

Technische und gewerbliche Schulen
Technical and Vocational Schools and Colleges

**Lehrplan der Höheren Lehranstalt für Elektronische
Datenverarbeitung und Organisation**
**Curriculum of the Secondary College of
Electronic Dataprocessing and Organisation**
(BGBl. II Nr. 382/1998)

English edition - May 1999

**Höhere technische Lehranstalten mit Elektronische
Datenverarbeitung und Organisation – Abteilungen
Secondary Technical Colleges with
Departments of Electronical Dataprocessing and Organisation**

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**CURRICULUM OF THE SECONDARY COLLEGE FOR
ELECTRONIC DATA PROCESSING AND ORGANISATION**

Program Codes:

8471.....Commercial Data Processing

8471.....Network Design & Management

8473.....media Technology & Buisness Application

I. SUBJECT TIME TABLE ¹⁾

(Total number of lessons and number of weekly lessons of the different subjects)

A. Compulsory subjects	Lessons per week					Sum	Group	Teaching Assign- ment
	1	2	3	4	5			
1. Religious Instruction	2	2	2	2	2	10	(III)	
2. German	3	2	2	2	2	11	(I)	
3. English.....	2	2	2	3	2	11	(I)	
4. History and Political Education	-	-	-	2	2	4	III	
5. Physical Education	2	2	2	1	1	8	(IVa)	
6. Geography and Economics	2	2	-	-	-	4	(III)	
7. Economy and Law	-	-	-	-	2	2	III	
8. Applied Mathematics	4	4	3	2	2	15	(I)	
9. Applied Physics	2	2	2	2	-	8	(II)	
10. Applied Chemistry and Ecology	3	2	-	-	-	5	II	
11. Principles of Electronic Data Processing	4	5	-	-	-	9	I	
12. Process Control and Computer Networks with Lab Exercises ²⁾	-	-	4	4	2	10	I	
13. Programming .. ³⁾	4	7	4	-	-	15	I	
14. Operating Systems	-	-	3	-	-	3	I	
15. Applied Data Techniques	-	-	4	-	-	4	I	
16. Project Development ⁴⁾	-	-	2	3	7	12	I	
17. Accounting ⁵⁾	2	3	2	-	-	7	I	
18. Business Organisation	2	2	3	-	-	7	II	
19. Computer-Aided Word Processing	3	-	-	-	-	3	III	
Compulsory subjects of school-autonomous special training focuses in compliance with Section B	-	-	-	14	13	27		
Total number of lessons per week	35	35	35	35	35	175		

B. Compulsory subjects of school-autonomous special training focuses	Lessons per week		Sum	Teaching Assign- ment Group
	4	5		
B.1 Commercial Data Processing				
1.1 Programming ³⁾	3	2	5	I
1.2 Applied Data Techniques ⁶⁾	3	2	5	I
1.3 System and Application Planning ⁷⁾	3	3	6	I
1.4 Accounting	3	2	5	I

1.5 Business Organisation	2	2	4	II
1.6 Practical Business and Management Skills	-	2	2	III
Number of weekly lessons, B. 1	14	13	27	

B. Compulsory subjects of school-autonomous special training focuses	Lessons per week		Teaching	
	4	5	Total	Assignment Group

B.2 Network Technology

2.1 Database Systems	2	-	2	I
2.2 Network Technologies ⁸⁾	3	4	7	I
2.3 Telecommunications ⁷⁾	2	3	5	I
2.4 Practical Hardware Lessons ⁹⁾	3	-	3	I
2.5 Complex Systems ⁷⁾	2	2	4	I
2.6 Data Security and Data Protection	2	-	2	I
2.7 Communication in Networks	-	2	2	II
2.8 Quality Management	-	2	2	II
Number of weekly lessons, B.2	14	13	27	

B.3 Media Technology and the Media Industry

3.1 Database Systems	2	-	2	I
3.2 Multimedia Techniques ⁸⁾	3	4	7	I
3.3 Telecommunications ⁷⁾	2	3	5	I
3.4 Multimedia Hardware ⁹⁾	3	-	3	I
3.5 Multimedia Publications in Networks ⁷⁾	2	2	4	II
3.6 Communication in Networks	-	2	2	II
3.7 The Media Industry	2	2	4	III
Number of weekly lessons, B. 3.....	14	13	27	

Mandatory work placement Minimum of 8 weeks during vacation before 5th year

C. Optional subjects, Non-obligatory exercises Tutorials	Lessons per week					Teaching Assignment Group
	1	2	3	4	5	

C.1 Optional Subjects

Second modern language ¹⁰⁾	2	2	2	2	2	(I)
Communication and Presentation Techniques	2	2	2	2	2	II

C.2 Non-Obligatory Practice

Physical Education	2	2	2	2	2	(IVa)
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C.3 Tutorials ¹¹⁾

- German
- English
- Applied Mathematics
- Relevant Theoretical Compulsory Subjects

- 1) Within the framework of Section III deviations from the subject table are permitted by school-autonomous provisions for curricula.
- 2) In combination with Laboratory practice of 2 lessons per week in year 3 and 2 lessons per week in year 4.
- 3) In combination with practice of 4 lessons per week in Electronic Data Processing in years 1, 2 and 3 and 3 lessons in the school-autonomous special training focus "Commercial Data Processing" per week in year 4 and 2 in year 5.
- 4) In combination with 2 lessons in Electronic Data Processing per week in year 4 and 5 hours per week in year 5.
- 5) In combination with practice of 2 lessons per week in Electronic Data Processing in year 2.
- 6) In combination with practice of 2 lessons in Electronic Data Processing per week in years 4 and 5.
- 7) In combination with practice of 2 lessons in Electronic Data Processing per week in year 5.
- 8) In combination with practice of 3 lessons in Electronic Data Processing per week in year 4 and 2 lessons per week in year 5.
- 9) In combination with practice of 2 lessons in Electronic Data Processing per week in year 4.
- 10) The name of the language must be mentioned in official papers.
- 11) Parallel to the individual compulsory subjects, up to 16 lessons per week in each academic year on request; classified as for corresponding compulsory subject.

II. GENERAL EDUCATION OBJECTIVES

Within the framework of the Austrian school system Secondary Technical and Vocational Colleges are designed to provide students with both general education and vocational training, which

- will enable them to pursue a highly qualified occupation and carry on a business in trade and industry.
- grants university access.

In order to meet the needs and requirements of everyday and professional life and in order to be prepared for the challenge of an academic career the graduate of a Secondary Technical and Vocational College will be equipped with professional skills (theoretical and practical knowledge of business-relevant and related topics), methodical competence (capability of gathering information, planning solutions to problems and selecting and applying suitable methods.), social consciousness (ability of co-operation, communication and working in teams) and individual creativity (capacity to organise his personal and professional life and his own personality actively, to show self-initiative and interest in further education).

In accordance with this comprehensive conception of competence the graduate of a Secondary Technical and Vocational College will acquire the following qualifications:

- He will get a sound engineering knowledge up to date required for everyday and professional life and an academic career. He will know business-relevant legal regulations, standards and practices and be able to employ and operate commonly used devices.
- He will observe and evaluate routines, facts, processes and strategies and be able to describe them in correct German and in at least one foreign language, written and orally. He will also be able to represent them by symbols used in mathematics and information science. The graduate will further be able to gain information from the media, evaluate it critically and relate it to other ideas.
- He will gain an insight into processes of political and managerial economy and will be informed about business administration and law, which will enable him to pursue a trade, a craft or a career in industry. He will further be able to further develop and utilise his skills in business life.
- He will be provided with fundamentals of engineering and science, basic concepts of mathematics and science in order to be ready to deal with issues relevant to everyday life and ecology. Complementary to business training he will further develop general interdisciplinary skills.
- He will be prepared to participate in public and cultural life; he will declare himself to co- and self-determination in democracy and show responsibility in the presence of ecological and political changes by standing up for international understanding, professional ethos, a critical attitude towards consumption, environmental protection and a conduct of partnership and devote his life to these values. He will recognise the meaning of co-operation within the European Union and with other countries.
- He will support a concept of proficiency consistent with society and environment and preserve this proficiency and health by his own attitude towards the way of life, leisure culture and further education. He will be ready to apply these principles to his staff, and foster them by an open management style.

