Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

CORSO DI LAUREA IN INFORMATICA E MANAGEMENT DELLE AZIENDE DIGITALI

Piano di studio e contenuto degli insegnamenti

BACHELOR IN WIRTSCHAFTSINFORMATIK

Studienplan und Inhalt der Kurse

Allocazione degli insegnamenti per anno di corso e per semestre / Aufteilung der Lehrveranstaltungen nach Studienjahr und Semester

Ogni anno di corso è articolato in due semestri. L'inizio e la fine dei semestri sono stabiliti nel Calendario Accademico. Le attività formative hanno durata semestrale o annuale.

Jedes Studienjahr ist in zwei Semester unterteilt. Anfang und Ende der Semester sind im Akademischen Kalender festgelegt. Die Lehrveranstaltungen haben eine Dauer von einem Semester oder sind Ganzjahreskurse.

Insegnamento/Lehrveranstaltung	**CFU/KP**	**Esame/ Prüfung**
Primo anno / Erstes Jahr		
Semestre / Semester 1		
Introduction to Linear Algebra and Discrete Mathematics	6	Si/Ja
Introduction to Programming	9	Si/Ja
Accounting for Decision Making	6	Si/Ja
Economics of Digital Markets	9	Si/Ja
Semestre / Semester 2		
Introduction to Analysis and Optimization Techniques	6	Si/Ja
Modeling and Databases • Module 1: Data and Process Modeling for Business Informatics • Module 2: Introduction to Databases for Business Informatics	12	Si/Ja
Application Engineering for Business Informatics	6	Si/Ja
Web and Internet Engineering	6	Si/Ja
Secondo anno / Zweites Jahr		
Corsi annuali / Ganzjahreskurse		
Introduction to Digital Business, Strategy and Management • Module 1: Strategic Management and Digital Business • Module 2: Change Management	10	Si/Ja
Specialisation in Digital Business *Digital Finance and Financial Markets* or *Digital Marketing and Advertising*	12	Si/Ja
Semestre / Semester 3		
Data Structures and Algorithms	6	Si/Ja
Probability Theory and Statistics	6	Si/Ja
Management of System Security and Networks	6	Si/Ja
English for Informatics and Digital Business	3	Idoneità/ Eignung
Semestre / Semester 4		
IT Management and ERP Systems • IT Management and Enterprise Modeling • ERP Systems and IT Service Management	12	Si/Ja
Engineering of Mobile Systems	6	Si/Ja
Terzo anno / Drittes Jahr		
Corsi annuali / Ganzjahreskurse		
Data Mining and Decision Making • Module 1: Introduction to Data Mining • Module 2: Data-driven Decision Making	12	Si/Ja
Free Choice	12	Si/Ja
Semestre/Semester 5		
Legal aspects of IT	3	Idoneità/ Eignung
Italian/German for Informatics and Digital Business	3	Idoneità/ Eignung
Seminar in Business Informatics and Information Systems	6	Si/Ja
Specialization in Digital Business	6	Si/Ja

Advanced Economics for Digital Business or *Market Research and B2B Digital Marketing* or *Financial Trading and Algorithms*		
Semestre / Semester 6		
Software Project Management	6	Si/Ja
Internship	6	Idoneità/ Eignung
Thesis	5	

