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**YEREVAN STATE UNIVERSITY**  
**FACULTY OF BIOLOGY**

**SELF-EVALUATION REPORT OF  
THE BIOLOGY DOCTORAL  
PROGRAMME**

**YEREVAN 2019**

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## Quality Assessment Criteria and Standards for Doctoral Education

<i>Criterion/standards</i>	<i>The evidences that will need to be considered to evaluate the criterion/standard</i>
<p><b>1. Institutional strategies</b></p> <p><i>The Higher Education Institution’s (hereinafter HEI) research strategy is in concord with its mission and goals.</i></p>	
<p>1.1 HEI has a research strategy that is adopted at the institutional level of the HEI, represents the institution’s mission and its goals for research.</p>	<p>1. Research strategy</p>
<p>1.2 Research strategy reflects the needs of the internal and external stakeholders and includes ethical concepts.</p>	<p>2. Code of ethics and internal disclosure procedures</p>
<p>1.3 HEI has formal mechanisms and procedures to evaluate the effectiveness of research strategy and to further improve it.</p>	<p>3. Action plan (long-term, mid-term, short-term planning) and supporting budget</p> <p>4. Policy and procedures for the assessment of the achieved goals and respective analysis</p> <p>5. The list of scientific publications, patents relevant for strategic area</p> <p>6. Relevant reports on the review process of the research strategy</p> <p>7. Other Policy of development and adoption of research strategy.</p> <p>8. Alignment of research strategy with mission and goals of the institution</p> <p>9. Mechanisms and tools for revealing the needs of internal and external stakeholders</p> <p>10. Evidences of the stakeholders’ involvement</p> <p>11. Other</p>
<p><b>2. Doctoral program</b></p> <p><i>The doctoral program’s ambitions are in concord with the institution’s research strategy, forms part of institutional planning and resource allocation, is designed to meet new challenges and needs of global labour market.</i></p>	

<p>2.1 Doctoral program is thoroughly formulated, according to the intended outcomes, is flexible, meets the needs of doctoral candidates and is in line with the institution’s research strategy.</p>	<ol style="list-style-type: none"> <li>1. Outcome based doctoral program (aligned with the HEI’s ambitions in research and labour market needs)</li> <li>2. Clearly defined concept of the programme and graduate profile</li> <li>3. Doctoral training programs based on original research and teaching of transferable skills (curriculum, individual research plan)</li> <li>4. Doctoral training leading to doctoral candidates’ autonomy</li> <li>5. Doctoral candidate handbook (published)</li> <li>6. Other</li> </ol>
<p>2.2 Doctoral program is contextually coherent with other relevant doctoral programs.</p>	<ol style="list-style-type: none"> <li>1. Doctoral program benchmarking policy, procedures and performance evidences</li> <li>2. Other</li> </ol>
<p>2.3 Doctoral program is functioning in the context of a strong research environment ensuring critical mass of researchers and relevant resources promoting interdisciplinary approach.</p>	<ol style="list-style-type: none"> <li>1. Relevant documents ensuring doctoral program resource allocation</li> <li>2. Relevant evidences (agreements, contracts, etc.) ensuring research environment and critical mass</li> <li>3. Other</li> </ol>
<p>2.4 Doctoral program provides training in core discipline areas and transferable skills and ensures an active involvement of doctoral candidates in research activities.</p>	<ol style="list-style-type: none"> <li>1. Flexible curriculum (translation of the objectives of the program in the curriculum, presence of interdisciplinary elements in the curriculum)</li> <li>2. Individual research plans (which takes into account the skills to be achieved)</li> <li>3. Mechanisms for the involvement of doctoral candidates to research oriented activities</li> <li>4. Evidences on encouragement of local and international cooperation</li> <li>5. Other</li> </ol>
<p>2.5 Doctoral program has set criteria on the assessment of the quality of research results against</p>	<ol style="list-style-type: none"> <li>1. Published criteria for the assessment of the research quality against the intended outcomes</li> </ol>

<p>achieved outcomes and mechanisms for the evaluation of the research results' social impact.</p>	<ol style="list-style-type: none"> <li>2. Grids to evaluate the extent of doctoral candidates' autonomy and other intended outcomes</li> <li>3. Mechanisms to evaluate the effectiveness of the criteria for the assessment of the research quality and to further improve them</li> <li>4. Mechanisms to measure social impact</li> <li>5. Other</li> </ol>
<p>2.6 There are set mechanisms and procedures in place to ensure development, approval, monitoring and periodic review of doctoral program with an active involvement of internal and external stakeholders.</p>	<ol style="list-style-type: none"> <li>1. Doctoral program design and approval policies and procedures</li> <li>2. Written policy for review/revision of the doctoral program based on the needs of stakeholders (internal and external stakeholders' needs assessment methods, effectiveness analyses and evidences)</li> <li>3. Improvement plans</li> <li>4. Other</li> </ol>
<p><b>3. Admission Policy</b></p> <p><b><i>HEI's admission policy on doctoral program is transparent, is in line with doctoral program's ambitions.</i></b></p>	
<p>3.1 HEI has set mechanisms for promoting equitable recruitment, selection and admission procedures.</p>	<ol style="list-style-type: none"> <li>1. Published admission policy</li> <li>2. Candidate recruitment policies and procedures (published)</li> <li>3. Other</li> </ol>
<p>3.2 Selection criteria of doctoral candidates are transparent, publicly available and are in line with the explicit outcomes of doctoral program.</p>	<ol style="list-style-type: none"> <li>1. Selection criteria (e.g. doctoral candidates' past academic performance, ability for research etc.)</li> <li>2. Procedures and evidences ensuring transparency and fair access to the institution</li> <li>3. Mapping (selection criteria with the explicit outcomes)</li> <li>4. Other</li> </ol>
<p>3.3 HEI periodically analyses the effectiveness of</p>	<ol style="list-style-type: none"> <li>1. Mechanisms for analysing the effectiveness</li> </ol>