In the sense of general education schools have to face additional tasks which are summarised in teaching principles. Among them are: Health, media and sexual education, political awareness, an acceptance of the

equality between men and women, concern for the environment, traffic concepts, a comprehensive national defence as well as an education concerning economy and consumption.

Subject-relevant training objectives:

In addition to providing a sound general education including technical English, the Secondary College for Electronic Data Processing and Organisation provides the student with a knowledge of electronic data processing in the fields of software and hardware, the planning and handling of projects, particularly in respect of software development, and commercial knowledge of business organisation and accounting. The practical training prepares the student for managerial tasks in a range of different companies, planning offices and public offices.

General specialist training is underpinned by three alternative special training focuses:

- The "**Commercial Data Processing**" special training focus concentrates specifically on software engineering, database systems and network structures as found in business practice. In the commercial field the student will acquire advanced knowledge of accounting and business organisation.
- The "**Network Technology**" special training focus takes a detailed look at technical aspects such as communication technology, process control systems and the programming of technically complex systems.
- In the "**Media Technology and the Media Industry**" special training focus the emphasis is on providing the technical and commercial skills required for the planning, development and practical use of multimedia products, with particular attention being paid to the current software and hardware environments of these products.

Graduates will be qualified to work primarily in the fields of computer and network system analysis, management and administration and the generation, testing and maintenance of software, and will be able to work as organisers and controllers in a wide range of different corporate fields.

The activities which the graduates will be able to undertake will range from clerical work to middle management positions in small, medium-sized or large enterprises.

III. SCHOOL-AUTONOMOUS PROVISIONS FOR CURRICULA, DIDACTIC PRINCIPLES

IIIa. General Provisions

School-autonomous provisions for curricula (School Organisation Law §6/1) grant schools independence in the organisation of subject-timetables and curricula-determined teaching-contents (syllabi of the different subjects) and in the choice of training and work forms as well as in the organisation of the training.

In order to make efficient use of these opportunities it is essential to be aware of the special needs and problems of the respective school or class at a certain location as well as the resulting ambitions and aims thereof. This independence requires the development of concepts which consider the needs of students, parents and teachers alike as well as the specific characteristics of the school.

School-autonomous provisions for curricula must not only observe the extent of teachers' weekly assignments provided but also institutional facilities such as rooms and equipment.

School-autonomous provisions for curricula have to consider training objectives concerning general education as well as occupation-oriented theoretical knowledge and practical skills. Within the framework of the Austrian school system they also have to provide students with the opportunity to transfer courses.

IIIb. School-Autonomous Deviations from Subject-Tables

School-autonomous provisions for curricula allow schools to work out their own tables of compulsory subjects, which may deviate from the standard ones, provided the following provisions are considered:

1. It is permitted to change the distribution of the total number of compulsory weekly lessons and their respective contents over the years.

2. During the course the number of weekly compulsory subjects can be reduced by up to ten lessons a week, if - in return - additional compulsory subjects are introduced or the number of lessons of curricular compulsory subjects is increased to the same extent. This reduction is limited by the fact that compulsory subjects may only be reduced by one lesson a week. The reductions must not cause a complete loss of a compulsory subject in one year.
3. In each year a compulsory subject can be combined with another methodically and content related compulsory subject to one comprehensive compulsory subject. The new name must refer to the names of the two subjects which the new subject derives from.
4. Instead of the compulsory subject English another modern language can be taught.

If paragraphs 1. or 2. are applied, special consideration has to be given to the fact that the total number of weekly lessons of the course must be preserved and that there must not be more than 40 lessons per week in any year.

School-autonomous provisions for curricula may establish extra-curricular optional subjects, non-obligatory practice lessons and tutorials as well as change the number of lessons for corresponding programmes provided by the curriculum.

IIIc. School-Autonomous Provisions for Training Focuses

If curricula include school-autonomous training focuses, these school-specific focuses have to be determined by school-autonomous provisions for curricula. Some focuses can be established as alternative compulsory subjects.

IIIId. Provisions concerning Contents of Subjects and Classification of Subjects according to Teaching Assignment Groups

- (1) If extra-curricular subjects are created or if subjects for which the curriculum provides no contents are established within the framework of school-autonomous provisions for curricula, school-autonomous provisions for curricula have to contain relevant directions. If school-autonomous provisions for subjects provide an increase in the number of lessons, additional training and teaching aims, descriptions of contents and didactic principles may be defined.
- (2) If additional subjects are created or existing subjects are changed subject-relevant training objectives of the curriculum and the following directions have to be observed.

Directions for Training and Teaching Aims:

The student will acquire general and subject-relevant competences which - under special consideration of regional requirements - emphasise and complete attitudes, knowledge and skills provided in other compulsory subjects.

Directions for Contents:

If contents include topics which cannot be covered by increasing the number of curricular lessons the following additional subjects have to be provided:

“Foreign Language“:

Another modern language whose organisation of contents and didactic principles is equivalent to those of the compulsory subject English. (Teaching assignment group I)

“Personality Training“:

Promotion of self-development by teaching offers concerned with general education, humanities and business practice. (For classification into teaching assignment groups see §7 of Teaching Assignment Law for federal teachers)

“Economy and Technology“:

Teaching programmes which emphasise economic training relevant to the specific technical field. (Teaching assignment group I for training areas management engineering, electronic data processing and organisation; otherwise teaching assignment group II)

“Law and Political Education“:

Teaching courses which stress political education and subjects concerning law with special regard to independent practice of trade. (Teaching assignment group III)

“Environment“:

Introduction to domains of general science in addition to technical-scientific education. (Teaching assignment group III)

“Special Theoretical Subject Training“:

Supplementary courses with non-encyclopaedic syllabi. (Teaching assignment group I)

“Projects“:

Teaching offers which aim at interdisciplinary strategies within the domain under special consideration of theoretical and practical laboratory assessments. (Teaching assignment group I)

“General Theoretical Subject Training“:

Introduction to engineering disciplines which are not focused on in the rest of the course. (Teaching assignment group II)

Directions for Didactic Principles:

Pedagogic concepts should foster the student’s ability to co-operate, his intellectual flexibility and his concern for his social, economic and ecological surroundings. Project teaching - even if involving students from different grades or block tuition- is recommended wherever possible.

DIDACTIC PRINCIPLES

IIIe. Preparations of Contents

In order to reach the general training objectives educational background of students have to be considered and the contents of the subjects have to be selected according to practical requirements of the subject field.

Sound knowledge of essential contents should be preferred to an overall outline. In order to foster motivation new topics have to be introduced with an orientation to practical problems. Cross- references within a subject and between subjects are essential for understanding the subject matter and for the development of interdisciplinary skills.

It is decisive for training success that subject matter is arranged clearly and according to the age of the students. Teaching - and understanding aids, especially those prepared by the teachers themselves, contribute to this success.

In order to provide the students with skills in due time and to avoid parallelisms teachers will have to work in teams. It is recommended to build up a network of related subjects in the form of co-ordinated content-distribution-plans.

As general education and training aims require training to be up to the state of the art, teachers are expected to improve their specific knowledge and skills continuously. The curriculum presents a directive framework for this purpose.

III f. Organisation of Lectures

Working on projects in groups simulates practice in business situations and emphasises the students’ communicative competence. The student will profit by the fact that his fellow students encourage and criticise his way of solving problems and his self analysis, which is essential for training progress and future professional work forms.

Excursions, field practice, lectures of industrial experts and work placement grant an insight into relations between technology and business organisation as well as into social aspects of professional life.

All lectures listed in the subject-table can partly or completely be given in block tuition (1 lesson per week corresponds to 40 lectures a year).

Different themes of a subject can be taught by different teachers according to the teachers' skills and special knowledge; teachers should aim at good co-operation with respect to their common assessment of the students' proficiencies.

