

Study plan

Name of study plan: Medical Laboratory Technician - full-time study

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Specializations in Health Service

Type of study: Bachelor full-time

Required credits: 180

Elective courses credits: 0

Sum of credits in the plan: 180

Note on the plan:

Name of the block: Compulsory courses

Minimal number of credits of the block: 178

The role of the block: Z

Code of the group: 17PBL POV 17

Name of the group: Medical Laboratory Technician compulsory course 17

Requirement credits in the group: In this group you have to gain 178 credits

Requirement courses in the group: In this group you have to complete 56 courses

Credits in the group: 178

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
17PBLAF1A	Human Anatomy and Physiology I	Z	5	2P+2C	Z	z
17PBLAF2A	Human Anatomy and Physiology II	Z,ZK	4	2P+2C	L	z
17PBLBP	Bachelor Thesis <i>Jozef Rosina</i>	Z	6	200XH	L	z
17BOZP	Occupational Safety and Health, Fire Protection and First Aid <i>Petr Kudrna Petr Kudrna Petr Kudrna (Gar.)</i>	Z	0	1P	Z	z
17PBLBCH1	Biochemistry I.	Z,ZK	4	2P+2L	L	z
17PBLBCH2	Biochemistry II <i>Daniela Obítková</i>	Z,ZK	5	2P+2L	Z	z
17PBLEZ	Ethics in Healthcare	KZ	2	2P	Z	z
17PBLF	Physics	Z,ZK	5	2P+2L	Z	z
17PBLGEN	Genetics	Z,ZK	4	2P+2S	L	z
17PBLHTS1	Hematology & Transfusiology I.	Z	5	2P+2L	Z	z
17PBLHTS2	Hematology & Transfusiology II.	Z,ZK	3	2P+2L	L	z
17PBLHHT	Histology and Histological Techniques	Z,ZK	5	2P+2L	Z	z
17PBLILPB	Individual Summer Biochemistry Practice <i>Jana Hudzietzová</i>	Z	4	200XH	L	z
17PBLISZ	Information Systems in Health Care	Z,ZK	5	2P+2C	Z	z
17PBLIT	Information Technologies	KZ	2	2P	Z	z
17PBLKB1A	Clinical Biochemistry I <i>Daniela Obítková</i>	Z	4	2P+2L	L	z
17PBLKB2A	Clinical Biochemistry II <i>Daniela Obítková</i>	Z,ZK	5	2P+2L	Z	z
17PBLKGE	Clinical Genetics	Z,ZK	4	2P+2C	L	z
17PBLKIM	Clinical Immunology	Z,ZK	4	2P+2L	L	z
17PBLKMBA	Clinical Microbiology	Z,ZK	5	2P+2L	Z	z
17PBLLPBA	Laboratory Practice - Biochemistry <i>Daniela Obítková, Jana Hudzietzová Daniela Obítková Daniela Obítková (Gar.)</i>	KZ	2	5XD	L	z