<p>applicants' assessment system</p>	<p>of applicants' assessment system, career development opportunities</p> <ol style="list-style-type: none"> <li>2. Improvement mechanisms of admission policy</li> <li>3. Other</li> </ol>
<p><b>4. Supervisor</b></p> <p><b><i>HEI provides highly qualified supervisors/well-structured supervisory team to achieve doctoral program's ambitions.</i></b></p>	
<p>4.1 Supervisors/supervisory team responsibilities, qualifications, workload, recognition criteria are comprehensively stated and described and are in line with doctoral program's ambitions.</p>	<ol style="list-style-type: none"> <li>1. Tripartite written agreements (HEI-supervisors-candidate)</li> <li>2. Clearly defined written obligation for main supervisor/supervisory team/research group</li> <li>3. Workload (number of doctoral candidates per mentor) -dedicating appropriate time for supervision</li> <li>4. Guidelines for dealing with supervisor-supervisee conflicts (conflict management)</li> <li>5. Other</li> </ol>
<p>4.2 HEI has supervisor/supervisory team appointment procedures.</p>	<ol style="list-style-type: none"> <li>1. Clear selection criteria of supervisors/supervisory team</li> <li>2. Appointment procedures (review of the procedure)</li> <li>3. Other</li> </ol>
<p>4.3 HEI has motivation mechanisms for supervisors to be involved in active researching and be part of relevant scientific network.</p>	<ol style="list-style-type: none"> <li>1. Policies and procedures for the motivation in general and the young ones in particular</li> <li>2. Other</li> </ol>
<p>4.4 There is well-established system for periodic evaluation of supervision that foster to review existing policies and procedures for supervision and to reveal the professional needs of supervisors.</p>	<ol style="list-style-type: none"> <li>1. Assessment policies and procedures (tools and mechanisms) for supervisors/supervisory team</li> <li>2. Number of thesis supervisors defended</li> <li>3. Number of supervisors participating in current competitive research projects</li> <li>4. Scientific contributions of a supervisor relevant to the program</li> </ol>

	<p>5. Mobility opportunities for supervisors</p> <p>6. Other</p>
<p>4.5 HEI fosters the development and professional progress of supervisors.</p>	<p>1. Mechanisms ensuring professional development of supervisors</p> <p>2. Appropriate budget allocation for professional development of supervisors</p> <p>5. Foreign teaching staff between the teaching staff who supervise doctoral theses and those who give training activities</p> <p>6. Other</p>
<p><b>5. Research Environment</b></p> <p><b><i>HEI promotes the quality research provisions by creating an environment conducive to research.</i></b></p>	
<p>5.1 There are necessary resources for the implementation of doctoral program in accordance with its content, which effectively support the implementation of program's ambitions and create an environment conducive to research.</p>	<p>1. Policies and procedures considering resource allocation for the doctoral education</p> <p>2. Appropriate research infrastructures (the material resources available are appropriate to the number of doctoral candidates and the characteristics of the doctoral program)</p> <p>3. Various sources of funding</p> <p>4. Short, medium and long term resource planning</p> <p>5. Other</p>
<p>5.2 HEI monitors the scientific progress of the individual doctoral candidates by achieved scientific results and provides career development opportunities. Supervisors have primary responsibility in doctoral candidate's scientific progress.</p>	<p>1. Monitoring mechanisms of doctoral candidates (reports, attestations, minutes etc.)</p> <p>2. Policies and procedures ensuring regular information flow for doctoral candidates</p> <p>3. Policies and procedures promoting additional support, advice and academic orientation for doctoral candidates (the services available to doctoral candidates provide adequate support for the learning process and facilitate their entry into the labor market)</p>

	<p>4. Career development opportunities (e.g. updating candidates on new career opportunities, personal and professional development, exchanges with other universities (mobility programs), opportunities for doctoral candidates to combine teaching with research, encouraging international cooperation, main job opportunities etc.)</p> <p>5. Doctoral candidates feedback on the support provided</p> <p>6. Signed agreements with other research centres, institutes or HEIs</p> <p>6. Other</p>
<p>5.3 HEI ensures that all doctoral candidates receive useful and regular information and advice to promote research and to have opportunity to work in research teams and different research environments.</p>	<p>1. Result monitoring (archive of periodical monitoring results)</p> <p>2. Respective analyses and reports</p> <p>3. Signed agreements with other research centres, institutes or HEIs</p> <p>4. Other</p>
<p>5.4 HEI has sound financial distribution policy and capacity to sustain and ensure the integrity and continuity of doctoral programs at the institution.</p>	<p>1. Mechanisms to find and control financial resources and to allocate them appropriately</p> <p>2. The institutional planning, administration and monitoring policies with regards to the budget</p> <p>3. Institutional policies that stipulate the terms and conditions for accepting gifts/donations from public, private and international organizations</p> <p>4. Adequate funding for transferable skills training</p> <p>5. Other</p>
<p>5.5 HEI has mechanisms in place for the evaluation of the effectiveness, applicability and availability of</p>	<p>1. Feedback mechanisms and respective analyses</p>

resources.	2.Improvement plans 3.Other
<b>6. Doctoral Candidates</b>  <i>Doctoral candidates are recognized as professionals with commensurate rights.</i>	
6.1 HEI has formal mechanisms to regulate relations between candidate, supervisors and institution where the rights and responsibilities of doctoral candidates are clearly formulated.	1. Written agreement (between HEI-supervisors-candidate) stating possibilities for doctoral candidate career development 2. Other
6.2 Doctoral candidates are engaged in governance at the university and participate in decision-making.	1.Policy and procedures for the involvement of doctoral candidates in the governance of the HEI 2. Mechanisms for the motivation of doctoral candidates to be involved in governance. 3. Other
6.3 HEI has set mechanisms that ensure quality of the student services and doctoral candidates are involved in the quality assurance practices.	1.Feedback mechanisms 2.Regulations stating doctoral candidates' role in the institution's quality assurance processes 3. Other
<b>7. Internationalization</b>  <i>Internationalization is coherent with institution's research strategy and the individual needs of the doctoral candidates.</i>	
7.1 HEI promotes fruitful and effective collaboration with local and international counterparts aiming to create critical mass and networking as well as to implement joint research and doctoral programs.	1. Strategic plan for internationalization (research part) 2. Policies, procedures and mechanisms promoting internationalization of research (local, international) 3. Agreements, memorandums etc. 4. Number of foreign teaching staff between the teaching staff who supervise doctoral theses and those who give training activities 5. Percentage of PhDs with international recognition