For pedagogic and organisational reasons different subjects can be combined to form concentrated training units. (School Time Law 1985, §4/2, Federal Law Gazette 77, as amended)

IV. SYLLABUS FOR RELIGIOUS INSTRUCTION LESSONS

- a.) Roman Catholic Instructions
See promulgation of Federal Law Gazette 30/1984
- b.) Protestant Instruction
See promulgation of Federal Law Gazette 515/1991
- c.) Old Catholic Instructions
are generally given in groups according to the Law of Religious Instructions §7 as amended.
Consequently the syllabus for the upper level of Secondary Academic Schools is to be applied.
- d.) Islamic Instructions
See promulgation of Federal Law Gazette 421/1983.
- e.) Israelite Instructions
Promulgation of Federal Law Gazette 88/1985 as amended shall analogously be applied.
- f.) New Apostolic Church Instructions
See promulgation of Federal Law Gazette 269/1986.
- g.) Instructions of The Church of Jesus Christ of the Latter Day Saints
See promulgation of Federal Law Gazette 239/1988.
- h.) Syrian-Orthodox Instructions
See promulgation of Federal Law Gazette 467/1988.
- i.) Greek-Orthodox Instructions
See promulgation of Federal Law Gazette 441/1991.
- j.) Buddhist Instructions
See promulgation of Federal Law Gazette 255/1992.

V. TRAINING AND TEACHING AIMS OF SUBJECTS; DISTRIBUTION OF CONTENTS OVER THE YEARS

A. COMPULSORY SUBJECTS

2. GERMAN

Training and Teaching Aims:
The student will

- have command of the standard German language in speech and writing.
- be able to make efficient use of means providing information on pronunciation, orthography grammar and style and gather relevant information on cultural and professional affairs.
- be able to develop and master personal and professional communicative situations in speech and writing state and present facts adequately to addressee and situation and evaluate business-oriented texts independently and critically.
- comprehend the quality of literary works, be able to evaluate it and gain an insight into the contents of other art forms.
- understand the function of the media as institutions, economic factors as well as educational, entertainment and information facilities. Within the range of his activities he will further be capable of dealing with media consciously, critically and participatingly.

Contents:

1st Year :

Correctness of Language:

Practice-oriented application of orthography and punctuation. Spelling and meaning of frequently used foreign words, technical terms. Language structures (identification, application).

Oral Communication:

Presentation of facts (that have been experienced, heard, seen or read) in standard language. Phone calls, reports, discussions.

Written Communication:

Practice-oriented textforms (report, summary curriculum vitae, letter of application). Creative text forms.

Literature, Art and Society:

Topics from the student's experiences treated in literature and other art forms (themes, motifs, formal aspects, descriptions, explanations, evaluation of texts). Literary genres.

Media:

Mass media (kinds and functions); advertising and consumption; sources of information (reference books, institutions, use of libraries)

2nd Year :

Oral and Written Communication:

Presentation of facts and the course of events, characterisations, analysing, commentaries. Presentation, making appeals, petitions, excerpts, minutes. Basic concepts of communication. Free creative writing.

Language Standards:

Training and improvement, orthography, punctuation, vocabulary and language structures.

Literature, Art and Society:

Society relevant topics in literature and other art forms (themes, motifs, formal aspects, description, explanation, evaluation of texts)

Media:

Styles in journalism and advertising.

3rd Year :

Written and Oral Communication:

Argumentation, commentaries, subject-relevant reports, technical texts, statements, interviews, conversation and discussion techniques. Communication techniques. Creative writing.

Language Standards:

Training and improvement. Orthography, punctuation, vocabulary and language structures.

Literature, Art and Society:

History of civilisation up to the beginning of the 19th century (époques in the light of intellectual history).
Text commentaries and evaluations.

Media:

Creative criteria and means of manipulation of mass media.

4th Year :

Oral and Written Communication:

Speech and lecture. Analysing and comments. Written reports. Creative writing.

Language Standards:

Training and improvement. Orthography, punctuation, vocabulary and language structure.

Literature, Art and Society:

History of civilisation of the 19th century (époques in the light of intellectual history); evaluation of texts.
Relations to other art forms.

5th Year :

Oral and Written Communication:

Job interview, letters of application, negotiations, debates, analysis and evaluation. Written report.

Presentation techniques. Free writing.

Language Standards:

Training and improvement. Orthography, punctuation, vocabulary and language structures.

Literature, Art and Society:

History of civilisation of the 20th century (époques in the light of intellectual history); evaluation of texts.
Commentaries on cultural works and contemporary developments.

Media:

Evaluation of media contents, analysis of effects.

In each year two to four written tests, which may require one or more lessons.

3. ENGLISH

Training and Teaching Aims:

The student will

- be able to master general and business-relevant communicative situations in the foreign language by showing skills in listening and reading comprehension and speech and writing; emphasis is laid on communicative skills and understanding.
- will be able to transfer information precisely from his mother tongue into the target language and vice versa and comment on it.
- will be able to deal with practical business events in speech and writing under special consideration of commonly used communication forms; he will also be able to join business-relevant group activities with English as a working language.
- will be able to employ technical tools for communication and information suitable for the specific situation and make use of modern presentation and moderation techniques.

Contents:

1st Year :

General Communication Topics:

Integration of previous experiences in communication; topics adequate to the student's knowledge, skills and interests.

Business-Relevant Communication Topics:

Elementary technical facts of the subject discipline; basic scientific and mathematical concepts.

Vocabulary and Language Structures:

Integration of previously acquired skills. Repetition and supplementation of grammatical skills and vocabulary required for idiomatic expression in the fields of relevant communication topics.

2nd Year .

General Communication Topics:

Themes taken from the student's social surroundings. Current issues.

Practice-Relevant Communication Topics:

Applications of scientific and basic technical subjects.

Vocabulary and Language Structures:

Extension of vocabulary and language structures required for expressing facts of relevant communicative themes.

3rd Year :

General Communication Topics:

Topics with special focus on Austria; current issues.

Practice-Relevant Communication Topics:

Products and processes of the subject area.

Vocabulary and Language Structures:

Training and improvement of vocabulary and language structure required for expressing facts of relevant communicative themes.

4th Year :

General Communication Topics:

Topics related to countries of the English speaking world and the European Community; current issues.

Business-Relevant Communication Topics:

Topics relevant to business administration and management engineering.

Vocabulary and Language Structures:

Complex contents of grammar and vocabulary.

5th Year :

General Communication Topics:

Topics of international relevance; current issues.

Business-Relevant Communication Topics:

Complex themes of business practice; business management and business organisation.

Vocabulary and Language Structures:

Applications of acquired structures and vocabulary; summarising survey.

In each year two to four written tests, which may require one or two lessons.

4. HISTORY AND POLITICAL EDUCATION

Training and Teaching Aims:

The student will

- be provided with historical knowledge relevant to everyday and business life under special consideration of Austrian history and he will be able to make use of this in his political and social activities.

- be able to gather and evaluate information required for an understanding of the contemporary situation of the world and the interactions of politics, economy and culture.
- be able to analyse and assess contemporary political, social, economic and cultural situations and processes relying on historical models.
- know the historical development of the branch of trade he has been trained for and relate it to the general historical development as well as affirm the preservation of cultural heritage.
- be prepared to participate actively in public and cultural life and show political and social responsibility; he will affirm the principles of the Austrian federal constitution and he will also be ready to meet different cultures and settle conflicts peacefully.
- be informed about development tendencies of the contemporary society.
- be conscious of environment and critical of consumption.

Contents:

4th Year :

Classical Antiquity:

Cultural and scientific heritage (democratic tendencies, religious heritage).

Middle Ages:

Culture and society in feudalism; development in Austria (formation of Austrian lands); from the theocentric to an anthropocentric view of the world.

Early Modern Times:

Inventions and discoveries; economy (from feudalism to early capitalism); culture, society and science (Renaissance, humanism, reformation; foundation of modern territorial states); developments in Austria.

Age of Reason and the Civil Revolution:

Basic spiritual concepts, state theories, revolution and Restoration, foundation of the United States; Napoleon and Europe; nationalism and liberalism; (human rights, separation of powers, development of parliamentarism); Industrial Revolution and social issues; society, economy, culture, science and technology. Development in Austria.

Age of Imperialism:

National unification endeavours; Europeanising of the world; Europe before the First World War; First World War; society (haute bourgeoisie, industrial society, women's liberation); ideologies and political movements (mass parties, right to vote); economy, science (evolution), technology, culture; development in Austria.

