

Date: \_\_\_\_\_ Educational organization of origin: \_\_\_\_\_

Title / Version: \_\_\_\_\_ Course Code: **BLG-5070-2: Applied Genetics**

**CONCEPTS AND TECHNIQUES**

The Living World General Concepts	Compulsory Concepts	Theory Part		Practical Part
		Evaluation of Competencies	Evaluation of Explicit Knowledge	
<b>Genetics</b>	Heredity			
	Chromosomes			
	Alleles			
	Characteristics			
	Homozygous and heterozygous			
	Dominance and recessiveness			
	Genotypes and phenotypes			
	Mendel's law <ul style="list-style-type: none"> <li>• Law of dominance</li> <li>• Law of segregation</li> <li>• Law of independent assortment</li> </ul>			
	Genetic Crosses <ul style="list-style-type: none"> <li>• Autosomal inheritance</li> <li>• Sex-linked inheritance</li> </ul>			
	Hereditary diseases			

CONCEPTS AND TECHNIQUES (Cont.)				
The Living World General Concepts	Compulsory Concepts	Theory Part		Practical Part
		Evaluation of Competencies	Evaluation of Explicit Knowledge	
<b>Molecular Biology</b>	Genome			
	DNA replication			
	Gene			
	Protein synthesis <ul style="list-style-type: none"> <li>• Transcription</li> <li>• Translation</li> </ul>			
	Genetic code			
	Mutation			
<b>Evolution</b>	Biological evolution			
	Genetic diversity			
	Gene pool			
	Mechanisms of microevolution <ul style="list-style-type: none"> <li>• Natural or artificial selection</li> <li>• Gene flow</li> <li>• Genetic drift</li> <li>• Random mating</li> <li>• Mutation</li> </ul>			
	Adaptation			
	Interventions modifying the genetics of a species			
<b>Genetic engineering</b>	Gene manipulation tools			
	DNA sequencing			
	Genetic engineering applications <ul style="list-style-type: none"> <li>• Cloning</li> <li>• Transgenesis</li> </ul>			

CONCEPTS AND TECHNIQUES (Cont.)		
Categories of Techniques	Techniques (not prescribed when data is provided)	Practical Part Evaluation of Competencies
Graphic language	Observable drawings	
Experimentation	Use of laboratory materials	
	Use of observational instruments	
	Preparation of samples	

The four general concepts are covered in the examination. It is not necessary, however, to include all the compulsory concepts for a given general concept.	
<p>Evaluation of competencies:</p> <ul style="list-style-type: none"> <li>Two to four general concepts must be covered. For these general concepts, a representative sample of the compulsory concepts must be covered.</li> </ul>	
<p>Evaluation of explicit knowledge:</p> <ul style="list-style-type: none"> <li>Two or three general concepts must be covered, including those not covered in the evaluation of competencies. Priority is given to compulsory concepts that were not covered in the evaluation of competencies.</li> </ul>	

THEORY PART			
Global Appreciation	Satisfactory	Revision Required	Comments and Suggestions
<b>GUIDE</b>			
General and compulsory concepts are clearly identified.			
The number of general concepts evaluated respects the requirements of the DED.			
For each general concept, representative samples of the compulsory concepts are evaluated.			
Provided materials:			
• Adult’s Booklet			
• Correction Key			
• Guide			
• Evaluation Booklet			
Authorized materials respect the requirements of the DED.			
The duration of the examination is 2 hours.			
<b>ADULT’S BOOKLET—EVALUATION OF COMPETENCIES SECTION</b>			
This section of the examination consists of 1 to 3 scenarios that involve an issue related to the genetic composition of an organism or population with 4–7 tasks (at least one task per scenario). The tasks consider issues related to DNA sequencing or genetic engineering applications.			
The issues inherent to these scenarios require that adult learners provide explanations, take a position, propose solutions, justify their position or solutions, answer questions, consider the impact of applications related to genetics on society and biodiversity, etc.			
Tasks are complex and open-ended; they relate to the context of the scenario.			

THEORY PART (Cont.)			
Global Appreciation	Satisfactory	Revision Required	Comments and Suggestions
<b>ADULT’S BOOKLET — EVALUATION OF COMPETENCIES SECTION (Cont.)</b>			
Tasks are complex, incorporating the following characteristics: <ul style="list-style-type: none"> <li>• Mobilize several concepts</li> <li>• Permit solutions</li> <li>• Use judgment, reasoning, or analysis</li> <li>• Require an opinion, take a position</li> <li>• Provide an explanation and justification</li> <li>• Mobilize the 3 evaluation criteria</li> </ul>			
<b>ADULT’S BOOKLET—EVALUATION OF EXPLICIT KNOWLEDGE SECTION</b>			
The booklet comprises 3 to 8 questions.			
Questions contain minimal or no context.			
The questions are varied in form and relate to each of the first 3 levels of cognitive skill (Knowing, Understanding and Applying).			
Concepts not assessed in the evaluation of competencies section are taken into account.			

