MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
V.N. Karazin Kharkiv National University
Name of the higher education institution

EDUCATIONAL PROGRAM

"Biology"

The first (Bachelor) level of higher education
by specialty 091"Biology"
branch of knowledge 09"Biology"
Qualification: Bachelor of Biology

APPROVED BY SCIENTIFIC COUNCIL OF
V.N. Karazin KHARKIV NATIONAL UNIVERSITY
Head of Scientific Council _____ / V.S. Bakirov/
(protocol № __ from "___"_____ 2017)

Educational Programme is implemented from _____2017
Rector_____ /V.S. Bakirov/
(order № __ from "___"_____ 2017)

Kharkiv 2017

PREFACE

Developed by workgroup of::

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6	**Dogadina Tetiana Vasylivna**	Doctor of Science (Biology), professor, head of Department of botany and plant ecology of the School of Biology
7	**Zhmurko Vasyl Vasylyovych**	Doctor of Science (Biology), professor, head of Department of plant and microorganisms physiology and biochemistry of the School of Biology, Dean of the Biological of the School of Biology
8	**Kozarinova Hanna Olegivna**	PhD (Biology), associate professor of Department of botany and plant ecology of the School of Biology
9	**Nahlov Oleksandr Volodymirovych**	PhD (Biology), associate professor of Department of human and animal physiology of the School of Biology
10	**Perskyi Yevhen Efroimovych**	Doctor of Science (Biology), professor, head of Department of biochemistry of the School of Biology
11	**Shkorbatov Yiury Georgiyovych**	Doctor of Science (Biology), professor, head of Department of mycology and phytoimmunology of the School of Biology

1. Profile of educational programme on specialty 091 "Biology""

1 – General information	
Full name of higher education institution and its structural unit	V.N. Karazin Kharkiv National University, School of Biology
Higher education level and qualification name	First (Bachelor) level of Higher Education Bachelor of Biology
Official name of educational program	Educational program "Biology"
Type of diploma and educational program length	Bachelor's diploma, unitary, 240 ECTS credits, period of study - 4 years
Accreditation	Licensed by the Ministry of Education and Science of Ukraine by Master level, НД № 2189559 from 18 .09.2017 till 01 July 2023
Cycle/Level	National Qualification Framework of Ukraine – level 7, FQ-EHEA – first cycle, EQF-LLL – level 6
Preliminary conditions	Secondary education. Secondary special education of a related profile. Second Higher Education. Requirements for competitive selection are determined by the University's rules of admission for Master's Programmes.
Language(s) of teaching	English
Period of validity of the program	until 01 July 2023
Internet address of permanent hosting of educational program description	http://start.karazin.ua/programs/7/2/091/1 http://biology.karazin.ua
2 – Purpose	
The training of specialists capable of solving complex specialized tasks and practical problems in the field of biology, professional activity or in the learning process, involves the application of certain theories and methods of the relevant science and is characterized by the complexity and uncertainty of the conditions	
3 – Characteristics of educational programme	
Subject area (branch of knowledge, specialty, specialization)	09 "Biology", 091 "Biology"
Orientation of educational program	Educational and professional
Main focus of educational program and specialization	Deepened special education in specialty "Biology". To provide students with the knowledge, skills and understanding of the field of biology, which will enable them to carry out their professional work on their own; to provide education in the field of biology with broad access to employment, to prepare students with an interest in certain areas of biology for mastering of programs of the next level of education, to form graduates of specific professional competences in biology through the implementation of individual educational trajectories, to enhance the interdisciplinary links and integrability of education and possibilities of transformation of individual units according to the structure of employer`s inquiries. Key words: biology, biochemistry, genetics, cytology, physiology of