	6.Other
7.2 The mobility of doctoral candidates is driven by the candidates' research projects.	<ol style="list-style-type: none"> <li>1. Mobility coherent with research strategy of the institution and the individual needs of doctoral candidates, relevant evidences</li> <li>2. Number of foreign doctoral candidates</li> <li>3. Other</li> </ol>
7.3 HEI allocates sufficient financial resources for internationalization.	<ol style="list-style-type: none"> <li>1. Budget allocation for research's internationalization</li> <li>2. Mechanisms to find and control financial resources and to allocate them</li> <li>3. Relevant analyses</li> <li>4. List of publications in the peer reviewed journals with impact factor (by teachers, supervisors and doctoral candidates)</li> <li>5. Other</li> </ol>
<p><b>8. PhD awarding</b></p> <p><i>HEI has clear mechanisms for monitoring and assessment of the research results (applicable to the institutions having Specialized Councils).</i></p>	
8.1 Specialized Council has PhD awarding criteria that are applied and periodically reviewed.	<ol style="list-style-type: none"> <li>1. Published criteria for PhD awarding</li> <li>2. Reports on the candidates' examination results</li> <li>3. Review procedures and relevant analyses</li> <li>4. Number of theses defended in the context of full-time studies</li> <li>5. Number of theses defended in the context of part-time studies</li> <li>6. Percentage of PhDs with international recognition</li> <li>7. Employment rate</li> <li>8. Rate of adaptation of work to studies</li> <li>9. Other</li> </ol>

8.1 HEI has set criteria for the nomination of the members of Specialized Council/s.	<ol style="list-style-type: none"> <li>1. Published criteria for the nomination of the members of Specialized Council/s.</li> <li>2. Other</li> </ol>
8.2 HEI periodically implements quality assurance of Specialized Council/s' activities.	<ol style="list-style-type: none"> <li>1. Internal quality assurance procedure of Specialized Council/s' activities</li> <li>2. Mechanisms ensuring the involvement of relevant stakeholders in the quality assurance processes of Specialized Council/s' activities</li> <li>3. Respective analyses and reports</li> <li>4. Improvement plans</li> <li>5. Other</li> </ol>
8.3 Specialized Council/s periodically publishes reports on the development of the relevant fields.	<ol style="list-style-type: none"> <li>1. Published reports, feedback on the reports</li> <li>2. Other</li> </ol>
<p><b><i>9. Internal quality assurance</i></b></p> <p><b><i>HEI has an internal quality assurance system, which promotes continual improvement of all the processes of doctoral education.</i></b></p>	
9.1 There are well-established and publicly available policies and procedures for internal quality assurance of doctoral education.	<ol style="list-style-type: none"> <li>1. Internal quality assurance policy and procedures for doctoral education</li> <li>2. Other</li> </ol>
9.2 The internal and external stakeholders of doctoral education are involved in the quality assurance processes.	<ol style="list-style-type: none"> <li>1. Internal quality assurance mechanisms for doctoral education reveal stakeholders needs (effectiveness analyses of the mechanisms, improvement plans)</li> <li>2. Feedback mechanisms from relevant stakeholders (effectiveness analyses of the feedback mechanisms, improvement plans)</li> <li>3. Other</li> </ol>

**APPENDIX 1 SELF-EVALUATION TEMPLATE**

*I hereby endorse*

Rector/Director \_\_\_\_\_

“ \_\_\_\_\_ ” \_\_\_\_\_ 201\_

**DOCTORAL PROGRAM SELF-EVALUATION**

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(Name of the Institution)

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(Name and code of the specialty)

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(Address of the Institution)

**YEREVAN 2019**

### Composition of the self-assessment working group

Name, Surname	Position	Responsibility in the group
<b>Emil Gevorgyan</b>	<b>Dean of Faculty of Biology</b>	
<b>Rouben Harutyunyan</b>	<b>Head of Chair of Genetics and Cytology</b>	
<b>Siranush Nanagyulyan</b>	<b>Head of Chair of Botany and Mycology</b>	
<b>Marina Arakelyan</b>	<b>Head of Chair of Zoology</b>	
<b>Anna Karapetyan</b>	<b>Head of Chair of Human and Animal Physiology</b>	
<b>Nelli Hovhannisyan</b>	<b>Head of Chair of Ecology and Nature Protection</b>	
<b>Mery Arzymanyan</b>	<b>PhD student</b>	
<i>Please insert rows, if necessary</i>		

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**Note:** *each standard should be assessed separately(e.g. 1.1; 1.2; 1.3...)*

## 1. Institutional strategies

***The Higher Education Institution's (hereinafter HEI) research strategy is in concord with its mission and goals.***

*Please mention the research ambitions of the HEI and describe the formation of research strategy reflecting the ambitions of the HEI in research.*

1.1 HEI has a research strategy that is adopted at the institutional level of the HEI, represents the institution's mission and its goals for research.

The research strategy of YSU is included in the University's development strategic plan as a separate chapter and is in line with YSU mission and goals (YSU development strategic plan 2016-2020, chapter II, [http://documentation.y-su.am/wp-content/uploads/2015/12/EPH\\_razmavarakan\\_tsragir\\_2016-2020.pdf](http://documentation.y-su.am/wp-content/uploads/2015/12/EPH_razmavarakan_tsragir_2016-2020.pdf)). Due to this plan the internationalization of the University's research, the growth of the number of students and teaching staff in the research projects, the development of cooperation between University and research institutes, HEIs and different companies are the crucial actions (strategic plan 2016-2020, chapter II, actions 2.1-2.3).

