
- Evolutionary architecture and modern delivery practices: continuous delivery, observability, architecture fitness functions, and change over time
- Architecture labs: design, prototype, document, and evaluate architecture solutions using contemporary software engineering and AI-assisted development tools where appropriate

Teaching and learning methods

The module combines structured input, guided self-study, and applied architecture labs. Lectures and online materials introduce the conceptual foundations, terminology, and methods needed for architectural reasoning. The accompanying readings and video lessons support self-paced preparation and allow students to revisit core concepts when working on the labs.

On-premise sessions are used primarily for discussion, workshops, design critique, lab work, and feedback. Students work individually and in groups on realistic architecture scenarios, develop solution proposals, document decisions, and evaluate their designs against explicit quality requirements. The labs are designed to connect theory with practice without prescribing one fixed solution path.

Contemporary software engineering toolchains, including AI-assisted development tools, may be used in the labs and assignments. Their use must be transparent and appropriate to the task. Students are expected to understand, review, and justify the architectural consequences of any generated artefacts, prototypes, diagrams, or documentation.

The module is planned as a blended-learning format. Approximately half of the learning activities take place in on-premise lectures, workshops, and lab sessions. The other half is organized as asynchronous online learning, self-study, readings, video lessons, and preparation or follow-up work for the labs.

SDA2 - Software Architecture - BWWh222

Literature

Main literature:

- Richards, M., & Ford, N. (2025). *Fundamentals of Software Architecture: An Engineering Approach* (2nd ed.). O'Reilly. <https://learning.oreilly.com/library/view/fundamentals-of-software/9781098175504/>
- Bass, L., Clements, P., & Kazman, R. (2021). *Software Architecture in Practice* (4th ed.). Addison-Wesley. <https://learning.oreilly.com/library/view/software-architecture-in/9780136885979/>

Recommended further reading:

- Ford, N., Richards, M., Sadalage, P., & Dehghani, Z. (2021). *Software Architecture: The Hard Parts*. O'Reilly. <https://learning.oreilly.com/library/view/software-architecture-the/9781492086888/>
- Kleppmann, M., & Riccomini, C. (2026). *Designing Data-Intensive Applications* (2nd ed.). O'Reilly. <https://learning.oreilly.com/library/view/designing-data-intensive-applications/9781098119058/>
- Vernon, V. (2013). *Implementing Domain-Driven Design*. Addison-Wesley. <https://learning.oreilly.com/library/view/implementing-domain-driven-design/9780133039900/>

Selected article:

- Tyree, J., & Akerman, A. (2005). Architecture decisions: Demystifying architecture. *IEEE Software*, 22(2), 19-27. <https://doi.org/10.1109/MS.2005.27>

Workload

6 ECTS

Contact lessons

Contact lessons will be taught on premise. Video lessons will be organized as asynchronous and remote sessions. We aim to balance these two to be about 50% each.

Attendance requirement

Workshops and guest lectures will require attendance. Schedule will be published at the start of the semester.

Competency assessment

The competency assessment consists of three graded assignments during the semester.

Two assignments are completed as group work and together account for 40% of the final grade. These assignments may include architecture labs in which students design, document, prototype, and evaluate software architectures for given scenarios. Contemporary software engineering toolchains, including AI-assisted development tools, may be used as part of the assignments. The exact scope, scenarios, toolchain requirements, deliverables, and assessment criteria will be published on Moodle.

One assignment is completed individually and accounts for 60% of the final grade. The individual assignment assesses each student's ability to apply, analyse, justify, and evaluate software architecture decisions independently. It may build on the group assignments, for example through an individual analysis, comparison, integration, measurement, or extension of the architectural solutions developed during the semester.

Generic assessment criteria may include:

- clarity and completeness of architecture documentation and project deliverables
- appropriate application of software architecture concepts, patterns, and methods
- quality of architecture decisions, including justification of trade-offs and constraints
- modularity, coupling, cohesion, and maintainability of the proposed solution
- effective and transparent use of contemporary development toolchains
- evaluation of the solution against the given scenario and quality requirements

The exact assessment criteria will vary for each assignment and will be available on Moodle.

