

### Semester 1:

#### General business studies:

Introduction to Economics:

- Basic Ideas
- Working capitals
- Accounting
- Company calculation
- Investment calculation
- Aims
- Planning
- Running a company

#### Media technology:

- Editing systems (online-offline, linear-non linear)
- dB
- Electrical engineering (ohm law, power,...)
- Current, power and voltage adjustment

#### Fundamentals of Media technology (practical):

Practical exercises complementary to theory (e.g. working with editing systems,...)

#### Fundamentals of Media organization & Presentation:

- Theory of composition
- Theory of shapes
- Theory of 3-dimensional drawing
- Theory of colors
- Typography

#### Fundamentals of Media organization & Presentation (practical):

Practical exercises complementary to theory (e.g. designing logos, ads, placards, flyers,...)

#### Computer Science 1:

Digital technology (logical connection, digital connection)

#### Computer Science 1 (practical):

Introduction to Unix and other operating systems (e.g. Windows)

#### Mathematics 1:

- Geometry (matrix, vectors, determinants, transformation),
- Analysis (trigonometric functions, exponential functions, differential calculation, complex numbers)

#### Media Psychology:

- How do humans work up information
- Psychological findings to the effects of Media

#### Physics:

- Light
- Lenses
- Transparency, Refraction, Transmission
- Lens-Systems
- Radiation

# DIGITAL MEDIA - MEDIA & COMPUTER SCIENCE

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## Subject Description

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### **Media:**

- Types of media
- History of media
- Mass Media
- Print Media
- Communication
- Freedom of press
- Freedom of information
- Current topics

### Semester 2:

#### Audio technology:

- Basic audio theory
- Audio perception and psycho acoustics
- Microphones and speakers
- Delay and Reverb
- Filters and equalizers
- Dynamic range and dynamics
- Recording consoles and mixer
- Digital audio; pulse code modulation
- Hard disk recording
- Audio interfaces and synchronization
- PC audio; streaming audio, multimedia
- Surround sound
- MIDI

#### Audio technology (practical):

Conception/Script and realization (recording, editing and mixing) of an audio-commercial:

Duration: 30 sec. Mixing of different sound-sources: Spoken voice, Music-Tracks, Noises. Realization with professional studio-equipment.

#### Computer graphics 1:

- 3D-Basics
- Modeling
- Hierarchy
- Scenes
- Splines
- Polygons
- Colors, Materials, Textures
- Light

#### Computer Science 2:

- Software Engineering
- Data structures
- Different models of software design
- Sort-procedures
- Find-procedures
- Algorithm
- Designing of software
- Designtools

#### Marketing 1:

- Basics
- Steps of marketing evolution
- Market segmentation
- Aspects and criteria of productfeatures (USP's, user benefits)
- Aspects and criteria of target groups
- Marketing strategies

#### Mathematics 2:

- Analysis (Integral, Fourier)
- Statistics

### **Educational Media:**

- Behavioral psychology
- Perceptual psychology
- Multiple use of media
- Cost-benefit analysis
- CBT-Production
- Target groups of edutainment media
- Target groups of teaching aims
- Educational objectives and learning structures
- Learning models, Learning situation
- Interactive scenario
- Text and image shaping
- Evaluation of an CBT application

### **Media organization & presentation 1:**

- Vector oriented graphic – pixel oriented graphic
- Composition of a picture
- Storyboard
- Screendesign

### **Media concept development 1:**

- Conception
- Expose
- Treatment
- Script
- Dramaturgy

### **Programming 1:**

- Introduction
- Basics of C
- Linear algorithm
- Non linear algorithm
- Loops
- Fields
- Functions (recursion, parameter transfer, structures, dynamic structures)

### **Programming 1 (practical):**

Programming programs regarding the topics of Programming 1.

### **Video technology:**

- Video scanning and recording
- Video transmission (CVS- and CCVS-Signal, PAL, SECAM, NTSC)
- Picture-Pickup, picture reproduction

### **Video technology (practical):**

Working in the studio (camera, editing systems,...)

### Semester 4:

#### Project Seminar 1:

CD-ROM for the management consulting group CSC Ploenzke

- Conception

#### Computer graphics 1:

- Shading
- Rendering (Raytracing, Radiosity)
- Offline Rendering – Real-time Rendering
- Virtual Reality
- Virtual Characters
- 3D-Internet
- 3D-Games

#### Digital AV technology:

- A/D conversion (low pass filtering, sampling, quantization, coding)
- Digitizing the composite video signal
- Component systems (4:2:2, 4:1:1, ITU-601, ITU-656, ITU-657)
- Channel coding (NRZ-Code, NRZI-Code, Miller-Code,...)
- Digital MAZ (D-1, D-2, DCT, Digital Betacam, D-5)

#### Digital Image Processing 1:

- Digital gray scale images
- Geometrical image modification (translation, scaling, rotation)
- Geometrical image resampling (interpolation methods)
- Visual perception (3-dimensional vision, stereo vision,...)
- Image statistics (entropy, correlation and convolution, filter)
- The pyramid as a structure for efficient computation (Gaussian pyramid, Laplacian pyramid,...)

