International Society for Engineering Education
Internationale Gesellschaft für Ingenieurpädagogik
Società Internazionale per la Pedagogia dell'Ingegneria

IGIP Recommendations

for Studies in Engineering Pedagogy Science

Decided by the International Monitoring Committee on September 11th, 2005

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English Version by the Authors

Content

1 Introduction

The minimum requirements of an engineering pedagogy curriculum are settled in chapter 1.3.4 of IGIP criteria for accreditation of engineering education studies.

Module Description		CP at least
Core Modules		**8**
RM1	Engineering Pedagogy Science in Theory and Practice	**6**
RM2	Laboratory Didactics	**2**
Theory Modules		**4**
RM3	Psychology and Sociology	**3**
REM	REM1 - Ethics (1 CP) REM2 - Intercultural Competences (1 CP)	**1**
Practice Modules		**6**
RM4	Rhetoric, Communication, Scientific Writing	**3**
RM5	Working with Projects	**1**
RM6	Media, E-Learning, Computer Aided Technologies	**2**
Elective Credit Points		**2**
FCP	Electives	**2**
Total		**20**

Table 1: Minimal standards for an engineering pedagogical curriculum[1].

The rules regarding the execution of the curriculum are:

1) The curriculum must contain all required modules (RM1-RM6) and one required elective (either REM1 or REM2 - total 18 CP).
2) Elective credit points (FCP) can be used according to the judgment of the educational institution to reinforce individual required modules (e.g. RM2 and RM5) and/or for adding an additional required module or a self-defined elective (ARM).
3) As necessary, the required modules RM3 and RM4 can each be divided into two modules and separately tested.

The basic requirements cover four blocks of modules:

- **Core module** (at least 8 CP): The two required modules RM1 (Engineering Pedagogy Science in Theory and Practice with at least 6 CP) and RM2 (Laboratory Didactics with at least 2 CP).
- **Theory modules** (at least 4 CP). This block contains the required module RM3 (Psychology and Sociology with at least 3 CP) as well as a required elective module REM (where REM1 is ‘Ethics’ and REM2 is ‘Intercultural Competences’ with at least 1 CP each).

[1] RM = Required module,
REM = Required elective (self-defined elective) module,
FCP = Free credit points.

- **Practice modules** (at least 6 CP). This block foresees the three required modules RM4 (Rhetoric, Communication, Scientific Writing with at least 3 CP), RM5 (Working with Projects with at least 1 CP) and RM6 (Media, E-Learning, Computer Aided Technologies with at least 2 CP).
- **Elective credit points** (at least 2 CP).

The elective credit points that are available (2 CP correspond to 10 % of the whole curriculum) can be used in this context for:

- Reinforcing individual required modules (especially RM2 and RM5).
- Taking on a second required module.
- Introducing an additional, self-defined elective.

Below, two alternatives are presented. The first alternative was developed keeping in mind a cautious further development of the traditional IGIP curriculum. The second alternative goes one step further and shows how an "ING-PEAD IGIP curriculum" is defined with the help of a module handbook.

2 IGIP Curriculum for Engineering Pedagogy: Alternative 1

2.1 Concept and overall goal of the IGIP Engineering Pedagogy Curriculum

The IGIP model's point of departure is that the individual engineering lecturers initiate and are responsible for the teaching and learning concepts for the training of engineers and technicians. The quality and success of the engineering studies are decisively influenced by the teachers' personalities and how they are trained.

Engineering educators expand their typical engineering subject competence by acquiring teaching and learning skills in theoretical and practical coursework corresponding to the objectives of the ING-PAED-IGIP model.

The students taking engineering education training should acquire the necessary professional skills which technical teachers must have to be able to exercise their profession effectively and creatively. These skills are explained in detail in section 3.3 and in Chapter 4 of the IGIP criteria for accrediting engineering pedagogy programs and are included as examples in the engineering pedagogy curriculum.

The proven IGIP engineering education curriculum is based on the knowledge of traditional pedagogy in philosophy and the liberal arts but respects the particular character of the technician and the analytical-methodological approach in the fields of engineering science.

After many years of experience in industry or research, engineers who are appointed as teachers at a technical school or university are influenced by their professional careers. Their way of thinking is determined by the precision of the technology, by their work with quantifiable, measurable events and objects. The influence of their discipline, the "language" of engineers, must be taken into account in their engineering pedagogy education, it must penetrate the engineering education curriculum.

The competence of an engineering educator is made up of a number of sub-skills. Examples of how the acquisition of these sub-skills can be measured (the required

minimum standard) are presented in the descriptions of the curriculum's individual modules.

2.2 Curriculum modules

This table contains an overview of the curriculum modules:

Module name		**CP**
RM1	Engineering Pedagogy in Theory and Practice	**6**
RM2	Laboratory Didactics	**2**
RM3a	Psychology	**2**
RM3b	Sociology	**1**
RM4a	Rhetoric, Communication	**2**
RM4b	Understandable text Creation, Scientific Writing	**1**
RM5	Working with Projects	**1**
REM1	Ethics	**1**
REM2	Biological and Intercultural Competences	**1**
RM6	Media , E-Learning, Computer Aided Technologies	**2**
FCP	Elective Credit Points	**1**
In Total		**20**

The elective available credit points were used to add another required subject (the curriculum thus contains REM1 and REM2) as well as an elective module, which – corresponding to the situation in the individual countries – is determined in coordination with the individual NMC.

Furthermore some of the modules were split. Instead of the required module RM3 (psychology and sociology with 3 CP) the two required modules RM3a (psychology with 2 CP) and RM3b (sociology with 1 CP) have been introduced. In the same manner the required module RM4 (Rhetoric, communication, scientific writing with 3 CP) was split in to required modules RM4a (Rhetoric, communication with 2 CP) and RM4b (Understandable text creation, scientific writing with 1 CP).

2.3 Description of the modules

2.3.1 RM1 – Engineering Pedagogy in Theory and Practice (6 CP)

The core module " Engineering Pedagogy in Theory and Practice" is the spine of the curriculum – the base and integrating part of the engineering pedagogy science "Technical Teacher Training." Here, the starting point is practically oriented technical teaching. This is understood as a process which, like any other, is subject to specific regularities and is determined by a series of components throughout its course. These components –

teaching goals (G), teaching materials (T), teaching media (M), psychological structure (P), social structure (S) and teaching methods (TM) have a complex interdependent relationship.

The overall volume of this module corresponds to 6 credits (at least 72 classroom hours), of which 3 credits (36 classroom hours) for the sub-module "Engineering Pedagogy in Theory" and 3 credits (36 classroom hours) for the sub-module "Engineering Pedagogy in Practice." The course contents of both sub-modules must be intimately related to each other – theory accompanied by integrated exercises.

In the sense of a theory and practice composite, all the modules of the curriculum are grouped around this core module in the context of the communicative interactive system. All the modules of the curriculum are integratively summarized at this point.

