Module directory
eHealth (M.A.)

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Explanations

Kinds of modules

The structure of this module directory follows the kinds of modules that exist at FUAS:

- **Basic modules (BM):** In these modules students acquire the basic knowledge and skills of their chosen degree programme; they do not specialise further. All basic modules are compulsory modules.
- **Major modules (MM):** Major modules offer students the chance to specialise in certain topics from their degree programme such as professional fields or industries. All major modules are binding elective modules.
- **Modules to be completed at the end of the studies (ESM):** These modules form the end of the studies.

This module directory uses the terms and terminology used and defined in the Principles of Assessment [Prüfungsverfahrensordnung] (PVO) of Flensburg University of Applied Sciences.

Type of module

Defines the character of a module. The different types of modules are:

- **Compulsory modules (CM):** These modules have to be completed by all students enrolled in a degree programme.
- **Binding electives (BEM):** Students can choose a number of related modules from a number of module catalogues offered (here: major modules, supplementary modules).
- **Non-binding electives (NEM):** Students can choose any given number of modules from a number of module catalogues offered. Non-binding electives do not affect the final grade.

Type of assessment

Defines the type of assessment required to successfully complete a module. The different types of modules are:

- **Coursework (CW):** If graded “fail”, this type of assessment can be re-taken for an unlimited number of times; coursework can be assessed with a grade or a certificate of attendance. Grades awarded for coursework do not affect the final grade.
- **Examination (Ex):** If graded “fail”, this type of assessment can only be re-taken for a limited number of times; examinations are assessed with a grade. Grades awarded for examinations affect the final grade according to their weight in the curriculum.
- **Component of an examination (CEx):** In terms of how it is graded and how often it can be re-taken the same rules apply as for Ex. This examination is made up of several components. In accordance with art. 14 para. 2 of the Principles of Assessment [Prüfungsverfahrensordnung, PVO] if an assessment is made up of more than one part, each part has to be graded with “ausreichend” [sufficient] at least. Unless specified otherwise, the final grade for a subject is derived from the arithmetic average of the individual parts of that assessment.
- **Assessment pre-requisite to an exam (APE):** Assessment whose successful completion is pre-requisite for the admission to a (subordinate) examination. If an APE is graded “fail”, it may be re-taken for an unlimited number of times.
Form of assessment

Defines the form assessments can take. The different types of modules are:

- **Written exam (WE) in accordance with art. 11 of the PVO**: Written test usually to be completed at the end of a semester (at the end of a series of classes forming a module). The time a written exam is to be completed in is to be defined in minutes, e.g. WE 90.

- **Oral exam (OE) in accordance with art. 12 of the PVO**: Oral exam usually to be completed at the end of a semester (at the end of a series of classes forming a module). An oral exam usually takes 30 minutes per candidate. In group examinations each candidate shall be examined for 15 minutes.

- **Other form of assessment (OA) in accordance with art. 13 of the PVO**: Other forms of assessment can include term papers, presentations in class, practical exercises, case studies, projects, designs, computer programmes or a combination of these. For compulsory modules up to three possible forms have to be defined in the degree programme’s Study and Examination Regulations in accordance with art. 3 para. 2. In the case of electives, the examiner in charge announces the specific form of assessment to be completed to the students and the Examinations Office at the beginning of the lecture period. A combination of different forms of assessment is permitted. This module directory uses “&” to mark a logical conjunction and “|” to mark a logical disjunction. For example: (Presentation in class | term paper) & oral exam, means the assessment is made up of a presentation in class or a term paper in addition to an oral exam. Presentation in class | (term paper & oral exam), however, means the assessment is made up of either a presentation in class or a term paper and an oral exam.

Type of class

Describes the manner in which the contents of a module are taught. The following types of class exist in accordance with art. 3 para. 5 of FUAS’ Principles of Assessment [Prüfungsverfahrensordnung, PVO]:

- **Lecture (L)**: Coherent presentation of the teaching content
- **Tutorial accompanying a lecture (T)**: Applying and further understanding the teaching content in small groups
- **Seminar (SE)**: Studying specific subject areas with the help of presentations independently created by the participants and/or in discussions in small groups
- **Laboratory (Lab)**: Acquiring and further understanding of knowledge by solving hands-on experimental tasks in small groups
- **Project (P)**: Working in teams to design and realise solutions for real-world problems
- **Workshop (W)**: Moderated dialogue in a small group in which tasks are discussed and approaches for solutions are found
- **Long-distance (LDC) and virtual classes (VC)**: Classes 1. - 6. above, held via digital communication between teaching staff and students
- **Field trip (FT)**: Field trip led by a member of teaching staff
- **Others classes (SV)**: Classes of another kind than those described under numbers 1. to 8.