	human and animals, bioecology, botany, zoology, animal ecology, plant physiology and biochemistry, microbiology, mycology, phytoimmunology, molecular biology, biotechnology.
Distinctive features of Educational Programme	The program is implemented in active research environment. The technologies of distance education are used.
4 – Employability and further education	
Employability	An expert rights to occupy the primary positions as biologist assistant, chemist assistant, laboratory assistant (biological research), technician-laboratory assistant, technician-ecologist, technician-laboratory assistant (biological research), specialist in biotechnology in specialized institutions and similar positions in commercial structures. High school teacher.
Further education	Bachelor in the specialty "Biology" rights to increase his level of education in the master`s in higher educational institutions of Ukraine and abroad.
5 – Education and assessment	
Teaching and learning	Student-centered, problem-oriented, initiative self-education. Lectures have problematic character, using analysis, synthesis, comparison, modeling, analogy, dialectics, abstracting, concretization, systemic, historic and logic approaches. Laboratory and practical lessons are carried out in small groups, include methods of experimental research, statistical processing of experimental data, information and communication technologies. Self work has research character and includes problem-based creative hometasks. Educational and methodical supply of selfwork is performed by the help of distant learning elements: electronic lectures, methodical guidelines and tasks. Accent is made on personal self-development promoting the formation of need and readiness to continue the self-education along lifetime.
Assessment	Current testing, presentation of certain topics of theoretical course, essay, individual educational research assignments, reports on practice results. Assessment of students studying success is evaluated by four-level (excellent, good, satisfactory, unsatisfactory) or by two-level national scale (passed, not passed); 100 scores system. Final attestation – public defense of Bachelor's qualification project.
6 – Programme Competences	
Integral competence	Ability to solve tasks and problems in the field of biological sciences and on the boundary between subject areas, while supposing implementation of theories and methods of natural sciences under complex and ambiguous conditions
Generic competences (GC)	GC1. Basic general knowledge in an amount sufficient to form a scientific outlook. GC2. Knowledge and understanding of the subject area (biology) and the field of professional activity in an amount sufficient for independent work on specialty. GC3. Ability to search for and analyze information from a variety of sources, including the results of own research. GC4. Ability to perform professional functions and conduct research at an appropriate level in the field of biological sciences and on the boundary between subject areas. GC5. Ability to identify promising areas of research, formulate purpose and objectives of research.

	GC6. Observance of moral and ethical aspects of professional activity and the necessity of intellectual honesty, as well as the ability to ensure life safety and biosafety. GC7. Ability to understand information from related fields of knowledge and to explain professional issues to specialists in other fields. GC8. Ability to generate new ideas (creativity). GC9. Ability to use modern information technologies and analyze information in the field of biology and on the boundary between subject areas. GC10. Ability to communicate in professional activities, including in an international context. GC11. Capacity to work both independently and in a team. GC12. The ability to criticism and self-criticism
Professional competences of specialty (PC)	PC1. Basic theoretical and methodological knowledge in the field of biological sciences and on the boundary between subject areas. PC2. Ability to apply knowledge and skills in mathematics, physics, chemistry and others related sciences for solving problems of modern biology. PC3. Knowledge of modern scientific issues in the field of specialization and ability to analyze the directions of development of modern biology. PC4. Ability to collect and record biological data using appropriate methods, techniques and tools in field and laboratory conditions and report on results. PC5. Ability to create appropriate models of biological systems and processes, explore them for getting a new findings and deepening understanding of nature. PC6. Ability to analyze and formulate conclusions (diagnosis) for various types of complex management tasks in scientific institutions. PC7. Ability to create biological databases and use computer programs for the analysis of biological information. PC8. Skills of reasoned discussion and communication in the field of biological sciences and on the verge of subject areas. PC9. Understanding career prospects, planning and managing career. PC10. Ability to solve inventive tasks in the field of biology or using biological effects. PC11. Ability to assess impact of economic activities on the environment, human health and biodiversity, justify and apply measures of environmental management and biodiversity conservation. PC12. Ability to use effectively in practice different theories of business administration of research activities. PC13. Ability to formulate modeling tasks, create models of objects and processes in living organisms and their components using mathematical methods and information technologies. PC14. Ability to perform work in compliance with the rules of biological ethics, biosafety, bioprotection.
7 – Programme Learning Outcomes (LO)	
	LO1. Be able to communicate in dialogue with colleagues and target audience. LO2. Use libraries, databases, internet resources to find the necessary information. LO3. Find ways to fast and effective solutions of problems, generate