The limitations conditioned by finances, equipment and by the absence of other resources leads to the restrictions not only in the involvement of the students and the teaching staff in research projects but also in the growth of number of research projects and research products.

Participation in scientific research programs will give an opportunity to involve more staff and students in research works. Currently, YSU has projects in framework of the program "Horizon 2020", projects financed by NATO, by CRDF, by OSCE, etc.. These kind of projects will give opportunities to conduct high quality research based on the resources provided by project partners, which will not only increase the research results (such as publications in peer-reviewed journals, patents etc.), but also rise the number of international cooperations.

The main purpose of YSU strategy is to provide society with highly qualified graduates.

Quality education is one of the top priorities of the university mission. It is reflected in YSU Development Strategic Plan 2016-2020. The educational programmes of the Faculty of Biology are in concord with the main areas stated in YSU mission including natural sciences.

Yerevan State University Faculty of Biology was established in 1933. Currently, the Faculty is the main educational center in Armenia to train high-quality specialists in various fields of Biology. At present, the Faculty consists of the following 7 chairs: (1) Genetics and Cytology; (2) Botany and Mycology; (3) Zoology; (4) Human and Animal Physiology; (5) Ecology and Nature Protection; (6) Biochemistry, Microbiology and Biotechnology; and (7) Biophysics.

The goals of mentioned academic programs comply with YSU main mission: creation, transfer and distribution of knowledge. These objectives are consistent with the YSU mission provisions, which define that "YSU has a major goal to promote research and appropriate culture development in the fields of armenology, humanitarian, social-economic and natural sciences".

It should be also mentioned that the academic programmes of Faculty of Biology at Bachelor's,

Master's and Post-graduate levels are science oriented and enable students to be involved in the research activities of research laboratories of research institute of Biology state financed and internationally funded research projects. In this regard, the list of academic programs is consistent with the priority directions of YSU mission.

1.2 Research strategy reflects the needs of the internal and external stakeholders and includes ethical concepts.

The research strategy is based on the requirements that are essential to meet the needs of the internal and external stakeholders- providing them a unique opportunity to directly take part in the processes concerning the research and researchers (including them in scientific councils, examination boards, etc.).

The practical activity of YSU does not fully meet the needs of the internal and external stakeholders and is particularly ineffective in a practical works' implementation stage.

YSU has a definite mission-based frame of internal and external stakeholders that includes:

- students, alumni, applicants and their parents,
- teaching, academic and administrative staff,
- employers,
- academic society, representatives of concerned organizations in educational, scientific and
- cultural fields,
- RA Government and authorized state body.

There are several mechanisms operating at YSU aimed at identifying the stakeholders' needs.

The representatives of both external and internal stakeholders are fully engaged in all the collegial management bodies of the University and its units. Thus, YSU Board is comprised of YSU academic and administrative staff (25%), students (25%), as well as the representatives of RA Government (state officials) and the representatives of the authorized state body that is RA Ministry of Education and Science. The latter are nominated from prominent figures of various fields of education, science, culture and economy, as well as from employers cooperating with YSU. 25% of YSU Academic Council members are university students. The formation procedures of YSU Faculty Boards and Academic Councils are also based on the principle of stakeholders' participation.

The participation of different groups of stakeholders in various university and faculty committees and panels can also be regarded as a mechanism of identifying the needs of stakeholders.

YSU also attaches great importance to identifying the needs and interests of its students. These mechanisms include student autonomy, their involvement in the University management, the activity of the student organizations operating at the University, surveys among students and alumni, etc.

Both YSU Charter and the Strategic Plan have based the fulfillment of YSU mission on the principles of participation and collegiality. The internal and external stakeholders have been engaged in the elaboration of the SP. It is proved by various facts.

Educational programs in the Faculty of Biology are one of the important parts of YSU internal planning and resource allocation processes.

Public opinion of newly developed programmes was not investigated, internal and external expertise was not implemented, mechanisms of effectiveness, compliance and continuous improvement assessment were not implemented during the development of new educational programmes for the Faculty of Biology, as well as other YSU faculty programmes.

1.3 HEI has formal mechanisms and procedures to evaluate the effectiveness of research strategy and to further improve it.

The mechanisms to encourage the effectiveness of research were developed as different types of bonuses. These mechanisms were developed as part of the research strategic plan of YSU (YSU development strategic plan 2016-2020, chapter II) adopted by the procedures established by scientific council of YSU. The content and the bonus size depend on the results and can be changed every year (the corresponding regulation is available on YSU website, [http://documentation.y-su.am/wp-content/uploads/2016/05/lravcharneri\\_hashvarkman\\_karg.pdf](http://documentation.y-su.am/wp-content/uploads/2016/05/lravcharneri_hashvarkman_karg.pdf)).

Although it is a flexible system, it can not take into account all the research results. The regulation is currently in the improvement stage.

To evaluate the effectiveness of research strategy, the indicators for each strategic action were developed e.g. the number of publications in journals with impact factor, the number of students (PhD, Master) involved in research projects, the number of international projects and scientific grants, the number of YSU research and teaching staff, who participated in international conferences, etc.

In the framework of PhD programme in Biology, developing of clear mechanisms to cooperate and to improve research and creative activities and educational process is of great importance. This is in accordance with YSU policy in this field.

Within the framework of PhD programme in Biology research activities carried out by the Chairs of the Faculty departments have been significantly improved. Basic research laboratories on General Biology, various research grants, including thematic and Ph.D. student's research support state-funded program contribute to this improvement. The link between research activities and learning gives the students an opportunity to acquire research skills.

## 2. Doctoral program

***The doctoral program's ambitions are in concord with the institution's research strategy, forms part of institutional planning and resource allocation, is designed to meet new challenges and needs of global labour market.***

*Please analyse how the doctoral program intended learning outcomes are achieved (stressing doctoral candidate progress).*

2.1 Doctoral program is thoroughly formulated, according to the intended outcomes, is flexible, meets the needs of doctoral candidates and is in line with the institution's research strategy.