17PBLLPGA	Laboratory Practice - Genetics and Molecular Biology <i>Daniela Obítková, Jana Hudzietzová Daniela Obítková Daniela Obítková (Gar.)</i>	KZ	4	10XD	L	z
17PBLLPHA	Laboratory Practice - Hematology and Transfusiology <i>Daniela Obítková, Jana Hudzietzová Daniela Obítková Daniela Obítková (Gar.)</i>	KZ	4	10XD	L	z
17PBLLPA	Laboratory Practice (Hematology, Transfusiology, Histology, Biochemistry, Microbiology & Immunology) <i>Daniela Obítková</i>	Z	7	40XD	L	z
17PBLLPIA	Laboratory Practice - Immunology <i>Daniela Obítková, Jana Hudzietzová Daniela Obítková Daniela Obítková (Gar.)</i>	KZ	4	10XD	L	z
17PBLLPMA	Laboratory Practice - Microbiology <i>Daniela Obítková, Jana Hudzietzová Daniela Obítková Daniela Obítková (Gar.)</i>	KZ	2	5XD	L	z
17PBLLZPA	Laboratory Medical Equipment	Z	2	1P+1L	Z	z
17PBLMAZ	Management and Administration in Healthcare	Z	1	1P	L	z
17PBLMTA	Medical Terminology	Z	3	1C	Z	z
17PBLMVV	Methodology of Scientific Research	Z	2	1P+1S	Z	z
17PBLMM	Methods of Microscopy	Z	2	2P+2C	L	z
17PBLMB	Molecular Biology	Z,ZK	5	2P+2L	Z	z
17PBLOZLA	General Chemistry and Basic Laboratory Calculations	Z,ZK	5	2P+2C+2L	Z	z
17PBLMKBA	General Microbiology	Z,ZK	3	2P+2L	L	z
17PBLOLD	General Laboratory Practice <i>Daniela Obítková</i>	Z	2	2C	L	z
17PBLOPL	Organization and Operation of a Hospital Laboratory	KZ	2	1P+1L	L	z
17PBLPMS	Probability and Mathematical Statistics	KZ	3	1P+1C	Z	z
17PBLPPA	First Aid	Z	2	1P+1S	Z	z
17PBLRO	Radiation Protection <i>Jana Hudzietzová</i>	Z	1	1P	L	z
17PBLSBP	Bachelor Thesis Seminar	Z	1	1S	Z	z
17PBLSL	Forensic Medicine	Z	2	1P	Z	z
17PBLSLPA	Good Laboratory Practice	Z,ZK	4	1P+2S	L	z
17PBLSJL	Quality Management System in the Laboratory	Z	1	1P+1S	L	z
17PBLVMVZ	Forensic Methods in Public Health Protection	Z,ZK	4	2P+2L	L	z
17PBLZACHA	Fundamentals of Analytical Chemistry	Z,ZK	3	2P+2L	L	z
17PBLZHE	Fundamentals of Hygiene and Epidemiology	Z	2	2P	L	z
17PBLZII	Fundamentals of Immunology and Immunochemistry	Z,ZK	5	2P+2L	Z	z
17PBLOBC	Fundamentals of Biology and Cytology	Z,ZK	3	2P	Z	z
17PBLZOP	Fundamentals of Nursing	Z	1	0.5C	L	z
17PBLZPAA	Fundamentals of Pathology	ZK	3	2P	Z	z
17PBLZTXAA	Fundamentals of Toxicology <i>Daniela Obítková</i>	Z,ZK	2	1P+1S	Z	z
17PBLZVZ	Fundamentals of Public Health and Health Legislation	Z	2	2P	L	z
17PBLZB	Medical Biophysics <i>Jozef Rosina</i>	Z,ZK	3	1P+1C	Z	z
17PBLZP	Health Psychology	Z	2	2P+1S	Z	z
17PBLZBPR	Bachelor Thesis <i>Jozef Rosina Jozef Rosina Jozef Rosina (Gar.)</i>	Z	1	2L	Z	z
17PBLZOD	Processing image data in laboratory diagnostics	Z	2	1P+1C	Z	z

Characteristics of the courses of this group of Study Plan: Code=17PBL POV 17 Name=Medical Laboratory Technician compulsory course 17

17PBLAF1A	Human Anatomy and Physiology I	Z	5
17PBLAF2A	Human Anatomy and Physiology II	Z,ZK	4
17PBLBP	Bachelor Thesis	Z	6
17BOZP	Occupational Safety and Health, Fire Protection and First Aid	Z	0
17PBLBCH1	Biochemistry I.	Z,ZK	4
Course participants will be introduced to the basics of Biochemistry. The course builds on the knowledge gained in general chemistry and extends this knowledge about the chemistry of living systems. The interpretation goes through the basic building structures of biological systems (amino acids, peptides, proteins, lipids, carbohydrates, nucleic acids), biological membranes and molecular genetics to the most important metabolic processes. Particular attention is paid to the aspects necessary for understanding the methods of work in the biochemical and clinical laboratory, which are part of the follow-up chemical discipline. The laboratories are focused on broadening the topics discussed in the lectures and their practical training, especially on the determination of biomolecules and the verification of their properties. Students should become familiar with the basic laboratory techniques of Biochemistry.			
17PBLBCH2	Biochemistry II	Z,ZK	5
17PBLEZ	Ethics in Healthcare	KZ	2