	ideas, using knowledge and skills acquired. LO4. Present results of scientific work in writing (in the form of report, scientific publications, etc.) and orally (in the form of presentations and report defense) using up-to-date technologies, conduct discussion correctly. LO5. Identify own contribution, carry out coordinated work on the result, taking into account social, civil and industrial interests. LO6. Know the basic rules of biological ethics, biosecurity, biosafety, basic approaches to risk assessment using the latest biological, biotechnological and medical-biological methods and technologies. LO7. Follow the rules of academic integrity while studying and conducting research activities in order to ensure confidence in the results of scientific work; know basic legal categories and peculiarities of implementing results of intellectual activity. LO8. Be able to identify potentially hazardous production processes that can create a threat of emergencies; comply with rules of safety. LO9. Know the features of modern biological science, the basic methodological principles of scientific research, methodological and methodical tools for carrying out scientific research in specialization. LO10. Be able to model the basic processes of research to select research methods, instruments or to develop new techniques. LO11. Be able to conduct statistical processing, analysis and generalization of experimental data using software and information technologies applicable in the field of biology. LO12. Know and analyze the principles of structural and functional organization, mechanisms of regulation and adaptation of organisms. LO13. Demonstrate and use knowledge of the basic patterns of formation, quantitative assessment and conservation strategies of biodiversity, increase of productivity and sustainability of agrocenoses and natural ecosystems. LO14. Use innovative approaches to solve specific biological problems. LO15. Know the main requirements of current legislation of Ukraine on the use of biological resources. Use regulations, normative and technical documentation in the field of scientific activity. LO16. Master the techniques of laboratory and field research of biological objects using appropriate equipment; methods of observation, description, identification, analysis, classification and cultivation of biological objects; methods of mathematical and statistical processing of the results of biological research. LO17. Apply the acquired knowledge in specialization to solve specific practical problems. LO18. Apply pedagogical technologies at the level sufficient for implementation of designed programs of educational disciplines by specialization in higher educational institutions. LO19. Model objects and processes in living organisms and their components using mathematical methods and information technologies. LO20. Demonstrate and use integrated current understanding of the principles of structural and functional organization of biological systems of different taxonomic affiliation, their phylogeny and ontogeny. LO21. Ability to use knowledge from different sections of biology for the analysis of biological phenomena and processes; to prepare an

	educational material for teaching biology in middle school. LO22. Be able to provide professional advice in the field of biology. LO23. Be able to popularize biological knowledge and defend the scientific outlook. LO24. Understand the main principles of the functioning of the international scientific community: the principles of reviewing manuscripts of publications, measuring scientific and economic indices, organizing international cooperation, submitting applications for grants and the principles for their selection.
8 – Resource support for program implementation	
Staffing	Guarantor of the educational program: Tokarsky Victor Arsentiiovych - Guarantor of Educational Programme Doctor of Science (Biology), professor, head of Department of zoology and animal ecology of the School of Biology Scientific and pedagogical staff with academic degrees and / or academic degrees, as well as highly skilled specialists, are involved in the program realization. In order to raise the professional level, all scientific and pedagogical workers undergo an internship once in five years, including overseas Lectures, seminars, round tables, workshops with specially invited foreign specialists are held.
Material and technical support	Educational buildings include auditoriums and thematic rooms with multimedia equipment, specialized educational and research laboratories (Laboratory of cell culture and animal tissue culture, Laboratory of Cell Biochemistry and Molecular Genetics, Laboratory of Bioinformatics, Laboratory of Genetics of Ontogenesis), computer classes with access to the Internet. Various collections of biological objects are used in educational and scientific activities, two of which (CWU herbarium and Drosophila lines collection) have the status of National heritage of Ukraine. Certain lessons are held on the base of the Botanical garden and the Museum of Nature. Field studies can be carried out in natural biotopes. There is an opportunity to perform qualification works both on the basis of the university and on the basis of specialized laboratories in the partner institutions (under the terms of the contract). Students are provided by places in dormitories. There is a sports hall, sports grounds, various sports sections and cultural centers. The points of nutrition offer a quality menu, including the Halal Certificate.
Informational and methodical support	The official website of the V.N. Karazin Kharkov National University: http://www.univer.kharkov.ua/; wireless points of access to the Internet; unlimited internet access; scientific library, reading rooms; virtual learning environment Moodle; corporate mail; training and work plans; curricula of the educational process; educational-methodical complexes of disciplines; training and work programs of disciplines; didactic materials for independent and individual work of students from disciplines; practice programs; methodical instructions for the implementation of individual tasks, control and diploma papers; criteria for assessing the level of training; packages of complex control works..
9 – Academic mobility	
National credit mobility	Applicants of higher education can realize the right to academic mobility in higher educational institutions and scientific institutions of Ukraine on the basis of agreements and on their own initiative on the basis of an individual invitation.