Doctoral program has exact intended outcomes and includes selective (optional) courses, which gives flexibility to the program. The program provides an environment for students to obtain skills and abilities such as ability to work in a team, do an individual research, acquire professional knowledge, conduct analysis, experiment and research independently. Doctoral candidates have also a yearly workload as a lecturer, so they can practice their teaching skills. There are no exact mechanisms to find out the extent of satisfaction of doctoral candidates by doctoral program. According to the YSU research strategy it is planned to improve doctoral program based on Salzburg principles.

#### 2.2 Doctoral program is contextually coherent with other relevant doctoral programs.

Due to international cooperation, the Curriculum of the Doctoral program “Biology” is coherent with relevant doctoral programs that are implemented in several universities outside Armenia. There are many PhD Biology programs located around the world, each offering unique programs and perspectives, with high quality education and professional faculty. Many PhD programs in Biology are innovative and interactive with students working closely with other students as well as faculty.

PhD in Biology programs usually include gaining a solid foundation in biology knowledge base, as well as such concentrations as ecology, evolutionary biology, molecular, cellular, and developmental biology, and neuroscience. PhD programs in Biology usually consist of challenging coursework, seminars, laboratory work, research, and dissertation, all working closely with faculty. Graduates of PhD Biology programs are prepared to enter careers as educators and researchers at private and public institutions.

#### 2.3 Doctoral program is functioning in the context of a strong research environment ensuring critical mass of researchers and relevant resources promoting interdisciplinary approach.

The research groups adjacent to each of the chairs are incorporated in research laboratories of Institute of Biology of faculty of Biology. The staff of these laboratories consists of more than 100 people. In this respect the faculty has its leading position among the 18 faculties of YSU.

The Faculty has a rather honorable staff: one academician and three associate members of the National Academy of Sciences of Armenia, 27 Doctors of Sciences and more than 100 PhDs. Main directions of scientific research at the Faculty relate to the fields of molecular and cell biology, molecular biophysics, biophysics of membranes, comparative and evolutionary biochemistry, plant biochemistry, botany and mycology, microbiology, plant biotechnology, human molecular genetics and cell genetics, botany and histology, physiology of human and animal higher nervous functioning, psychophysiology, ecology of biocenosis, study and conservation of biodiversity and different aspects of nature protection.

A number of graduates of the Faculty are internationally famous scientists who used to work or work at scientific centers of the former Soviet Union and other foreign countries. Well-known

specialists of the Faculty work successfully in scientific cooperation with their colleagues from various scientific centers of such countries as USA, France, Great Britain, Germany, Italy, Japan, Russian Federation through series of lectures and scientific reports.

Faculty of Biology offers Doctoral programs for many specializations: Biochemistry, Biophysics and Bioinformatics, Genetics, Biotechnology, Human and Animal Physiology, Molecular and Cell Biology, Microbiology, Zoology and Parasitology, Botany and Mycology, Ecology.

According to YSU development strategic plan it is planned to improve and modernize the research infrastructures. Despite all the abovementioned factors, non-sufficient number of candidates forming the critical mass and the lack of corresponding resources do not allow to improve research environment as well as it is needed. However, encouraging scientific aspiration among young researchers through state programs and adopted policy to involve young researchers in scientific activities can provide a big number of interested applicants and consequently attribute to forming the critical mass needed.

The most perspective young researchers, especially in natural sciences, find well-paid positions outside Armenia, which, in its turn, leads to brain-drain.

2.4 Doctoral program provides training in core discipline areas and transferable skills and ensures an active involvement of doctoral candidates in research activities.

Educational component of the Doctoral program includes trainings in core disciplines of Biology and in transferable skills. Corresponding courses are described in the doctoral programs.

The programs aims to prepare specialists with fundamental knowledge and skills in biochemistry, biophysics and bioinformatics, botany and mycology, zoology, genetics and cytology, physiology, ecology and nature protection, microbiology and biotechnology, who will be able to:

- understand the leading role of biodiversity as factor of stability of live systems and biosphere as a whole,
- analyze morphological, self-reproduction, physiological, biochemical, biophysical features of live systems,
- implement actions for biodiversity preservation, as well as for its rational use for economic and medical purposes
- carry out fundamental and applied scientific biological research under both laboratory and field conditions as well as implement the results in production,
- analyze and estimate anthropogenous influence and its consequences on environment and wildlife,
- use modern information technologies in various biological areas.

University research strategy plan provides mechanisms which will be implemented to increase the number of young researchers, doctoral candidates and students involved in scientific research projects.

The number of speciality courses that are necessary for the current specialization is relatively small compared with general courses.

2.5 Doctoral program has set criteria on the assessment of the quality of research results against achieved outcomes and mechanisms for the evaluation of the research results' social impact.

There are no written regulations or mechanisms that will enable evaluating the quality of research results and achieved outcomes in terms of the social impact.

2.6 There are set mechanisms and procedures in place to ensure development, approval, monitoring and periodic review of doctoral program with an active involvement of internal and external stakeholders.

YSU has policy for development, approval, monitoring and review of doctoral programs. In particular, besides the annual approval of each doctoral program, there is an annual attestation of research work that the PhD student has performed. Moreover, the scientific council not only evaluates the research itself, but also assesses the research plan and the corresponding program. Periodic changes taking place in the courses of doctoral programs suggested by the educational-methodic council of the faculty of Biology and ratified by the scientific council of the faculty, are inclined to involve the most significant discoveries and innovations occurring in different spheres of fast developing biological science in the existing courses. For more effective solution of learning, educational and developmental problems, programs of all the courses taught at the Faculty of YSU have undergone substantial development. It is carried out and discussed at the chairs and faculty methodological and scientific councils. In order to improve the program secondary and simplistic issues were removed focusing on more complex issues, achievements of modern biological sciences as well as basic and applied problems. A more in-depth study of the substance, practical problems (tasks) and interdisciplinary links were given much consideration.