Language of instruction and examination language

The following languages are mentioned in the module directory:

- **German (GER)**
- **English (EN)**

This module directory uses the following conventions to clarify which language is used:

| GER & EN | The module is offered in both German and English, i.e. it is made up of German and English language parts. |
| GER | EN: The module is taught either entirely in German or entirely in English. Which of the languages is used will be determined at the beginning of the lecture period. |
# Course plan

## 1. semester of the programme

<table>
<thead>
<tr>
<th>Module</th>
<th>Type of assessment</th>
<th>HPW</th>
<th>CP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Economics</td>
<td>BM</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Applications in Health Management</td>
<td>BM</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Medical Documentation</td>
<td>BM</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Business Administration in Health Care</td>
<td>BM</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Information Management</td>
<td>BM</td>
<td>4</td>
<td>5</td>
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<tr>
<td>IT Basics for Health Care</td>
<td>BM</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Project Management</td>
<td>BM</td>
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</table>

All modules of the 1st semester of the programme

26 33

## 2nd semester of the programme

<table>
<thead>
<tr>
<th>Module</th>
<th>Type of assessment</th>
<th>HPW</th>
<th>CP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Care Systems</td>
<td>BM</td>
<td>4</td>
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</tr>
<tr>
<td>Business Analytics</td>
<td>BM</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Communication Technology (Mobile Communication)</td>
<td>BM</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Applications for Patients</td>
<td>BM</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Quality Management</td>
<td>BM</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Health Care Management or eHealth Applications</td>
<td>MM</td>
<td>4</td>
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</tr>
</tbody>
</table>

All modules of the 2nd semester of the programme

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## 3rd semester of the programme

<table>
<thead>
<tr>
<th>Module</th>
<th>CP</th>
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<tbody>
<tr>
<td>eHealth Project (Internship)</td>
<td>30</td>
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</table>

All modules of the 3rd semester of the programme

30

## 4th semester

<table>
<thead>
<tr>
<th>Module</th>
<th>Type of assessment</th>
<th>CP</th>
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<tbody>
<tr>
<td>Master’s thesis</td>
<td>Thesis and colloquium</td>
<td>30</td>
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</table>

All modules of the 4th semester of the programme

30

All semesters (1 to 4)

<table>
<thead>
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<th>HPW</th>
<th>CP</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>120</td>
</tr>
</tbody>
</table>
Basic modules (BM)

Basic modules are designed to allow students to acquire the basic knowledge and skills of their chosen degree programme. They do not specialise further. Basic module are always compulsory modules.

If a degree programme accepts new students in every semester, basic modules are offered in every semester.
If a degree programme only accepts new students once per year, basic modules are offered in that semester.
(cf. “offered in“)
Health Economics

Module information

<table>
<thead>
<tr>
<th>Semester of the programme</th>
<th>Duration (semesters)</th>
<th>Offered in</th>
<th>Time in class (hpw/h)</th>
<th>Revision (outside class) (h)</th>
<th>Workload (h)</th>
<th>Credit Points (CP)</th>
<th>Language of instruction</th>
<th>Module area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>1st</td>
<td>summer ❌ winter ✔</td>
<td>4/60</td>
<td>90</td>
<td>150</td>
<td>5</td>
<td>GER</td>
<td>BM</td>
</tr>
</tbody>
</table>

Intended learning outcomes

- Schulenberg describes Health Economics as the analysis of the economic aspect of health and medical care by applying theoretical concepts from economics. Based on this, the participants of this module understand how the German health care system works and they critically reflect the economic framework conditions putting a focus on modern networking structures.
- The students analyse and interpret control mechanisms, investments and employment in the health sector.
- They critically debate changes in current health politics.
- They are able to identify changing conditions in the health sector as a market and evaluate the success factors (opportunities and threats) that apply.
- They critically reflect on health-economic contents, assess the efficiency of measures and the financial systems in health and medical care.

Contents

1. The health sector
2. The health sector as an economic factor
3. Coordinated systems (integrated care, disease management, health centres etc.)
4. Suppliers and demanders/financing/sub-markets
5. Distribution
6. Evaluating the efficiency and effectiveness of measures
7. Cost objects
8. Current health politics
9. Supply of pharmaceutical products
10. International projects

Teaching method

Seminar incl. external talks

Mode and type of assessment

<table>
<thead>
<tr>
<th>Type of module</th>
<th>Type of assessment</th>
<th>Mode of assessment</th>
<th>Examination language</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM</td>
<td>Ex</td>
<td>OA: Presentation</td>
<td>GER</td>
</tr>
</tbody>
</table>