5th Year :

Tendencies and Developments in the 20th Century - the Period before 1945:

Russian revolution. Reorganisation of Europe; totalitarian ideologies and systems (politics, persecution, resistance); crises of democracies; League of Nations; non-European developments; Second World War; society, economy, culture (inflation, world depression, governmental control, science, technology); development in Austria (domestic and foreign policy of the First Republic, time of national socialism).

Tendencies and Developments in the 20th Century - the Period after 1945:

United Nations and international organisations; east-west-conflict (formation of blocks, political centres of conflict), unification of Europe (EEC, Council of Europe, European Community, European Economic Area, EU); de-colonisation and movement of the non-aligned countries; north-south-conflict; racism, alternative movements, terrorism, social conflicts; peace initiatives; society, culture, economy (economic growth and ecology, science, technology); developments in Austria (domestic and foreign policy of the Second Republic, neutrality, social partnership between employers and employed)

Contemporary Social and Political Developments:

Changes and conflicts in Eastern and Southern Europe. Nationalism. Migration and multicultural society. Political dimension of European integration.

Basic Concepts of Politics:

Democracy (direct and indirect democracy; parliamentarism). Formation of political will in democracy (elections, parties, representations of interest). Areas of the Austrian political system. International politics. Basic constitutional rights, rights of freedom and human rights.

5. PHYSICAL EDUCATION

See Federal Law Gazette 37/1989.

6. Geography with economics

Training and Teaching Aims:

The student will

- be provided with regional and global topographic knowledge relevant to business and leisure time.
- be able to gather, evaluate and present information necessary for the investigation and assessment of living spaces.
- display a knowledge in economic geography.
- be able to explain geofactors and comment on their networking in ecological and economic systems.
- be informed about the limitations of the earth's resources and be able to explain the conflicts caused by their exploitation and distribution.
- be able to analyse individual and social demands for geographic space and recognise social aspects.
- understand the meaning of regional development and area development planning for securing quality of life.
- be ready to participate responsibly in the arrangement and preservation of living space.

Contents:

1st Year :

Landscape and Human Ecology:

Ecological structure of economy concerning geofactors; regional belts of the earth; interaction between ecosystems and working human beings.

Population:

Representation of processes concerning population; demographic structures and processes; limits of capacities.

Social and Economic Orders:

International economy; global interactions; alliances (EU and non-European alliances).

2nd Year .

Developing Countries:

Features; problems, development theories and strategies.

Industrial countries:

Sectoral change; urbanisation; economic regions; regional development and area development planning.

7. ECONOMY AND LAW

Training and Teaching Aims:

The student will have a knowledge of the legal regulations applicable to his special discipline.

Contents :

Year 5:

Company law:

Private law, commercial law (business administration, companies register, services, commercial transactions, commercial sales). Competition law. Industrial law (embarking on and carrying out a trade). Intellectual property protection.

Contract law:

Formal aspects (origination of contracts, questions of interpretation, secondary agreements, withdrawal, breach of contract, compensation).

Contracts for the transfer of ownership, for the performance of work (contracts for work, contracts for the supply of work, shipping contracts, special problems in connection with contracts for EDP services, transfer of use (rental agreements, leasing agreements, custody agreements, loan agreements), non-gratuitous contracts for services or work, transfer of risk.

Data protection law:

Provisions, interpretation, procedures.

Employees' rights:

Employment law (employment contracts, rights and obligations of the contracting parties, termination of employment; Austrian Clerical Employees Act; waged employees, apprentices), work protection (working time protection, general and special technical work protection, obligation to display notices, social security).

Skills:

Application of laws, commentaries on laws and public directories. Drafting of simple documents on problems relating to employment law.

Further education:

Reference works, journals, institutions.

8. APPLIED MATHEMATICS

Training and Teaching Aims:

The student will

- know the mathematical terminology, theories and methods relevant to practice and further academic studies and will be able to apply them.
- be able to analyse basic facts and proceedings of nature, technology and economy and describe them by mathematical models, find model solutions and evaluate them.
- be able to employ mathematics as a tool for gaining information and for communication in business, engineering and science.
- be able to present mathematical concepts and demonstrate algorithms.
- be able to employ modern aids efficiently.

Contents :

Years 1 and 2:

1st Year :

Algebra:

Number systems; operations with variables and terms; vectors (representation, magnitude, addition, subtraction, multiplication by a scalar); linear equations and inequalities; solving of formulas, systems of linear equations.

Numerical Computations:

Representation of numbers; errors of representation; estimation of results.

Functions:

Concepts, representation in co-ordinate systems; linear function; evaluation of tables, interpolation; direct and inverse proportionalities.

Geometry:

Plane geometry (similarities; triangle, rectangle, circle; Pythagorean Theorems); stereometry; trigonometry of right triangles.

2nd Year :

Algebra and Geometry:

Vectors (dot product, orthogonality, vector product). Quadratic equations; exponential equations. Complex numbers (representation, operations). Trigonometry of the oblique triangle.

Functions:

Properties; inverse functions; quadratic functions, power and radical functions, exponential and logarithmic functions; general sine function, addition theorems, evaluation of functional graphs and functional equations; parametric representation.

Business Mathematics:

Compound interest calculations, linear optimisation.

Theory of Probability and Statistics:

Frequency distributions; characteristics; probability (addition and multiplication rules).

Year 3:

Analysis:

Sequences, limits, continuity. Differentiation (difference and differential quotient, rules for differentiation, applications). Integration (definite and indefinite integral, integration of elementary functions, applications). Functions in two independent variables.

Numerical Mathematics:

Error approximation and propagation: problems of conditioning; numerical methods for the solution of equations, numeric integration. Interpolation.

Year 4:

Analysis:

Simple difference and differential equations.

Linear algebra and analytic geometry:

Matrices (operations, applications), determinants. Straight lines and planes; conic sections in central position.

Year 5:

Theory of probabilities and statistics:

Discrete and continuous distributions, inductive statistics (estimation of parameters, significance tests). Statistical methods of quality management. Applications.

Current issues of applied mathematics with special focus on the subject discipline.

Years 3 to 5:

Applications relating to the student's specialist field: use of practice-relevant calculation aids, computer-aided mathematical assignments.

Four written tests in years with at least three lessons per week, otherwise two.

9. APPLIED PHYSICS

Training and Teaching Aims:

The student will

- watch and describe processes in nature and relate them to special branches of physics;
- find out about important physical relationships on the basis of experiments and simulations using modern media aids;

- understand and apply physical methods and relate them to physical-technological assignments using (simple) mathematical symbols;
- be able to describe connections in words, in symbolic language and scientific terminology as well as graphically and in tables and formulae;
- be able to estimate dimensions and assess the plausibility of results;
- know and be able to apply the physical laws which are relevant to the production and application of materials, devices, machines, plants and processes commonly used in business practice. He will display a sound knowledge of technologies applied in energy utilisation and will be able to describe their effects on the environment;
- know the modes of thinking and working of classical modern physics; he will be aware of the nature of conceptions of physical models and their limitations; he will further be able to comment critically on current scientific issues.
- have in-depth knowledge of the areas of physics relevant to electronic data processing, particularly semiconductor physics and digital electronics.

Contents :

Year 1:

General physics:

Meaning and methods in physics. International units (SI system).

The mechanics of the mass point:

Kinematics (velocity, acceleration, rotary motion, composite motion). Dynamics (inertia, force, mass, Newton's laws). Work, energy, momentum, equation of energy, principle of linear momentum, power, friction. Central forces, gravitation.

Aeromechanics and hydromechanics:

Pressure, buoyancy, flows. Molecular forces.

Electricity:

Electrical charge, electric field.

Year 2:

Oscillations and waves:

Oscillations and waves in mechanics, optics and electromagnetism; resonance; wave propagation, standing waves, interference, diffraction and scattering; modulation; acoustics.

Physical and geometrical optics:

Interference, diffraction, reflection, refraction, polarisation, dispersion, capacity of resolution of optic devices, dualism of light..

Optics:

Reflection, refraction, total reflection, light velocity; imaging by optic systems. Diffraction at gap and grid, capacity of resolution of optic devices, interferences of thin layers, polarisation, photo elasticity, scattering. Light and colour, emission and absorption spectra; photometry.

Year 3:

Electricity and magnetism:

Electric current. Effects of electric current.