### 3. Admission Policy

*HEI's admission policy on doctoral program is transparent, is in line with doctoral program's ambitions.*

*Please analyse whether the selection mechanisms of doctoral candidates are aligned with the doctoral program's ambitions.*

1.1 HEI has set mechanisms for promoting equitable recruitment, selection and admission procedures.

YSU has adopted mechanisms for students' recruitment, selection and admission. All the corresponding documentations are available (<http://ysu.am/entrant/hy/1372846077>) and in line with the Regulation of Ministry of Education and Science (MoES). The admission call announcements, the number and the distribution of available positions by doctoral programs are published at YSU website annually.

These mechanisms are bound with regulations defined by MoES and are not conditioned only by the scientific and research policy of the University.

Regulations obligated by the Ministry and Government don't take into account the requirements defined by the University based on the specificity of current doctoral program.

1.2 Selection criteria of doctoral candidates are transparent, publicly available and are in line with the explicit outcomes of doctoral program.

YSU has doctoral candidates' selection criteria that are in line with MoES regulations and are publicly available: the question list of admission exam (defined by specialization) and the available positions for admissions are published on YSU official website. The admission procedure is transparent as much as it is possible.

The limitation of admission positions and the big number of specialties and consequently doctoral programs in YSU, deprive some candidates of the competition opportunity as not all doctoral programs are available every year for admission.

The formal criteria of doctoral candidates' selection that are not the consequence of University's policy, can lead to admission of non-target candidates which don't have research skills.

1.3 HEI periodically analyses the effectiveness of applicants' assessment system.

YSU does not analyse the effectiveness of applicants' assessment system.

#### 4. Supervisor

***HEI provides highly qualified supervisors/well-structured supervisory team to achieve doctoral program's ambitions.***

*Please analyse how the HEI assures sufficient supervision motivated for the implementation of doctoral program's ambition.*

4.1 Supervisors/supervisory team responsibilities, qualifications, workload, recognition criteria are comprehensively stated and described and are in line with doctoral program's ambitions.

The rights and responsibilities of the supervisor and the doctoral students are formulated in the tripartite agreement which have to be signed by the supervisor and the student and thereafter confirmed by the University. The eligibility of researcher to be a supervisor is defined by Supreme Certifying Committee (SCC). Each supervisor can have not more than 5 doctoral candidates.

1.2 HEI has supervisor/ supervisory team appointment procedures.

YSU has supervisor appointment procedure, which includes agreement between candidate and supervisor, corresponding selection of supervisor and candidate by the Chair, approval by the

scientific council of the corresponding faculty and satisfaction of the requirements of Supreme Certifying Committee.

The requirements for supervisors defined by SCC are formal restrictions. Sometimes this fact deprives young, active, creative researchers of the opportunity to be a supervisor or by separate decision of the Higher Attestation Commission.

**4.3** HEI has motivation mechanisms for supervisors to be involved in active researching and be part of relevant scientific network.

YSU have motivation mechanisms for supervisors to be involved in active researching and be part of relevant scientific network. The supervisor is rewarded on a per-hour basis and receives additional opportunities to publish scientific articles, expand the range of scientific interests, and create new scientific international contacts. Periodic scientific reports of the PhD students in the faculty scientific council, scientific and educational business trips and scientific workers of the faculty, periodic participation representatives in International scientific and educational conferences, monthly scientific seminars organized by the Chair, lectures and reports delivered by foreign leading scientists, and periodic improvement of the material and technical basis of the educational laboratories (receiving new devices, equipment renewal) and many other events contribute to the above-mentioned goals.

**4.4** There is well-established system for periodic evaluation of supervision that foster to review existing policies and procedures for supervision and to reveal the professional needs of supervisors.

YSU does not have system for periodic evaluation of supervision and does not evaluate the effectiveness of the scientists' supervision. Due to this, some supervisors do not fulfill their obligations in a proper way, and there are no mechanisms to fix this. Therefore, in order to establish the corresponding assessment system, the mechanisms and procedures of supervision evaluation are going to be developed.

**4.5** HEI fosters the development and professional progress of supervisors.

YSU has different types of employeerewards and bonuses to fosterthe development and professional progress of researchers and teaching staff including supervisors. The corresponding regulation has mechanisms to encourage publication activity, participation in conferences, organization of Olympiads, defence of doctoral thesis and so on ([http://documentation.y-su.am/wp-content/uploads/2016/05/lravcharneri\\_hashvarkman\\_karg.pdf](http://documentation.y-su.am/wp-content/uploads/2016/05/lravcharneri_hashvarkman_karg.pdf)).The university also provides the environment necessary for creative work (including laboratories,library, etc.).

The international exchange programs provide trainings of supervisors at partner institutions.

The supervisors which are internationally recognized researchers often leave because of the attractive offers to work in better conditions outside Armenia.

## 5. Research Environment

***HEI promotes the quality research provisions by creating an environment conducive to research.***

*Please analyse how the HEI ensures the proper implementation of the doctoral program.*

5.1 There are necessary resources for the implementation of doctoral program in accordance with its content, which effectively support the implementation of program's ambitions and create an environment conducive to research.

The librarian resources with widespread options are available at YSU for the implementation of the doctoral program. Besides the existence of research laboratories, highly-qualified researchers and professors, who publish in high ranking journals, and win different awards and grants, ensure the quality of the program's implementation.

The laboratory equipment improvement programs are planned based on the YSU finances, grants and donations which are not sufficient for the development of laboratory facilities by University's vision.

Cooperation with different institutions (particularly in the framework of the projects H2020, Erasmus plus, ISTC, OSCE, CRDF, NATO Science for peace, etc.) provides the program with all the necessary resources, including well-equipped laboratories, research experience sharing programs, trainings on up-to-date research skills and so on.

The dependence of the program and research activities in general on non-effective procurement procedure makes its implementation vulnerable.