The engineering pedagogy education must start with the required module “Engineering Pedagogy in Theory and Practice” At the outset, this gives the target group a structural overview and introduction. Over the course of the program, the remaining material in the module should be integrated into the training schedule and, at the end of the training program, should also be planned to provide a final summary.

The focus of the exercises is the development of lesson plans with themes from technical subjects and how to present the lessons.

The exercises must be planned in detail in writing and be practised with the group. In every case, they should be recorded and analyzed using these video recordings (TV-Video-training). Besides the teacher of the course, the group also acts in this context as a review panel.

Minimum standards for achieving the sub-skills of this module are included as examples:

Students

- Sketch and analyze the engineering pedagogy model of the teaching process.
- Describe the basic variants of the information flow in the teaching process; analyze the relevant advantages and disadvantages, name examples of applications.
- Name the components of the six-dimensional educational space (teaching process components) and illustrate them with examples from their own disciplines.
- Describe how these components interrelate; formulate the relationships between the components in the form of a mathematical function using the example for the teaching method.
- Describe the engineering pedagogy approach to planning lessons based on the Cartesian method. Illustrate this approach with examples in their own disciplines.
- Consciously taking into account the components of the teaching process, select the best teaching methods.
- Name typical teaching methods, their advantages and disadvantages, and illustrate them with examples from their disciplines.
- Analyze and use the most appropriate analogies, simulations and animations.
- Analyze possible approaches to deriving laws in an educational context and illustrate them with examples from their disciplines.
- Formulate concrete, clear teaching goals and also consider the goal level.
- Transform the contents of scientific and technical subjects in their teaching discipline by means of the appropriate material selection and material structure.

- Analyze the subject-matter-time problem, use most appropriate methods for its solution and illustrate the problematic with examples from their disciplines.
- Underscore central phenomena, terms, laws and their interrelationships.
- Concentrate on clearness and good intelligibility, use appropriate teaching media, use the proven intelligibility dimensions.
- Present optimally: understandably, clearly, both verbally and non-verbally.
- Obtain effective feedback from students.
- Use the best media.
- Motivate students and activate their participation.
- Initiate a positive learning atmosphere.
- Take into account the individual learning style of the students.

2.3.2 RM2 – Laboratory Didactics (2 CP)

In terms of focal points, this module deals with psychomotoric aspects of technical teaching, experimental technical projects and research. The module "Laboratory Didactics" requires the previous knowledge of and intensive working with the contents of the module "Engineering Pedagogy in Theory and Practice."

Minimum standards for the acquisition of sub-skills in the module "Laboratory Didactics" are included as examples:

Students

- Demonstrate the importance of laboratory work in engineering pedagogy
- Analyze the experiment as a part of the process of acquisition of scientific knowledge.
- Select optimum learning goals for laboratory work.
- Develops the structure of controlled experiments: defining the objective – formulating hypothesis – setting up the experiment – determining results and conclusions.
- Master and use the basic forms of educational laboratory work: tightly defined exercise experiments – individually designed experiments – semester paper on laboratory work, etc.
- Master the basic forms of written laboratory reports: test chart – record of results – findings report – technical report, etc.
- Master the basic forms of oral laboratory reports.
- Analyze the possibilities of computer use in the laboratory.
- Follow safety regulations in the laboratory.

2.3.3 RM3a – Psychology (2 CP)

In this module an in-depth understanding of teaching and learning should be worked out, especially topics related to cognitive psychology as well as educational psychology should be examined.

Minimum standards for achieving sub-skills in this module are included as examples:

Students

- Have a general overview of psychology and master the basic terminology of psychology.
- Analyze terms "talent" and "ductility" (technical knowledge, understanding, intelligence).

- Describe the most important learning theories.
- Sketch out the steps of human information processing (Frank Organizational Chart), name and use their most important consequences to design their courses.
- Describe the problematic of "forgetting" and "retaining."
- Analyze the problematic "motive" and use motivating measures in their teaching.
- Assess their own teaching activity and draw corresponding consequences.

2.3.4 RM3b – Sociology (1 CP)

The purpose of this module is to sketch out the methodological approach of sociology. In particular, this should be presented using the example of how social groups function and their characteristic dependencies.

Minimum standards for the acquisition of sub-skills of this module are included as examples:

Students

- Analyze factors of social interaction in engineering teaching.
- View the school class as a social group whose members are the teacher as well as the students.
- Characterize the usual structures in student groups.
- Complement the teacher-center teaching with group-centered teaching.
- Characterize the leadership styles and prefer the socially integrative leadership style in their teaching.
- Analyze organizations and leadership styles in teaching.
- Analyze the teacher personality, especially specifics, taking as examples the character of technical lecturers.

2.3.5 RM4a - Rhetoric, Communication (2 CP)

The study of rhetoric should lead to an increased awareness of how language is used and provide at least a superficial demonstration of the problematic of voice training, the right articulation from a basic degree of clarity to fascinating persuasive power. The actual communication and discussion training is intended to improve language use both in teaching situations and in situations involving decisions amongst colleagues.

Minimum standards for the acquisition of sub-skills of this module are included as examples:

Students

- Master (at least basic aspects of) voice training.
- Master (at least basic aspects of) and exercise proper articulation with a focus on clarity to fascinating persuasive power.
- Direct attention to language use both in teaching situations and in situations involving decisions amounts colleagues.
- Sharpen their perception of the abilities and needs of students and colleagues.
- Exercise analysis and overcoming of linguistic barriers specific to the discipline.
- Exercise cooperative forms of speaking and negotiating in view of social situations.
- Master the art of holding discussions, especially during advisory discussions and oral tests.

- Master the feedback technique and moderation.
- Are aware of both verbal and non-verbal behavior.

This module focuses on the exercises of the participants.

2.3.6 RM4b – Understandable Text Creation, Scientific Writing (1 CP)

The objective of this module – starting from the theoretical basics - is close-to-practice training for independent composition of easily understandable texts in the fields of technology and the natural sciences.

Minimum standards for the acquisition of sub-skills of this module are included as examples:

Students

- Explain the most important "Intelligibility Theories."
- Master the four most important dimensions of "intelligibility" (Hamburger school).
- Realize a perception training unit for these dimensions.
- Realize a complex training unit to improve given texts (scripts, manuals, operating instructions, ...).
- Realizes a training unit for the independent composition of easily understandable texts.
- Analyze text – image interaction.
- Characterize the most important scientific papers (seminar papers, diploma papers, dissertations ….).
- Explain the most important principles of scientific writing (honesty, rational argumentation, reproducibility, completeness …).
- Explain the system of citing sources (citations, references to literature, comments and bibliographies ….both in printed media and on the internet).
- Describe and analyze the most important types of text and text standards in the technology and the natural sciences.

This module focuses on the exercises of the participants.