Admission requirements

None

Reusability

None
Recommended reading

- Schöffski, Schulenburg: Gesundheitsökonomische Evaluationen, Heidelberg 2012
- Grö nemeyer: Med. in Deutschland. Standort mit Zukunft; Berlin 2013
- Amelung, Eble, Hildebrandt: Innovatives Versorgungsmanagement: Neue Versorgungsformen auf dem Prüfstand; Berlin 2011
- Lüngen, Büscher: Gesundheitsökonomie; Stuttgart 2015
- A list of recommended reading will be provided at the beginning of the semester.
Applications in Health Management

Module information

<table>
<thead>
<tr>
<th>Semester of the programme</th>
<th>Duration (semesters)</th>
<th>Offered in</th>
<th>Time in class (hpw/h)</th>
<th>Revision (outside class) (h)</th>
<th>Workload (h)</th>
<th>Credit Points (CP)</th>
<th>Language of instruction</th>
<th>Module area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>1st</td>
<td>summer</td>
<td>3 / 45</td>
<td>75</td>
<td>120</td>
<td>4</td>
<td>GER</td>
<td>EN</td>
</tr>
</tbody>
</table>

Intended learning outcomes

- The students analyse and discuss the requirements different organisations have for information systems.
- They use examples from practice to discuss the importance of a given information system.
- They use hospital information systems, the ERP functions in particular.
- They analyse syntax problems of communication in health and medical care and they apply relevant standards to solve them.
- They deduct case studies from files from networks or institutions.
- They apply academic methods to design application scenarios for information systems in health care.
- They deduct architectures from requirements defined for information systems.

Contents

1. The relevance of ICT for health and medical care (focus: institutions/networks)
2. Web platforms using the “Gesundheitsportal Flensburg” as an example
3. Overview: Hospital information systems, esp. ERP, systems for departments or residential doctors
4. Syntactical interoperability (interfaces in particular)
5. Standards, e.g. xDT
6. Electronic patient and case files
7. System architectures

Teaching method

Seminar incl. external experts and field trips

Mode and type of assessment

<table>
<thead>
<tr>
<th>Type of module</th>
<th>Type of assessment</th>
<th>Mode of assessment</th>
<th>Examination language</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM</td>
<td>Ex</td>
<td>OA: Oral exam &amp; written exam</td>
<td>GER</td>
</tr>
</tbody>
</table>

Admission requirements

None

Reusability

None
**Recommended reading**

- Laudon K et al. (2010) Wirtschaftsinformatik. Pearson, Munich
- An extended or updated list of recommended reading will be provided at the beginning of the semester.
Medical Documentation

Module information

<table>
<thead>
<tr>
<th>Semester of the programme</th>
<th>Duration (semesters)</th>
<th>Offered in</th>
<th>Time in class (hpw/h)</th>
<th>Revision (outside class) (h)</th>
<th>Workload (h)</th>
<th>Credit Points (CP)</th>
<th>Language of instruction</th>
<th>Module area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>1st</td>
<td>summer</td>
<td>4/60</td>
<td>90</td>
<td>150</td>
<td>5</td>
<td>GER</td>
<td>EN</td>
</tr>
</tbody>
</table>

Intended learning outcomes

- Students are introduced to medical terminology.
- They analyse specific symptoms on the basis of basic medical knowledge (anatomy, physiology).
- In particular, they are able to correctly understand diagnoses (ICD-10) and procedures (OPS).
- They analyse and assess documentation processes up until billing: Starting from ICDs/OPS to DRG and e-prescriptions.
- They connect medical treatment paths to electronic and non-electronic documentation bases.
- They critically reflect the legal certainty of e-documentation.
- They apply documentation to exemplary patient histories.
- They discuss the basics of medical documentation and apply academic methods to describe correlations in writing. They cooperate with partners working as a team.

Contents

1. Medical terminology
2. Medical basics
3. Diagnoses (encoding) and procedures (encoding)
4. DRG codes
5. Basics of documentation
6. IT-based documentation processes
7. Digital patient file and digital signature
8. Case Management

Teaching method

Seminar; the students are given a detailed insight to medical basics and types of documentation.

Mode and type of assessment

<table>
<thead>
<tr>
<th>Type of module</th>
<th>Type of assessment</th>
<th>Mode of assessment</th>
<th>Examination language</th>
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</thead>
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<tr>
<td>CM</td>
<td>Ex</td>
<td>WE 90</td>
<td>GER</td>
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</table>