THEORY PART (Cont.)			
Global Appreciation	Satisfactory	Revision Required	Comments and Suggestions
<b>ADULT'S BOOKLET GENERAL</b>			
The visual aspect is appropriate (layout, illustrations, spaces for answers, etc.).			
The methods of representation are varied (graphs, tables, texts, equations, diagrams, etc.).			
The level of difficulty is appropriate.			
Scenarios are free of stereotypes, discriminations, or offensive elements.			
Content is <b>original</b> (not based on educational accounts or other materials) and is mathematically and scientifically sound.			
The appendices (tables, formulas, and quantities) are complete and conform to the DED.			
Copyright:			
<ul style="list-style-type: none"> <li>• Rights have been obtained, with supporting documents clearly indicating sources (if applicable).</li> </ul>			
<ul style="list-style-type: none"> <li>• The images and texts are copyright free; the source of each image and text is clearly indicated underneath it.</li> </ul>			
<ul style="list-style-type: none"> <li>• In the case of photos or drawings made by the authors of the exam, a letter granting copyright permission to GRICS is attached to the examination.</li> </ul>			

THEORY PART (Cont.)			
Global Appreciation	Satisfactory	Revision Required	Comments and Suggestions
<b>CORRECTION KEY</b>			
Examples of appropriate responses are provided for all tasks and questions.			
Marking scales are clear.			
A total of 20 marks are allotted for the explicit knowledge section.			
<b>EVALUATION BOOKLET</b>			
The checklist contains observable actions for each criterion.			
Each observable action connects with the concepts evaluated and respects the elements of the evaluation criteria			
The observable actions can be evaluated using the Criterion-Referenced Rubrics.			
A total of 40 marks are allotted for the evaluation of competencies section.			
<b>CONCORDANCE OF BOOKLETS</b>			
There is a concordance between all the documents: <i>Guide, Adult's Booklet, Correction Key, and Evaluation Booklet.</i>			

PRACTICAL PART			
Global Appreciation	Satisfactory	Revision Required	Comments and Suggestions
<b>GUIDE</b>			
The general and compulsory concepts evaluated are clearly identified.			
The adult learner solves a problem related to one of the following concepts: <ul style="list-style-type: none"> <li>• Genetics</li> <li>• Applied genetics</li> </ul>			
The adult learner solves the problem using one of the following:  The experimental method: requires analysis of data which is provided <ul style="list-style-type: none"> <li>• Discussion of scientific or technological concepts</li> <li>• Analysis of the results</li> <li>• An answer to the problem with an explanation</li> </ul> OR  The modelling approach includes: <ul style="list-style-type: none"> <li>• Development of a plan of action</li> <li>• Carrying out the plan of action</li> <li>• Analysis of the results collected.</li> </ul>			
The general and compulsory concepts evaluated are coordinated with the theory section.			



PRACTICAL PART (Cont.)			
Global Appreciation	Satisfactory	Revision Required	Comments and Suggestions
<b>GUIDE (Cont.)</b>			
Provided materials: <ul style="list-style-type: none"> <li>• Adult's Booklet</li> <li>• Correction Key</li> <li>• Guide</li> <li>• Evaluation Booklet</li> </ul>			
Duration of the examination is 3 hours.			
A list of materials required is provided.			
If necessary, instructions for the preparation of laboratory materials are provided.			
The guide includes a list of materials as well as the procedure to be given to the adult if requested.			

PRACTICAL PART (Cont.)			
Global Appreciation	Satisfactory	Revision Required	Comments and Suggestions
<b>ADULT'S BOOKLET</b>			
The scenario is safe; safety instructions are clearly stated when needed.			
The scenario proposes at least four tasks associated with each of the four evaluation criteria.			
The template complies with the DED and the prototype examination.			
The task is complex with the following characteristics: <ul style="list-style-type: none"> <li>• Mobilizes several concepts</li> <li>• Provides data for analysis in the experimental approach</li> <li>• Proposes a problem to be solved</li> <li>• Requires the development of a laboratory report, following an outline that is provided</li> <li>• Uses judgment, reasoning or analysis</li> <li>• Mobilizes the 4 evaluation criteria</li> </ul>			
Content is <b>original</b> (not based on educational accounts or other materials) and is mathematically and scientifically sound.			
The level of difficulty is appropriate.			
Scenarios are free of stereotypes, discriminations, or offensive elements.			

PRACTICAL PART (Cont.)			
Global Appreciation	Satisfactory	Revision Required	Comments and Suggestions
<b>ADULT'S BOOKLET (Cont.)</b>			
The appendices (tables, formulas and quantities) are complete and conform to the DED.			
Copyright:			
<ul style="list-style-type: none"> <li>• Rights have been obtained; supporting documents clearly indicate sources (if applicable).</li> <li>• The images and texts are copyright free; the source of each image and text is clearly identified underneath it.</li> <li>• In the case of photos or drawings made by the authors of the exam, a letter granting copyright permission to GRICS is attached to the examination.</li> </ul>			
<b>CORRECTION KEY</b>			
Examples of appropriate responses are provided for all tasks.			
<b>EVALUATION BOOKLET</b>			
The checklist contains observable actions for each criterion.			
Each observable action connects with the concepts evaluated and respects the elements of the evaluation criteria			
The observable actions can be evaluated using the Criterion-Referenced Rubrics.			

PRACTICAL PART (Cont.)			
Global Appreciation	Satisfactory	Revision Required	Comments and Suggestions
<b>EVALUATION BOOKLET (Cont.)</b>			
A total of 40 marks are allotted.			
<b>CONCORDANCE OF BOOKLETS</b>			
There is a concordance between all the documents: <i>Guide, Adult's Booklet, Correction Key, and Evaluation Booklet.</i>			