2.3.7 RM5 – Working with Projects (1 CP)

The subject of this module is a form of learning which is especially suitable for connecting the application of and immersion into specialized scientific contents with a subjectively oriented personality development. The module "Working on Projects" requires knowledge learned in the core module " Engineering Pedagogy in Theory and Practice." and the modules " Psychology and Sociology," and others.

Minimum standards for the acquisition of the sub-skills of this module are included as examples:

Students

- Name the basic abilities to be promoted during work on projects.
- Consider the importance of emotions to people; illustrate this with examples from their own disciplines.
- Master the systematic planning and organization of specialized scientifically oriented projects.
- Master the handling of open-ended learning processes: judging instead of evaluating.

- Organize the effective presentation of project results by the learning group.

2.3.8 REM1 – Ethics (1 CP)

This module is intended to present basic positions in ethics, attention being devoted especially to ethics in the fields of science and technology.

Minimum standards for the acquisition of the sub-skills in this module are included as examples:

Students

- Know the basic positions of ethics.
- Make efforts to promote awareness of how technological practice has enormous ethical relevance.
- Reflect on technology between the conflicting interests of people, society and the environment.
- Analyze the importance of codes of ethics based on examples from different engineering associations.
- Analyze anthropological, educational psychology bases of morality and the development of morality.
- Use case examples for processing in discussion the moral-ethical legitimacy of their own behavior in case examples.
- Realize practical exercises: ethical dilemmas.

2.3.9 REM2 – Biological and Intercultural Aspects (1 CP)

This module deals with the development characteristics peculiar to people, the biologically and psychologically set limits of human endurance, with the problematic of the term normalcy and the interculturally conditioned problems in courses.

Minimum standards for the acquisition of the sub-skills of this module are included as examples:

Students

- Describe development characteristics peculiar to people, especially from the view of the biological and psychological limits of endurance.
- Characterize the term normalcy; study the individual characteristics and syndromes of disturbed students.
- Develop openness, understanding and sensitivity for different cultural influences.
- Have and use basic knowledge and awareness of main-stream cultures.

2.3.10 RM6 – Media, E-Learning and Computer Aided Technologies (2 CP)

This module focuses on the most important devices, facilities and systems contributing to the design of classroom teaching. Attention is devoted to the function, operation, but especially the appropriate use of the devices.

Minimum standards for acquiring the sub-skills of this module are included as examples:

Students

- Define the term "teaching media."
- Sketch and analyze the structure of the most important teaching media.

- Differentiate between "classic" and "new" media.
- Name the typical ways of using what are known as "classic" teaching media.
- Master the operation of these media (hardware) as well as the optimum set-up of the corresponding data media (software).
- Use adequately what are known as the "new" media, e.g. advanced learning platforms, various forms of internet communication, plan the didactic concept of notebook classes, explain and use databases, etc.
- Use knowledge of auditoriology, consider such things as optimum projection conditions for visualizations (room-dependent, requirements for image and object), etc.

For this curriculum:

Em. O. Univ.Prof. Dipl.-Ing. Dr.phil. DDDr. h.c. Adolf Melezinek

3 IGIP Curriculum for Engineering Pedagogy: Alternative 2

3.1 Preliminary remark

During the renewal of the ING-PAED IGIP – curriculum a secured basis could be assumed:

The curriculum, which was previously developed by Adolf Melezinek, has been anchored since 1993 thanks to his personal commitment at numerous universities in many countries as an advanced training program for technical lecturers.

Since then there have been discussions about the themes in the engineering pedagogy science curriculum and about its renewal, especially in the IGIP Working Group "Technical Teacher Training," and published in the conference reports of annual IGIP – symposia on engineering education.

In close cooperation with Adolf Melezinek the IGIP working groups developed

- Technical Teacher Training (initiative and coordination) - Bernd Lübben and Vera Ziroff Gut
- Curriculum Development - Traugott Schelker
- Working on Projects - Ralph Dreher and Fritz Kath
- Knowledge Management and Computer Aided Technology - Hans-Bernhard Woyand
- Natural Sciences in Engineering Pedagogy - Leo Gros
- People and Technology - Joachim Hoefele
- Language and Humanities in Engineering Pedagogy - Robert Ruprecht
- Women in Technical Careers - Gudrun Kammasch

in the years 2004 / 2005 the currently available up-dated version of the "ING-PAED IGIP-Curriculums."

The ING-PAED IGIP curriculum permits engineering educators to acquire professional competences as stated in Chapter 4 of the "IGIP Criteria for the Accreditation of Engineering Education Programs."

3.2 Concept

The following guiding ideas were formulated for the IGIP-PAED IGIP Curriculum:

The ING-PAED IGIP Curriculum

- Communicates engineering teaching competences as education in the sense of a triad consisting of knowledge, a repertoire of teaching methods, and value orientations.
- Enables teachers in engineering programs to realize a future-oriented training program for engineering and prepares them to take responsibility for a sustainable, humane and socially and environmentally compatible contribution to shaping society, the world of work and technology.
- Communicates for this educational task
  - the necessary knowledge and the necessary insights,
  - a repertoire of teaching methods which connects aspects of teaching the subject with general social science aspects,

  - (as well as) educational and subject-related vital value orientations.

- Makes statements regarding:
  - the disciplines and modules of the curriculum,
  - the individual contents and goals/competences,
  - practical phases, which must relate to the theoretical context, and permit reflection on teaching practice against a theoretical background,
  - testing modalities.

Engineer educators use the knowledge and abilities acquired here in their teaching and enable the learners in turn to use complex scientific and technological systems in a competent and sustainably responsible manner which reflects the educational goal.

3.3 Structure, disciplines and modules of the IGIP curriculum

The diagram prefacing the module manual defines the structure and complexity of the individual modules and disciplines of the engineering education curriculum and establishes the individual ECTS credit points.

The core module **Engineering Pedagogy in Theory and Practice** and the continuation of this, the basic module **Laboratory Didactics** form the spine of the curriculum, this where the course to be presented for the final exam (with planning, video recording of the performance, and analysis) and the didactic case study are developed.

Mainly theory-oriented modules with basics are arranged to the left of this core module, more practice-oriented modules to the right.

In the module **Psychology and Sociology** those contents are selected from the classic disciplines psychology, sociology and biology which engineering educators need for teaching and practice. This module represents an essential basis for all the modules of the curriculum.

The module **Media, E-Learning, Computer-Aided Technologies** is an introduction into the appropriate use of modern media.

The special significance of project work in today's engineering education science and practice is reflected in the newly included module **Working with Projects**.

Considering the internationalism and mobility of teachers and students as well as the important ethical questions in the profession of engineers the issues of **Intercultural Competences** and **Ethics** should be taken up in all modules as important cross-sectional tasks. However, in addition, these subjects have also been given consideration and depth as elective modules.

We recommend implementing the focal points of the knowledge and competences learned in the individual modules directly in the teaching during the short teaching trials of engineering pedagogy practice which take place immediately afterwards. At this time the lecturers of the individual modules should be included in the evaluation and thoughtful analysis of these teaching trials.