Contenuto degli insegnamenti / Inhalt der Lehrveranstaltungen

Insegnamento/Lehrveranstaltung	CFU/ KP	SSD
Primo anno / Erstes Jahr		
Introduction to Linear Algebra and Discrete Mathematics • Background on complex numbers, trigonometry and polynomials • Vectors and matrices • Linear systems • Induction principle and recursion • Sets, functions and counting • Relations and graphs	**6**	**MAT/02**
Introduction to Analysis and Optimization Techniques • Sequences and series • Univariate functions • Derivatives and differentials • Basic optimization techniques • Discrete (financial) market models • Mathematical methods for decision making	**6**	**MAT/05**
Introduction to Programming • Basic algorithms and data structures • Data types and expressions • Classes and objects • Conditionals and loops • Object-oriented design • Arrays and collections • Input/Output and exception handling • Inheritance and polymorphism • Recursion	**9**	**INF/01**
Accounting for decision making • understanding of the concepts and language of accounting • preparation of financial statements (income statement, balance sheet, statement of cash flows) • basic interpretation and analysis of financial statements • cost behavior and cost-volume-profit analysis • fundamentals of internal decision-making • introduction to budgeting and management control	**6**	**SECS-P/07**
Economics of Digital Markets • Introduction to Microeconomics • Consumer Theory • Producer Theory • Basic Game Theory • Industrial Organization • Strategic Interactions	**9**	**SECS-P/06**
Modeling and Databases	**12**	**ING-INF/05**
Module 1: Data and Process Modeling for Business Informatics • Principles of data modeling • Data modeling with ER and UML • Relational mapping	6	ING-INF/05

• Descriptive process modeling • Analytic process modeling • Decision modeling		
Module 2: Introduction to Databases for Business Informatics • Relational Model • Query languages (relational algebra and SQL) • Query management • Database design • Building database applications • NoSQL and large-scale data management	6	INF/01
Application Engineering for Business Informatics • Software Processes • Agile Project Management • Software Requirements and Architecture • Data and Software Modelling • Application Construction and Implementation • Testing and Quality Management	**6**	**INF/01**
Web and Internet Engineering • Development of web applications: basics of usability, accessibility and responsive design • Web protocols and markup languages • Client-side dynamicity and web scripting languages • Client-side GUI frameworks • Web application design and web services • Languages and frameworks for server-side web development	**6**	**INF/01**
Secondo anno / Zweites Jahr		
Introduction to Digital Business, Strategy and Management	**10**	**SECS-P/08**
Module 1: Strategic Management and Digital Business • Introduction to Digital Business • Introduction to Operative and Strategic Management • Information Rules • Competitive Advantage and Digitalization • Management of ICT • Corporate Strategy and Digitalization	5	**SECS-P/08**
Module 2: Change Management • Organization Processes • Business Modelling • Designing Change Processes • Management of Change • ICT and Change	5	**SECS-P/08**
Digital Finance and Financial Markets (Specialisation)	**12**	**SECS-P/09**
Module 1: Principles of Finance for CS • Arbitrage principles in finance • Risk and Return • Real Investment Analysis • Raising capital	6	SECS-P/09
Module 2: Financial Markets • Financial system and Financial intermediation • Banks and Non-Banks • Capital Markets and Investment Banks • Asset Management	6	SECS-P/11
Digital Marketing and Advertising (Specialisation)	**12**	**SECS-P/08**
Module 1: Introduction to Digital Marketing and Advertising • Strategic thinking alongside the use of digital media • Essential elements of DM • Techniques and platforms (social media, content marketing, SEO, user experience, personalisation, display advertising and CRM) • Aspects of implementation (planning, integration)	6	SECS-P/08