17PBLF	Physics	Z,ZK	5
17PBLGEN	Genetics	Z,ZK	4
17PBLHTS1	Hematology & Transfusiology I.	Z	5
17PBLHTS2	Hematology & Transfusiology II.	Z,ZK	3
17PBLHHT	Histology and Histological Techniques	Z,ZK	5
17PBLILPB	Individual Summer Biochemistry Practice	Z	4
17PBLISZ	Information Systems in Health Care	Z,ZK	5
17PBLIT	Information Technologies	KZ	2
Computer history, structure of computers, motherboard, processors, memory, graphical card, computer buses, BIOS, I/O devices, server, desktop, notebook, pocket PC, data storage, mobile devices, memory card, OS, tasks and memory management, printers scanner, multimedial devices, mass data storage, multitasking, multiprocessing, set of instruction, assembler, programming languages, power test, network, LAN, WAN, internet, TCP/IP, HTTP, FTP etc., client-server, gate, router, using IT in medicine and telemedicine.			
17PBLKB1A	Clinical Biochemistry I	Z	4
17PBLKB2A	Clinical Biochemistry II	Z,ZK	5
17PBLKGE	Clinical Genetics	Z,ZK	4
17PBLKIM	Clinical Immunology	Z,ZK	4
17PBLK MBA	Clinical Microbiology	Z,ZK	5
17PBLLPBA	Laboratory Practice - Biochemistry	KZ	2
17PBLLPGA	Laboratory Practice - Genetics and Molecular Biology	KZ	4
17PBLLP HA	Laboratory Practice - Hematology and Transfusiology	KZ	4
17PBLLP A	Laboratory Practice (Hematology, Transfusiology, Histology, Biochemistry, Microbiology & Immunology)	Z	7
17PBLLP IA	Laboratory Practice - Immunology	KZ	4
17PBLLP MA	Laboratory Practice - Microbiology	KZ	2
17PBLLP ZA	Laboratory Medical Equipment	Z	2
The subject follows the previous knowledge of the students of general chemistry and biochemistry and presents them the methods of work and instrumentation in the biochemical and clinical laboratory. Students will be introduced into principles of individual methods, their applications in clinical biochemistry and their technical aspects. Students will be acquainted with new trends in medical determinations, such as immunoassay, mass spectrometry and POCT determination. During the laboratory exercises the students will be introduced to the laboratory equipment of the bioanalytical and clinical laboratories, will get acquainted with the specifics of the laboratory analysis of the biological material and with the correct principles of laboratory data processing.			
17PBLMAZ	Management and Administration in Healthcare	Z	1
17PBLMTA	Medical Terminology	Z	3
The course provides students with basic information about the English terminology in relation to the technical documentation of laboratory instruments to the instructions for use of laboratory tests and specialized medical terminology.			
17PBLMVV	Methodology of Scientific Research	Z	2
17PBLMM	Methods of Microscopy	Z	2
Learning various types of microscopic methods used in biological sciences and medicine. Light microscopy techniques, techniques of electron microscopy (SEM and TEM) in biology, fluorescence microscopy, confocal microscopy and more. In laboratory: Introduction to the structure and function of the optical microscope; familiarity with the technique of observation and drawing of objects. Native biological preparations, types of dyeing, the most commonly used dyes. Staining of biological material. Permanent preparations, types of potting media, making permanent preparations. Preparation of samples for electron microscopy.			
17PBLMB	Molecular Biology	Z,ZK	5
17PBL OZLA	General Chemistry and Basic Laboratory Calculations	Z,ZK	5
Introduction to chemistry, categorization and properties of substances, chemical bonds, chemical reactions, elements in periodic table, organic chemistry fundamentals, natural substances, polymers, analytical methods - instrumental analysis, chemical calculations, chemical equations.			
17PBLMKBA	General Microbiology	Z,ZK	3
17PBL OLD	General Laboratory Practice	Z	2
17PBL OPL	Organization and Operation of a Hospital Laboratory	KZ	2
17PBLPMS	Probability and Mathematical Statistics	KZ	3
The students are acquainted with principles of the scientific research methodology, accumulation of input data, formulation of hypotheses, evaluation of results. Principles of statistical methods and their use and interpretation. The subject matter presented includes Random variables, their distribution, characteristics, transformations, and the population sample, estimates of parameters, testing hypotheses. The exercises are focused on practical work with Microsoft Office Excel 2010.			
17PBLPPA	First Aid	Z	2
17PBLRO	Radiation Protection	Z	1
17PBLSBP	Bachelor Thesis Seminar	Z	1
17PBLSL	Forensic Medicine	Z	2
17PBLSLPA	Good Laboratory Practice	Z,ZK	4
17PBLSJL	Quality Management System in the Laboratory	Z	1
17PBLVMVZ	Forensic Methods in Public Health Protection	Z,ZK	4
17PBLZACHA	Fundamentals of Analytical Chemistry	Z,ZK	3
Purpose of this course is to introduce analytical chemistry, especially theoretical basis, categorization and review of methods. Practical work in laboratory empowers students to develop practical skills in chemical laboratory.			
17PBLZHE	Fundamentals of Hygiene and Epidemiology	Z	2
17PBLZII	Fundamentals of Immunology and Immunochemistry	Z,ZK	5
In this course, students learn the structure and physiological functions of the immune system, with its tissues, cells and molecules; the mechanisms of the innate and acquired immunity. The list is also impaired immune function, immunodeficient conditions, autoimmunity and hypersensitivity states. The practical exercises are then theoretically and practically acquainted with the principles of selected immunological examination methods, their implementation and evaluation.			