International credit mobility	Erasmus Mundus, DAAD German Academic Exchange Program, Fulbright Fellowship Program, Open Society Institute Programs (Washington), etc., as well as individual invitations from higher education institutions and research institutions outside of Ukraine.
Teaching of foreign students	Foreign citizens study on a paid basis (on a contract basis) at the expense of individuals and legal entities. All other requirements are governed by the University's Rules of admission.

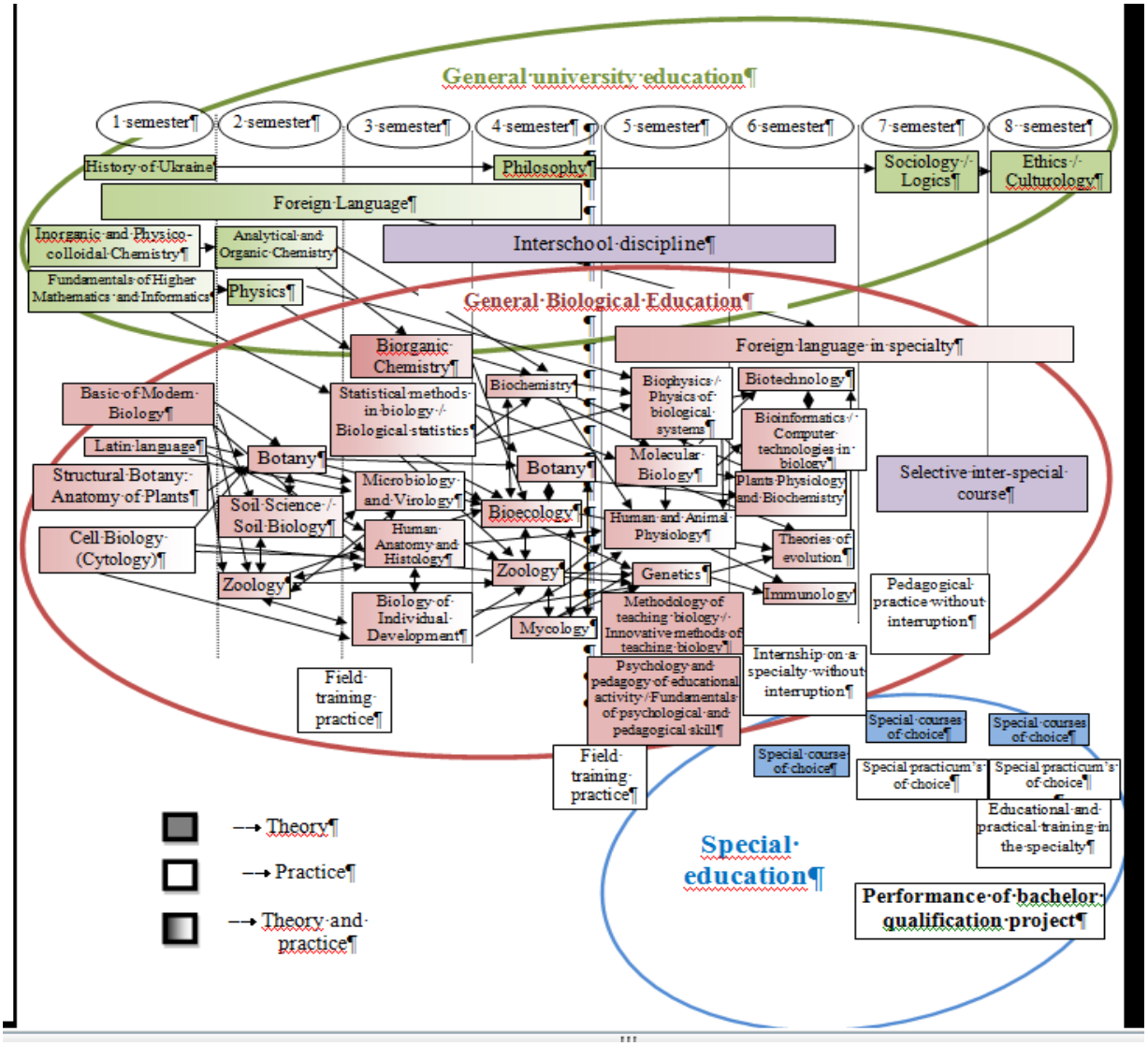
2. List of educational and professional program components and their logical order