Module 2: Analytics of Consumer Behavior • Basics of Consumer Behaviour and Consumer Decision Making • Concepts and Applications • Analytical models for Consumer Behaviour Modelling • Prediction models for Consumer Behaviour Modelling	6	SECS-P/08
Data Structures and Algorithms • Searching and sorting • Divide and conquer algorithms • Analysis of algorithms: correctness and complexity • Abstract data types: stacks, queues, priority queues, maps • Dynamic data structures and associated algorithms: linked lists and trees • Graphs and elementary graph algorithms	**6**	**INF/01**
Probability Theory and Statistics • Discrete and continuous probabilities • Independence of random variables and conditional probabilities • Sum of random variables, the central limit theorem and Monte Carlo method • Descriptive statistics and inference • Sampling and parameter estimation • Statistical models and testing	**6**	**MATH/06**
Management of System Security and Networks • Key concepts of system security and networked systems, threats and data security • Basic mechanisms of cryptography • Identification, authentification and biometrics • Chip cards • Security infrastructures and certificates • Web and internet security	**6**	**ING-INF/05**
English for Informatics and Digital Business • Writing skills: practice of coherent academic discourse to produce subject-specific texts; • Spoken skills: improvement of spoken interaction and production through the practice and production of academically and professionally acceptable presentations and other domain-specific speaking activities; • Development of receptive skills through the exposure to and analysis of various types of written and spoken discourse typical in Computer Science and development of grammatical and lexical range and accuracy so that communication is fluent and spontaneous.	**3**	**L-LIN/12**
IT Management and ERP Systems	**12**	**INF/01**
Module 1: IT Management and Enterprise Modeling • Basic concepts of IT management • Managing technical environments • Security issues in IT management • IT related standards, laws, and regulations • Risk management and disaster recovery • Service-based management of IT	6	INF/01
Module 2: ERP Systems and IT Service Management • Concepts, technologies and systems in the ERP market • ERP project lifecycle • ERP systems from the developer perspective (customizing and developing) • IT service management processes • Management simulation game on the information and technology function in organizations • Best practice case studies, frameworks and tools	6	INF/01
Engineering of Mobile Systems • Design of native mobile applications • Android development platform • iOS development platform • Frameworks for mobile development • New architectures: Arduino, Raspberry • Internet of Things	**6**	**INF/01**
Terzo anno / Drittes Jahr		
Data Mining and Decision Making	**12**	**INF/01**
Module 1: Introduction to Data Mining • Introduction and steps of the KDD process • Data quality and data preparation	6	INF/01

• Basic Data Mining methods • Tools for Data Mining • Process models, process discovery and conformance checking • Process mining methods		
Module 2: Data-driven Decision Making • Data analytics in business decisions and Decision Support Systems • Decision theory and Human Decision Making • Measuring business activities and data collection • Methods and techniques for data analysis, visualization and decision support • Frameworks and tools • Projects/Case studies on data-driven decision making	6	INF/01
Legal aspects of IT • Privacy and data protection • Copyright and Intellectual property rights • E-Commerce and governance of the Internet	**3**	**IUS-01**
German for Informatics and Digital Business • Writing skills: practice of coherent academic discourse to produce subject-specific texts; • Spoken skills: improvement of spoken interaction and production through the practice and production of academically and professionally acceptable presentations and other domain-specific speaking activities; • Development of receptive skills through the exposure to and analysis of various types of written and spoken discourse typical in Computer Science and development of grammatical and lexical range and accuracy so that communication is fluent and spontaneous.	**3**	**L-LIN/14**
Italian for Informatics and Digital Business • Writing skills: practice of coherent academic discourse to produce subject-specific texts; • Spoken skills: improvement of spoken interaction and production through the practice and production of academically and professionally acceptable presentations and other domain-specific speaking activities; • Development of receptive skills through the exposure to and analysis of various types of written and spoken discourse typical in Computer Science and development of grammatical and lexical range and accuracy so that communication is fluent and spontaneous.	**3**	**L-FIL-LET/12**
Seminar in Business Informatics and Information Systems • Research methods in business informatics and information systems • Literature research • Scientific writing • Models for quality control in scientific research • Current topics in business informatics and information systems • Presentations of seminar papers on topics in business informatics and information systems	**6**	**INF/01**
Advanced Economics for Digital Business (Specialisation) • Introduction to Macroeconomics Business Cycles and Economics Growth • Aggregate Production and Productivity • Advanced Game Theory and Industrial Organizations • Mechanism Design • Empirical Methods for Applied Analysis	**6**	**SECS-P/02**
Financial Trading and Algorithms (Specialisation) • Economics and finance of trading markets • Trading in electronic markets • Automatic strategies for intra-day trading • Blockchain financial applications	**6**	**ING-INF/05**
Market research and B2B Digital Marketing (Specialisation) • Market research (objectives, concepts, tools) • Data processing and information extraction • Market surveillance and market intelligence • Specialised market research for digital and B2B business (concepts, methods, tools)	**6**	**SECS-P/08**
Software Project Management • Project Planning • Team Building and Management • Competitive Bidding and Client Interaction • Risk Analysis and Management • Quality Assurance - Monitoring and Evaluation • Budgeting and Cost Control	**6**	**INF/01**

Insegnamenti di specializzazione / Spezialisierungskurse

Il programma prevede una specializzazione in *digitial business* per un totale di 18 crediti formativi universitari.