17PBL0BC	Fundamentals of Biology and Cytology	Z,ZK	3
The course provides basic information about the chemical composition of living systems (biopolymers - structure and conformation, carbohydrates, lipids, nucleic acids and proteins), the cellular organization of non-cellular forms through prokaryotes to eukaryotes. It deals with the construction of a eukaryotic cell and its compartments (the composition of the cytoplasm, nucleus, plastids, mitochondria, membranes and membrane organelles - the endoplasmic reticulum, Golgi apparatus, lysosomes, cytoskeleton: microtubules, microfilaments). The contents are also the life processes of the cell (the cell cycle, cell division - cytokinesis, cell differentiation and cell death, apoptosis, necrosis). The course also includes selected chapters of genetics and evolution of living systems.			
17PBLZOP	Fundamentals of Nursing	Z	1
17PBLZPAA	Fundamentals of Pathology	ZK	3
17PBLZTXAA	Fundamentals of Toxicology	Z,ZK	2
17PBLZVZ	Fundamentals of Public Health and Health Legislation	Z	2
17PBLZB	Medical Biophysics	Z,ZK	3
17PBLZP	Health Psychology	Z	2
17PBLZBPR	Bachelor Thesis	Z	1
17PBLZOD	Processing image data in laboratory diagnostics	Z	2

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 2

The role of the block: S

Code of the group: 17PBL PV 2S

Name of the group: Medical Laboratory Technician compulsory optional course 2nd semester 13_14_15_16

Requirement credits in the group: In this group you have to gain at least 2 credits (at most 6)

Requirement courses in the group: In this group you have to complete at least 1 course (at most 3)

Credits in the group: 2

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
17PBLAZI	Applied Medical Informatics	KZ	2	1P+1C	L	s
17PBLPPP	Working with Programming Tools (Advanced)	KZ	2	2C	L	s
17PBLPPZ	Working with Programming Tools (Beginners)	KZ	2	2C	L	s

Characteristics of the courses of this group of Study Plan: Code=17PBL PV 2S Name=Medical Laboratory Technician compulsory optional course 2nd semester 13_14_15_16

17PBLAZI	Applied Medical Informatics	KZ	2
The subject contains the basic areas of medicine, which are presented on the internet by the medium of medical-related web pages. Information sharing via internet in discussion forums and electronic conferences for fields like pharmacy or stomatology is also discussed.			
17PBLPPP	Working with Programming Tools (Advanced)	KZ	2
17PBLPPZ	Working with Programming Tools (Beginners)	KZ	2

List of courses of this pass:

Code	Name of the course	Completion	Credits
17BOZP	Occupational Safety and Health, Fire Protection and First Aid	Z	0
17PBLAF1A	Human Anatomy and Physiology I	Z	5
17PBLAF2A	Human Anatomy and Physiology II	Z,ZK	4
17PBLAZI	Applied Medical Informatics	KZ	2
The subject contains the basic areas of medicine, which are presented on the internet by the medium of medical-related web pages. Information sharing via internet in discussion forums and electronic conferences for fields like pharmacy or stomatology is also discussed.			
17PBLBCH1	Biochemistry I.	Z,ZK	4
Course participants will be introduced to the basics of Biochemistry. The course builds on the knowledge gained in general chemistry and extends this knowledge about the chemistry of living systems. The interpretation goes through the basic building structures of biological systems (amino acids, peptides, proteins, lipids, carbohydrates, nucleic acids), biological membranes and molecular genetics to the most important metabolic processes. Particular attention is paid to the aspects necessary for understanding the methods of work in the biochemical and clinical laboratory, which are part of the follow-up chemical discipline. The laboratories are focused on broadening the topics discussed in the lectures and their practical training, especially on the determination of biomolecules and the verification of their properties. Students should become familiar with the basic laboratory techniques of Biochemistry.			
17PBLBCH2	Biochemistry II	Z,ZK	5
17PBLBP	Bachelor Thesis	Z	6
17PBLEZ	Ethics in Healthcare	KZ	2
17PBLF	Physics	Z,ZK	5

