A Level Preparation: Information Technologies

Module Code: DLAPITE

<table>
<thead>
<tr>
<th>Module Type</th>
<th>Admission Requirements</th>
<th>Study Level</th>
<th>CP</th>
<th>Student Workload</th>
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<tr>
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<td>DLFSWE01_E</td>
<td>CP 10</td>
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<th>Semester / Term</th>
<th>Duration</th>
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<tr>
<td>see curriculum</td>
<td>Minimum 1 semester</td>
<td>WiSe/SoSe</td>
<td>English</td>
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Module Coordinator

Prof. Dr. Thorsten Fröhlich (A Level Preparation: Information Technologies AS) / Prof. Dr. Markus C. Hemmer (A Level Preparation: Information Technologies A)

Contributing Courses to Module

- A Level Preparation: Information Technologies AS (DLAPITE01)
- A Level Preparation: Information Technologies A (DLAPITE02)

Module Exam Type

<table>
<thead>
<tr>
<th>Module Exam</th>
<th>Split Exam</th>
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<tr>
<td>A Level Preparation: Information Technologies AS</td>
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<tr>
<td>A Level Preparation: Information Technologies A</td>
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Weight of Module

see curriculum
Module Contents

A Level Preparation: Information Technologies AS
- Data processing and information
- Hardware and software
- Monitoring and control
- Algorithms and flow charts
- eSecurity
- The digital divide
- Expert systems
- Spreadsheets
- Modeling
- Database and file concepts
- Sound and video editing

A Level Preparation: Information Technologies A
- IT in society and emerging technologies
- Communications technology
- Project management
- Life cycle management
- Mail merge
- Graphics creation and animation
- Programming for the web
## Learning Outcomes

### A Level Preparation: Information Technologies AS

On successful completion, students will be able to

- understand the impact of all aspects of our lives through the application of technology to process information.
- see how hardware and software interact with each other in an IT system.
- apply basic IT-related techniques on practical examples
- know how computer systems are connected to form networks to share data and resources.
- understand the internet as a global communications network that uses standardized communications protocols for connecting computers worldwide and sharing information in many different forms.
- know how information systems are developed within a planned cycle of stages that cover the system's initial development and continue through to its scheduled updating or redevelopment.
- be informed about new and emerging technologies and consider how they affect everyday life.

### A Level Preparation: Information Technologies A

On successful completion, students will be able to

- assess the impact of information technologies on society and social development
- know and understand the principles of computer networking
- understand project planning, organization, tools, and assessment
- analyse and design software development lifecycles
- develop form letters and apply mail merging
- apply fundamental image editing and animation techniques
- understand the structure and syntax of HTML web pages and script languages

### Links to other Modules within the Study Program

This module is similar to other modules in the field of Computer Science & Software Development

### Links to other Study Programs of the University

All Bachelor Programs in the IT & Technology field
A Level Preparation: Information Technologies AS
Course Code: DLAPITE01

<table>
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<th>Language of Instruction and Examination</th>
<th>Contact Hours</th>
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Course Description
The course is to help students prepare for Cambridge International AS Level Information Technology tests. The course communicates the necessary basics to complete the tests. With the help of the individual contents and instructions for self-study and self-testing, efficient preparation for passing the Cambridge International AS Information Technology test occurs. Students benefit from different learning forms to understand the particular areas of information technology. All learning forms have the same goal: to deepen and store knowledge using practical examples. Practical tasks can be reviewed in tutorials and discussed with qualified tutors. The content of the AS-Level topics is assumed knowledge for the A-Level components.

Course Outcomes
On successful completion, students will be able to
- understand the impact of all aspects of our lives through the application of technology to process information.
- see how hardware and software interact with each other in an IT system.
- apply basic IT-related techniques on practical examples
- know how computer systems are connected to form networks to share data and resources.
- understand the internet as a global communications network that uses standardized communications protocols for connecting computers worldwide and sharing information in many different forms.
- know how information systems are developed within a planned cycle of stages that cover the system's initial development and continue through to its scheduled updating or redevelopment.
- be informed about new and emerging technologies and consider how they affect everyday life.