The module descriptions are open-ended to permit specifying locally the respectively different requirements and conditions depending on the educational institutions, regions and countries.

3.4 Portfolio and Final Examination

Corresponding to the "IGIP Criteria Chapter 1.3.4," the participants in the engineering educator training document on a continuous basis the learning processes and work results module by module in a portfolio that contains the confirmation of the teachers of the individual modules.

Furthermore, corresponding to the "IGIP Criteria Chapter 1.3.4," the complete planning, performance and analysis of a course including video recording as well as the solution of a didactic case study is presented for the final exam to the "Engineering Pedagogy Colloquium" - both documented in the portfolio.

3.5 Tabular overview over the ING-PAED IGIP Curriculum

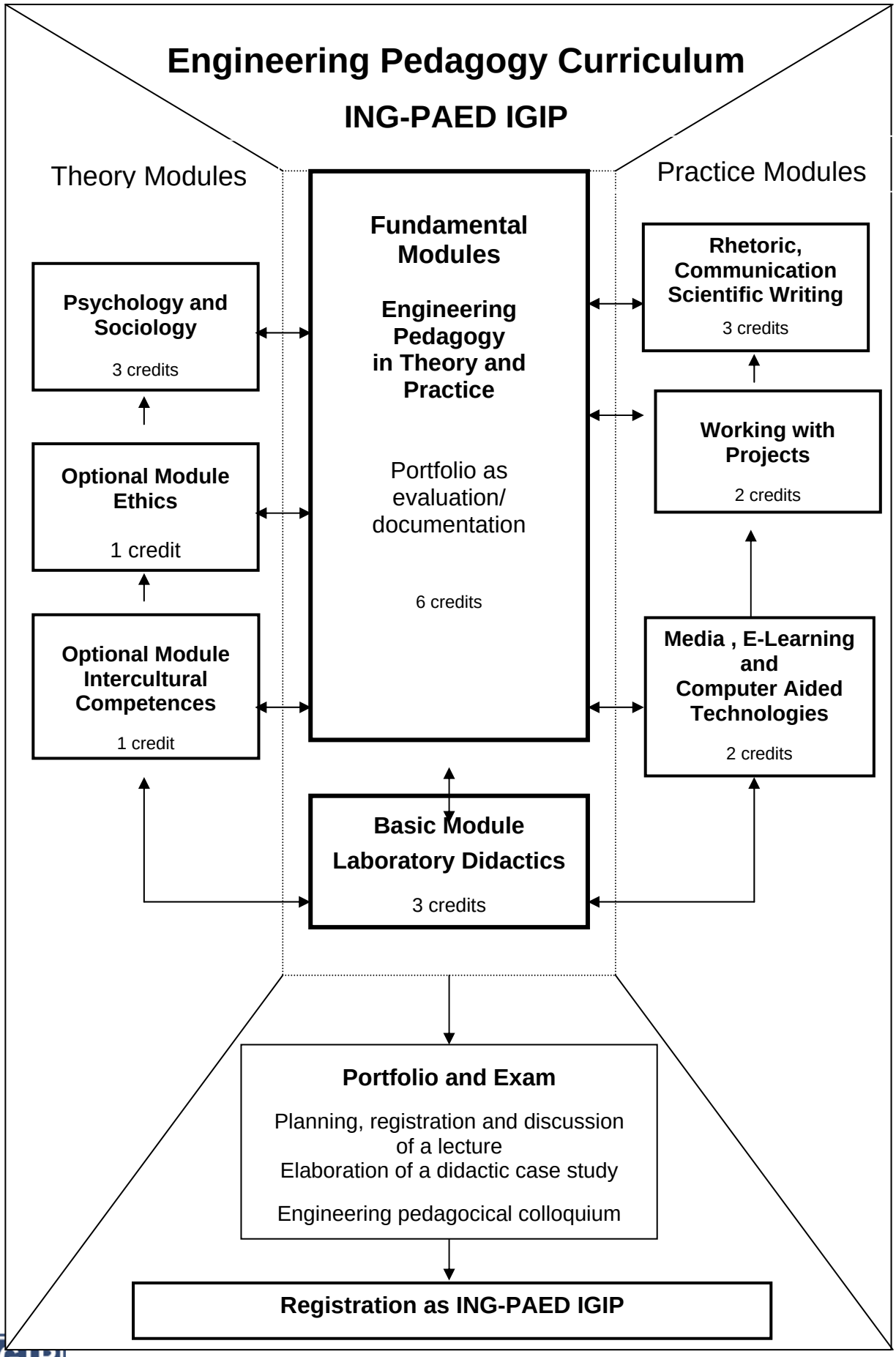
Module name		**CP**
RM1	Engineering Pedagogy in Theory and Practice	**6**
RM2	Laboratory Didactics	**3**
RM3	Psychology and Sociology	**3**
RM4a	Rhetoric, Communication	**2**
RM4b	Scientific Writing	**1**
RM5	Working with Projects	**2**
RM6	Media , E-Learning, Computer Aided Technologies	**2**
REM	Electives REM1 - Ethics or REM2 - Intercultural Competences	**1**
Total		**20**

The elective credit points have been used to extend the required modules RM2 (Laboratory Didactics) up to 3 CP and RM5 (Working with Projects) up to 2 CP.

Furthermore one of the modules has been split. Instead of the required module RM4 (Rhetoric, Communication, Scientific Writing with 3 CP) the two required modules RM4a (Rhetoric, Communication with 2 CP) and RM4b (Scientific Writing with 1 CP) have been introduced.

3.6 Diagram of the ING-PAED IGIP Curriculum

Cf. the illustration on the next page.


Engineering Pedagogy Curriculum
ING-PAED IGIP
Theory Modules
Practice Modules
Fundamental Modules
Engineering Pedagogy in Theory and Practice
Portfolio as evaluation/ documentation
6 credits
Psychology and Sociology
3 credits
Optional Module Ethics
1 credit
Optional Module Intercultural Competences
1 credit
Rhetoric, Communication Scientific Writing
3 credits
Working with Projects
2 credits
Media , E-Learning and Computer Aided Technologies
2 credits
Basic Module Laboratory Didactics
3 credits
Portfolio and Exam
Planning, registration and discussion of a lecture
Elaboration of a didactic case study
Engineering pedagocical colloquium
Registration as ING-PAED IGIP

