

## **Brief Description of the Master Study Program „Psychology: Human Performance in Socio-Technical Systems (HPSTS)“**

### 1 Objectives, Contents, and Structure of the Program

#### 1.1 Qualification Objectives

The students know and understand, beyond the bachelor level, central approaches, theories and findings of psychological science against the background of fundamental principles, methods, and potential applications. On this basis, they are able to develop research questions and projects independently, to carry these out in a methodologically appropriate fashion, as well as to critically reflect, evaluate, and present their results. Students are able to use the described abilities and skills in new and interdisciplinary research settings and applied contexts, such as in the intersecting areas between human performance and cognitive-affective neuroscience, clinical psychology and psychotherapy, as well as adjoining areas of the life sciences. The students are able to integrate information from a variety of theoretical and methodological sources and to deal with the complexity of each issue from the field of psychological science adequately and in a (method-)critical fashion, even when and especially if information is incomplete or contradictory. At the same time, they have the necessary tools to reflect the social and ethical aspects of their actions concerning psychological research and practice in a responsible manner. The students have the ability to communicate adequately and unambiguously the logic, the results, and the conclusions drawn from their work in the field of psychology and to communicate these ideas to both a professional and layman audience. On the basis of the forms of instruction and learning employed in the study program, the students possess learning skills that allow them to acquire theoretical and methodological knowledge in the field of psychology in a self-directed and independent manner.

After adequate time of familiarization in professional life, the graduates are empowered – through a broad psychological knowledge, the knowledge of scientific methods, the competence of abstraction and transfer of knowledge – to deal with multifaceted and complex tasks in the field of psychology and its applications. In particular, students can apply their theoretical and methodological knowledge in a problem- and goal-oriented fashion to solve design, research, and intervention issues concerning the optimization of human behavior, learning, and performance in socio-technical systems. They possess scientific psychological skills for the analysis, (re-)design, and evaluation of work systems. They are able to implement, scientifically evaluate, and optimize validated methods of aptitude testing, requirements analysis, personnel selection, and of development of expertise in socio-technical systems. The students are also able to develop and evaluate educational and training interventions as well as related learning environments for training and education on the basis of the knowledge acquired. They have mastered essential practical intervention strategies of traffic psychology and are able to use fundamental knowledge on social psychology to analyze and solve practical problems at the workplace. In addition, the students can present the main aspects of study design, data collection, and analysis both in written and spoken word.

#### 1.2 Contents and Structure

In line with these objectives, the master study program HPSTS focuses on teaching the fundamental principles, methods, and applications for the optimal design and the efficient management of socio-technical systems, the individual extension in supplemental areas, and the acquisition of general skills. The program has a modular structure. It encompasses nine modules of the compulsory area and two compulsory elective areas that allow a focus on the practical application of learning in four different knowledge domains as well as the addition of cognitive-affective neuroscience (CANE) or clinical

psychology and psychotherapy (KPP). It concludes with a master thesis. The following table summarizes the structure of the program:

Area	Contents	Module	CP
Compulsory	Fundamental Subjects	HPSTS-1: Organization- & Work Psychology	9
		HPSTS-2: Personnel Psychology	6
		HPSTS-3: Competence Acquisition in Sociotechnical Systems	6
		HPSTS-4: Traffic and Transportation Psychology	6
		HPSTS-5: Applied Cognitive Research	6
		HPSTS-6: Social Interaction and Performance	6
	Methods	HPSTS-7: Advanced Multivariate Statistics	6
		HPSTS-9: Master-Thesis Seminar	6
Electives I	Applications	HPSTS-8: A, B, C or D	9
		HPSTS-I: Internship	15
Electives II	Supplemental Area A	CANE	15
	or		
	Supplemental Area B	KPP E1	6
		KPP E2	9
Master Thesis			30
			120

Specific contents and qualification objectives, instruction and learning methods, etc. can be found in the module descriptions (appendix 1 of the study regulations). In accordance with the module descriptions, the courses will be held in German or English.

The curriculum is divided into four semesters. The appropriate distribution of the modules to individual semesters, the adherence of which allows for the completion of studies in the regular period of study, as well as the nature and scope of each included lectures and the number and regular dates of the required study records and examinations can be reviewed in the attached study schedule (appendix 2 of the study regulations).

### 1.3 Admission Requirements

Prerequisite for admission to the program is a first university degree recognized in the Federal Republic of Germany in the field of psychology with a minimum duration of 6 semesters or a first university degree in one of the following subjects: work sciences, computer sciences, engineering-, traffic-, economic sciences, business education, industrial engineering, teacher training, public health, occupational health, sociology.

Furthermore, good command of the English and German languages (level B2 of the European framework of reference for languages) has to be proven if English/German is not the native language of the applicant.

The special eligibility for the master program HPSTS is finally recognized if evidence for good knowledge of at least four of the twelve core areas of the master program HPSTS has been provided for and there is also sufficient knowledge of the fundamental subjects of psychology.