Admission requirements

None

Reusability

None
**Recommended reading**

- Sunyaev, Ali: Health-Care Telematics in Germany: Design and Application of a Security Analysis Method; Wiesbaden 2011
- Schlottmann, Kaczmarek: Kommentierung Deutsche Kодиерrichtlinien Version 2018; Deutsche Krankenhaus V.-G., 2018
- Münch, Amelung, Chase, Urbanski, Bertram, Binder: Die elektronische Patientenakte; Heidelberg 2016
- Browser für Operationen- und Prozeduren Schlüssel: https://www.dimdi.de/static/de/klassi/ops/kodesuche/onlinefassungen/opshtml2018/index.htm
- Jehle, Czeschik, Freund, Wellhofer: Medizinische Informatik kompakt; Berlin 2015
- Krankenhausentgeltsatzgesetz (German hospital law) (in its current form)
- Webgrouper, Browser für Diagnosen und Prozeduren: http://drg.uni-muenster.de
- Jehle, Czeschik Medizinische Informatik kompakt; Berlin 2015
Business Administration in Health Care

Module information

<table>
<thead>
<tr>
<th>Semester of the programme</th>
<th>Duration (semesters)</th>
<th>Offered in</th>
<th>Time in class (hpw/h)</th>
<th>Revision (outside class) (h)</th>
<th>Workload (h)</th>
<th>Credit Points (CP)</th>
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<th>Module area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>1st</td>
<td>summer ☒</td>
<td>3 / 45</td>
<td>75</td>
<td>120</td>
<td>4</td>
<td>GER</td>
<td>EN</td>
</tr>
</tbody>
</table>

Intended learning outcomes

- Students understand how individual factors in a business context interact in health-related businesses.
- They apply business administrative functions to calculate their cost-benefit-relation and thus make it transparent.
- They are familiar with the correlations in financing in the health sector (e.g. DRG system) and the impact they have on businesses in that sector.
- They analyse marketing measures in the health sector and appreciate them.
- They develop and present their own business cases.
- They reflect on given contents and are able to transfer contents from a general business administrative context to the specifics of the eHealth market.
- They review application aspects critically.

Contents

1. Business administrative framework conditions for health service providers
2. Basic terms of Business Administration
3. Correlations in financing in the health sector (e.g. DRG system) and their impacts on businesses
4. Marketing (the Internet and online applications in the context of communication policies)
5. Development of business cases/business models
6. Management control/IT control

Topics from health and medical care from a business administrative and eHealth perspective
Example for a semester project: Development of a business model for an eHealth application

Teaching method

Seminar incl. internal and external talks

Mode and type of assessment

<table>
<thead>
<tr>
<th>Type of module</th>
<th>Type of assessment</th>
<th>Mode of assessment</th>
<th>Examination language</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM Ex OA</td>
<td>Written test (120 minutes)</td>
<td>presentation &amp; semester project</td>
<td>GER</td>
</tr>
</tbody>
</table>

Admission requirements

None

Reusability

None
Recommended reading

- Zapp, Oswald, Neumann, Wacker, Kurscheid: Controlling und Reporting im Krankenhaus; Stuttgart 2015
- Johner, Haas: Praxisbuch: IT im Gesundheitswesen; Munich 2009
- Sisignano: Management und Kommunikation: Erfolgsstrategien für die Klinik der Zukunft; Cologne 2008
- Wünsche: BWL für IT-Berufe; 2nd ed., Wiesbaden 2010
- Kreuzer: BWL kompakt; 4th ed., Vienna 2013
- Jäckel: Telemedizinführer (several volumes)
- a list of recommended reading will be provided at the beginning of the semester.
Information Management

Module information

<table>
<thead>
<tr>
<th>Semester of the programme</th>
<th>Duration (semesters)</th>
<th>Offered in</th>
<th>Time in class (hpw/h)</th>
<th>Revision (outside class) (h)</th>
<th>Workload (h)</th>
<th>Credit Points (CP)</th>
<th>Language of instruction</th>
<th>Module area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>1st</td>
<td>summer ☑️  winter ☒️</td>
<td>4/60</td>
<td>90</td>
<td>150</td>
<td>5</td>
<td>GER</td>
<td>EN</td>
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</table>

Intended learning outcomes

- The students analyse how individual factors in a business context interact in regard to domain-specific IT systems and draw conclusions for measures health-related businesses should take.
- They select appropriate data protection tools for given institutions in the health sector.
- They develop IT and business strategies.
- Students use innovation management methods and discuss and create their own business models for the health sector, also working in teams.
- They analyse semantic problems of communication in health and medical care and they apply relevant terminology standards to solve them.
- They model domain-specific processes, visualise them using software and chose the appropriate tools and notations to do so.
- They use specific parameters to control information processing for the health sector.
- They practice academic research methods and tools.