SDA2 - Software Architecture - BWWh222

Degree programme, semester	BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern
	BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern
	BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern
	BSc Business Information Technology, 2026-2027, 7 HS, TZ, Bern
	BSc Business Information Technology, 2026-2027, 5 HS, VZ, Bern
	BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern

SDA4 - Hands-on Architecture - BWWh224

ECTS	6
Study language	English
Module level additive	Advanced level
Lecturer(s)	Höhn Sebastian
Module responsibility	Höhn Sebastian
Short description of the module	SDA4 is the hands-on integration module of the Software Design and Architecture specialization. It brings together software architecture, enterprise architecture, and UX strategy in realistic architecture labs and case studies. Students work on practical architecture challenges where technical systems, business capabilities, user needs, organizational constraints, and existing application landscapes must be considered together. The module focuses on applying architectural thinking in situations that resemble professional practice: incomplete information, competing goals, legacy constraints, stakeholder perspectives, and the need to make decisions explicit and defensible. The module builds on themes from the other SDA modules without requiring them as strict prerequisites. Theoretical foundations, methods, and tools are introduced or refreshed where needed. The focus is on applying concepts in context: analysing a situation, developing architecture options, documenting decisions, evaluating trade-offs, and communicating recommendations. A central part of the module is applied architecture lab work. In these labs, students work individually and in groups on realistic scenarios. Depending on the lab, they may analyse an enterprise context, define architecture-relevant user and stakeholder concerns, design or evaluate software and integration architectures, prototype selected aspects, and formulate architecture recommendations. Contemporary software engineering and AI-assisted tools may be used where appropriate, but the emphasis is on architectural reasoning, not on a specific toolchain.
Entry requirements	The knowledge and skills acquired so far during the bachelor programme are presupposed. The module can be taken independently of the other SDA modules; relevant foundations from software architecture, enterprise architecture, and UX strategy will be introduced or refreshed where needed.
Competencies upon completion	After successfully completing the module, students can: - analyse realistic architecture problems by considering business goals, user and stakeholder needs, organizational constraints, existing application landscapes, and technical constraints - integrate concepts from software architecture, enterprise architecture, and UX strategy when developing architecture options and recommendations - identify architecture-relevant concerns across different levels, including enterprise capabilities, business processes, user journeys, application components, interfaces, data flows, and technology platforms - develop and compare architecture options for realistic scenarios and justify choices based on explicit trade-offs and constraints - apply selected methods, models, and notations from enterprise architecture, software architecture, and UX strategy to structure and communicate analysis results - document architecture decisions, assumptions, risks, and recommendations in a clear and traceable way - evaluate proposed solutions against business, user, technical, and organizational requirements - use contemporary digital and AI-assisted toolchains transparently and critically as part of analysis, modelling, prototyping, documentation, and evaluation - collaborate effectively in architecture labs, including peer review, feedback, and constructive critique - communicate architecture recommendations to different stakeholder groups and defend them based on evidence, reasoning, and trade-offs - reflect on their own working process and improve their solution based on feedback, evaluation results, and changing assumptions

SDA4 - Hands-on Architecture - BWWh224

Content

The following topics are planned. The exact depth, tools, and examples may vary depending on the lab scenarios and current developments in architecture practice.

- Integrated architecture work: connecting enterprise architecture, software architecture, and UX strategy in realistic problem settings
- Architecture problem framing: stakeholders, business goals, user needs, constraints, assumptions, risks, and decision drivers
- Enterprise context analysis: capabilities, business processes, application landscapes, information flows, technology platforms, and organizational constraints
- UX strategy at architecture level: user groups, journeys, pain points, service touchpoints, accessibility and usability concerns, and their implications for architecture decisions
- Software architecture in context: components, interfaces, APIs, integration patterns, data ownership, deployment options, and quality requirements
- Architecture modelling and documentation: selected models, views, diagrams, decision records, roadmaps, and recommendation documents
- Trade-off analysis and architecture evaluation: comparing solution options against business, user, technical, and organizational criteria
- Prototyping and validation where appropriate: using lightweight artefacts, experiments, simulations, or technical prototypes to reduce uncertainty
- Tool-supported architecture work: selected digital tools for modelling, documentation, prototyping, collaboration, and AI-assisted analysis or development
- Architecture labs: group and individual work on realistic case studies, including analysis, solution design, documentation, peer review, feedback, and presentation of recommendations

Teaching and learning methods

The module combines short conceptual inputs, guided self-study, and applied architecture labs. Lectures and online materials introduce or refresh the methods, terminology, and examples needed for the current lab work. Readings, videos, and selected resources support preparation and allow students to deepen specific topics where needed.