Durante il secondo anno dovrà essere frequentato uno dei seguenti corsi integrati di 12 crediti:

- Digital Finance and Financial Markets
- Digital Marketing and Advertising

Durante terzo anno dovrà essere frequentato un ulteriore corso di specializzazione di 6 crediti in finanza digitale, marketing digitale o macroeconomia, scelto tra i seguenti:

- Advanced Economics for Digital Business
- Financial Trading and Algorithms (requisito di livello di ingresso è il corso Digital Finance and Financial Markets)
- Market Research and B2B Digital Marketing (requisito di livello di ingresso è il corso Digital Marketing and Advertising)

Il Consiglio di corso può limitare annualmente il numero di corsi di specializzazione offerti, in funzione delle risorse finanziarie e di personale disponibili.

Der Studiengang sieht eine Spezialisierung in Digital Business im Umfang von insgesamt 18 Kreditpunkten vor.

Im zweiten Studienjahr muss einer der folgenden integrierten Kurse zu 12 Kreditpunkten besucht werden:

- Digital Finance and Financial Markets
- Digital Marketing and Advertising

Im dritten Studienjahr muss eine weitere Vertiefungs-Lehrveranstaltung zu 6 Kreditpunkten aus Digital Finance, Digital Marketing oder Makroökonomie besucht werden:

- Advanced Economics for Digital Business
- Financial Trading and Algorithms (Einstiegsvoraussetzung ist der Kurs Digital Finance and Financial Markets)
- Market research and B2B Digital Marketing (Einstiegsvoraussetzung ist der Kurs Digital Marketing and Advertising)

Der Studiengangsrat kann das Angebot der Spezialisierungskurse abhängig von den finanziellen und personellen Ressourcen jährlich einschränken.

Corsi curriculari di lingua / Curriculare Sprachkurse

Il piano di studio prevede due insegnamenti di lingua obbligatori (6 CFU in totale).

L'insegnamento "English for Informatics and Digital Business" di 3 CFU è obbligatorio per tutti gli studenti.

Gli studenti frequentano il secondo insegnamento di lingua di 3 CFU nella loro terza lingua (italiano o tedesco).

Per essere ammesso agli insegnamenti di lingua lo studente deve certificare un livello minimo di B2 nella lingua del relativo insegnamento.

Der Studienplan sieht zwei obligatorische Sprachlehrveranstaltungen vor (6 KP insgesamt).

Die Lehrveranstaltung „English for Informatics and Digital Business" zu 3 KP ist für alle Studierenden verpflichtend.

Die Studierenden besuchen die zweite Sprachlehrveranstaltung zu 3 KP in ihrer dritten Sprache (Italienisch oder Deutsch).

Um die Sprachlehrveranstaltungen besuchen zu können, muss der Studierende mindestens Niveau B2 in der Unterrichtssprache der Lehrveranstaltung nachweisen.

Insegnamenti a scelta dello studente (Free Choice) / Wahlfächer (Free Choice)

Gli studenti devono scegliere liberamente attività formative (lezioni, tirocini e progetti) per un totale di 12 crediti formativi universitari.

Die Studierenden müssen freie Lehrveranstaltungen (Vorlesungen, Praktika und Projekte) für insgesamt 12 Kreditpunkte wählen.

Tali attività formative devono essere approvate dal Consiglio di Corso di Laurea, che ne verifica la coerenza con il percorso formativo dello studente.

Il tirocinio o il progetto Free Choice possono avere un numero di crediti pari a 6 o a 12.