Contents

1. Information as a crucial factor
2. Domain-specific data protection requirements
3. Business and IT strategies
4. Strategic eHealth applications (overview, incl. HIS, telemedicine, electronic files)
5. Innovations & business modelling; service engineering
6. Semantic interoperability, e.g. subject-specific terminology
7. Modelling (e.g. UML, BPMN) & process management
8. IT control
9. Academic research techniques & clinical studies

Teaching method

Seminar incl. external talks and web-based elements (IT strategies)

Mode and type of assessment

<table>
<thead>
<tr>
<th>Type of module</th>
<th>Type of assessment</th>
<th>Mode of assessment</th>
<th>Examination language</th>
</tr>
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<tbody>
<tr>
<td>CM</td>
<td>Ex</td>
<td>WE 60</td>
<td>GER</td>
</tr>
</tbody>
</table>

Admission requirements

None

Reusability

None
Recommended reading

- Johner C et al. (2015) Basiswissen Medizinische Software. dpunkt, Heidelberg
- Wager K et al. (2017) Health care information systems. Jossey-Bass, , San Francisco
- Krankenhaus Umschau, führen und wirtschaften im Krankenhaus, das Krankenhaus, IT-Journal, G+G (Gesundheit und Gesellschaft), E-HEALTH-COM, subscription available.

An extended or updated list of recommended reading will be provided at the beginning of the semester.
IT Basics in Health Care

Module information

<table>
<thead>
<tr>
<th>Semester of the programme</th>
<th>Duration (semesters)</th>
<th>Offered in</th>
<th>Time in class (hpb/h)</th>
<th>Revision outside class (h)</th>
<th>Workload (h)</th>
<th>Credit Points (CP)</th>
<th>Language of instruction</th>
<th>Module area</th>
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<td>1st</td>
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<td>150</td>
<td>5</td>
<td>GER</td>
<td>EN</td>
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</tbody>
</table>

Intended learning outcomes

- The students know the technological basics and are able to apply them.
- They analyse data protection and security requirements with a view to health data and develop appropriate concepts based on this.
- They develop decision-making criteria for the domain-specific selection of technological components.
- They reflect given contents, prepare them for application and test suitable academic research and writing techniques.

Contents

1. Technological basics (hardware, software)
2. Networks
3. Interface communication (HL 7, DICOM, XML etc.)
4. Cloud computing
5. Databases
6. Data protection and security
7. Application in health care, e.g. KV-SafeNet, -FlexNet, KV-Connect or TI/ eGK
8. Exercises

Teaching method

Seminar

Mode and type of assessment

<table>
<thead>
<tr>
<th>Type of module</th>
<th>Type of assessment</th>
<th>Mode of assessment</th>
<th>Examination language</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM</td>
<td>Ex</td>
<td>OA: Presentation &amp; exercise at the computer</td>
<td>GER</td>
</tr>
</tbody>
</table>

Admission requirements

None

Reusability

None
Recommended reading

- An extended or updated list of recommended reading will be provided at the beginning of the semester.
Project Management

Module information

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<td>5</td>
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</table>

Intended learning outcomes

- Students practice project management methods and tools.
- They apply group work, conflict and personnel management techniques.
- They develop project management tools, esp. from IT and systems development, such as product specifications.
- They develop their own project plans and visualise them using software.
- Students who complete this module successfully, are prepared for the eHealth project.
- They understand requirements and put them down in performance specifications using tools and methods from Requirements Engineering.

Contents

1. Introduction to, basics of and motivation for the topic
2. Success factors and software (incl. exercises at the computer)
3. Communication and conflict management in the (project) team and the overall environment
4. Project implementation (managing a project): planning, implementation and control
5. Specific conceptualisation (from product specifications to performance specifications)
6. Project management frameworks and processes, e.g. PMI, agile etc.
7. Software and requirements engineering
8. Change management
9. Management control und quality management in projects (risks and how to manage them)
10. Project-based organisation
11. Case studies

Teaching method

Seminar

Mode and type of assessment

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<thead>
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<th>Type of module</th>
<th>Type of assessment</th>
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</tbody>
</table>

Admission requirements

None

Reusability

None
Recommended reading

- Johner C, Haas P (ed.) Praxishandbuch: IT im Gesundheitswesen. Hanser, Munich [chapters 1.1, 18, 23]
- Johner C et al. (2015) Basiswissen Medizinische Software. dpunkt, Heidelberg
Health Care Systems

Module information

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Intended learning outcomes

- The students understand and analyse the characteristic structures of international health systems and how they work.
- They develop criteria to assess them. They develop criteria to compare different health systems.
- They discuss how well prepared these systems are for the future and develop relevant influencing factors for the current status of eHealth.
- They develop indicators to assess health systems on their own and evaluate institution-specific aspects.
- They discuss the efforts being made to create international standards and reflect on how they can be developed further.

As the staff of this field are involved in several international projects, students can gain meaningful insights and may even become actively involved.

Contents

1. Health and medical care around the world
2. Criteria to compare health systems
3. IT tools used health and medical care around the world (research focus of the EU amongst others)
4. International efforts to create standards
5. International eHealth projects

The international aspect will be further promoted through cooperations with universities in Kaunas, Seinäjoki, Tromsøe, Aalborg and Talinn. Erasmus agreements have been signed.