3.7 Module Manual for Engineering Pedagogy Studies

3.7.1 RM1 – Engineering Pedagogy in Theory and Practice

Type	Description
Title	• **Engineering Pedagogy in Theory and Practice** • **Part 1: Module Engineering Pedagogy in Theory** • **Part 2: Module Engineering Pedagogy in Practice**
Credits	6 (3 credits each part)
Presence Time	Total 72 h
Learning Objectives / Competences	Engineering educators expand their typical engineering subject competence with teaching and learning competences in the field of engineering pedagogy science (especially educational, subject teaching and evaluative competences) in theory and practice corresponding to the general objectives of the ING-PAED IGIP concept. In the interaction of pedagogy theory and teaching methodology practice they develop the core competences for planning, performing and evaluating teaching and learning events of all kinds in the disciplines of natural sciences and engineering for the fields of higher and continuing education. The **Theory -Module Engineering Pedagogy** provides the theoretical basis for the "engineering pedagogy competence" in the sense of knowledge, a repertoire of teaching methods, and value orientations in teaching. This means the ability - Sensibly to select content, methods and media corresponding to the discipline, theme and level of study; - To perceive students individually as partners in learning in relationships marked by mutual respect and to motivate and guide them towards research-oriented learning; - To reflect on one's own teaching in view of the components of the six-dimensional education space and to continuously grow; and, most importantly, - To be enthusiastic about the subject and the teaching , to provide the basics which sustainably enable working out new problems thanks to knowledge that is connectable to new learning. The **Practice Module Engineering Pedagogy** trains the practical basics for "competence as an engineering educator" in the sense of putting knowledge to work, a repertoire of teaching

	methods, and value orientations in teaching. Aptitude develops as - Well-grounded decisions are made on content, method and media which correspond to the discipline, theme and level of study; - The students are perceived individually as a learning partner in relationship marked by mutual respect and are motivated to reflect on their own learning and to improve themselves continuously; - Insight from other modules are applied and integrated as components in the six-dimensional education space into the learning process. This is the prerequisite for maintaining - Enthusiasm for the subject and the teaching, to provide the basics by means of knowledge that can be adapted and that enables the sustainable working out of new problems.
Requirements	According to the IGIP accreditation criteria
Level	According to the IGIP accreditation criteria
Recommended Learning Form	**Seminar** (Engineering Pedagogy in Theory) with integrated exercises (Engineering Pedagogy in Practice) to be implemented in the lesson. These exercises are intended to be prepared in the course of planning and developing as case studies in the seminar and be reflected on and evaluated afterwards in a concluding phase. **Exercises** (Engineering Pedagogy in Practice) with integrated seminar themes (Engineering Pedagogy in Theory) for implementation in teachings. These exercises are planned as case studies, carried out and documented, and presented in the seminar to initiate improvement processes. **Portfolio** as an individual documentation of the learning process.
Status	Required module (basic module of study)
Recommended Exam Form	Cf. Chapter 1.3.4 "IGIP Accreditation Criteria" Written elaboration: 1. Portfolio as individual documentation of the training and continuous education process. 2. Conception of a course in view of the whole semester's work in written form (curriculum draft). 3. Detailed planning, execution (incl. video recording) and analysis of a single course taking into account all aspects (see contents) of the training. 4. Solution of a didactic case study.

	5. Engineering Pedadogy colloquium
Conclusion of the Module	Provided participation is on a regular and active basis
Approved Modules	Modules with comparable content
Contents	**Theory module Engineering Pedagogy** **1. Education and the training of engineers:** Historical review, outstanding personalities, theories and innovations. **2. Technical teaching as specialized teaching:** The Klagenfurt engineering pedagogy model of the teaching process as well as other models and concepts for education and training in engineering and natural sciences Didactic analysis as the core of planning work. Subject systematic and interdisciplinary thinking in contexts. Knowledge-based structures as perspectives of methodological approaches to teaching. **3. Methods of engineering pedagogy** Teaching and learning oriented methods including telematic methods (see also practice module Media, e-learning, Computer Aided Technologies). Methods based on technological structures and technical processes (see also basic module Laboratory Didactics). Method concepts as preparation for typical professional engineering work (see also practice module Working on Projects). Opportunities and limits of a method are developed from the respective thematic and its methodological analysis with respect to personality growth of teachers and learners (see theory modules of the IGIP curriculum). **4. Knowledge levels, learning goals and competences** Knowledge and experience, teaching and learning, research and development, co-shaping and participation, planning and executing, observing and reporting, documenting and presenting, analyzing and evaluating, systematizing and innovating in the training and adult education processes of the various disciplines. **5. Visualization** Concepts for visualizing natural and engineering science interrelations and processes and their realizations by the appropriate use of media (see also practice module Media, e-Learning, Computer Aided Technologies) **6. Curriculum development and implementation** Analysis of the general conditions and objectives for the

development of curricula. Co-ordination processes in the framework of cooperations or various areas of responsibility. Implementation processes as decisions, grounded on teaching methods, on a teaching and learning concept and on media equipment. This includes the problematic of the didactically reduced knowledge levels ("overview knowledge" versus "knowledge of examples") as well as the promotion of classifying and thinking in systematic connections.

7. **Didactic structuring**

   Design of interdisciplinary teaching and learning processes: problem orientation, project orientation, application orientation, science orientation, technical process orientation, work process orientation and others, using examples for the **Module Engineering Pedagogy In Practice**. See also core module **Laboratory Didactics** and practice module **Working with Projects**.

Practice Module Engineering Pedagogy

8. **Planning, executing and reflecting on individual teaching phases or complete courses such as:**

   Lecture, seminar, colloquium, theoretical exercise, experimental exercise, laboratory session, project, excursion, scientific guidance

   with interrelating references between theory and practice of engineering pedagogy as well as mentoring and supervision with audiovisual recording.

9. **Designing special phases in courses**

   Initiating teaching and learning processes. Cooperating in the team. Promoting classroom knowledge as well as of the availability of knowledge and experience. Visualization and documentation of learning achievements. Improvement of expertise, methodology and social competences.

10. **Module integrating teaching and learning concepts**

    Inclusion of essential assertions from the parallel modules on theory and practice

    - Psychology and Sociology
    - Rhetoric, Communication, "Scientific Writing"
    - Media, E-Learning, Computer Aided Technologies
    - Working with Projects

As well as the electives

- Ethics
- Intercultural Competences

	as "cross-section themes" paying particular attention to the conception of didactic method in the trial teaching sessions.
Recommended Bibliography	Melezinek, Adolf (1999): Ingenieurpädagogik. Praxis der Vermittlung technischen Wissens. Wien / New York: Springer - Verlag, 4. Aufl. Proceedings of the annual IGIP symposiums of the years 2001 – 2005.
Further Hints	The other theory modules are offered at staggered hours parallel with the core module **Engineering Pedagogy in Theory and Practice.** The respective elements from these theory modules then flow into the tasks assigned to be completed in the individual practice phases. Planning, execution, evaluation and didactic reflection also make reference to them. The **Laboratory Didactics** module builds on this. Module prerequisite is an intensive participation in the **Engineering Pedagogy** module. Hence, the test for the **Laboratory Didactics** module should not take place until after the **Engineering Pedagogy in Theory and Practice** module has been successfully completed.