2.1. Component list of educational programme (EP)

Code	Components of the Educational Programme (educational disciplines, course projects (work), practice courses, qualification work)	Amount of ECTS credits	Form of final assessment
1	2	3	4
Obligatory components of EP			
The cycle of humanitarian and socio-economic training.			
OC 1.	History of Ukraine	3	exam
OC 2.	Philosophy	3	exam
OC 3.	Foreign Language	6	credit
OC 4.	Foreign language in specialty	3	exam
The cycle of fundamental training (natural - scientific)			
OC 5.	Fundamentals of Higher Mathematics and Informatics	6	exam
OC 6	Physics	4	exam
OC 7.	Inorganic and Physico-colloidal Chemistry	6	exam
OC 8.	Analytical and Organic Chemistry	5	credit
OC 9	Biorganic Chemistry	4	exam
OC 10.	Bioecology	3	credit
OC 11.	Theories of evolution	3	exam
The cycle of professional and practical training			
OC 12.	Botany	9	exam
OC 13.	Zoology	9	exam
OC 14.	Basic of Modern Biology	3	credit
OC 15.	Structural Botany: Anatomy of Plants	4	credit
OC 16.	Plants Physiology and Biochemistry	7	exam
1	2	3	4
OC 17.	Cell Biology (Cytology)	5	exam
OC 18.	Human Anatomy and Histology	6	exam
OC 19	Human and Animal Physiology	7	exam
OC 20.	Biology of Individual Development	3	credit
OC 21.	Microbiology and Virology	5	exam
OC 22.	Mycology	3	credit
OC 23.	Biochemistry	5	exam
OC 24.	Biotechnology	3	credit
OC 25.	Molecular Biology	4	exam
OK 26.	Immunology	3	exam
OK 27.	Genetics	4	exam

1	2	3	4
ОК 28.	Latin language	7	credit
ОК 29.	Field training practice	10	credit
ОК 30.	Internship on a specialty without interruption	5	credit
ОК 31.	Pedagogical practice without interruption	5	credit
ОК 32.	Educational and practical training in the specialty	5	credit
ОК 33.	Performance of bachelor qualification project	4	defense
Total amount of ECTS credits for obligatory components::		**158**	
Selective components of EP *			
The cycle of humanitarian and socio-economic training.			
SC 1.1.	Sociology / Logics	3	credit
ВБ 1.2.	Ethics / Culturology	3	credit
ВБ 1.3.	Interschool discipline	14	4 credit's
The cycle of fundamental training (natural - scientific)			
ВБ 1.4.	Biophysics / Physics of biological systems	3	exam
ВБ 1.5.	Bioinformatics / Computer technologies in biology	3	credit
ВБ 1.6.	Statistical methods in biology / Biological statistics	3	credit
The cycle of professional and practical training			
ВБ 1.7.	Methodology of teaching biology / Innovative methods of teaching biology	3	credit
ВБ 1.8.	Psychology and pedagogy of educational activity / Fundamentals of psychological and pedagogical skill	3	credit
ВБ 1.9.	Soil Science / Soil Biology	3	credit
ВБ 1.10.	Radiobiology	3	credit
ВБ 1.11.	Selective inter-special course	8	2 exam's
ВБ 1.12.	Special courses of choice	19	1 credit, 4 exam's
ВБ 1.13.	Special practicum's of choice	16	4 credit's
Total amount of ECTS credits for selective components:		**82**	
Curriculum volume		**240**	

2.2. Structural logic scheme of EP



3. Form of attestation of graduates

Attestation of graduates of Educational Programme on specialty 091 Biology is carried out in the form of defense of the qualifying of bachelor qualification project and results in awarding a Master's degree (with certified document of the government-approved format) with the qualification: Bachelor of Biology. Biologist.

