COURSE GUIDE FOR
CLINICAL PHYSIOLOGY AND BIOCHEMISTRY

Academic year 2020-2021
(Date last update: 07/07/2020)
(Date approved in Physiology Department Council: 08/07/2020)
(Date approved in Biochemistry and Molecular Biology II Department Council: 09/07/2020)

<table>
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<tr>
<th>MODULE</th>
<th>SUBJECT MATTER</th>
<th>YEAR</th>
<th>SEMESTER</th>
<th>CREDITS</th>
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<tbody>
<tr>
<td>Medicine and Pharmacology</td>
<td>Clinical Physiology and Biochemistry</td>
<td>4th</td>
<td>2nd semester</td>
<td>6 ECTS (4.5 T+ 1.5 P)</td>
<td>Elective course</td>
</tr>
</tbody>
</table>

TEACHING STAFF\(^{(1)}\)

ADDRESS, TELEPHONE NUMBER, EMAIL, ETC.
DIRECCIÓN COMPLETA DE CONTACTO PARA TUTORÍAS (Dirección postal, teléfono, correo electrónico, etc.)

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TIMETABLE FOR TUTORIALS OR LINK TO WEBSITE

https://www.ugr.es/~fisiougr/tutorias.php
http://farmacia.ugr.es/BBM2/index.html

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\(^{(1)}\) Consult any updates in Acceso Identificado > Aplicaciones > Ordenación Docente
(\(\sim\)) This course guide should be filled in according to UGR regulations on assessment of student learning: (http://secretariageneral.ugr.es/pages/normativa/fichasugr/ncg7121/)
<table>
<thead>
<tr>
<th>BELONGS TO UNDERGRADUATE DEGREE PROGRAMME</th>
<th>AND ALSO TO OTHER UNDERGRADUATE DEGREE PROGRAMMES</th>
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<td><em>Grado</em> in Pharmacy</td>
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**PREREQUISITES OR RECOMMENDATIONS (where applicable)**

- It is recommended to have a previous basic knowledge (background knowledge) of Human and Cell Physiology (I and II), Physiopathology, Structural Biochemistry, Metabolic Biochemistry and Human Anatomy.
- A good level of English and Informatics skills are also required.
- Ability to process and to elaborate documents in virtual format and on paper.

**BRIEF DESCRIPTION OF CONTENT (ACCORDING TO OFFICIAL VALIDATION REPORT)**

Introduction to laboratory diagnosis of common diseases. Clinical Physiology. Clinical Biochemistry and Molecular Pathology

**GENERAL AND SPECIFIC COMPETENCES**

**GENERAL SKILLS:**

- CG9. To participate in the activities of promotion of the health, prevention of disease, in the individual, familiar and community area; with the integral and multiprofessional vision of the process health - disease.
- CG10. To design and to evaluate reagents, methods and analytical clinical technologies, knowing the basic foundations of the clinical analyses and the characteristics and contents of the laboratory diagnosis.
- CG13. To develop skills of communication and information, both oral and written, to deal with patients and users of the center where to perform his professional activity. To promote the capacities of work and collaboration in multidisciplinary teams and the related ones to other sanitary professionals.
- CG15. To recognize the own limitations and the need to support and update the professional career, giving special importance to the independent learning of new knowledge being based on the scientific available evidence.

**SPECIFIC SKILLS:**

- CE36. To know and understanding the basic foundations of the clinical analyses, the characteristics and contents of the results of the main clinical laboratory tests.
- CE39. To know and understanding the technologies and skills used in the design and evaluation of the preclinical and clinical tests.
- CE49. To know the analytical technologies and skills related to the laboratory diagnostics.