3.7.2 RM2 – Laboratory Didactics

Type	Description
Title	**Laboratory Didactics**
Credits	3
Presence Time	36 h
Learning Objectives / Competences	The **Laboratory Didactics** module reinforces in particular social, organizational, communicative, ethical skills and enables the graduates to; • Plan and develop laboratory exercises reflecting the schedule of courses and, in doing so, pay particular attention to the different learning levels as well as "soft skills" such as team and communication competences during the technical conception of the laboratory experiments • Write didactically structured laboratory manuals • Plan a didactically-structured use of media, including electronic media; • Perceive students as partners – aware of the importance of human relationships for learning as such and different cultural influences; • Call attention to and communicate the special importance of the relationship between technology and responsibility: both in relation to safety concerns in the laboratory itself as well as in relation to “products of technique” in estimating their human, social, and ecological consequences .
Requirements	• Grounded knowledge in the individual discipline including unsupervised laboratory work. The expertise must permit being able to react immediately and appropriately to new, spontaneously arising problems in laboratory practice (especially during "Working on Projects" in the laboratory). • Expertise and personal competence, occupational safety, safety and environmental aspects (environmental impact, disposal, and other subjects) must be continuously included and adequately translated into action. • Advanced knowledge of Engineering Pedagogy in Theory and Practice
Level	According to the IGIP accreditation criteria
Recommended Learning Form	Seminar with integrated exercises (continuation of **Engineering Pedagogy in Theory and Practice**)

Status	Required module (basic module of study)
Recommended Exam Form	Cf. Chapter 1.3.4 "IGIP Criteria" For documentation in the portfolio: the conception of a laboratory exercise 1. With regard to the whole duration of the semester 2. As well as the detailed planning of an exercise day considering all aspects (s. contents) of laboratory work 3. Presentation of the pertinent, written laboratory instructions
Conclusion of the Module	Provided participation is on a regular and active basis
Approved Modules	Modules with comparable content
Contents	1. The various steps and methods of laboratory work: from "integrated laboratory" to the "project oriented laboratory" and to the final paper 2. From comprehension to guided and finally unsupervised experimentation: the progressive complexity of learning, acting and understanding during the various phases of laboratory work 3. Epistemological and empirical aspects of laboratory work: recognize and/or create living reality with technological systems Historic and cultural importance of the "laboratory" 4. Reinforcement of social competences in the laboratory: Appropriate use of elements of rhetoric and presentation, communication and team work 5. The supportive use of electronic media in laboratory exercises and to prepare laboratory exercises 6. Laboratory instructions and scripts Aspects of design corresponding to the various stages of laboratory work 7. Laboratory reports Where and in which form are they reasonably demanded in the various stages of laboratory work (oral and/or written)? 8. Intercultural aspects of laboratory work, e.g. affects of language barriers, different attitudes in daily situations during laboratory work
Recommended Bibliography	For example: Bruchmüller, Hans-Georg; Haug, Albert (2001): Labordidaktik für Hochschulen. Schriftenreihe report Band 40, Hrsg.:

	Lenkungsausschuss der Studienkommission für Hochschul-didaktik an den Fachhochschulen Baden-Württembergs. Alsbach/Bergstraße. Bruchmüller, Hans-Georg (2004): INGMEDIA unterstützt Präsenzlabor. Lernsoftware fürs Ingenieur-Studium. FHU life, Magazin der FH Ulm, Heft 2, S. 4-6 und S.9. Bericht über ein BMBF-Projekt unter Beteiligung von fünf Hochschulen im universitären und Fachhochschulbereich Kammasch, Gudrun (2004): Labordidaktik in der Diskussion. Das Labor und die Nutzung seiner methodischen Vielfalt im derzeitigen Umstrukturierungs-prozess der Hochschulen. NNHL 1 15 04 11, E 5.2 S. 1-18 … and further equivalent literature.
Further Hints	The contributions, especially those of Albert Haug, in the framework of the IGIP symposia on Laboratory Didactics and on Working with Projects give an extensive understanding of the theory of this module. The prerequisite for the module **Laboratory Didactics** is an intensive participation in the **Engineering Pedagogy** module. Exercises for this should wait until the advanced engineering pedagogy practice. The test for the **Laboratory Didactics** module should not be held until after the engineering pedagogy module has been successfully completed.

3.7.3 RM3 – Psychology and Sociology

Type	Description
Title	**Psychology and Sociology**
Credits	3
Presence Time	36 h
Learning Objectives / Competences	The **Psychology and Sociology** module forms both the foundation for the **Rhetoric, Communication, Scientific Writing, Working with Projects, Ethics, Intercultural Competences** and **Engineering Pedagogy** modules as well as the structural basis for the acquisition of psychological, social, educational competences as well as reflexive and self-development competence. The participants - Acquire theoretical and practical fundamentals in social and communication psychology, in learning and development psychology, in pedagocical psychology, - Acquire psychological, social and pedagogical competence, - Acquire a deeper understanding of teaching and learning, of interaction between teachers and students on levels of cognition, perception, emotion and action - Experience and understand learning as part of the interaction between teachers and learners, in which the individual personality of the participants and their respective biographies, learning background and development have an impact - Train their observation of themselves and others - Are aware of inner processes in the teaching and learning situation, think about them, and work on them, to acquire competence about themselves and others, - Strengthen their ability to work in teams.
Requirements	According to the IGIP accreditation criteria
Level	According to the IGIP accreditation criteria
Recommended Learning Form	**Lecture** to selected theoretical basics **Seminar** with exercises on case studies
Status	Required module
Recommended Exam Form	Cf. Chapter 1.3.4 "IGIP Criteria" Take up psychological and sociological aspects in the final test of the " **Engineering Pedagogy in Theory and Practice** " module 1. In the portfolio to document the continuing education process to ING PAED IGIP 2. In the conception and execution of a course (curriculum

	draft) 3. In reflecting on teaching methods of the course taught in the engineering pedagogy colloquium
Conclusion of the Module	Provided participation is on a regular and active basis
Approved Modules	Modules with comparable content
Contents	From the following four main chapters, at least four aspects must be treated. **1. Social and communications psychology** - People as social creatures - Group relationships and group dynamics - Symmetrical and asymmetrical relationship patterns in groups - Self-perception and perception of others in social and communicative processes - Capacity for empathy and awareness - Ability to shape emotional and cognitive processes **2. Learning psychology** - Biological basics of learning - Brain functions - Memory: retention and forgetting - Intelligence and talent - Learning techniques - Fear of tests **3. Development psychology** - Developmental phases of man - Influences in the early years of a person's development - Bonding and bonding patterns - The role of role models - Importance of the peer group - Psychological disturbances and their influence on learning - Aggression and violence **4. Educational psychology** - Introduction to university teaching - Importance of personality - Importance of the group - Learning atmosphere and learning success - Emotion and emotional intelligence - Workload and stress Apart from an introduction to the theoretical substance of these subjects in psychology, what should be primarily trained is also