17PBLGEN	Genetics	Z,ZK	4
17PBLHHT	Histology and Histological Techniques	Z,ZK	5
17PBLHTS1	Hematology & Transfusiology I.	Z	5
17PBLHTS2	Hematology & Transfusiology II.	Z,ZK	3
17PBLILPB	Individual Summer Biochemistry Practice	Z	4
17PBLISZ	Information Systems in Health Care	Z,ZK	5
17PBLIT	Information Technologies	KZ	2
Computer history, structure of computers, motherboard, processors, memory, graphical card, computer buses, BIOS, I/O devices, server, desktop, notebook, pocket PC, data storage, mobile devices, memory card, OS, tasks and memory management, printers scanner, multimedial devices, mass data storage, multitasking, multiprocessing, set of instruction, assembler, programming languages, power test, network, LAN, WAN, internet, TCP/IP, HTTP, FTP etc., client-server, gate, router, using IT in medicine and telemedicine.			
17PBLKB1A	Clinical Biochemistry I	Z	4
17PBLKB2A	Clinical Biochemistry II	Z,ZK	5
17PBLKGE	Clinical Genetics	Z,ZK	4
17PBLKIM	Clinical Immunology	Z,ZK	4
17PBLK MBA	Clinical Microbiology	Z,ZK	5
17PBL LPA	Laboratory Practice (Hematology, Transfusiology, Histology, Biochemistry, Microbiology & Immunology)	Z	7
17PBL L PBA	Laboratory Practice - Biochemistry	KZ	2
17PBL L PGA	Laboratory Practice - Genetics and Molecular Biology	KZ	4
17PBL L PHA	Laboratory Practice - Hematology and Transfusiology	KZ	4
17PBL L PIA	Laboratory Practice - Immunology	KZ	4
17PBL L PMA	Laboratory Practice - Microbiology	KZ	2
17PBL L ZPA	Laboratory Medical Equipment	Z	2
The subject follows the previous knowledge of the students of general chemistry and biochemistry and presents them the methods of work and instrumentation in the biochemical and clinical laboratory. Students will be introduced into principles of individual methods, their applications in clinical biochemistry and their technical aspects. Students will be acquainted with new trends in medical determinations, such as immunoassay, mass spectrometry and POCT determination. During the laboratory exercises the students will be introduced to the laboratory equipment of the bioanalytical and clinical laboratories, will get acquainted with the specifics of the laboratory analysis of the biological material and with the correct principles of laboratory data processing.			
17PBLMAZ	Management and Administration in Healthcare	Z	1
17PBLMB	Molecular Biology	Z,ZK	5
17PBLMKBA	General Microbiology	Z,ZK	3
17PBLMM	Methods of Microscopy	Z	2
Learning various types of microscopic methods used in biological sciences and medicine. Light microscopy techniques, techniques of electron microscopy (SEM and TEM) in biology, fluorescence microscopy, confocal microscopy and more. In laboratory: Introduction to the structure and function of the optical microscope; familiarity with the technique of observation and drawing objekt .Nativní biological preparations, types of dyeing, the most commonly used dyes. Roztlakové medication. Permanent preparations, types of potting media, making permanent preparations. Preparation of samples for electron microscopy.			
17PBLMTA	Medical Terminology	Z	3
The course provides students with basic information about the English terminology in relation to the technical documentation of laboratory instruments to the instructions for use of laboratory tests and specialized medical terminology.			
17PBLMVV	Methodology of Scientific Research	Z	2
17PBL OBC	Fundamentals of Biology and Cytology	Z,ZK	3
The course provides basic information about the chemical composition of living systems (biopolymers - structure and conformation, carbohydrates, lipids, nucleic acids and proteins), the cellular organization of non-cellular forms through prokaryotes to eukaryotes. It deals with the construction of a eukaryotic cell and its compartments (the composition of the cytoplasm, nucleus, plastids, mitochondria, membranes and membrane organelles - the endoplasmic reticulum, Golgi apparatus, lysosomes, cytoskeleton: microtubules, microfilaments). The contents are also the life processes of the cell (the cell cycle, cell division - cytokinesis, cell differentiation and cell death, apoptosis, necrosis). The course also includes selected chapters of genetics and evolution of living systems.			
17PBL OLD	General Laboratory Practice	Z	2
17PBL OPL	Organization and Operation of a Hospital Laboratory	KZ	2
17PBL OZLA	General Chemistry and Basic Laboratory Calculations	Z,ZK	5
Introduction to chemistry, categorization and properties of substances, chemical bonds, chemical reactions, elements in periodic table, organic chemistry fundamentals, natural substances, polymers, analytical methods - instrumental analysis, chemical calculations, chemical equations.			
17PBL PMS	Probability and Mathematical Statistics	KZ	3
The students are acquainted with principles of the scientific research methodology, accumulation of input data, formulation of hypotheses, evaluation of results. Principles of statistical methods and their use and interpretation. The subject matter presented includes Random variables, their distribution, characteristics, transformations, and the population sample, estimates of parameters, testing hypotheses. The exercises are focused on practical work with Microsoft Office Excel 2010.			
17PBLPPA	First Aid	Z	2
17PBLPPP	Working with Programming Tools (Advanced)	KZ	2
17PBLPPZ	Working with Programming Tools (Beginners)	KZ	2
17PBLRO	Radiation Protection	Z	1
17PBLSBP	Bachelor Thesis Seminar	Z	1
17PBL SJL	Quality Management System in the Laboratory	Z	1
17PBLSL	Forensic Medicine	Z	2
17PBLSLPA	Good Laboratory Practice	Z,ZK	4
17PBLVMVZ	Forensic Methods in Public Health Protection	Z,ZK	4
17PBLZACHA	Fundamentals of Analytical Chemistry	Z,ZK	3
Purpose of this course is to introduce analytical chemistry, especially theoretical basis, categorization and review of methods. Practical work in laboratory empower students to develop practical skills in chemical laboratory.			
17PBLZB	Medical Biophysics	Z,ZK	3

17PBLZBPR	Bachelor Thesis	Z	1
17PBLZHE	Fundamentals of Hygiene and Epidemiology	Z	2
17PBLZII	Fundamentals of Immunology and Immunochemistry	Z,ZK	5
In this course, students learn the structure and physiological functions of the immune system, with its tissues, cells and molecules; the mechanisms of the innate and acquired immunity. The list is also impaired immune function, immunodeficient conditions, autoimmunity and hypersensitivity states. The practical exercises are then theoretically and practically acquainted with the principles of selected immunological examination methods, their implementation and evaluation.			
17PBLZOD	Processing image data in laboratory diagnostics	Z	2
17PBLZOP	Fundamentals of Nursing	Z	1
17PBLZP	Health Psychology	Z	2
17PBLZPAA	Fundamentals of Pathology	ZK	3
17PBLZTXAA	Fundamentals of Toxicology	Z,ZK	2
17PBLZVZ	Fundamentals of Public Health and Health Legislation	Z	2

For updated information see <http://bilakniha.cvut.cz/en/FF.html>

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