#### Computer Science 3:

- Trees (Binary Search Trees, Heap-Trees, Huffman-Trees)
- Graphs
- Implementation
- Data base (relational system, ER-Model, normal form, SQL)

#### Interactive Media:

- Conceptual aspects of interactive media (WWW, CD-ROM)
- Practical tools to produce and evaluate interactive media (WWW, CD-ROM)

#### Media Conception 2:

Analyzing movies

- Picture and sound composition, assembly
- Characters (protagonist, antagonist, changing characters, style of acting,...)
- Dramatic structure (aim of the protagonist, conflicts, hindrances, motives, fields paradigm, opening, preparation and gleaning, place and gather, denotation and connotation)
- Interpretation

#### Project Management & Project Calculation:

- Introduction
- Project organization
- Project planning
- Project monitoring and project control
- Project management and behavioral basic approach

- Calculation in the phases of a multimedia project
- Project management software
- Introduction of project management in a enterprise
- Media calculation (modules of costs, calculation methods, calculation strategies)

### **Telecommunications Media 1:**

- Basics
- OSI Reference Model
- Cables (twisted pair, coaxial, fiber optics, ...)
- Serial interface
- Synchronous and asynchronous communication
- Error detection/correction
- Modem
- Standard applications (e.g. fax, file transfer, teletex, interactive video text,...)
- Communication Networks (LAN, WAN, Private Switched Telephone Network, ISDN, ADSL, DSL, HDLC, Packet Switched Network, Leased Line, wireless communication)
- Networking
- TCP/IP, Internet

### **Advertising:**

- Rule of communication
- Advertising objects,-instruments and -individuals
- Planing and realization of advertising projects (analysis of enterprises, market structures, definition of advertising targets, media selection process, budgeting, definition of target groups, psychology in advertising, creating advertising objects, advertising objects and media mix)

### **Realization of a short film:**

- Conception (storyboard, script)
- Production
- Postproduction

### **Screen Design Photoshop:**

How to use Photoshop.

### **Semester 5:**

#### **Project Seminar 2:**

CD-ROM for the management consulting group CSC Ploenzke

- Production

#### **Programming 2:**

- C++ (classes, friends, this-variable, overloading, inheritance, virtual functions, templates)
- JAVA (introduction, data- and control structures, objects, exceptions, threads, awt-library, applet-programming, client-server programming)
- Methods of analysis and design (object oriented system design, other object oriented languages)

#### **Programming 2 (practical):**

Programming programs regarding the topics of Programming 2.

#### **Digital Image Processing 2:**

- Image transforms (Wavelet transform, Fourier transform, Cosine transform)
- Special applications (image coding (jpeg), stereo image processing, pattern recognition, computer-holography, medical image processing)

#### **Digital Image Processing 2 (practical):**

- Programming with Matlab

#### **Telecommunications Media 2:**

- Ethernet
- Token ring
- Internetworking (repeater, bridge, router)
- Internet applications
- Internet-Provider
- Proxies
- Net security (Firewall)
- Global Networks (ATM)
- CATV
- Encryption (PGP)

#### **Marketing 1 (practical):**

- Creating flyers, banners and posters
- Conception of a Website
- Planing of exhibitions and fairs

#### **Media organization & presentation 2:**

- Treatment of a movie
- Preliminary remark
- Selling Statement
- Characters of the story
- Chronology of the story, dramaturgy,...
- Perfect scene

#### **Project Management & Project Calculation:**

- Infrastructure of information
- Creating a catalog of requirements for a project management software, based on the experiences made in the Project Seminar. Catalog must include: e.g. organization of documents; demonstration of phases and milestones; address

management; structure; scheduling; appointments and deadlines; calculation, costs; warnings; interface design; help;...)

### **computer based Video technology:**

- Different formats of video/audio/data recording (formats, standards, hardware): e.g. VHS, DV, D1, CD-ROM, DVD,...)
- Different display techniques (PALC, TFT, FED, laser TV, OLED)
- Methods of data reduction (e.g. mpeg)

### **Interface design for the WWW:**

Theory:

1. The Cyberspace:
  - The computer as a communication medium
  - Principles of interface design
  - Typography
  - Layout
  - Navigation
  - Topics
  - Language (vocabulary, syntax, stile)
  - Graphics, pictures, image design
  - Multimedia
2. Web Site Design
  - Web Site Design (Content, Visual, Information, Interaction, Compatibility, Performance)
  - Realization and management of a Web Site
3. Dynamic HTML
4. Java Script and DOM
5. event-handler
6. Dynamic Style Sheets

Practical part:

- Conception and realization of a Website

### **Knowledge Management & Intranet:**

- Market of knowledge (demand, offerer, broker, economy)
- Aims, identification, acquisition, development, distribution, use, preservation and evaluation of knowledge
- Analyzing the current intranet
- Conception to improve the intranet