**OBJECTIVES (EXPRESSED AS EXPECTED LEARNING OUTCOMES)**

- To integrate the knowledge obtained in the Clinical subjects of Physiology and Biochemistry.
- To interpret the laboratory tests used in the diagnosis and follow-up of common diseases.
- To apply the interpretation of laboratory information in the follow-up of the efficiency and of the therapeutic safety.
- To be able to accomplish of reports with the results of the physiological and biochemical diagnosis of laboratory.
- To introduce the specialization in the clinical matters of Clinical Analyses, Clinical Biochemistry, Microbiology and Clinical Parasitology.

**DETAILED SYLLABUS**

**THEORETICAL PROGRAM**

**BLOCK I. CLINICAL PHYSIOLOGY**

THEMATIC UNIT 1. METHODS OF BLOOD’S EXTRACTION (1.5 h.)

THEMATIC UNIT 2. HEMATOPOYETIC ORGANS (1.5 h.)
Blood cells, origin, differentiation and cellular maturation. Morphologic characteristics of the blood cells.

THEMATIC UNIT 3. BASIC HEMATIMETRY

THEMATIC UNIT 4. INTRODUCTION TO THE STUDY OF THE ERITROCYTARY PATHOLOGY (1 h.)

THEMATIC UNIT 5. MICROCYTIC ANEMIAS (3h.)

THEMATIC UNIT 6. MACROCYTIC ANEMIAS (1 h.)
Megaloblasticanemiasby vitamin B12 and folic acid deficiency. Non-megaloblastic macrocytic anemias.

THEMATIC UNIT 7. NORMOCYTIC ANAEMIAS (2 h.)

THEMATIC UNIT 8. INTRODUCTION TO THE STUDY OF THE LEUKOCITARY FUNCTIONALISM (2 h.)

THEMATIC UNIT 9. CHRONIC MYELOPROLIFERATIVE SYNDROMES (1 h.)
Chronic myeloid leukaemia. Chronic myeloproliferative syndromes with hemo-peripheral expression. T and B-cell chronic lymphocytic leukaemia.

THEMATIC UNIT 10. CLASSIFICATION OF THE ACUTE LEUKAEMIAS (1 h.)
Secondary acute leukaemias. Linfoproliferative syndromes without hemo-peripheral expression. Lymphomas and myelomas.

THEMATIC UNIT 11. HEMOSTASIS: COAGULATION AND FIBRINOLYSIS (1.5 h.)
Elements that intervene in the hemostasis. Platelets. Plasmatic factors of the coagulation and fibrinolytic system. Analytical tests of the exploration of the different components.

THEMATIC UNIT 12. FUNCTIONAL ALTERATIONS OF THE PLATELETS (1.5 h.)

THEMATIC UNIT 13. RENAL FUNCTION: PRINCIPLES OF THE RENAL CLEARANCE (1 h.)
Methods to determine the renal clearance. Measures of glomerular filtration, renal blood flow and effective renal plasma flow. Tubular function tests. Dilution and concentration tests.

THEMATIC UNIT 14. EXAMINATION OF THE ACID-BASE BALANCE (1 h.)
Arterial gasometry. Interpretation of information in respiratory and metabolic acidosis. Respiratory and metabolic alkalosis. Effects of compensation.

THEMATIC UNIT 15. CEPHALORAQUID LIQUID (1 h.)
Formation, circulation and composition. Obtaining sample. Cells count and leucocitary formula. Biochemical tests

THEMATIC UNIT 16. SEMINAL FLUID (1 h.)

LABORATORY PRACTICE PROGRAM
Practice 1. Blood cells count: red cells, white cells and platelets
Practice 3. Leucocitary formula.
Practice 4. Reticulocyte count.

BLOCK II. CLINICAL BIOCHEMISTRY

THEMATIC UNIT 1. CLINICAL BIOCHEMISTRY.
Diagnostic semiology. Analytical and biological variability control.

THEMATIC UNIT 2. HYPERGLYCEMIA AND HYPOGLYCEMIA. Diagnosis and monitoring of the diabetic patient.

THEMATIC UNIT 3. LIPOPROTEINS. Evaluation of the atherogenic risk.


