

THE MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN
FEDERATION

**Federal State Budgetary Educational Organization of Higher
Professional Education**

Tambov State Technical University FSBEO HPE TSTU



**BRIEF DESCRIPTION OF THE BASIC EDUCATIONAL
PROGRAM OF HIGHER EDUCATION**

Field of Study

09.04.02 - Information systems and technologies (Master's level)

Master's Program

09.04.02.01 Analysis and synthesis of information systems

Qualification

Master

Form of study

Full-time

Tambov, 2016

Abbreviations

FSBEO HPE TSTU	- Federal state budgetary educational organization of higher professional education Tambov State Technical University
HE	- higher education
BEP	- basic educational program
GCC	- general cultural competence
PC	- professional competence
UPC	- university professional competence
BEPC	- basic educational program courses
FSES HE	- Federal state educational standard of higher education
C	- curriculum
SP	- study program

1 General

1.1 Basic educational program implemented in the university

Basic educational program implemented in Tambov State Technical University 09.04.02 Information systems and technologies (Master's level), Master's program 09.04.02.01 Analysis and synthesis of information systems is a set of documents developed and approved by the institution of higher education to meet the requirements of labor market in compliance with the Federal state educational standard of higher education for the field of study 09.04.02 - Information systems and technologies (Master's level) (approved by the Ministry of Education and Science of the Russian Federation of " 30 " October 2014, # 1402).

BEP regulates objectives, learning outcomes, content, conditions and technologies of the educational process, assessment of graduates' progress and quality of education.

1.2 General description of BEP HE

1.2.1 Program objectives

The BEP is aimed at the development of students' personal qualities that contribute to their creativity, cultural growth and social mobility, including motivation, self-diligence, diligence, responsibility, independence, commitment to ethical values, tolerance, persistence in achieving goals.

The BEP objective is to help graduates to develop general cultural and professional competences to succeed in their professional career and meet the labor market demands.

1.2.2 Program duration

In compliance with the FSES HE the duration of BEP 09.04.02 - Information systems and technologies (Master's level) is 2 years.

1.2.3 Credits

In compliance with the FSES HE the total workload of the BEP is 120 credits and includes all kinds of classroom and independent work, practical work and assessment.

One credit corresponds to 36 academic hours; the academic year for full-time education is equal to 60 credit units.

1.3 Admission requirements

An applicant must provide a nationally recognized document of higher education equivalent to Bachelor's degree certificate (diploma). Admission to universities is regulated by the Admission Rules of FSBEU HPE TSTU for the BEP HE. Admission tests include a university interview in the chosen Master's program.

2 Description of graduates' professional activities

2.1 The scope of graduates' professional activities

In compliance with FSES the scope of professional activities for BEP HE 09.04.02 - Information systems and technologies (Master's level) graduates includes research, development, introduction of information technologies and systems.

2.2 Types of graduates' professional activities

In compliance with FSES HE and labor market requirements graduates of the BEP HE 09.04.02 - Information systems and technologies (Master's level) must be ready for the following types of professional activities:

- project work;
- production and technological work.

2.3 Areas of graduates' professional activities

Graduates of the BEP HE 09.04.02 - Information systems and technologies (Master's level) must be able to solve the following professional problems:

- development strategy design, definition of design goals, criteria efficiency, limitations of applicability;
- conceptual design of information systems and technologies;
- preparation of tasks for design components of information systems and technology the methodology of system engineering;
- selection and introduction of computer-aided design;
- unification and typification of design solutions.

3 Graduates' learning outcomes

Learning outcomes are determined by the competences acquired by graduates, i.e. ability to apply knowledge, skills and personal qualities to meet the goals of professional activities.

On completion of the program graduates must develop the following general cultural, general professional and professional competences:

General cultural competences:

- Ability to improve and develop own intellectual and cultural level (GCC-1);
- Capacity for independent learning new methods of research, to change scientific and scientific-production profile of their professional activities (GCC-2);
- Ability to use Russian and foreign languages as means of business communication (GCC-3);
- Ability to apply in practice abilities and skills in organization of research and design works in the management team (GCC-4);
- Ability to take initiative, including risk situations, to take full responsibility (GCC-5);
- Ability to gain with the help of information technology and use in practice new knowledge and skills, including new knowledge areas, not directly related to business (GCC-6);
- Ability to operate modern equipment and instruments (in accordance with the objectives of the master's program) (GCC-7).

General professional competences:

- Ability to perceive mathematical, socio-economic and professional knowledge, ability to acquire independently, develop and apply it to the solution of unusual tasks, including new or unfamiliar environment and in an interdisciplinary context (GPC-1);
- Ability to build the arguments and statements based on the interpretation of the data integrated from different fields of science and technology, to make judgments based on complete data (GPC-2);
- Ability to analyze and assess the levels of competencies, combined with the ability and readiness to self-regulation in further education and professional mobility (GPC-3);
- Ability to use at least one foreign language for social and professional communication, ability to apply special vocabulary and professional language vocabulary (GPC-4);
- Possession of methods and means of obtaining, storage, processing and transmission of information through modern computer technology, including global computer networks (GPC-5);
- Ability to analyze professional information, emphasize the main structure, make and present analytical reports with substantiated findings and recommendations (GPC-6).