The attestation is carried out openly and publicly.

Qualification Project should meet the requirements:

- should provide the solution of a theoretical or practical problem with the application of fundamental provisions and methods of system analysis, be characterized by complexity and uncertainty of the conditions;
- should contain an analysis of the current state of the problem being solved, and the working hypothesis;
- must describe the methods used and the results obtained;

- should contain analysis and theoretical substantiation of the research results;
- must be written in scientific style, in English;
- must be tested for plagiarism;
- the abstract of the thesis should be hosted on the site of the higher educational institution.

4. Correspondence matrix of Educational Programme competences and components

	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11	CC 12	CC 13	CC 14	CC 15	CC 16	CC 17	CC 18	CC 19	CC 20	CC 21	CC 22	CC 23	CC 24	CC 25	CC 26	CC 27	CC 28	CC 29	CC 30	CC 31	CC 32	CC 33	SC 1	SC 2	SC 3	SC 4	SC 5	SC 6	SC 7	SC 8	SC 9	SC 10	SC 11	SC 12	SC 13
GC 1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
GC 2									•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									•	•	•			•	•	•	•	•
GC 3					•	•																							•	•		•	•				•	•	•					•	•	•
GC 4					•	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•		•	•			•							•	•	•
GC 5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
GC 6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
GC 7	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
GC 8	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
GC 9					•	•	•	•		•	•	•	•							•	•			•	•	•	•						•		•	•	•					•		
GC 10	•	•	•	•	•	•	•	•	•	•	•			•												•							•	•			•			•					
GC 11																													•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
GC 12	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
PC 1										•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									•	•	•	•	•	•	•	•	•	•	•
PC 2					•	•	•	•	•																				•	•	•	•	•													
PC 3										•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•												•	•	•	•	•	•	•	•	•	•
PC 4					•	•				•														•		•											•	•	•							
PC 5																•			•					•	•		•										•	•								
PC 6					•	•	•	•	•																				•	•		•	•				•	•								
PC 7		•	•	•																				•	•			•		•	•	•	•	•	•	•									
PC 8	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
PC 9					•	•	•	•		•	•	•	•							•	•			•	•	•	•						•		•	•	•					•		
PC 10										•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•						•		•	•	•					•		
PC 11																													•	•	•	•	•				•	•	•	•	•	•	•	•	•	•
PC 12	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
PC 13																															•			•	•	•				•	•					

5. Matrix of implementation of Educational Programme learning outcomes (LO) by corresponding components

	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11	CC 12	CC 13	CC 14	CC 15	CC 16	CC 17	CC 18	CC 19	CC 20	CC 21	CC 22	CC 23	CC 24	CC 25	CC 26	CC 27	CC 28	CC 29	CC 30	CC 31	CC 32	CC 33	SC 1	SC 2	SC 3	SC 4	SC 5	SC 6	SC 7	SC 8	SC 9	SC 10	SC 11	SC 12	SC 13
LO1	•	•	•	•							•					•	•	•	•																										
LO 2					•	•	•	•	•	•	•													•	•												•	•	•						
LO3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
LO4																									•	•	•	•	•	•	•	•	•											•	•	•
LO5	•	•								•	•			•						•				•	•				•					•	•						•	•				
LO6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
LO7	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
LO8										•						•		•	•		•	•	•	•	•	•		•	•																
LO9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
LO10										•					•				•					•	•	•											•	•	•						
LO11					•	•	•	•	•					•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•		•	•				•	•							
LO12												•	•	•	•	•	•		•	•		•					•																		
LO13										•	•	•	•								•	•																				•			
LO14										•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•												•	•
LO15										•		•	•	•							•	•						•	•	•	•	•									•				
LO16																•	•	•	•				•	•	•		•	•	•	•	•	•				•	•	•				•	•	•
LO17																									•	•	•	•	•	•	•	•										•	•	•
LO18		•	•	•																											•									•	•				
LO19																•			•					•		•	•				•						•			•	•			•	•
LO20										•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•		•	•									•		•	•	•
LO21														•													•											•	•						
LO22										•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•																		•	•	•
LO23		•	•	•								•	•	•													•											•	•				•	•	•
LO24				•								•	•								•	•			•	•	•						•	•	•							•	•	•