Electrical conduction in solid bodies, liquids and gases. Structure of magnetic field, magnetic properties of substances, magnetic fields of flows. Electromagnetic induction.

Electric conduction in a vacuum. Electromagnetic oscillations and waves. Technical applications of electrodynamics and impulse technique.

Digital electronics:

Components, gates, circuits. Optoelectronics.

Year 4:

Thermodynamics:

Temperature, heat energy, heat transfer, thermal insulation, phase diagram of ideal gases (aggregate states, phase diagram); theorems of heat theory, gas kinetics, diffusion. Laws of thermal radiation.

Fundamentals of quantum mechanics:

Wave-part-dualism, quantisation of energy, uncertainty principle, material waves. Lasers.

Fundamentals of the Theory of Relativity:

Constancy of light velocity; equivalency of mass and energy, space-time continuum, experiments in thought.

Atomic and nuclear physics:

Structure of atoms and nuclei; radioactivity; fission, nuclear fusion, effects of radioactive radiation, radiation protection, application of radioactive isotopes.

Energy utilisation:

Technologies for energy utilisation and conversion; energy supplies; use of solar energy; entropy and ecological balance; energy budget of the earth.

10. APPLIED CHEMISTRY AND ECOLOGY

Training and Teaching Aims:

The student will

- observe and describe proceedings as well as phenomena of nature and technology and relate them to special branches of chemistry.
- know the concepts and methods applied in chemistry.
- be able to comment on current scientific issues.
- know the laws and methods of chemistry relevant to personal life and business practice and estimate dimensions; he will also display a knowledge in relevant chemical production and disposal technologies.
- show responsibility in the exploitation of materials by considering ecological and health factors.
- realise the opportunities and limitations of technological, economic and ecological assessments of products.
- recognise the meaning of soil, air, water and natural cycles as well as their changes caused by anthropogenous influences.
- know how to gain further information.

Contents:

1st Year :

Structures of Matter:

Pure substances, mixtures, elements, compounds, atomic models, nuclides, radioactivity, periodic system, chemical compounds, formula representation and nomenclature.

Chemical Reactions:

Reaction equations, energy budget, chemical balances, catalysis, stoichiometry.

Types of Reactions:

Electrochemical series, Galvanic elements, electrolysis, corrosion, protection against corrosion.

Inorganic Basic Materials:

Production, use, cycles and residual utilisation.

Ecology:

Ecosphere and ecosystems (air, water, soil), cycles, balances, pollution, environmental protection.

2nd Year :

Carbon:

Bond types, modification, inorganic carbon compounds, (oxides, carbon acid), hydrocarbon, petroleum chemistry (petroleum, recovery, refining, products), hydrocarbon derivatives containing halogen, oxygen or nitrogen; macromolecules (natural substances and plastic materials), production, applications, residual utilisation.

Silicon:

Pure silicon, silicic acid, natural and technical silicates, organic silicon compounds, production, applications, residual utilisation, building materials.

Ecology:

Influence on ecosphere,(air, water, soil) in the surroundings of carbon and silicon processing plants, environmental analytics and measures of environmental protection in special examples.

11. PRINCIPLES OF ELECTRONIC DATA PROCESSING

Training and Teaching Aims:

The student will

- be acquainted with the set-up and method of operation of electronic data processing equipment;
- be able to understand the algorithmic mechanical and problem-oriented considerations on which programming languages are based and state the most important features of the most common programming languages;
- be able to convert from verbal to symbolic methods of representation and vice versa;
- be able to identify and remedy contradictions and ambiguities in the source material and generate a suitable structural model in accordance with the assignment given;
- incorporate new information properly in an existing structure and amend it where necessary.

Contents:

Year 1:

Data and data carriers:

Concepts relating to data processing, data and programs, codes, types of data carrier, peripherals for the recording and administration of data.

EDP systems:

Method of operation and structure of components, operating modes, applications. Interaction of hardware and software.

Number systems:

Representation, linking and conversion of numbers in any number systems, intra-computer number notation and number processing.

Propositional logic:

Boolean algebra. Propositional logical connections, transfer of descriptions of facts in German into propositional logical symbols and vice versa, truth functions, tautologies, contradictions, insert and replace; propositional connective bases and normal forms. Simplification of propositional logical expressions.

Year 2:

Analysis of switching circuits:

Application of propositional logic to circuits, analysis and synthesis of circuits, combinational and sequential modules, methods of representation.

Hardware:

Computer architectures; overview of current state of development.

Software technology:

Basic algorithms; standard software, customised software; system and application software.

Programming languages:

Overview, features, fields of application, meta and object languages, syntactical description methods in programming languages.

Syntax analysis processes for languages.

Logic:

Predicate logic, polyvalent logic.

12. PROCESS CONTROL AND COMPUTER NETWORKS WITH LABORATORY EXERCISES

Training and Teaching Aims:

The student will:

- be able to use computers in control and data communication systems;
- be able to understand the operation and structure of computer networks and set them up and manage them;
- be acquainted with security problems in networks and the measures to be taken to guarantee data security and protection;
- be able to set up and manage network services and programme distributed applications.

Contents :

Year 3:

Data exchange between computers and peripherals (set-up and programming of bus systems and interfaces). Basic principles of measurement and process technology. Basic principles of data communication. Remote data transmission software layers (basic principles and implementation of protocols). Hardware and software components of remote data transmission systems. Public telecommunications and data services.

Year 4:

Network planning.

Implementation and administration of networks.

Programming of distributed applications in LANs and WANs. Network services. Network security.

Year 5:

Network management.

Regulation and control:

Concepts. Automation. The computer as an open-loop and closed-loop control device. Set-up of open-loop and closed-loop control circuits.

In years 4 and 5: specific topics relating to the student's school-autonomous special training focus.

13. PROGRAMMING

Training and Teaching Aims:

The student will

- be able to independently design, interlink, encode, test, debug and document programs in at least three current, independent programming languages for commercial or administrative tasks and mathematical and technical aspects of them;
- be able to assess the applicability of program structures and their notation and of programming languages to a given problem;
- be acquainted with standards and methods for the design and generation of program sequences and documentation and be able to apply them economically;
- be able to support the team objective in solving problems in teams and be able to carry out the role assigned to him;
- be able to tackle long, complicated tasks without becoming discouraged or impatient;
- have sufficient theoretical knowledge to understand new developments in programming languages.

Contents :

Year 1:

Algorithms:

Logical sequence of programs (input, processing, output). Sequence control structures, forms of representation.

First programming language:

Syntax and semantics. Designing, coding and testing programmes, troubleshooting, program implementation. Relationship with the operating system used.

Programming methods:

Aids, standards and supporting software for the generation of program sequences.

Year 2:

Algorithms:

Comparative observation of different structure diagrams, problem analyses, model formation.

Programming languages:

Semantics and syntax without organising large quantities of data. Designing, coding and testing programmes, troubleshooting, program implementation.

Linking parts of programs and integration of libraries.

Programming methods:

Modularisation. Software life cycle. Principles of modern programming methods. Uses of programming tools.

Year 3:

Programming languages:

Organisation of large quantities of data. Program optimisation in respect of run time, security and ease of maintenance. Program documentation. Features of the languages learned so far. Extrapolation of criteria for selecting the programming language best suited to the problem.

Query languages. Dialogue processing.

Programming applications:

Programs and program modules (commercial and technical aspects), application of mass data storage.

14. OPERATING SYSTEMS

Training and Teaching Aims:

The student will

- be acquainted with the principles of system software and current operating systems and will have a knowledge of their modular structure and method of operation;
- be able to evaluate differences in operating systems and the advantages and disadvantages in respect of their uses.

Contents :

Year 3:

Tasks of the operating system:

Program compilation, data management (physical storage, conversion of logical input and output to physical input and output), job control, system control, improvement in throughput and exploitation for program and data management, networkability.

Structure of operating systems:

System core, monitors, library concepts, system files, operational security mechanisms. Concepts of system programming, relevant service and auxiliary programs.

Types of operating system:

Differences in forms of operation and their technical implementation, operating systems and applications, knowledge of which operating systems are best for or specific to certain applications.

System design:

Hardware requirements, modular structure of operating systems, system generation.