Diese Lehrveranstaltungen müssen vom Studiengangsrat genehmigt werden, der die Kohärenz zum Studienprogramm des Studierenden überprüft.

Für das Free-Choice-Praktikum oder -Projekt können 6 oder 12 Kreditpunkte vergeben werden.

Organizzazione didattica / Organisation der Lehre

Attività didattiche / Bildungstätigkeiten

Sono previsti vari tipi di attività didattiche frontali che, in modi diversi, conferiscono conoscenze pratiche e teoriche:

Corso:

insegnamento strutturato in regolari incontri con gli studenti e costituito da lezioni durante le quali il docente spiega il programma.

Esercitazione:

attività che accompagna il corso ed è strutturata in regolari incontri con piccoli gruppi di studenti; durante l'esercitazione viene rielaborato il programma e/o lo studente applica le nozioni apprese durante la lezione; l'esercitazione può anche consistere nell'elaborazione di un progetto sotto la sistematica supervisione del docente.

Internship:

Tirocinio formativo e di orientamento: attività esterna svolta presso strutture private o della pubblica amministrazione, il cui fine è quello di realizzare un momento di alternanza tra studio e lavoro e di agevolare le scelte professionali mediante la conoscenza diretta del mondo del lavoro. Il tirocinio è disciplinato dal "Regolamento di tirocinio generale d'Ateneo".

Progetto:

il progetto comprende la soluzione di compiti di tecnologia dell'informazione sotto la guida di un docente e all'interno nell'area di ricerca delle Facoltà di Scienze e Tecnologie informatiche e di Economia.

L'entità massima degli insegnamenti è di seguito stabilita:

1 credito corrisponde sempre ad un impegno totale per lo studio di 25 ore (insegnamento frontale e studio individuale).

Verschiedene Formen von Frontalunterricht vermitteln auf unterschiedliche Art und Weise theoretische und praktische Kenntnisse:

Vorlesung:

In Vorlesungen wird der Lehrstoff durch den Dozenten in regelmäßig abgehaltenen Vorträgen vermittelt.

Übung:

Übungen sind Veranstaltungen, welche begleitend zu Vorlesungen stattfinden und in denen die Durcharbeitung von Lehrstoffen sowie die Vermittlung von Fertigkeiten unter Mitarbeit des Studierenden in Kleingruppen erfolgt; die Übung kann auch in der Ausarbeitung eines Projektes unter der systematischen Anleitung eines Dozenten erfolgen.

Internship:

Ausbildungs- und Orientierungs-praktikum: externe Tätigkeit, die in einem Unternehmen oder einer öffentlichen Verwaltung durchgeführt wird, deren Zweck es ist, einen Austausch zwischen Studium und Arbeit zu schaffen und die Berufswahl durch direkte Kenntnis der Arbeitswelt zu erleichtern. Das Praktikum wird von der „Allgemeinen Praktikumsordnung der Universität" geregelt.

Projekt:

das Projekt umfasst die Lösung von informationstechnischen Aufgabenstellungen unter Anleitung eines Dozenten und im Rahmen der Forschungsschwerpunkte der Fakultäten für Informatik und Wirtschaftswissenschaften.

Der maximale Umfang der Lehrveranstaltungen ist folgend festgelegt:

1 Kreditpunkt entspricht immer einem Studienaufwand von insgesamt 25 Stunden (Frontalunterricht und individuelles Studium).

1 credito, nelle attività formative di base e caratterizzanti, equivale pertanto fino a 10 ore di didattica in classe (lezione frontale e esercitazione) e almeno 15 ore di studio individuale.

1 credito, nelle attività formative affini e integrative, equivale a 7 ore di didattica in classe (lezione frontale) e 18 ore di studio individuale.

La distribuzione di ore tra lezione ed esercitazione viene definita in ciascuna scheda descrittiva del corso (Course Presentation Form) e approvata dal Consiglio di Corso.