There are 2 innovation centers in the faculty: Research Center of Applied Biology and YSUJ microbial biotechnologies and Bio-fuel Innovative Center.

5.2 HEI monitors the scientific progress of the individual doctoral candidates by achieved scientific results and provides career development opportunities. Supervisors have primary responsibility in doctoral candidate's scientific progress.

Doctoral candidate has an individual plan, which includes the educational and research activities that are planned annually. There is also an annual attestation of doctoral candidate, where the scientific council discusses not only the candidate's results but also the contribution of the supervisor. Supervisor is also responsible for providing necessary information and advice concerning the research and corresponding procedures. Perspective and successful candidates have opportunity to continue their research work after the defense. They can also be involved in educational process and give lectures.

There are no mechanisms for doctoral candidate to evaluate the provided support.

The existing resources allow to prepare qualified young specialists, who are involved in scientific research work or grant projects that are being performed in the department during their doctoral education.

Each year, the academic council of the faculty of Biology conducts certification of graduate students, where each graduate student gives a detailed report on the work done.

5.3 HEI ensures that all doctoral candidates receive useful and regular information and advice to promote research and to have opportunity to work in research teams and different research environments.

It is the primary responsibility of the supervisor to give all the necessary information and advice concerning the research in which candidate is involved. YSU provides opportunities to work in different research teams and corresponding research environments at local partner institutions as well as at international partner organizations.

Currently there are no mechanisms to control and monitor the activities of supervisors and doctoral candidates regularly, but the strategy to establish such procedures is being developed.

Research and teaching skills are improved during scientific-pedagogical practice according to the plan that is mutually drafted and affirmed by the scientific supervisor of the PhD student.

According to that plan the PhD student delivers seminars and practical courses for the students and reviews their course papers.

5.4 HEI has sound financial distribution policy and capacity to sustain and ensure the integrity and continuity of doctoral programs at the institution.

YSU has exact mechanisms to control financial resources, to plan, manage and monitor the policies regarding the budget and, in general, there is a clearly defined policy on financial distribution to provide the implementation of doctoral programs.

Because of the lack of financial resources, necessities of the doctoral program are not always satisfied. So the involvement of other financial resources such as grants and research projects by supervisors and researchers is encouraged.

The postgraduate programs of the Faculty of Biology are scientific-educational programs that enable students to be included in the base and grant research programs of the faculty. This circumstance is also in line with the mission of the university as a research institution. This greatly contributes to the increase of the scientific and research level.

5.5 HEI has mechanisms in place for the evaluation of the effectiveness, applicability and availability of resources.

YSU does not have mechanisms or procedures to evaluate the effectiveness, applicability and

availability of resources.

Productive implementation and creation of relevant scientific-educational environment are also supported by scientific-technical activities of the faculty of Biology. Thus, PhD students of faculty of Biology use resources present at the scientific-research laboratory of General Biology carrying out yearly essays or experimental projects.. In this way, the students have a chance to make use of modern methodological approaches applied by the scientists, their scientific drafting, which positively influences on the scientific level of their graduation papers, theses. These also serve to develop graduates' professional abilities.

## 6. Doctoral Candidates

***Doctoral candidates are recognized as professionals with commensurate rights.***

*Please analyse whether the doctoral candidates are part of implementation of the HEI's ambitions in research.*

6.1 HEI has formal mechanisms to regulate relations between candidate, supervisors and institution where the rights and responsibilities of doctoral candidates are clearly formulated.

To regulate relations between candidate, supervisors and University, YSU has adopted tripartite agreement, where the rights and responsibilities of all parties are formulated. Starting from the moment of admission, the doctoral candidates are granted the same rights and opportunities as the researchers, including the rights to use the laboratories, library and other infrastructure as provided by YSU.

There are no mechanisms to reveal supervisors or doctoral candidates that do not perform their duties and, if it is the case, to change the supervisor.

6.2 Doctoral candidates are engaged in governance at the university and participate in decision-making.

Active doctoral candidates are involved in the governance of the university and participate in decision-making through students' councils.

As the relative number of doctoral candidates compared with the total number of YSU students is too small so the chances to be selected as a member of governance council are also little. There is no separate selection mechanism for doctoral candidates.

6.3 HEI has set mechanisms that ensure quality of the student services and doctoral candidates are involved in the quality assurance practices.

YSU does not have mechanisms or procedures that ensure quality of the student services and involvement of doctoral candidates in the quality assurance practices.

### 7. Internationalization

***Internationalization is coherent with institution's research strategy and the individual needs of the doctoral candidates.***

*Please analyse how the HEI strives to be a part of local and international research networks by the implementation of the doctoral program.*

7.1 HEI promotes fruitful and effective collaboration with local and international counterparts aiming to create critical mass and networking as well as to implement joint research and doctoral programs.

According to the YSU development strategic plan (chapter 2, task 3, internationalization of University's research activities) in order to ensure the internationalization of research, YSU cooperates with local and international organizations and institutes aiming to create critical mass and implement joint research and doctoral programs.

7.2 The mobility of doctoral candidates is driven by the candidates' research projects.

Doctoral candidates can take different courses from other departments of YSU as well as do research not only in Armenian HEI or institutes but also at partner institutes or universities outside Armenia. Doctoral candidate takes part in short-term or long-term scientific visit programs based on financial support of YSU, State Committee of Science, Young Researchers' Support Program, Colleague exchange program in the framework of the projects Horizon 2020, Erasmus plus, ISTC, OSCE, CRDF, NATO Science for peace, Volkswagen foundation, ANSEF and other programs and foundations. Because of the mobility and local resource limits doctoral candidates make their future plans outside the country.

7.3 HEI allocates sufficient financial resources for internationalization.

Despite the finances that are allocated for internationalization (YSU, state financing and resources mentioned in 7.2) there are still serious financial limits restricting the active internationalization actions.