	introspective and extrospective observation as part of teaching engineering sciences. This means thinking over, working on and understanding personal reactions in the teaching/learning situation. Using video recordings, personal teaching sequences can be worked on; case examples discussed and be interpreted against the background of the acquired theoretical basics. This way, a basic understanding of learning is promoted in the context of scientific and engineering teaching together with the socio-psychological processes associated with it and the development of emotional intelligence is supported when interacting with the students.
Recommended Bibliography	Atkinson, R.L.: Psychology. Harcourt, Inc. 2000 Edelmann, W.: Lernpsychologie. 6., vollst. überarb. Aufl. Weinheim 2000 Gage, N.L.; Berliner, D.C. (1996). Pädagogische Psychologie (5. Aufl.). Weinheim 1996 Goleman, D.: Emotionale Intelligenz. München 1997 Heckhausen, H.: Motivation und Handeln (2. ed.). Berlin 1989 Kuhl, J. (2001). Motivation und Persönlichkeit. Göttingen: Hogrefe. Oerter, Rolf; Montada, Leo: Entwicklungspsychologie. 3., vollständig überarbeitete Auflage, Kap. 18, Weinheim 1995, S.862-894 Spitzer, Manfred: Lernen. Gehirnforschung und die Schule des Lebens. Heidelberg 2002
Further Hints	Selected topics of **Psychology and Sociology** will be introduced within the modules **Engineering Pedagogy in Practice** and **Laboratory Didactics** as well

3.7.4 RM4a – Rhetoric, Communication

Type	Description
Title	**Rhetoric, Communication**
Credits	2
Presence Time	24 h
Learning Objectives / Competences	The communicative competences are essential for working successfully as a teacher, both for communicating engineering knowledge and skills as well as for promoting the ability to work in teams and cooperate. The participants - Master the monologue and dialogue forms of communication - Acquire language skills (voice training, clear and understanding wording, argue persuasively, use language appropriately and effectively for listeners and the situation) - Write clearly structured lectures and speak on their subjects well and correctly - Open discussions naturally and appropriately, keep them moving, and end them - Develop an awareness of the complexity of interpersonal relationships on cognitive and emotional levels - Can actively listen (can understand, interpret and appropriately react to the verbal and nonverbal message of others) - Know feedback rules and question techniques and learn to use them - Recognize manipulation techniques and can deal with conflict situations
Requirements	Participate in module **Psychology and Sociology**
Level	According to the IGIP accreditation criteria
Recommended Learning Form	**Seminar** with **practical exercises** (Video registration and discussion)
Status	Required module
Recommended Exam Form	According to the IGIP accreditation criteria
Conclusion of the Module	Provided, participation is on a regular and active basis Portfolio of a teaching sequence
Approved Modules	Modules with comparable content

Contents	- skills - Theoretical and practical basics of rhetoric and communication - Communication models - Holding discussions (expert and advisory discussions, oral examinations) and negotiating techniques - Feedback techniques and moderation - Cooperative talking - Verbal and non-verbal behavior in teaching situations - Organize expert discussions
Recommended Bibliography	Alteneder, Andreas: Fachvorträge vorbereiten und durchführen. 9. Auflage, Erlangen 1994 Amon, Ingrid: Die Macht der Stimme. Persönlichkeit durch Klang, Volumen und Dynamik. 3., erw. Aufl., Frankfurt/Wien 2004 Duden: Reden – gut und richtig halten. Hg. v. Dudenredaktion, in Zus.-Arb. mit Siegfried A. Huth. Mannheim 2000 Schultz von Thun, Friedemann: Miteinander Reden. Bd. 1-3. 11. Auflage Reinbek bei Hamburg 1981-2003 Waibel, Jochen: Ich Stimme : das Stimmhaus-Konzept für die Balance von Stimme und Persönlichkeit. Bergisch Gladbach 2000
Further Hints	Selected topics of **Rhetoric, Communication** will be introduced within the modules **Engineering Pedagogy in Practice** as well

3.7.5 RM4b – Scientific Writing

Type	Description
Title	**Scientific Writing**
Credits	1
Presence Time	12 h
Learning Objectives / Competences	The **Scientific Writing** module permits lecturers to write scientific and engineering texts correctly, cogently and understandable also taking into account their didactic conception. The participants - Are familiar with text types and their characteristic in science and technology - Master text conventions and standards in science and technology - Learn the didactic conception of scientific and engineering texts (script, key word script, formulas, guiding questions, etc.) - Are familiar with the special characteristics of specialist language - Can write understandably for target audiences - Can structure texts clearly - Create convincing graphics, illustrations and transparencies - Can design the layout of a text appropriately.
Requirements	Participate in module **Rhetoric, Communication**
Level	According to the IGIP accreditation criteria
Recommended Learning Form	Seminar with case studies
Status	Required module
Recommended Exam Form	According to the IGIP accreditation criteria
Conclusion of the Module	Provided participation is on a regular and active basis
Approved Modules	Modules with comparable content
Contents	- Text types and text conventions in science and technology - General language, specialist language and meta-language

	- Writing processes - Didactic aspects of texts in university teaching of science and technology - Characteristics of text intelligibility (incl. exercises) - Cogency in terms of substance, language and presentation - Exercises for text production and text revision - Appropriate graphics and illustrations to support the text - Layout design
Recommended Bibliography	Jacobs, Eva-Maria; Knorr, Dagmar (H.): Schreiben in den Wissenschaften. Frankfurt/M. 1997 Kruse, Otto: Keine Angst vor dem leeren Blatt. Ohne Schreibblockaden durchs Studium. Frankfurt/M. 2002 Kruse, Otto; Jacobs, Eva-Maria; Ruhmann, Gabriele (Hg.): Schlüsselkompetenz Schreiben. Konzepte, Methoden, Projekte für Schreibberatung und Schreibdidaktik an der Hochschule. Berlin 1999 Langer, I./Schulz von Thun, W./Tausch, R.: Verständlichkeit in Schule, Verwaltung, Politik und Wissenschaft. München 1974
Further Hints	Selected topics of **Scientific Writing** will be introduced within the modules **Engineering Pedagogy in Practice** and **Laboratory Didactics** as well

3.7.6 RM5 – Working with Projects

Type	Description
Title	**Working with Projects**
Credits	2
Presence Time	24 h
Learning Objectives / Competences	The "Working with Projects" ("WP") is a form of learning which is especially suitable for linking the application and deepening of specialized scientific contents with a subject-oriented personality development and offers many opportunities to enlarge one's skills as an engineering educator. The goal of this module should be that tomorrow's engineering educators • Can have a conscious feel for this simultaneous connection of competence in the subject, method and social competences in this form of learning and • Deal simultaneously with the necessary role of the teacher during the "Working with Projects" module in a reflective manner. Hence, the core of this module is that tomorrow's engineering educators themselves process a project designed around a technical subject to have a personal educational experience which, thanks to the joint processing together with the teacher, supports their efforts to : • Become familiar with the value and limits of this form of learning; • Recognize the necessity of intentional preparation from the view of the teacher and the learner, • Learn to rate themselves in terms of their abilities to moderate, to flexibly design lessons, and reflect on the subject and themselves, to be able to • Perfect these to such an extent that they are potentially capable of using working on projects as a form of learning .
Requirements	Participate in modules **Engineering Pedagogy in Theory and Practice** and **Psychology and Sociology**
Level	Expert level
Recommended Learning Form	Execution and reflection on a subject-related project by the students
Status	Required module (basic module of study)
Recommended Exam Form	According to the IGIP accreditation criteria