On-premise sessions are used primarily for lab work, workshops, coaching, design critique, peer review, and presentations. Students work on realistic architecture scenarios in groups and individually. They analyse the given context, develop solution options, document decisions, evaluate trade-offs, and communicate recommendations.

The labs are designed to connect theory with practice without prescribing one fixed solution path. Depending on the scenario, students may work with artefacts such as stakeholder analyses, capability maps, process or journey models, application landscape views, architecture diagrams, interface sketches, Architecture Decision Records, prototypes, evaluation criteria, and recommendation documents.

Contemporary digital toolchains, including AI-assisted tools, may be used in the labs and assignments where appropriate. Their use must be transparent and critically reflected. Students are expected to understand, review, and justify the architectural consequences of generated artefacts, models, prototypes, or documentation.

The module is planned as a blended-learning format. Approximately half of the learning activities take place in on-premise lectures, workshops, coaching, and lab sessions. The other half is organized as asynchronous online learning, self-study, readings, video lessons, and preparation or follow-up work for the labs.

SDA4 - Hands-on Architecture - BWWh224

Literature

Main literature

- Ross, J. W., Weill, P., & Robertson, D. C. (2006). *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution*. Harvard Business Review Press.
URL for verification: <https://www.oreilly.com/library/view/enterprise-architecture-as/9781422148174/>
- Kalbach, J. (2020). *Mapping Experiences: A Complete Guide to Customer Alignment Through Journeys, Blueprints, and Diagrams* (2nd ed.). O'Reilly.
URL for verification: <https://www.oreilly.com/library/view/mapping-experiences-2nd/9781492076629/>
- van Kelle, E., Verschatse, G., Baas-Schwegler, K., & Yao, X. (to verify). *Collaborative Software Design: How to Facilitate Domain Modeling Decisions*. Manning.
URL for verification: <https://www.manning.com/books/collaborative-software-design>

Recommended further reading

- Levy, J. (2021). *UX Strategy: Product Strategy Techniques for Devising Innovative Digital Solutions* (2nd ed.). O'Reilly.
URL for verification: <https://www.oreilly.com/library/view/ux-strategy-2nd/9781492052425/>
- Skelton, M., & Pais, M. (2019). *Team Topologies: Organizing Business and Technology Teams for Fast Flow*. IT Revolution.
URL for verification: <https://teamtopologies.com/book>
- Selected readings from the literature of SDA1, SDA2, and SDA3 may be used depending on the lab scenarios.

Workload

6 ECTS require 180h effort:

- 26-32h face-to-face lessons
- 26-32h online lessons
- 100-120h group and self-study

Contact lessons

Contact lessons will be taught on premise.

Video lessons will be organized as asynchronous and remote sessions.

We aim to balance these two to be about 50% each.

Attendance requirement

Guest lectures will require attendance.

The schedule will be published at the start of the semester.

Competency assessment

Three graded assignments through the course of the semester.

Two assignments are graded as a competency assessment as group grade, 40% (due dates CW 44 and 51). One assignment is graded as an individual grade, 60% (due data CW 1/2027).

Generic assessment criteria might include:

- Clarity and completeness of the project deliverables
- Application of theoretical concepts to practical scenarios
- Quality of collaboration and peer feedback
- Effectiveness of solutions and recommendations

The exact assessment criteria will vary for each assignment and will be available on moodle.

Aids for written examination

There is no written exam.