## 8. PhD awarding

***HEI has clear mechanisms for monitoring and assessment of the research results (applicable to the institutions having Specialized Councils).***

*Please analyse how the Specialized Councils acknowledge the formation of an autonomous researcher.*

8.1 Specialized Council has PhD awarding criteria that are applied and periodically reviewed.

There are 12 specialized Councils at YSU. PhD awarding procedure is regulated by the requirements of Supreme Certifying Committee. Supreme Certifying Committee confirms the decision of Specialized Council to award doctoral candidate with scientific degree diploma.

8.2 HEI has set criteria for the nomination of the members of Specialized Council/s.

Nomination and selection of the members of Specialized Councils is regulated by the Supreme Certifying Committee among the professionals of the current research sphere.

8.3 HEI periodically implements quality assurance of Specialized Council/s' activities.

YSU doesn't have procedures and mechanisms to implement quality assurance procedures of Specialized Councils' activities.

8.4 Specialized Council/s periodically publishes reports on the development of the relevant fields.

There is no such practice for Specialized Councils to publish reports on the development of the relevant fields.

## 9. Internal quality assurance

***HEI has an internal quality assurance system, which promotes continual improvement of all the processes of doctoral education.***

*Please analyse how the HEI promotes the formation of quality assurance culture for doctoral education.*

9.1 There are well-established and publicly available policies and procedures for internal quality assurance of doctoral education.

YSU does not have internal quality assurance system of doctoral programs. We hope to develop and establish policies and procedures for internal quality assurance of doctoral education in the framework of the Erasmus Plus program "Promoting internationalization of research through

establishment of Cycle 3 QA System in line with the European Agenda (C3QA)”.
9.2 The internal and external stakeholders of doctoral education are involved in the quality assurance processes.
9.3 HEI collects reliable information on the implemented processes through feedback mechanisms, which is evaluated for the improvement of the goals and processes of doctoral education.
9.4 The internal quality assurance system of doctoral education is periodically reviewed.

### SWOTanalysis of the doctoral program

	<p><b>External Opportunities</b></p> <p>(O)</p> <ol style="list-style-type: none"> <li>1. Involvement of Armenia in Framework Programs for Research and Innovation, and colleague exchange programs (Such as Horizon2020, Erasmus Plus, etc.)</li> <li>2. The international exchange programs providing trainings of supervisors and candidates at partner institutions.</li> <li>3. Cooperation with enterprises.</li> </ol>	<p><b>External Threats</b></p> <p>(T)</p> <ol style="list-style-type: none"> <li>1 The lack of state financing and limits of other financial resources.</li> <li>2. Internationally recognized supervisors and perspective young researchers find well-paid positions outside Armenia, which leads to brain-drain.</li> <li>3. The regulations established by Government and Ministry do not take into account YSU requirements and specificity of each doctoral program.</li> <li>4. Non-effective procurement procedure</li> </ol>
<p><b>Internal Strengths</b></p> <p>(S)</p> <p>1. The research strategy of YSU is included in University’s development strategic plan as a separate chapter and is in line with</p>	<p>S-O</p> <p>“Max-Max” Strategy</p> <p>Improvement of strategy to implement joint research and educational programs together with enterprises.</p>	<p>S-T</p> <p>“Max-Min” Strategy</p> <p>Further improvement of research strategy to develop mechanisms for attracting external financial resources.</p> <p>Improve already implemented</p>

<p>YSU mission and goals</p> <p>2. The mechanisms to encourage the effectiveness of research and professional progress of researchers and teaching staff are developed as different types of employee bonuses.</p> <p>4. Tripartite agreement which have to be signed by supervisor, student and confirmed by the University.</p> <p>5. Perspective and successful candidates have opportunity to continue their research work after the defense.</p>	<p>Promoting effectiveness of research and professional progress of researchers and teaching staff through resources provided by partners involved in international cooperation or research project with YSU.</p> <p>Using the cooperation with enterprises provide career development opportunities in industry.</p>	<p>mechanisms to encourage and attract researchers and teaching staff by increasing the amount of bonuses and rewards.</p> <p>Improvement of career development opportunities providing perspective candidates with research and teaching activities, preventing the brain-drain.</p>
<p><b>Internal Weaknesses</b></p> <p>(W)</p> <p>1. Limited financial resources leading to the restrictions in involvement of students and teaching staff in research projects.</p> <p>2. The practical activity of YSU does not fully meet the needs of the internal and external stakeholders and is weak in a practical works' implementation stage.</p> <p>3 YSU does not have motivation mechanisms for supervisors to be involved in active researching and be part of relevant scientific network</p> <p>4. YSU does not have system for periodic evaluation of supervision and effectiveness of scientists' supervision</p> <p>5. There are no mechanisms for doctoral candidate to evaluate the provided support.</p> <p>6. The laboratory equipment improvement programs are planned based on the YSU finances, grants</p>	<p>W-O</p> <p>“Min-Max” Strategy</p> <p>Participation in scientific research programs will give an opportunity to involve more staff and students in research works.</p> <p>Improve research strategy to meet the needs of the internal and external stakeholders.</p> <p>Using the experience obtained from international exchange programs at partner universities to develop motivation mechanism for supervisors to be involved in research actively.</p> <p>Usage of the corresponding regulations of European partners to develop the mechanism and over all control on supervisor and doctoral candidate.</p> <p>Implementation of feedback system and corresponding questionnaire for doctoral students.</p> <p>Involving various enterprises, sponsors and international foundations to provide laboratory</p>	<p>W-T</p> <p>“Min-Min” Strategy</p> <p>Development of effective procurement procedure together with the corresponding state agency that will be different from state regulation concerning the procurement procedure of research facilities.</p> <p>Development and establishment policies and procedures for internal quality assurance of doctoral education in the framework of the Erasmus Plus program “Promoting internationalization of research through establishment of Cycle 3 QA System in line with the European Agenda (C3QA)”.</p>

<p>and donations which are not sufficient for the development of laboratory facilities by University's vision.</p> <p>7. The absence of internal quality assurance of doctoral program.</p>	<p>equipment.</p>	
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