Teaching method

Seminar with presentations held by the participants (in English)

Mode and type of assessment

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<th>Mode of assessment</th>
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</table>

Admission requirements

None

Reusability

None
Recommended reading

- Schölkopf, Pressel: Das Gesundheitswesen im internationalen Vergleich: Gesundheitssystemvergleich und europäische Gesundheitspolitik (Health Care Management); 2nd ed., Berlin 2014
- Busse, Zentner, Schlette: Health Policy Developments; Gütersloh 2006
- De Gooijer: Trends in EU Health Care Systems; Heidelberg 2010
- Busse, Blümel, Spranger: Das deutsche Gesundheitssystem: Akteure, Daten, Analysen; 2nd ed., Berlin 2017
- Various websites (e.g. WHO, OECD)
- A list of recommended reading will be provided at the beginning of the semester.
Business Analytics

Module information

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<th>Semester of the programme</th>
<th>Duration (semesters)</th>
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<th>Time in class (hpw/h)</th>
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<td>GER</td>
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</table>

Intended learning outcomes

- The students apply select tools to analyse data.
- They develop analysis processes and implement them.
- They process the results, visualise and interpret them.
- Students are familiar with the terminology of Artificial Intelligence and they are able to develop application scenarios.

Contents

1. Tools for data analysis
2. Descriptive statistics
3. Advanced analyses
4. Information visualisation
5. Conceptual basics of artificial intelligence

Teaching method

Lecture and project

Mode and type of assessment

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<th>Mode of assessment</th>
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Admission requirements

None

Reusability

None

Recommended reading

A list of recommended reading will be provided at the beginning of the semester.
Communication Technology (Mobile Communication)

Module information

<table>
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<th>Semester of the programme</th>
<th>Duration (semesters)</th>
<th>Offered in</th>
<th>Time in class (hpw/h)</th>
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<td>150</td>
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<td>GER</td>
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</tbody>
</table>

Intended learning outcomes

- Students are familiar with the architecture and services of current systems of mobile communication.
- They gain an understanding of the technological correlations of the (data) transfer aspects and the resulting mobile platforms and apps.
- They are able to assess how these technologies can be applied in the medical field.
- They can transfer these contents to medical applications.

Contents

**Systems**

- Mobile communication systems (development from GSM to LTE)
- Short-range systems (Bluetooth, Wi-Fi, DECT)
- Satellite communication systems (INMARSAT, GPS)

**Application aspects**

- Mobile platforms (Android, iOS, ...)
- Mobile computing
- Mobile security
- Specifics of app development in the medical field

**Others**

- Interoperability aspect (short-range systems in particular)
- Radiation exposure and health risks

Teaching method

Seminar

Mode and type of assessment

<table>
<thead>
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<th>Type of module</th>
<th>Type of assessment</th>
<th>Mode of assessment</th>
<th>Examination language</th>
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<td>CM</td>
<td>Ex</td>
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Admission requirements

None

Reusability

None
Recommended reading

- Lecture notes
Applications for Patients

Module information

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<th>Semester of the programme</th>
<th>Duration (semesters)</th>
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</table>

Intended learning outcomes

- The students analyse and discuss the requirements for information systems, which are not particular for different institutions and the potential of cloud computing for example.
- They use patients as examples to discuss the importance of a given information system.
- They develop case studies from files, which are not particular for different institutions.
- They use applications, especially in regards to their health file functionality.
- They apply academic methods to develop application scenarios for information systems in health care, which are not particular for different institutions.
- They work in teams to design applications focussing on the requirements non-professional users have.
- They analyse existing telematic fundamentals and telemedicine projects and identify potential for improvement.

Contents

1. ICT in health and medical care independent of specific institutions
2. Patient empowerment
3. Health platforms
4. Domain-specific CRM solutions
5. Software-as-a-service models in health care
6. Patients in control of electronic health files (EGA/PHR, PEPA)
7. Telemedicine
8. Telematics, esp.: TI: eGK & HBA

Teaching method

Seminar

Mode and type of assessment

<table>
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Admission requirements

None

Reusability

None
Recommended reading

- Laudon K et al. (2010) Wirtschaftsinformatik. Pearson, Munich

An extended or updated list of recommended reading will be provided at the beginning of the semester.
Quality Management

Module information

<table>
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<tr>
<th>Semester of the programme</th>
<th>Duration (semesters)</th>
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<th>Time in class (hpw/h)</th>
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</table>

Intended learning outcomes

- Students examine quality standards in the German health system.
- They analyse how applicable processes are.
- They develop assessment criteria for the quality of processes, structures and results.
- They analyse the certificates currently in use in the German health system.
- Students critically examine guidelines used in the health system.
- They apply workflow management systems and assess clinical processes using quantitative methods.
- They apply group work techniques in an adequate manner.