SDA4 - Hands-on Architecture - BWWh224

Degree programme, semester	BSc Business Information Technology, 2026-2027, 5 HS, VZ, Bern
	BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern
	BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern
	BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern
	BSc Business Information Technology, 2026-2027, 7 HS, TZ, Bern
	BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern

SPM2 - Change and Transformation Projects - BWWh242

ECTS	6
Unterrichtssprache	Deutsch
Modulniveau Zusatz	Hauptstudium
Dozierende	Jud Reto, Liedtke Andreas
Modulverantwortung	Dr. Andreas Liedtke
Kurzbeschreibung des Moduls	Projekte enthalten grundsätzlich einen Change-Anteil in ihrer Umsetzung. In diesem Modul wird speziell auf das Change Management als eigenständige Disziplin eingegangen. Grundlagen der Theorie und ein Basisverständnis vom Change Management sollen vermittelt werden. Mit einem Simulations-Tool für Change-Management, wird der Change Prozess in einem Unternehmen nachgestellt. In Gruppen der Studierenden müssen Mitarbeitende des fiktiven Unternehmens möglichst situationsgerecht und effizient durch geeignete Massnahmen durch den Change-Prozess begleitet werden. Das Simulations-Tool wird ergänzt durch die theoretischen Konzepte des Change-Managements wie beispielsweise das Change-Modell von P. Kotter oder die Change-Kurve nach Kübler-Ross. Change- und Transformationsprojekte werden aus der Praxis vorgestellt. Die Teilnehmerzahl ist auf maximal 30 Studierende begrenzt um in kleinen Arbeitsgruppen intensiv das Vorgehen im Change Management reflektieren zu können. Für die Teilnahme wird eine grosses Interesse an der Thematik und intensive Teilnahme in kleinen Arbeitsgruppen vorausgesetzt.
Eingangskompetenz	Basis Vorlesung Projektmanagement wie WPR1
Kompetenz	Fachkompetenz Die Studierenden sind in der Lage einen Change Prozess mit Hilfe der vorgestellten Modelle zu beschreiben und einzelne Phasen zu erkennen. Die Studierenden können einen Change-Prozess mit Methoden und geeigneten Massnahmen unterstützen. Die Studierenden kennen die wichtigsten Aspekte aus der Thematik «Positive Leadership und Positive Mindset» Die Studierenden können anhand der Praxisbeispiele aus Change Projekten die angewandten Methoden beschreiben Methodenkompetenz Die Studierenden können die vorgestellten Methoden und Prozesse wie beispielsweise das 8-Stufen Modell nach Kotter, die Change-Kurve nach Kübler Ross und ähnliches Die Studierenden kennen die Prinzipien des Positive Leadership und Positive Mindset Die Studierenden sind in der Lage Change-Prozesse zu begleiten und eigenständig Massnahmen aus den gezeigten Methoden für Praxisprojekte vorzuschlagen. Sozialkompetenz Die Studierenden erfahren im Rahmen der Projektarbeit, dass im Change-Management sehr unterschiedliche Phasen durch die Betroffenen Personen durchlaufen werden. Die Studierenden wissen, wie zentral und wichtig für die Betroffenen Menschen die Begleitung in einem Change Prozess ist. Die Studierenden erfahren, wie die Themen des «Positive Leadership» und «Positive Mindset» auf ihre eigene Arbeit auswirkt, die Studierenden können sich diesbezüglich selbst reflektieren

SPM2 - Change and Transformation Projects - BWWh242

Inhalt

- Change-Management Modelle aus der Theorie
- Simulations-Tool zum Thema Change Management
- Reflexionseinheiten in Kleingruppen zum Verhalten im Simulations-Tool
- Praxisbeispiele zum Thema Change-Management

Lehr- und Lernmethode

Simulations-Tool
Vorlesungen

Fachliteratur

Wird zu Beginn der Vorlesung bekannt gegeben

Workload

180h

Präsenzpflicht

Folgende Termine sind obligatorisch:

- 16.09.26 vor Ort Einführung in die Spielsimulation
- 23.09.26 Spieleinführung
- 30.09.26 Online Coaching in Kleingruppen
- 07.10.26 Online Spielsimulation
- 14.10.26 vor Ort Reflexion
- 21.10.26 Online Coaching in Kleingruppen
- 18.10.26 Online Spielsimulation
- 04.11.26 vor Ort Reflexion
- 11.11.26 Online Coaching in Kleingruppen
- 18.11.26 Online Spielsimulation
- 25.11.26 vor Ort Reflexion
- 02.12.26 Online Coaching in Kleingruppen
- 09.12.26 Online Spielsimulation

Kompetenznachweis

KN1: Gruppenarbeit zum Thema Change, schriftliche Arbeit, Note zählt 50%, Abgabe 06.11.26
KN2: schriftliche Einzelarbeit, Note zählt 50%, Abgabe 18.12.26

