Template
SSC-based Objective-Module Matrix

TC 02

Electrical Engineering, Information Technology and Related Programmes – Bachelor Degree

Instructions for Creating the Objectives Module Matrix

An objective-module matrix – also known as *learning outcome-course matrix* – makes it possible to classify a study programme in two ways:

1. A simple objective-module matrix compares the learning outcomes (objectives) aimed for with a study programme with the modules (courses) that contribute to achieving this profile.
2. An SSC-based objective-module matrix is a tool for comparing the learning outcomes (objectives) of a study programmes to the learning outcomes defined by the ASIIN Subject-Specific Criteria (SSC). This matrix thus makes it possible to show how the ASIIN SSC are fulfilled in the learning objectives and the individual modules of the degree program.

In a first step, this „mapping" procedure helps to determine the extent to which learning outcomes of a degree programme reflect, supplement or deviate from the exemplary learning objectives of the SSC. The learning outcomes formulated in the SSC always represent the typical objectives of a degree programme in the specified subject are. Deviations from the SSC are possible depending on the profile and orientation of a degree programme and can be explained by the university. Depending on the degree of subject orientation, learning outcome formulations from different SSCs can also be combined.

The second step is to reflect on the extent to which each individual module or course of a degree programme serves to achieve one or more learning objectives our learning outcomes. The assigned overarching learning outcomes should then also be reflected in the respective module description or course syllabus. In other words, at degree program level it can be checked whether all learning objectives are covered by the assigned modules and at module level it can be checked whether the overarching learning objective at degree program level is reflected accordingly in the module objectives.

Please fill in the following matrix for the respective degree program. First, compare the learning outcomes of the degree program with the SSC. Then write down in which modules or courses the individual learning outcomes are implemented.

Note: Some of the SSC have been abbreviated to match the matrix below. For their full content, please refer to the Subject-Specific Criteria Document directly.

ASIIN Subject-Specific Criteria (SSC)	Learning Outcomes of the Study Programme	Corresponding Modules
Knowledge and Understanding Graduates have in particular		
acquired a broad and well-founded basic knowledge of mathematics, natural sciences and engineering, which enables them to understand and analyse complex phenomena occurring in electrical engineering, information technology or computer science and to independently develop and apply practice-oriented or theory-oriented solutions	**GR1 Engineering Knowledge: Ability to integrate mathematics, natural science, engineering fundamentals and professional knowledge to solve complex engineering problems in power systems, electrical energy conversion and electrical control. (GR1.1-GR1.4)**	**Advanced Mathematics, University Physics, Linear Algebra, Complex Variables and Integral Transforms, Circuit Principles, Analog Electronics, Digital Electronics, Engineering Electromagnetic Fields, C Programming**
acquired an understanding of the broader ethical and multidisciplinary context of engineering	**GR6 Engineering and Society: Ability to analyze and evaluate the impact of engineering practice on society, health, safety, law and culture. GR8 Professional Ethics: Possess humanistic and social science literacy and social responsibility. (GR6.1-GR6.2, GR8.1-GR8.3)**	**Ideological and Moral Cultivation and Rule of Law, Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, Situation and Policy, Engineering Ethics (integrated in core courses), Graduation Project**
Interdisciplinary Competences Graduates		
can analyse and present technical contexts from their own and related fields in a comprehensible way	**GR10 Communication: Ability to communicate effectively with industry peers and the public on complex**	**College English, Electrical Engineering Professional English,**

	engineering problems, including report writing, presentations, and cross-cultural communication. (GR10.1-GR10.3)	**Technical Paper Writing, Curriculum Design reports, Graduation Project defense**
are able to work on technical tasks in a team and, if necessary, take over the coordination of the team	**GR9 Individual and Team: Ability to work as an individual, team member or leader in multidisciplinary teams. (GR9.1-GR9.2)**	**Innovation and Entrepreneurship Education, Curriculum Design (group projects), Engineering Training, Graduation Internship, Graduation Project**
know and understand the methods of project management and economic methods such as risk and change management as well as their limits	**GR11 Project Management: Understand and master engineering management principles and economic decision-making methods, applicable in multidisciplinary environments. (GR11.1-GR11.3)**	**Engineering Economics and Management Fundamentals, Innovation and Entrepreneurship Education, Graduation Project (project planning and management)**
recognise the need for independent, lifelong learning and are able to pursue it	**GR12 Lifelong Learning: Possess awareness and ability of independent and lifelong learning to adapt to social and engineering professional development. (GR12.1-GR12.2)**	**Professional English, Technical Paper Writing, Innovation and Entrepreneurship courses, Graduation Project (literature review), elective courses in frontier technologies**
recognise the need for independent, lifelong learning and are able to pursue it	**GR12 Lifelong Learning: (Same as above - duplicate SSC entry) Recognise the need for independent, lifelong learning and are able to pursue it. (GR12.1-GR12.2)**	**Professional English, Technical Paper Writing, Innovation and Entrepreneurship courses,**