Conclusion of the Module	Presentation of a project result by the group of students
Approved Modules	Modules with comparable content
Contents **Comment:** The contents as specified are intended as examples. What and in what scope is thematized emerges from the specific problem situations in project work	• Differentiating between purpose and goal of project work, • The basic abilities promoted by project work, • The value of the emotions for people, • Planning the work project from the view of the teacher, • Process of intentional preparation, • Methods / strategies of introspective and extrospective reflection • Dealing with open-ended learning processes: judging instead of evaluating.
Recommended Bibliography	Dreher/Spöttl (Hg.): Arbeiten mit Projekten. Ein Ansatz für mehr Selbstständigkeit beim Lernen. Bremen, 2002
Further Hints	The current status of discussion about project work can be summed up by the publications of the IGIP working group "Working with Projects." A cooperation between those responsible for the core module **Engineering Pedagogy in Theory and Practice** and the module **Psychology and Sociology**"(esp. learning psychology) is not only desirable, it is necessary. The members of a learning group should have the same / similar educational background in the subject. Selected elements from the module **Working with Projects** are planned into and tried out in the Modules **Engineering Pedagogy in Practice** and in the module **Laboratory Didactics**.

3.7.7 RM6 – Media, E-Learning and Computer Aided Technologies

Type	Description
Title	**Media, E-Learning and Computer Aided Technologies**
Credits	2
Presence Time	24 h
Learning Objectives / Competences	The module should provide the basis for the competence to integrate "classic" as well as "new media" in a didactically appropriate and technically perfect way into the lesson.
Requirements	Well-founded knowledge within the corresponding subject
Level	According to the IGIP accreditation criteria
Recommended Learning Form	Seminar with case studies
Status	Required module
Recommended Exam Form	According to the IGIP accreditation criteria
Conclusion of the Module	Regular and active participation is understood
Approved Modules	Modules with comparable content
Contents	1. Commonly used media, appropriate deployment and utilization 2. Basic types of media-supported teaching learning forms tele-teaching, tele-tutoring, tele-cooperation, media-supported individual learning, synchronous and asynchronous e-earning techniques, e.g. learning platforms 3. The appropriate use of CAD, CAM and CAE in teaching: animation, simulation and their limits 4. Examples of successful and abortive integration of media in teaching
Recommended Bibliography	Ehlers, Ulf-Daniel [Hrsg., 2003]: E-Learning-Services im Spannungsfeld von Pädagogik, Ökonomie und Technologie. L 3 – lebenslanges Lernen im Bildungsnetzwerk der Zukunft / Bundesministerium für Bildung und Forschung; Bundesinstitut für Berufsbildung, BiBB. Bielefeld: ISBN: 3-7639-3098. Kerres, Michael (2001): Multimediale und telemediale Lernumgebungen. Konzeption und Entwicklung. München. Niegemann, Helmut M. (2004): Kompendium E-Learning. Berlin. ISBN: 3-540-43816-5.

	Sauter, Annette M. : Blended learning: effiziente Integration von E-Learning und Präsenztraining. In: Sauter; Sauter (2004): 2. Aufl. München. ISBN: 3-472-05592-8
Further Hints	Selected topics of **Media, E-Learning and Computer Aided Technologies** will be introduced within the module **Engineering Pedagogy in Practice** as well.

3.7.8 REM1 – Ethics

Type	Description
Title	**Ethics**
Credits	1
Presence Time	12 h
Learning Objectives / Competences	– Expanding skills related to ethical norms – Knowing basic ethical positions – Reflect on engineering between the conflicting interests of people, society and the environment – Analyze importance of codes of ethics of various engineering associations – Become familiar with anthropological, educational and psychological basics of moral judgments – Work through moral-ethical legitimating of own behavior in case studies in discussions
Requirements	According to the IGIP accreditation criteria
Level	According to the IGIP accreditation criteria
Recommended Learning Form	Seminar with case studies
Status	Required elective module
Recommended Exam Form	According to the IGIP accreditation criteria
Conclusion of the Module	Regular and active participation is understood
Approved Modules	Modules with comparable content
Contents	– Ethics and morality in world cultures – Basic positions of ethics in the context of Occidental Christian cultural development – Ethics in engineering and science – Anthropologic, educational and psychological basics of morality and moral development – Practical exercises: ethical dilemmas – Case examples
Recommended Bibliography	Hoefele, Joachim: Zur Motivation ethischen Verhaltens. In: Bildung durch Kommunikation, hg. v. Melezinek, A./Kiss,I. Budapest 1996, S.326-331 Hubig, Christoph: Technik- und Wissenschaftsethik. Ein Leitfaden. Berlin/London 1993 Lenk, H.; Ropohl, G. (Hrsg.): Technik und Ethik. 2. Auflage,

	Stuttgart 1993 Oerter, Rolf; Montada, Leo: Entwicklungspsychologie. 3., vollständig überarbeitete Auflage, Kap. 18, Weinheim 1995, S.862-894 Staub, Ervin: Individuelles Selbst und Gruppenselbst, Motivation und Moral. In: Edelstein, Wolfgang; Nunner-Winkler, Gertrud; Noam, Gil: Moral und Person. Frankfurt/M. 1993, S.363-384
Further Hints	Selected topics of **Ethics** will be introduced within the module **Engineering Pedagogy in Practice** as well

3.7.9 REM2 – Intercultural Competences

Type	Description
Title	**Intercultural Competences**
Credits	1
Presence Time	12 h
Learning Objectives / Competences	Deepen sensitivity and openness for cultural influences in teaching / learning processes and different types of courses. Especially: – Develop understanding for special situation of students from other countries/cultures, – Develop ability to be able to adequately respond to individuals. – Capable of calling on basic knowledge of other cultures.
Requirements	According to the IGIP accreditation criteria
Level	According to the IGIP accreditation criteria
Recommended Learning Form	Seminar with case studies
Status	Required elective module
Recommended Exam Form	According to the IGIP accreditation criteria
Conclusion of the Module	Regular and active participation is understood
Approved Modules	Modules with comparable content
Contents	– Idea of world-wide and regionally important culture areas, their characteristic and values – The importance of human rights as individual rights – Anthropological foundation of humanity and cultural diversity – Examples of interculturally determined problems in courses – Examples of "intercultural competence"
Recommended Bibliography	-
Further Hints	Selected topics of **Intercultural Competences** will be introduced within the module **Engineering Pedagogy in Practice** as well.