15. APPLIED DATA TECHNIQUES

Training and Teaching Aims:

The student will:

- be acquainted with the methods of data entry, internal and external data storage, data recovery and data organisation;
- have a command of elementary database design.

Contents :

Year 3:

Data entry systems in a business environment. Data carriers. File management at operating system level. Forms of internal and external storage and addressing. Forms of file organisation and access. Basic principles of data modelling. Data definition and administration languages. Basic principles of data integrity.

16. PROJECT DEVELOPMENT

Training and Teaching Aims:

The student will:

- have a command of the methods involved in the planning, execution and control of EDP projects;
- be able to recognise the need for and advantages of project-oriented working;
- be able to structure project tasks and sequences and take account of both individual details and overall contexts;
- be able to take account of standards relevant to the implementation of projects and make good use of symbolic and graphic representations and aids;
- be able to support the team objective in solving problems in teams and be able to carry out the role that is the most suited to him and the tasks he has been assigned;
- promote communication in the team, handle conflicts and take on responsibility;
- support decisions made and present results in a suitable form.

Contents :

Year 3:

Methods of project management:

Methods for finding, setting and evaluating goals; project organisation (forming teams, functions, responsibilities); management and control; communication and documentation (project reports).

Project phases:

Project concept, preliminary study (feasibility study, establishment of alternatives, project decision, project order), project planning (definition, analysis, implementation planning), project execution (implementation, testing, integration), maintenance, phase models.

Software engineering project methods:

Scheduling and costing, methods of recording and analysing the current situation, representation techniques, structuring and design methods. Testing and quality assurance.

Communication and documentation:

Specifications, project documentation, product documentation, on-line help; communication within a team, negotiating with partners, moderation and presentation.

Year 4:

Computer-aided project development:

Computer support in teamwork, estimation of costs and time frame, CAD, computer-aided implementation, maintenance and documentation.

Case studies:

Case studies from business administration and organisation and from technical areas. Simple, guided projects; project reflection.

Year 5:

Case studies:

Complex case studies (operational performance areas, integrated data processing, cross-area tasks. Involvement in interdisciplinary tasks.)

Practical project:

Execution of a complex project for business-administration and technically oriented end-users to be carried out on a work-sharing basis, integration on customer's premises.

In years 4 and 5: specific topics relating to the student's school-autonomous special training focus.

17. ACCOUNTING

Training and Teaching Aims:

The student will:

- be acquainted with the legal principles of accounting;
- be acquainted with the various accounting systems, be able to post the most common business transactions and be able to draw up simple year-end accounts;
- be acquainted with and be able to apply the elements of tax law applicable to common commercial transactions;
- be acquainted with the most common cost accounting systems and be able to carry out relevant calculations;
- be able to use data processing systems for accounting.

Contents :

Year 1:

Basic principles of accounting:

Concepts, classification and tasks of accounting. Basic legal principles, with particular emphasis on computerised accounting. Voucher system. Accounting systems.

Double-entry bookkeeping:

Concepts and features, types of books, balance sheet. Charts and classification of accounts.

Opening accounts, posting regular transactions in the general ledger, closing the general ledger.

Taxes:

VAT (concept, legal principles, impact on purchases and sales).

Year 2:

Balance sheets:

Principles of balancing accounts, evaluation of individual assets and liabilities, selected key figures.

Double-entry bookkeeping (with bookkeeping programs):

Advanced knowledge of posting regular transactions in the general ledger. Use of bookkeeping programs.

Year 3:

Cost accounting:

Tasks and significance of cost accounting in accounting, cost concepts, cost types, absorption costing (cost type accounting, cost centre accounting, cost unit accounting), profit-and-loss accounts, direct costing as an instrument of corporate management (concepts, applications).

Principles of personnel accounting.

18. BUSINESS ORGANISATION

Training and Teaching Aims:

The student will:

- be acquainted with the tasks and structure of a business;
- be acquainted with and be able to apply the methods and techniques involved in executing organisational tasks;
- be acquainted with the methods used to achieve a company's objectives, improve its profitability and humanise the staff's work.

Contents :

Year 1:

Fundamental business concepts:

Elements of the economy, the market, business, the enterprise.

Legal principles of the rendering of business services:

Legal forms of companies, commerce, firms, companies register, staff.

Contracts of sale;

Content; initialisation and signature; proper fulfilment, fulfilment in breach of contract (types, consequences); administration, basic data.

Year 2:

Basic principles of organisation:

Concept of organisation, principles, company organisation structure and the structuring of operations.

Rendering of business services and the organisation thereof in general:

Materials management, marketing.

Areas of business services, taking particular account of the use of computers (in manufacturing companies):

Research and development, production, quality control, order processing.

Solution of functional problems; use of EDP systems supporting this field.

Year 3:

Industry-specific features of areas of business services, taking particular account of the use of computers (in non-manufacturing companies):

Rendering of services, commerce (with product management systems), banking, insurance, public administration and other areas of services;

Organisation:

Organisational models and their representation, phases of organisation (the organisational cycle, reorganisation), resistance, formal and informal organisation, methods and techniques of execution and documentation in the individual phases; organisation projects.

Solution of organisational problems; use of EDP systems supporting this field.

19. COMPUTER-AIDED WORD PROCESSING

Training and Teaching Aims:

The student will:

- be able to touch type using computer-aided word processing systems;
- be able to create business, official and private documents confidently and without errors in line with current standards making proper practical use of word processing programs and making use of the different layout options offered by the program;
- be able to draft documents using or incorporating current spreadsheet and graphics programs;
- be able to design VDU workplaces independently and to recognise ergonomic aspects involved.

Contents :

Year 1:

Standards and customs:

Systems and methods of formatting and formal classification; external appearance of commercial documents; standard and non-standard business letters; generation of documents according to concepts and unformatted drafts.

Word processing:

Computer-aided creation, editing, storage, printing out and sending of documents according to hand-written or typed drafts, from dictation and from data carriers.

Creation of serial and standard letters; modular correspondence. Incorporation of current spreadsheets and graphics programs. Ergonomics at the VDU workplace.

B. COMPULSORY SUBJECTS OF SCHOOL-AUTONOMOUS SPECIAL TRAINING FOCUSES

B.1 COMMERCIAL DATA PROCESSING

1.1. PROGRAMMING

Continuation of compulsory subject "Programming" in Section A.

Contents :

Year 4:

Programming applications:

Programs and program modules (commercial and technical aspects), application of mass data storage. Screen programming.

Supporting software:

User interfaces. Application and adaptation of generators and third-party software. Libraries. Prototyping.

System programming:

Interprocess communication. System-relevant software.

Year 5:

Current applications (types, practical implementation). Portability considerations. Expansion of practical skills underpinned with theoretical knowledge.

1.2 APPLIED DATA TECHNIQUES

Training and Teaching Aims:

The student will:

- know how to use database systems used in practical situations and be acquainted with the relevant specialist terminology, taking data security, data maintenance, data protection and mass data processing times into account;
- be able to use conceptual and physical database design techniques in practice.

Contents :

Year 4:

Data models with implementations. Relational model and normal forms. Conceptual database design.

Data modelling for standard tasks in operational data organisation. Database administration, complex data query and data manipulation languages; programming language interfaces. Data decoding and compression.

Year 5:

Transaction processing and data consistency. Internal organisation of database systems taking mass data and high transaction volumes into account. Performance analysis and improvement. Distributed data

maintenance. Security and back-up strategies. Database programming techniques with implementation examples. Execution of operational applications, from the design stage to the implementation stage.

1.3 SYSTEM AND APPLICATION PLANNING

Training and Teaching Aims:

The student will:

- have a command of the concepts, principles and methods involved in organising the use of EDP and be acquainted with both the technical facilities and practical and operational aspects thereof;
- be acquainted with all the necessary concepts, guidelines, norms and standards necessary to issue an invitation to tender for an EDP system;
- be able to plan the company organisation and operational structures relating to an EDP system;
- be able to draw up data security, protection and back-up concepts;
- be able to evaluate estimates and costings of system components;
- be able to install and integrate computer systems.

Contents :

Year 4:

EDP in the company:

Information systems and business organisation; forms of use; structuring of operations in respect of information systems; job descriptions. Applications of information technology; use of information technology in different function areas.