THEMATIC UNIT 5. DISPROTEINEMIAS AND DIAGNOSTIC TECHNIQUES.

THEMATIC UNIT 6. CLINICAL ENZYMOLGY.

THEMATIC UNIT 7. BIOCHEMICAL RISK MARKERS OF THE HEPATIC FUNCTION
THEMATIC UNIT 8. TUMORAL BIOCHEMICAL RISK MARKERS

THEMATIC UNIT 9. HEREDITARY DISEASES.

THEMATIC UNIT 10. BIOCHEMICAL ASSESSMENT IN DIFFERENT PHYSIOLOGICAL SITUATIONS.

LABORATORY PRACTICE PROGRAM

Practice 1. Glucose, total cholesterol, HDL-cholesterol and triacylglycerides determination
Practice 2. Uric acid, urea and creatinin determination
Practice 3. GPT and GOT determination

BIBLIOGRAPHY

FUNDAMENTAL BIBLIOGRAPHY:

PHYSIOLOGY


BIOCHEMISTRY

• Sánchez de Medina Contreras F, Sánchez Pozo A, Suárez Ortega MD. Apuntes de Bioquímica Clínica. ICE, Universidad.
• González A. Principios de Bioquímica Clínica y Patología Molecular. Elsevier España 2010.

COMPLEMENTARY BIBLIOGRAPHY:


RECOMMENDED LINKS

PHYSIOLOGY

• Anemias https://medlineplus.gov/spanish/ency/article/000560.htm
• ASH Educational Materials http://labmed.hallym.ac.kr/hematol/ASH-Edu.htm
• Interactive Basic Hematology https://hemeteam.com/
• The Medical Biochemistry http://web.indstate.edu/thcmehwking/blood-coagulation.html#intro
• Bloodline http://www.bloodline.net/
• Hematology Links - Atlas and Slides http://www.hematologyatlas.com/principalpage.htm
• Hematology, MedMark http://www.medmark.org/hem/hem2.html
• Hematopathology Index Medscape http://www.medscape.com/index/section_154_0
• HemoSurf http://www.aum.iawf.unibe.ch/vlz/bwl/Haematologie/index.htm
• American Society of Haematology https://www.ashacademy.org/Product/TeachingCasesList

BIOCHEMISTRY

http://www.the-aps.org/ The American Physiological Society
http://physoc.org/ The Physiological Society
http://www.seccff.org/ Sociedad Española de Ciencias Fisiológicas
http://www.feps.org/ Federación Europea de Sociedades de Fisiología
http://www.biorom.uma.es/indices/index.html (Página con contenidos relacionados con Bioquímica y especialmente metabolismo. Incluye presentaciones de clase, problemas y preguntas tipo test)
http://www.sigmaaldrich.com/life-science/metabolomics/learning-center/metabolic-pathways.html (Páginas que contiene información de rutas y mapas metabólicos, clasificados por diferentes tipos de metabolismo)
Información sobre la asignatura puede ser consultada en la página web del Departamento de Bioquímica y Biología Molecular II: http://farmacia.ugr.es/BBM2/.

TEACHING METHODOLOGY

The subject will be taught using master classes, practical classes and seminars in which the support of clinical cases that will be discussed with the students will be used. Students will also expose some works using for their preparation part of the autonomous work that they must do in person.

• Theoretical classes: In-person theoretical classes will be taught in which the blackboard will be used and as support material transparencies, slides, animated diagrams and videos. This material will be accessible to the student through the web page of the subject, which will use the SWAD or Prado2 platforms of the University of Granada. When necessary, photocopies with the relevant diagrams will be supplied in class. The importance of study using textbooks will be stressed. The teachers will direct the students so that certain topics of the program are conveniently studied before their discussion in the theoretical class. Studying only with class notes is not considered formative enough. Students may interrupt the teacher's explanations as many times as necessary to request clarifications or resolve doubts, as well as to request additional information. Similarly, the teacher may require the participation of students in the discussion. Throughout the course, reinforcement seminars will be held at the discretion of the teacher and in agreement with the students.