The core areas are:

- Cognitive Affective Science
- Consumer Research
- Human Factor Engineering / Ergonomics / Neuroergonomics
- Human Resource Management
- Learning & Instruction
- Marketing
- Organization & Work Science
- Public Health; Occupational Health
- Quality Management
- Social Behavior Science
- Statistical Methods
- Traffic and Transportation Science

Good knowledge in a core area exists if course credits of 5 ECTS within the core area have been obtained successfully.

The fundamental subjects of psychology are:

- General psychology
- Biological psychology
- Differential and personality psychology
- Developmental psychology
- Methods of psychology
- Psychological diagnostics
- Social psychology

Sufficient knowledge of the fundamental subjects of psychology exists if course credits of 20 ECTS in total have been obtained from at least three of the seven fundamental subjects.

#### 1.4 Regular Period of Study

The regular period of study is four semesters and includes - besides regular attendance - self-study, supervised practice hours, and the master examination.

#### 1.5 Completion of the Program

The study program concludes with the degree „Master of Science (M.Sc.) in *Psychology: Human Performance in Socio-Technical Systems*.

## 2 Integration into the Departmental Profile and the Developmental Plan of the University

For many years, the department of psychology has been establishing three profile lines: 1) cognitive-affective neuroscience, 2) clinical psychology and psychotherapy, and 3) human performance in socio-technical systems. The master study program HPSTS, together with the other two newly established master programs, carries this profiling - up to now with regard to the research areas - forward towards instruction and teaching. On the university level, it integrates into the area of mathematics and science and the research profile line “health sciences, biomedicine and bioengineering.”

The courses offered by the department are intended to allow in particular bachelor graduates of psychology, but also graduates of related subjects, to develop their professional interests along the aforementioned profile lines focused in areas of psychology for which the department of psychology enjoys a high reputation. Regarding the master study program HPSTS, due to the unique curriculum within Germany of combining work and organizational psychology contents with transport and

engineering psychology as well as with the international and interdisciplinary focus of the program, a high attractiveness of the program can be expected both nationally and internationally.

### 3 Associations with Other Faculties

An important part of the program refers to applications for the optimization of complex socio-technical systems. The already varied existing collaborations with diverse technical subjects at TU Dresden will provide a research-active environment. Within the modules HPSTS-8 (Research and Intervention) and HPSTS-I (Internship), the students have the opportunity to deal with such applications in non-psychological disciplines, e.g., in traffic sciences, computer science, mechanical engineering, medicine, or economic sciences.

### 4 General Qualifications

The study of the master study program HPSTS also includes the acquisition of general skills, i.e., interdisciplinary (key) competencies, such as:

- *Self-management* (including self-critical thinking: accepting feedback on one's own behavior, time management, thorough and critical analysis methods with extensive information, entrepreneurship)
- *Capabilities of scientific work* (including the reception of complex issues based on English texts; solving complex problems; methodologically critical and statistical thinking in complex structures; critical reflection and discussion of complex theoretical, methodological and empirical facts; deriving further research questions and applications)
- *Techniques of scientific work* (including literature research; knowledge of international research and publication standards; multimedia literacy; processing and understandable presentation of complex issues in various formats; problem-oriented software application; cost-benefit thinking, objective analysis, quality management, project management)
- *Teamwork skills* (including collaboration in groups; giving and receiving of feedback on behavior, organization and facilitation of group processes and group discussions, collaborative learning)

The acquisition of these skills is integrated into the general courses of the individual modules, in which students can practice these skills and receive feedback. The instructors in the individual modules are therefore encouraged to take into account the acquisition of general skills in their course concepts (e.g., via self-organized, time efficient theoretical and method-critical reading and discussions of English research articles in the group, processing, and presentation of significant results by means of multimedia, moderation of related group work and -discussions and giving and receiving feedback in seminars).

### 5 Environmental Relevance of the Study Program

Environmental problems are consistently caused by human behavior. Psychology, as the science of human behavior, provides the basis for the description, explanation, prediction, and influence of behavior, and as such, environmental behavior. Psychologists are thus by their training experts for solving environmental problems that are rooted in human behavioral patterns. In the study program HPSTS, also numerous elements of technical systems are of relevance (e.g., in the areas of transport, work systems, or education) that must be evaluated and designed together with experts from the fields of engineering, the natural, and life sciences in order to identify environmentally sound solutions, such as handling and use of energy, water, hazardous materials, or the disposal of waste products. Therefore, both the content of the program as well as the training associated with the research are relevant for environmental issues.

## 6 Rulings of the Faculty Committees

The department of psychology has voted unanimously for the creation of the three study programs Psychology: Cognitive-Affective Neuroscience, Clinical Psychology and Psychotherapy, and Psychology: Human Performance in Socio-Technical Systems, in the meeting of the expert committee on 08.10.2012. The faculty board has unanimously approved the establishment of the three master degree programs in its meeting held on 17.12.2012.

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Signed, Prof. Dr. Jürgen Wegge  
Program Coordinator for HPSTS