Functions in the field of EDP:

System planning, system analysis, system and application programming, archiving and system maintenance, production preparation, operating, quality assurance and control.

Planning an EDP department:

Data flow analyses, communication requirements, feasibility considerations (cost and time estimates, probable quantity of data).

Ergonomic EDP workplace design.

Strategic IT management, access to EDP system from the workplace - teleworking.

Installation and integration of standard software, operating systems, networks, databases.

Year 5:

Use of EDP systems:

Organisational preparation and measures relating to the use of the system; system introduction, system management, system integration; dimensioning of system components; tuning.

Hardware and software adaptations:

Current hardware and software, problems arising in system conversions.

Selection of IT components:

Operational framework for the acquisition, specifications and criteria catalogue for the system; guidelines for inviting tenders; standards; offers; assessment of offers; evaluation.

Data security and protection:

Basic principles, technical and organisational measures; preventative disaster protection.

1.4 ACCOUNTING

Continuation of compulsory subject "Accounting" in Section A.

Training and Teaching Aims:

The student will:

- be acquainted with the significance of accounting within companies and be able to use it as a corporate management tool;
- be able to prepare and evaluate figures in accounts;
- be able to understand, create and analyse balance sheets;
- be able to solve common personnel accounting tasks;
- have a knowledge of the most important provisions of tax and taxation law;
- be able to solve complex, inter-disciplinary accounting problems.

Contents :

Year 4:

Income and expenditure accounts:

Legal principles, execution.

Personnel accounting:

Settlement of regular and other earnings, settlement with the tax office, social insurance funds and local authorities.

Year-end accounts:

Reserves. Balance sheets from sole traders and companies.

Taxes:

Tax systems, income tax including wage and capital gains tax, taxation law.

Goods and payment transactions with other countries.

Use of EDP in accounting.

Year 5:

Analysis of balance sheets:

Evaluation of figures in accounts. Collection, preparation and representation of accounting figures, key figures, balance sheet analysis and corporate comparisons.

Financial planning:

Drawing up of financial plans, incorporation in a company's overall planning.

Controlling.

Complex accounting problems. Case studies.

1.5 BUSINESS ORGANISATION

Continuation of the compulsory subject "Business Organisation" in Section A.

Training and Teaching Aims:

The student will:

- be able to analyse business administration problems of a commercial and administrative nature and work out suggestions for their solution;
- be able to recognise the correlation between target-oriented procedures and psychological organisational procedures and management in a company;
- acquire a knowledge of the basic principles of carrying out one's profession independently.

Contents :

Year 4:

Instruments for analysing business concepts in terms of their feasibility (investment and financing).

Organisational psychology and sociology:

Basic assumptions of human behaviour, the individual, the group, motivation, conflicts, organisation of work, organisational development and advice.

Management in organisations:

Significance of positions entailing directing activities, management (theories, forms, and styles of management, management techniques).

Theory of decision-making:

Coming to a decision, decision-making techniques.

Introduction to internal and inter-company communication:

Basic principles, methods and techniques, communication facilities, information processing.

Comprehensive solution of organisational problems; use of EDP systems supporting this field.

Year 5:

Personnel management:

Planning, acquisition, selection, recruitment, remuneration, assessment.

Establishment of companies:

Legal and financial requirements, locations, risks, social insurance and taxes, accounting, staff and their authorities, company concepts; mergers; de-mergers.

Solution of complex economic and organisational problems; use of EDP systems supporting this field.

1.6 PRACTICAL BUSINESS AND MANAGEMENT SKILLS

Training and Teaching Aims:

The student will:

- be able to carry out common managerial tasks;
- be able to present himself in the best possible manner in job interview situations and on business occasions;
- be able to bring about effective and harmonious communication between people;
- recognise the importance of further education in his personal and professional development and take the corresponding measures.

Contents :

Year 5:

Management case studies taking current trends in corporate management into account; further education in management (paying particular attention to modern professional literature).

Personality development:

Communication, rhetoric, presentation; negotiation techniques.

Career planning:

Job application, further career planning.

B.2 NETWORK TECHNOLOGY

2.1 DATABASE SYSTEMS

Training and Teaching Aims:

The student will

- be acquainted with the media, methods and systems of data storage and recovery and the logic of internal processing in networks and distributed systems and be able to apply this.

- be able to plan and implement common data retention tasks with the aid of databases on networks, taking data integrity, ease of maintenance, the optimal use of disk space and the resultant processing time into account.

Contents :

Year 4:

Theoretical graphic principles of data structures and networks. Data encoding and compression. Media and structures of data storage and data recovery methods. Distributed data retention. Theory and practice of database systems and their incorporation in networks.

2.2 NETWORK TECHNOLOGIES

Training and Teaching Aims:

The student will

- be able to use networks as an extension of the computer.
- be able to design a computer network and help create it;
- know how to use commercial software and network operating systems and how to integrate software applications in existing public networks;
- be acquainted with the problems which can arise when networking computers and how to solve them.

Contents :

Year 4:

Installation of components:

Overview of the most important network operating systems and their use; planning and installation of servers, workstations, peripherals and applications.

Operators:

Management of workgroups, applications, printing systems, activities relating to the maintenance of network hardware and software.

Year 5:

Intranet and Internet:

Heterogeneous networks; special protocols and how they interact; intra-company and inter-company data processing; special software for workgroups and document management. Planning of complete networks; comparison of the major network components; Internet services.

Management and troubleshooting:

Management systems and their use in concrete networks. Software distribution and inventarisation, licensing strategies and their supervision. Measurement equipment for networks and measurements in existing networks aimed at tracing bottlenecks and errors.

2.3 TELECOMMUNICATIONS

Training and Teaching Aims:

The student will

- be able to use computers in telecommunications;
- be able to draft concepts for the use of telecommunications in computer networks and help set up such networks;
- be acquainted with the opportunities offered by telecommunications and their incorporation in a company's EDP landscape;
- be acquainted with the problems which arise in the use of telecommunications and be able to suggest solutions to them.

Contents :

Year 4:

Overview of telecommunications services and their use in data processing. Multiplex process applications, applications in basic and wide-band technology, capacity considerations. Interaction of traditional non-computerised telecommunications services and computerised services.

Year 5:

Use of concrete products on the basis of some examples. Incorporation of mobile, decentralised, external staff.

2.4 PRACTICAL HARDWARE LESSONS

Training and Teaching Aims:

The student will

- learn how to handle hardware both on the basis of simple circuits for open-loop and closed-loop control routines and by means of simple network components, and how to make use of this knowledge in practical situations;
- be able to select specific hardware components and estimate how they will interact with an overall system;
- be able to plan and supervise the installation of a network together with the relevant experts.

Contents :

Year 4:

Building of simple circuits for closed-loop control tasks and connecting them to form a whole system. Incorporation of microcontrollers in networks and their communication via simple interfaces.

Use and configurations of network components (interfaces, repeaters, Hub switches); properties of network cabling; sources and resistance to interference; structure of a transmission link.

2.5 COMPLEX SYSTEMS

Training and Teaching Aims:

The student will

- be able to apply his knowledge of various subjects to complex systems, and in particular to contribute his personal strengths to teamwork tasks and help solve major problems;
- have a command of complex data processing systems and be able to apply this knowledge.

Contents :

Year 4:

Overview of complex data processing systems; application of such systems to current tasks; searching for material in international data networks.

Year 5:

Current case studies:

Implementation of projects based on tasks which cannot be solved by traditional means or which would entail an unjustifiably great level of effort to do so.

2.6 DATA SECURITY AND PROTECTION

Training and Teaching Aims:

The student will

- be acquainted with data security and protection problems and be able to counter the relevant dangers in this field;
- be able to plan and implement preventative strategies in a computer system and estimate and check the quality of the strategies used;
- be able to play a leading role in drawing up a disaster contingency manual.

Contents :

Year 4:

Data protection:

Introduction and concepts, access and access protection, encoding processes, authenticity checking and key distribution, incorporation of safety mechanisms in a network reference model, standards. Implementation of at least one data protection device.

Data security:

Introduction and concepts, interference programs, network backup strategies, redundant storage forms, security against breakdown, planning a preventative strategy, creation of a disaster contingency manual, implementation of disaster recovery.