Weiterführende, vertiefende Module

SPM1 und SPM3

Studiengang, Semester

BSc Wirtschaftsinformatik, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern
BSc Wirtschaftsinformatik, 2026-2027, 5 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern

SPM3 - Project Management in the Area of Digitalization and Innovation - BWWH243

ECTS	6
Unterrichtssprache	Deutsch
Modulniveau Zusatz	Hauptstudium
Dozierende	Hehn Jennifer, Liedtke Andreas, Wiedemann Anna
Modulverantwortung	Dr. Andreas Liedtke
Kurzbeschreibung des Moduls	Es wird der Zusammenhang unterschiedlicher Aspekte zu den Themen Agilität in der Organisation und im Projektmanagement dargestellt.
Eingangskompetenz	Basisvorlesung in Projektmanagement wie WPR1
Kompetenz	Fachkompetenz: - Die Studierenden können unterschiedliche Aspekte zur Thematik Agilität anwenden, beschreiben und kennen die Zusammenhänge - Die Studierenden sind in der Lage zu begründen, wann eine agile und wann eine klassische Projektumsetzung vorteilhaft ist. - Die Studierenden wenden die erworbenen Kenntnisse im Projektmanagement an. Methodenkompetenz: - Die Studierenden können die vorgestellten Methoden in einem Projekt konkret anwenden - Die Studierenden kennen einzelne Methoden wie Lego Serious Play und können diese anwenden - Die Studierenden kennen agile Organisationsformen Sozialkompetenz: - Die Studierenden erfahren im Rahmen der Projektarbeit, dass die Gruppe mehr ist als die Summe ihrer Mitglieder. Sie sind in der Lage, die Gruppenarbeit so zu organisieren und zu steuern, dass die geforderten Arbeiten effizient, rechtzeitig, gut abgestimmt und qualitativ zufriedenstellend erbracht werden.
Inhalt	- Lego Serious Play-Methode - Mindset und Leadership - Organisationsmodelle wie Spotify oder Holakratie - Leadership - KI im Projektmanagement - DevOps
Lehr- und Lernmethode	- Vorlesungen - Flipped Classroom - Leadership Simulation
Fachliteratur	- Handbuch Projektmanagement, Kuster et. al Springer Gabler, 2019 - Ganzheitliches Projektmanagement, K. Pfetzing, Verlag Dr. Götz Schmidt, 2017 - weitere Literatur wird in der Vorlesung bekannt gegeben

SPM3 - Project Management in the Area of Digitalization and Innovation - BWWh243

Workload

- Kontaktstudium: 10 Vorlesungen a 4 mal 45 h: Gesamthaft 30h
- Begleitetes Selbststudium: 4-5 h
- Selbststudium ca 80h
- Gruppenarbeit ca 65h

Kontaktstudium

gemäss Ankündigung im Unterricht

Präsenzpflcht

Präsenzpflcht gilt bei

- 30.09.2026
- 07.10.2026
- 21.10.2026
- 28.10.2026
- 18.11.2026
- 02.12.2026
- 09.12.2026

Kompetenznachweis

KN 1: Eine Flipped Classroom Session in der Gruppe (50% Gesamtgewichtung), Gruppenbewertung einer Gruppenpräsentation, Termine 28.10.2026, 09.12.2026

KN 2: Semesterende: schriftliche Prüfung am Ende des Semesters in den offiziellen Prüfungswochen, 60 min (50% Gesamtgewichtung)

Hilfsmittel bei schriftlicher Prüfung

Keine

Wörterbuch Sprache Kompetenznachweis - Muttersprache

BFH-Taschenrechner

Wiederholungsmodalitäten

Gemäss Studien- und Prüfungsreglement

Weiterführende, vertiefende Module

SPM1, SPM2

Studiengang, Semester

BSc Digital Business & AI, 2026-2027, 5 HS, TZ, Bern
BSc Digital Business & AI, 2026-2027, 3 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 5 HS, VZ, Bern
BSc Wirtschaftsinformatik, 2026-2027, 5 HS, VZ, Bern
BSc Digital Business & AI, 2026-2027, 7 HS, TZ, Bern
BSc Wirtschaftsinformatik, 2026-2027, 7 HS, TZ, Bern