Contents
1. Data processing and information
   1.1 Data and information
   1.2 Quality of information
   1.3 Encryption
   1.4 Checking the accuracy of data
   1.5 Data processing
2. Hardware and software
   2.1 Mainframe computers and supercomputers
   2.2 System software
   2.3 Utility software
   2.4 Custom written software and off-the-shelf software
   2.5 User interfaces

3. Monitoring and control
   3.1 Monitoring technologies
   3.2 Control technologies

4. Algorithms and flowcharts
   4.1 Algorithms and flowcharts

5. eSecurity
   5.1 Personal data
   5.2 Malware

6. The digital divide
   6.1 The digital divide

7. Expert systems
   7.1 Expert systems

8. Spreadsheets
   8.1 Create a spreadsheet
   8.2 Test a spreadsheet
   8.3 Use a spreadsheet
   8.4 Automate operations with a spreadsheet
   8.5 Graphs and charts

9. Modeling
   9.1 Modeling and simulations
10. Database and file concepts
   10.1 Create a database
   10.2 Normalization to third normal form (3NF)
   10.3 Data dictionary
   10.4 Query selection
   10.5 File and data management

11. Sound and video editing
   11.1 Sound and video editing

Literature

Compulsory Reading

Further Reading
Study Format Distance Learning

<table>
<thead>
<tr>
<th>Study Format</th>
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<td>Distance Learning</td>
<td>Online Lecture</td>
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Information about the examination

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Student Workload

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<th>Presence</th>
<th>Tutorial</th>
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<th>Practical Experience</th>
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<td>30 h</td>
<td>30 h</td>
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Instructional Methods

- Learning Sprints®
- Course Book
- Vodcast
- Shortcast
- Audio
- Exam Template
- Review Book
- Creative Lab
- Guideline
- Live Tutorium/Course Feed
- Reader
- Slides
A Level Preparation: Information Technologies A
Course Code: DLAPITE02

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Course Description
The course is to help students preparing for Cambridge International A-Level Information Technology tests. It communicates the necessary basics to complete the tests and provides the foundation for continuing self-studies to efficiently prepare for passing the test. The course assumes knowledge of the Cambridge International AS-Level and additionally covers commonly used information technologies, their concepts, development, applications, and their impact on societal development. Students benefit from different learning forms to understand the selected areas of information technology. All learning forms have the same goal: to deepen and store knowledge using practical examples. Practical tasks can be reviewed in tutorials and discussed with qualified tutors.

Course Outcomes
On successful completion, students will be able to
- assess the impact of information technologies on society and social development
- know and understand the principles of computer networking
- understand project planning, organization, tools, and assessment
- analyse and design software development lifecycles
- develop form letters and apply mail merging
- apply fundamental image editing and animation techniques
- understand the structure and syntax of HTML web pages and script languages

Contents
1. IT in society and emerging technologies
   1.1 Digital currencies and data mining
   1.2 Social networking services and platforms
   1.3 The impact of IT on society, monitoring and surveillance
   1.4 Technology enhanced learning
2. New and emerging technologies
   2.1 Near Field Communication
   2.2 Ultra HD television systems
   2.3 Artificial Intelligence and robotics
   2.4 Augmented and virtual reality
   2.5 Computer-assisted translation
   2.6 Holographic imaging and 3D printing

3. Communications technology
   3.1 Network hardware, servers, and clouds
   3.2 Network protocols
   3.3 Switching, routing, and flow control
   3.4 Wireless transmission and mobile communication systems
   3.5 Network security and disaster recovery management

4. Project management
   4.1 The stages of the project life cycle
   4.2 Project management software
   4.3 Tools and techniques for project management tasks

5. Life cycle management
   5.1 Analysis and design
   5.2 Documentation
   5.3 Development and testing
   5.4 Implementation, evaluation, and maintenance
   5.5 Prototyping and methods of software development

6. Mail merge
   6.1 Master documents and forms
   6.2 Rules and fields
   6.3 Standard letters and labels

7. Graphics creation and animation
   7.1 Common graphics skills
   7.2 Text, vector, and bitmap images
   7.3 Compression
8. Animation and morphing
   8.1 Frames and canvas operations
   8.2 Timings & coordinates
   8.3 Tweening and morphing
   8.4 Sound implementation

9. Programming for the web
   9.1 HTML and CSS
   9.2 JavaScript
   9.3 Operators and functions

Literature

Compulsory Reading

Further Reading
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