2.7 COMMUNICATION IN NETWORKS

Training and Teaching Aims:

The student will

- be acquainted with the relevant specialist terminology and the necessary vocabulary and language structures to be able to read and understand English specialist literature and manuals, document programs in English, draft and give talks in English and communicate actively by e-mail.

Contents :

Year 5:

Initiation of a project with an institution abroad, acquisition of literature, discussions in English, documentation of projects in English.

Presentation with modern aids; continuation of project, specialist vocabulary. Basic principles of correspondence, vocabulary and language structures.

2.8 QUALITY MANAGEMENT

Training and Teaching Aims:

The student will

- be acquainted with the aspects of the general managerial responsibilities which are laid down and achieved through quality policy, and to be able to participate in carrying out these responsibilities;
- be acquainted with the necessary quality assurance systems and be able to implement them in practice, especially in the EDP field, and be able to check that they are being observed;
- be able to participate in all areas of quality management, especially in quality planning and assessment and the introduction and supervision of quality assurance measures.

Contents :

Year 5:

Quality assurance and management:

Relevant laws, regulations, standards and provisions; QA systems; QM measures; impact on internal and inter-company structures; QM manuals; audits, certification; procedures and costs; TQM strategies; current QM developments; practice-based, foreseeable future developments.

B.3 MEDIA TECHNOLOGY AND THE MEDIA INDUSTRY

3.1 DATABASE SYSTEMS

See the compulsory subject "Database systems" in Section B.2.

3.2 MULTIMEDIA TECHNIQUES

Training and Teaching Aims:

The student will

- obtain an overview of multimedia techniques and their specific uses;
- have a command of the basic techniques of media production and get to know and use programming techniques in multimedia applications;
- plan and implement a multimedia project using a selected author system;
- be able to draw up the theoretical backbone of such a project.

Contents :

Year 4:

Multimedia areas:

Basic principles of the combination of text, images, sound and moving images.

Photography:

Digital pictures. Photography techniques and finishing.

Movie:

Production facilities, camera and digital photography techniques. Editing. Studio equipment.

Video:

Basic equipment and accessories. Recording techniques, editing and recording on current media.

Basic principles of design using current multimedia data formats.

Year 5:

Computer animation:

Conception, equipment, processes and programming techniques.

Virtual Reality:

Equipment and programming techniques. Uses.

Media software:

Introduction to commercial software multimedia generation packages and presentation techniques and their use on the basis of practical examples. Analysis of such packages and recognition of the advantages and disadvantages.

Practical application within the scope of a project:

Definition of the aim of the project. Project structure plan. Resources and cost planning.

Project support:

Decision-making. Reporting. Presentation and visualisation of interim and final results.

3.3 TELECOMMUNICATIONS

See the compulsory subject "Telecommunications" in Section B.2.

3.4 MULTIMEDIA HARDWARE

Training and Teaching Aims:

The student will

- be acquainted with and be fully competent to use other kinds of current hardware and equipment used in multimedia.
- be able to perform installation and conversion work on equipment needed for the application concerned and perform minor repairs on it himself;
- be able to install software tools and multimedia products in data networks and on common data carriers and be acquainted with and able to observe the relevant safety and accident prevention regulations.

Contents :

Year 4:

Image techniques:

Cameras (photography, film, video, digital photography).

Audio techniques:

Sound studio equipment, speech input and output devices.

Visualisation techniques:

Screen and projection equipment.

Multimedia hardware:

Computers and peripherals. Message switching hardware, with particular emphasis on mobile communications equipment and open-loop and closed-loop control hardware.

Safety regulations and accident prevention.

Special project-specific subjects.

3.5 MULTIMEDIA PUBLICATIONS IN NETWORKS

Training and Teaching Aims:

The student will

- be acquainted with and be able to operate local and international data networks;
- be acquainted with and be able to apply economic and effective advertising measures used in publications;
- also be able to generate such publications with common tools and install them in networks;
- be aware of the ethical responsibility vis-à-vis society involved with such publications and be able to observe this in his work.

Contents :

Year 4:

Media themes:

Information, infotainment, art, culture and other examples from the professional field.

Media production:

Theoretical and practical production of media products. Examples from the professional field.

Advertising and marketing media:

Measures for the use of various multimedia advertising media.

Year 5:

On-line direct marketing:

Dialogue-oriented telecommunication services and their use. Generation of practice-related examples.

Multimedia catalogues:

Product presentation in the new media. Generation of practice-related examples.

Multimedia kiosk systems:

Architecture and implementation of a distributed multimedia kiosk system in one or more of the following areas: presentation, transaction, consultancy, information and training.

Media ethics:

Responsibility vis-a-vis society. Socio-political impact of the media, control and self-regulation.

3.6 COMMUNICATING IN NETWORKS

See the compulsory subject "Communication in Networks" in Section B.2.

3.7 THE MEDIA INDUSTRY

Training and Teaching Aims

The student will:

- be acquainted with the development and methods of operation of the media industry;
- be able to apply advertising planning and psychology methods;
- be acquainted with regulations and laws applicable to the media;
- be able to understand the internal structures in media companies and their decision-making processes;
- be able to calculate the costs of products relating to his specialist field and to evaluate cost centres;

Contents:

Year 4:

Principles of the media industry:

Development of the media. Freedom of the press and freedom of expression, relevant aspects of constitutional law. Methods of working (editorial offices, news agencies, product agencies, manufacturing and sales).

Basic principles of advertising:

Advertising as a form of market communication. Advertising planning (analysis of consumer behaviour, market segmentation). The advertising message. Limits of advertising. Market research. Media and media planning. Media analysis.

Advertising psychology:

The psychology of design, colour and learning. Deep psychology aspects. Target group behaviour in advertising. Presentation of media productions.

Copyright and media law. Competition law..

Year 5:

Management of media companies:

Organisation structures in information acquisition, processing and distribution companies. Information and telecommunication services. Raising capital, liability, tax aspects. Co-operation between media companies. Marketing channels in the media industry.

Cost estimating of media products:

Cost estimation data. Cost estimating of technical working procedures. Material cost calculations. Payroll schemes. Operational structures. Pricing. Cost estimating of specific media products.

Media economics:

Media research. Economic significance of traditional and "new" media.

MANDATORY WORK PLACEMENT

Training and Teaching Aims:

The student will

- be able to apply the knowledge and skills acquired in theory lessons and practical training programmes to actual business practice.

Organisation and Contents:

Mandatory work placement must last for at least eight weeks; it is advisable to split it into two four-week periods, however. The first part shall mainly comprise handicraft activities, while the second one should provide experience in engineering and business organisation. Preparation and review of mandatory work placement has to include issues on social and labour legislation.

The student has to hand in a mandatory work placement report to the head of the department documenting his activities and acquired skills.

C. OPTIONAL SUBJECTS, NON-OBLIGATORY EXERCISES, TUTORIALS.

C.1 OPTIONAL SUBJECTS

SECOND MODERN LANGUAGE

(French, Italian, Spanish, Serbo-Croatian, Hungarian). Compulsory subject English shall apply analogously.

COMMUNICATION AND PRESENTATION TECHNIQUES

Training and Teaching Aims:

The student will:

- be able to use language and non-verbal signals systematically, control emotions in a discussion, and hold conversations and give talks and presentations in German and English;
- be able to effectively put across his own personality and subject matter with technical aids;
- be able to lead and co-ordinate discussions, meetings and conferences systematically.

Contents :

Years 1 to 5:

Communication, rhetoric and speech techniques:

Preparation of speeches and talks, language formulation, presentation aids.

Presentation:

Technical and structural set-up, preparation of presentation aids, technical aids.

Chairing of discussions:

Leading discussions, summarising statements, time and conflict management.

C.2 NON-OBLIGATORY PRACTICE

PHYSICAL EDUCATION

See Federal Law Gazette 37/1989

C.3 TUTORIALS

Training and Teaching Aims:

Students who show a contemporary performance drop, but are principally qualified and prepared to work, will be provided with knowledge and skills needed to achieve training and teaching aims.

Contents:

Contents of the corresponding compulsory subject shall apply analogously; they are limited to repetitions and exercises.

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