Professional competences:

- Ability to develop design strategies, define design goals, criteria, limitations (PC-1);
- Ability to develop new methods and means of designing information systems (PC-2);
- Ability to develop new technologies of information systems design (PC-3);

University professional competences:

- Ability to develop and explore mathematical models of information systems and models of the subject areas (UPC-1)
- Ability to develop and apply intelligent information systems (UPC-2)
- Ability to provide information protection of professional activity objects (UPC-3)
- Ability to organize the collaboration with the teams of customer and developer IT project, to make managerial decisions using different opinions, find a compromise between the different

requirements (cost, quality, deadlines) to the IT-project both in long and short-term planning, find optimal solutions (UPC-4)

–Ability to develop information and software tools implementing databases (UPC-5)

–Ability to develop software tools implementing Web technologies (UPC-6)

–Ability to develop hardware and software implementing network information technology (UPC-7)

–Ability to use the capabilities of the operating systems in the development and implementation of information systems (UPC-8)

–Ability to apply modern technologies of intellectual data analysis (Data Mining) for the development of expert-analytical support systems of acceptance of optimum decisions (UPC-9).

Additional competences:

- Ability to use English language for professional communication in oral and written forms (AC-1)
- Readiness for educational and methodological work within the system of higher education (AC-2)
- Readiness for organizational-administrative activity for the development of the Tambov region (AC-3)

4 Program structure

The content and organization of the educational process are regulated by the curriculum; study programs; learning materials, ensuring the quality of education; practical experience plans; the annual academic calendar and the learning resources for the implementation of the educational process.

The curriculum (Appendix 1) describes the courses which are divided into three blocks (the objectives and description of the courses are listed in Appendix 2):

Master's program structure		Workload of the Master's program in credit units
	Courses (modules)	60
Block 1	Core courses:	18
	1. Design of information systems, course work	10
	2. Russian language	6
	3. Fundamentals of scientific research	5
	Additional courses:	45
	Compulsory courses:	26
	1 Information security and information protection	5
	2 Intelligent information systems	4
	3 Management of IT-projects	5
	4 Technologies of database design, course work	8
	5 Methods of research and modeling of information processes and systems	4
	Elective courses:	14
	1.1 Object-oriented programming in Web development	<u>3</u>
	1.2 Technologies of device applications development	<u>3</u>
	2.1 Operating systems	<u>3</u>
	2.2 Fundamentals of system programming	<u>3</u>
3.1 Fundamentals of data mining	<u>5</u>	
3.2 Data mining methods	<u>5</u>	
4.1 Network technologies	<u>5</u>	
4.2 Fundamentals of computer networking	<u>5</u>	
Block 2	Practical experience, including research work:	<u>51</u>
	1 Research work	<u>21</u>
	2 Internship on acquiring primary professional skills	<u>6</u>
	3 Internship on computer systems design	<u>15</u>
	4 Research internship	<u>9</u>
	Optional courses:	6
1. Business English	2	
2. Higher education pedagogy	2	
3. Organizational and managerial activities	2	
Block 3	Graduation Certification	<u>6</u>
	The total amount of credit hours (without optional courses)	120
	The total amount of credit hours	126

Graduation certification is obligatory; the graduate certificate can be awarded upon completion of the entire educational program. Graduation certification includes:

- state exam;
- defense of graduate qualification work (Master's thesis).

5 Learning and teaching resources

5.1 Faculty and staff

The program is delivered by research and teaching staff qualified for teaching courses in 09.04.02 Information systems and technologies (Master's program "*Analysis and synthesis of information systems*"); all lecturers hold a relevant degree or professional experience and are systematically engaged in research and academic work.

The teaching staff have publications in peer-reviewed domestic and foreign scientific journals, proceedings of national and international conferences, symposia, and do advanced professional training in leading research centers, RAS institutes, Russian and foreign universities every three year.

The graduate chair for the BEP 09.04.02 - Information systems and technologies (Master's program "*Analysis and synthesis of information systems*") is the Department of *Information systems and information protection*.

The program leader is Prof., Dr. Yu.Yu. Gromov.

5.2 Material resources and facilities

The Department of Information systems and information protection responsible for the program implementation has modern material resources and technical facilities, ensuring all types of disciplinary and interdisciplinary training, as well as laboratory, practical and research work.

5.3 Information resources

The university library is well stocked with textbooks and learning materials recommended for the program study, as well as guidance on theoretical and practical problems for all courses and all kinds of academic and research activities. Effective information support of research and academic processes is enhanced by the access to a number of electronic library systems.

- *Elibrary*: Electronic library system (<http://elibrary.ru/>),
- *Publishing house Lan*: Electronic and library system (<http://eJanbook.com/>),
- *Knigafond*: electronic-library system (<http://knigafund.ru/>),
- *Unified window of access to educational resources* (<http://window.edu.ru/>),
- *American Physical Society*: publishing house (<http://publish.aps.org/>),
- POLPRED: electronic database (Polpred.com),
- *RUSSIA*: university information system (<http://uisrussia.msu.ru/>),
- *Consultant Plus*: legal reference system
- *TSTU* electronic library system