Contents

1. Introduction to quality management
2. Customer and process orientation
3. Certificates in the health system (DIN ISO EN; EFQM; KTQ)
4. Internal process orientation
5. Guidelines
6. Workflow management systems
7. Application of quantitative methods

Teaching method

Seminar/project

Mode and type of assessment

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Admission requirements

None; recommended: completion of Health Economics

Reusability

None
Recommended reading

- Hensen, Peter: Qualität im Gesundheitswesen, Wiesbaden 2016
- Magnusson/Kroslid/Bergmann: Six Sigma umsetzen: die neue Qualitätsstrategie für Unternehmen; mit neuen Unternehmensbeispielen, Munich 2004
- Lauterbach/Schrapp: Gesundheitsökonomie, Management und Evidence-based Medicine, Stuttgart 2010
- Krankenhaus-Umschau: KU Fachmagazin für Führungskräfte der Gesundheitswirtschaft, Kulmbach 2008
- Wagner, Karin (Hrsg.): Qualitätsmanagement im Gesundheitswesen und präventive Vorsorge in Unternehmen, Munich 2009
- A list of recommended reading will be provided at the beginning of the semester.
eHealth Project (Internship)

Module information

<table>
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<td>30</td>
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</table>

Intended learning outcomes

- Students experience work situations in businesses in the field of eHealth.
- They solve personal, subject-specific and contextual conflicts.
- They understand how technologies and solutions are applied.

Contents

Students work on eHealth projects in companies and organisations in the field of health and medical care and write a final report.

Teaching method

Project; project supervision by a member of teaching staff of the degree programme (cf. internship guidelines)

Mode and type of assessment

<table>
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Admission requirements

Successful completion of the Project Management module in the first semester

Reusability

None
Major modules (MM)

Major modules offer students the chance to specialise on certain topics from their degree programme such as professional fields or industries. They can choose modules from a pre-defined catalogue. All major modules are binding elective modules. The major modules are offered in the 2nd semester of the programme. Each major is made up of modules adding up to 4 hours per week or 4 Credit Points per semester.
Health Care Management
(made up of module parts 1 and 2)

Module information

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<th>Semester of the program</th>
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Module part Health Care Management 1

Intended learning outcomes

- The students understand how the factors relevant to ensure a health care that meets the demands of the patients correlate.
- They analyse interface problems in health care management and use eHealth solutions to develop possible improvements.
- They are aware of epidemiological principles and discuss them.
- They understand the relevance of a health system for the health of the people of a country.
- They are familiar with the basic principles of planning, control, implementation and analysis of epidemiological studies and apply them.
- They include health prevention aspects in their work and assess eHealth solutions in this area.
- They reflect on their work considering ethical framework conditions and medical ethics in particular.

Contents

1. Public Health basics
2. Epidemiology: definition and terminology
3. Prevalence and incidence
4. Exemplary public health cases from the region and the world
5. Medical ethics

Recommended reading

- A list of recommended reading will be provided at the beginning of the semester.

Module part Health Care Management 1

Module part Health Care Management 2

Intended learning outcomes

- Students assess the change digital transformation causes in the doctor-doctor and the doctor-patient relationship and evaluate corresponding measures from a management perspective.
- They are familiar with the basics of personnel management and apply them to structures in health and medical care.
- They know leadership theories and discuss their relevance for the health sector.
- They acquire leadership and management skills for their roles on that level in the health sector.
- They reflect how eHealth applications can be used to increase efficiency, improve quality and reduce costs.
Contents

1. Doctor-doctor and the doctor-patient relationship
2. Leadership and management in health care
3. Leadership and management roles in the health sector
4. HR-specific challenges in health care
5. Methods for managing and leading staff in the health sector
6. Using eHealth applications to increase efficiency

Recommended reading

A list of recommended reading will be provided at the beginning of the semester.

Teaching method

Seminar/project

Mode and type of assessment

<table>
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Admission requirements

None

Reusability

None
eHealth Applications

(made up of module parts 1 and 2)

Module information

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Module part eHealth Applications 1

Intended learning outcomes

- The students analyse and discuss the requirements service providers have for information systems and the potential of the app market for example.
- They analyse modern technologies to use data, in particular those for analysis and the support in decision-making and they develop case studies from the service providers’ requirements.
- Based on academic methods, they work in teams to design applications focussing on the requirements professional users have.
- They develop scenarios for the application of robotic and cyber-physical systems in health and medical care, in particular for staff in the health sector.
- They analyse existing projects of IT-based supply of health care and deduce potential for improvement, for the German health market in particular.