Fanno eccezione i seguenti casi:

- *"Seminar in Business Informatics and Information Systems":* 6 crediti equivalgono a 30 ore di didattica frontale e 120 ore di studio individuale (Scrittura di una relazione seminariale) .
- "*Economics of Digital Markets*": 9 crediti equivalgono a 93 ore di didattica frontale e 132 ore di studio individuale.
- *"Accounting for decision making":* 6 crediti equivalgono a 48 ore di didattica frontale e 102 ore di studio individuale.
- *"Legal aspects of IT":* 3 crediti equivalgono a 20 ore di didattica in classe e 55 ore di studio individuale
- *Corsi di lingua:* 3 crediti equivalgono a 30 ore di didattica in classe e 45 ore di studio individuale.
- *Tirocinio formativo e di orientamento:* 1 credito corrisponde a 25 ore di lavoro presso il luogo di svolgimento del tirocinio.
- *Progetto:* 1 credito corrisponde a 25 ore di lavoro autonomo dello studente presso la facoltà.

1 Kreditpunkt der Grundvorlesungen und der Fachtypischen Ausbildungen entspricht daher bis zu 10 Stunden Frontalunterricht (Vorlesung und Übung) und mindestens 15 Stunden individuellen Studiums.

1 Kreditpunkt der benachbarten und verwandten Ausbildung entspricht 7 Stunden Frontalunterricht (Vorlesung) sowie 18 Stunden individuellen Studiums.

Die Verteilung der Stunden von Vorlesung und Übung wird in der entsprechenden Kursbeschreibung (Course Presentation Form) festgelegt und vom Studiengangsrat genehmigt.

Ausnahmen bilden folgende Lehrveranstaltungen:

- *"Seminar in Business Informatics and Information Systems":* 6 Kreditpunkte entsprechen 30 Stunden Frontalunterricht und 120 Stunden individuellen Studiums (Verfassen einer Seminararbeit).
- "*Economics of Digital Markets*": 9 Kreditpunkte entsprechen 93 Stunden Frontalunterricht und 132 Stunden individuellen Studiums.
- *Accounting for decision making":* 6 Kreditpunkte entsprechen 48 Stunden Frontalunterricht und 132 Stunden individuellen Studiums
- *"Legal aspects of IT":* 3 Kreditpunkte entsprechen 20 Stunden Frontalunterricht und 55 Stunden individuellen Studiums.
- *Sprachkurse:* 3 Kreditpunkte entsprechen 30 Stunden Frontalunterricht und 45 Stunden individuellen Studiums.
- *Ausbildungs- und Orientierungspraktikum:* 1 Kreditpunkt entspricht 25 Stunden Arbeitsleistung am Praktikumsort
- *Projekt:* 1 Kreditpunkt entspricht 25 Stunden autonomer Tätigkeit des Studierenden an der Fakultät.

Lingua d'insegnamento / Unterrichtssprache

Gli insegnamenti, dei primi due anni di studio, si tengono prevalentemente in lingua inglese.

Le seguenti attività formative possono essere tenute in lingua italiana o tedesca: la lingua è decisa annualmente dal Consiglio di Facoltà, tenendo conto sia della disponibilità dei docenti sia dell'equilibrio linguistico dell'offerta formativa.

Die Lehrveranstaltungen in den ersten beiden Studienjahren erfolgen hauptsächlich in englischer Sprache.

Folgende Lehrveranstaltungen können in italienischer oder in deutscher Sprache angeboten werden: die Sprache wird jährlich vom Fakultätsrat festgelegt, wobei sowohl die Verfügbarkeit von Dozenten als auch die sprachliche Ausgewogenheit des Angebots berücksichtigt wird.

- Seminar in Business Informatics and Information Systems
- Legal aspects of IT
- Software Project Management
- Specialization in Digital Business (Market research and B2B Digital Marketing / Financial Trading and Algorithms | Advanced Economics for Digital Business)

- Seminar in Business Informatics and Information Systems
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