		Graduation Project (literature review), elective courses in frontier technologies
have knowledge of foreign languages relevant to professional practice	**GR10 Communication: Have knowledge of foreign languages relevant to professional practice; ability to read technical literature and communicate in cross-cultural contexts. (GR10.2-GR10.3)**	**College English (Years 1-2), Electrical Engineering Professional English (Year 3), foreign language general elective courses**
are able to identify problems and solve them using various research and working techniques	**GR2 Problem Analysis: Ability to identify, express and analyze complex engineering problems through literature research to obtain effective conclusions. (GR2.1-GR2.3)**	**Circuit Principles, Analog Electronics, Digital Electronics, Automatic Control Theory, Power System Analysis, Technical Paper Writing, Graduation Project**
can work in an interdisciplinary environment	**GR9 Individual and Team: Ability to work in an interdisciplinary environment, collaborate with members from other disciplines. (GR9.1-GR9.2)**	**Innovation and Entrepreneurship Education, multidisciplinary Curriculum Design, Engineering Training, Graduation Internship in enterprise settings**
possess social and professional ethical competences and are able to shape social processes critically, reflectively and with a sense of responsibility and in a democratic spirit	**GR8 Professional Ethics: Possess social and professional ethical competences, understand and abide by engineering professional ethics and norms. (GR8.1-GR8.3)**	**Ideological and Moral Cultivation, Situation and Policy, Engineering Ethics (integrated in core courses and practice), Graduation Project**
Engineering Methodology Graduates are qualified to		

select and apply the current modelling, calculation, design and test methods for their specialisation	**GR3 Design/Development of Solutions + GR5 Modern Tool Usage: Ability to select and apply modelling, calculation, design and test methods; develop, select and use appropriate modern engineering tools. (GR3.1-GR3.3, GR5.1-GR5.4)**	**Circuit Principles, Analog Electronics, Digital Electronics, Automatic Control Theory, Power Electronics, Electrical Control and PLC, Power System Relay Protection, MATLAB/Simulink simulation, CAD software**
research technical literature and other sources of information on problems posed	**GR2 Problem Analysis + GR4 Research: Ability to research technical literature and other sources of information on problems posed. (GR2.3, GR4.1)**	**Technical Paper Writing, College English, Professional English, Graduation Project (literature review section), all core courses (reference reading assignments)**
design and conduct experiments and computer simulations and interpret the data obtained	**GR4 Research: Ability to design and conduct experiments and computer simulations, and interpret the data obtained. (GR4.2-GR4.4)**	**University Physics Experiment, Circuit Principles Lab, Analog Electronics Lab, Digital Electronics Lab, Power Electronics Lab, Electrical Machine Lab, Power System Analysis Lab, Control System Modelling and Simulation, Graduation Project**
use databases, standards, codes of good practice and safety regulations	**GR6 Engineering and Society: Ability to use databases, standards, codes of good practice and safety regulations; understand technical standards, intellectual property,**	**Electrical Engineering Practice, Safety Education (integrated in labs and practice), Power System**

	industrial policies and laws. (GR6.1)	**Relay Protection (standards), High Voltage Technology (safety codes), Graduation Internship**
Engineering Development Graduates		
have special skills in the development of analogue and digital, electrical and electronic circuits, systems and products	**GR3 Design/Development of Solutions: Have special skills in the development of analogue and digital, electrical and electronic systems, components and devices. (GR3.1-GR3.3)**	**Analog Electronics, Digital Electronics, Power Electronics, Electrical Control and PLC, Power System Analysis, Electronic Technology Comprehensive Curriculum Design, PLC Curriculum Design, Graduation Project**
are proficient in the use of the process elements modelling, simulation and testing in a problem-oriented way as well as their integration during development	**GR5 Modern Tool Usage: Proficient in the use of process elements modelling, simulation and test in the development process. (GR5.1-GR5.4)**	**MATLAB/Simulink (in Automatic Control, Power System Analysis), Multisim (in Electronics), PLC programming software, CAD/EDA tools, Control System Modelling and Simulation course**
are capable of developing saleable products for the global market	**GR3 Design/Development + GR11 Project Management: Capable of developing saleable products for the global market, considering innovation, multi-constraints and full lifecycle management. (GR3.2, GR11.1-GR11.3)**	**Innovation and Entrepreneurship Education, Engineering Economics and Management, Electronic Technology Comprehensive Curriculum Design, PLC Curriculum**