Contents

1. Service providers’ perspective on and requirements for IT
2. From data collections to big data in the health sector
3. Support in decision-making, e.g. with the help of AI
4. Service robots & CPS (health/hospital 4.0)
5. Apps, in particular those for professional users
6. eHealth: Potentials and limits in an international comparison (sample projects)

Recommended reading

Module part eHealth Applications 2

Intended learning outcomes

- The students analyse and discuss the requirements consumers have for information systems and the potential of the app market for example.
- They use examples such as fitness trackers to discuss the importance of a given information system and assess their value.
- Based on academic methods, they work in teams to design applications focussing on the requirements non-professional users have.
- They develop scenarios for the application of tele monitoring or AAL systems, in particular for patients or private individuals as users.
- They analyse market trends and deduce requirements, for the German health market in particular.

Contents

1. Perspective on and requirements for IT users have (esp. patients, health-aware users, friends and family)
2. Apps, in particular those for consumers
3. Fitness trackers and quantified self
4. Tele monitoring
5. AAL & home care
6. eHealth - trends and expectations for health and medical care

Recommended reading

• Laudon K et al. (2010) Wirtschaftsinformatik. Pearson, Munich
• Sarnikar S et al. (2013) Cases on healthcare information technology for patient care management. IGI, Hershey.

An extended or updated list of recommended reading will be provided at the beginning of the semester.

Teaching method
Seminar

Mode and type of assessment

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Admission requirements
None

Reusability
None
Modules to be completed at the end of the studies (ESM):
Master’s thesis

Module information

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<th>Duration (semesters)</th>
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</table>

Intended learning outcomes

- The students prove that they are able to apply academic research and writing techniques by showing how individual factors relate to each other in a complex context. They do so with a topic of their own choice agreed upon with a supervisor.
- They produce an extensive written paper in a target-oriented manner and without external help while keeping the necessary critical distance (in consultations).
- They apply appropriate methods to visualise their findings.
- They critically discuss and present these findings.

Contents

The master’s thesis consists of a final thesis and a colloquium. In the thesis the student carries out extensive research and reflects on a topic; it is written based on academic standards. The colloquium follows the thesis and aims to reflect the main findings made and methods applied.

The final thesis typically is written in cooperation with a company or organisation from the health sector.

Teaching method

Written copy, electronic copy (e.g. CD)

Mode and type of assessment

<table>
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<th>Type of assessment</th>
<th>Mode of assessment</th>
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Admission requirements

Successful completion of all modules from semesters 1 to 3.

Reusability

None
Recommended reading

- ku – Krankenhaus Umschau, führen und wirtschaften im Krankenhaus, kma, das Krankenhaus, Krankenhaus IT-Journal, E-HEALTH-COM, subscription available.
- An extended or updated list of recommended reading may be provided at the beginning of the semester.
## Annex 1: Contact

<table>
<thead>
<tr>
<th>Module</th>
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<tr>
<td>Applications in Health Management</td>
<td>1st</td>
<td>Stappenbeck</td>
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<tr>
<td>Medical Documentation</td>
<td>1st</td>
<td>Prof. Dr. Lehr</td>
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<td>Prof. Dr. Lehr</td>
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<td>Business Analytics</td>
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<td>Prof. Dr. Gerken</td>
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<td>Quality Management</td>
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<td>Prof. Dr. Lehr / Prof. Dr. Severin</td>
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<tr>
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<td>eHealth Project</td>
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<td>Prof. Dr. Lehr</td>
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### Documentation of changes/updates:

<table>
<thead>
<tr>
<th>When</th>
<th>Who</th>
<th>What</th>
<th>Where</th>
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<tr>
<td>4 Aug 2019</td>
<td>Klaus von Stackelberg</td>
<td>Version control set up</td>
<td>File</td>
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<tr>
<td>4 Aug 2019</td>
<td>Bosco Lehr</td>
<td>Updated the module names according to requirements and recommendation</td>
<td>File</td>
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<tr>
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<td>Klaus von Stackelberg</td>
<td>Deleted class numbers and weighting factors (after consulting Gudrun Dix)</td>
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<tr>
<td>5 Aug 2019</td>
<td>Klaus von Stackelberg</td>
<td>Compared and matched module names and structures with Examination and Study Regulations</td>
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<tr>
<td>5 Aug 2019</td>
<td>Bosco Lehr</td>
<td>Small changes, mainly language-related</td>
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<td>16 Aug 2019</td>
<td>Bosco Lehr &amp; Klaus von Stackelberg</td>
<td>Checked corrections</td>
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<tr>
<td>2 Mar 2020</td>
<td>Jan Gerken &amp; Klaus von Stackelberg</td>
<td>Included AI contents in the Business Analytics module description</td>
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Last update: 2 Mar 2020 [Version_20200802]