		Design, Graduation Project (product-oriented topics), discipline competitions
Engineering Practice and Product Development Graduates		
can apply their knowledge and understanding to gain practical skills for solving problems, carrying out investigations and developing systems and processes	**GR1 Engineering Knowledge + GR3 Design/Development: Can apply knowledge and understanding to gain practical skills for solving engineering tasks. (GR1.3-GR1.4, GR3.1-GR3.3)**	**Engineering Training, Circuit Principles Lab, Analog/Digital Electronics Labs, Power Electronics Lab, Electrical Machine Lab, Curriculum Design, Comprehensive Practical Training, Graduation Internship, Graduation Project**
can draw on experience of the possibilities and limitations of the application of materials, computer-aided model designs, systems, processes and tools when solving complex problems	**GR5 Modern Tool Usage: Can draw on experience of the possibilities and limitations of the application of engineering scientific methods. (GR5.1-GR5.4)**	**All laboratory courses (experimental methods and limitations), MATLAB/Simulink simulation (limitations of models), Graduation Project (discussion of method limitations)**
know the practice and requirements in production operations	**GR3 Design/Development: Know the practice and requirements in production operations, understand industrial production processes and standards. (GR3.1-GR3.3)**	**Graduation Internship (in power plants, electrical equipment manufacturers), Engineering Training, Electrical Assembly and Fabrication Training, enterprise**

		visits
are able to research technical literature and other sources of information	**GR2 Problem Analysis + GR4 Research: (Duplicate SSC entry) Are able to research technical literature and other sources of information. (GR2.3, GR4.1)**	**Technical Paper Writing, College English, Professional English, Graduation Project (literature review), all core courses (reference reading)**
demonstrate an understanding of the health, safety and legal implications of engineering practice and the impact of engineering solutions in a social and environmental context	**GR6 Engineering and Society + GR8 Professional Ethics: Demonstrate understanding of health, safety and legal implications of engineering activities. (GR6.1-GR6.2, GR8.3)**	**Safety Education (integrated in all labs and practice), High Voltage Technology (safety), Power System Relay Protection (standards), Situation and Policy, Engineering Ethics**
undertake to act in accordance with the professional principles and standards of engineering practice	**GR8 Professional Ethics: Undertake to act in accordance with professional principles and standards of good practice. (GR8.1-GR8.3)**	**Ideological and Moral Cultivation, Engineering Ethics (integrated), Graduation Internship (professional conduct), Graduation Project (academic integrity)**
are able to transfer new results of engineering and natural sciences into industrial and commercial production, taking into account sustainability, environmental compatibility as well as economic and safety requirements	**GR3 Design/Development + GR12 Lifelong Learning: Able to transfer new results of engineering and natural sciences into industrial applications. (GR3.2, GR12.2)**	**Smart Grid Technology, New Energy Power Generation Technology, HVDC Transmission, AI in Power Systems (electives), Graduation Project (research-oriented topics), discipline**

		competitions
are able to deepen the acquired knowledge independently	**GR12 Lifelong Learning: Able to deepen the acquired knowledge independently. (GR12.1-GR12.2)**	**Professional English, Technical Paper Writing, elective courses (Smart Grid, New Energy, etc.), online learning resources, Graduation Project (self-directed research)**
are aware of the non-technical implications of engineering	**GR6 Engineering and Society + GR7 Environment and Sustainable Development: Are aware of the non-technical implications of engineering, including environmental, social and sustainable development impacts. (GR6.2, GR7.1-GR7.2)**	**Situation and Policy, New Energy Power Generation Technology (environmental aspects), Smart Grid Technology, Engineering Ethics, Graduation Project (consideration of non-technical factors)**
are capable of developing saleable products for the global market	**GR3 Design/Development + GR11 Project Management: (Duplicate SSC entry) Are capable of developing saleable products for the global market. (GR3.2, GR11.1-GR11.3)**	**Innovation and Entrepreneurship Education, Engineering Economics and Management, Curriculum Design (product-oriented), Graduation Project, discipline competitions**