• Laboratory practical classes: compulsory attendance. Classes on practical foundations in a laboratory of Human Physiology and Biochemistry and Molecular Biology. The practices will be compulsory attendance and will be carried out in 2 sessions of 3 hours duration plus 1 session dedicated to the theoretical-practical examination, under the supervision of a teacher, in both departments. Each student must write and submit a report on the work done and the results obtained daily. Your assessment will be conducted based on both a written test, a practice and participation in the practices.

• Group tutorials: Where the overall work of the students will be reviewed and general problems of the subject will be solved.

• Personalized tutoring: where the doubts of the students will be solved individually and they will be helped to choose the most suitable way of working for optimal performance.

• Autonomous personal work: Students will be able to carry out a work for their exposition and group discussion, which can be assessed in the Academic Activities section.

ASSESSMENT (ASSESSMENT INSTRUMENTS, CRITERIA AND PERCENTAGE VALUE OF FINAL OVERALL MARK, ETC.)

• It is necessary to have all the approved practices to pass the subject.
• None of the approved partials is saved for the next course.
• To pass the course, a balance in the knowledge of Physiology and Biochemistry is necessary.
• Final grade: The student’s final grade will be the compendium of the work done during the course in the scheduled activities, and they cannot pass the course without having demonstrated a sufficient level of knowledge in the written tests.

• The following criteria will be met:

a) Written tests on the contents of the theoretical program. Passing any of the tests will not be achieved without a uniform and balanced knowledge of all the subject matter included.

b) Practical classes.

c) Autonomous work and exhibition, where appropriate.

d) Attendance at and participation in face-to-face activities.

e) Participation in forums on program topics, if applicable.

• In accordance with the regulations for the evaluation and qualification of the students of the University of Granada approved on May 20, 2013, the evaluation will be continuous with the exception provided for in said regulations, in which a single final exam will be held.

CONTINUOUS EVALUATION

It will be based on evaluating students’ work throughout the course and active participation in theoretical and practical classes, implementation of proposed activities, seminars, tutorials, etc. will be valued. The greatest weight in the evaluation will fall on the responses to the written exams.

A mid-quarter examination will be conducted on the topics of Clinical Physiology. If it does not exceed it, it may be repeated in the ordinary call.

Written exams will consist of teachers’ judgment in test-type questions, short questions or development questions to assess knowledge objectives as well as to know if the competencies of the subject have been achieved.

To pass the subject will be essential:

1. Have completed the internships and passed the corresponding exams. In the event that a student does not carry out the internship, he or she may pass a theoretical-practical examination in the laboratory.
2. Have passed the two written examinations of both the Clinical Physiology and Clinical Biochemistry part. The average will be carried out whenever a minimum of 4.5 is reached and the average of both is equal to or greater than 5

The relative weight in the final qualification of the different sections, once the limitations indicated above have been overcome, will be:

**Physiology Department:**
Practices: 5%; Presentation of topics by students, completion of work and participation in seminars: 5%, Attendance with use of class: 5% Written exam: 35%

**Biochemistry and Molecular Biology II Department:**
Practices: 10 %; Several activities: 5 %; Written exam: 35%.

As a consequence of the change to the teaching modality of semesters closed in the Faculty of Pharmacy
for the 2019-2020 academic year, the non-delay and immediacy of the ordinary and extraordinary call, students who had a partial approved in the ordinary call will be kept for the extraordinary call.

Students with the practices approved in a previous call and as long as there has been no change in the practical teaching program, may choose not to do them in subsequent academic years, appearing with a grade of apt (5). In the event that they would like to qualify for a higher grade, they must indicate this to the Secretary of the Department so that they can be called again.

**STUDENTS WITH SPECIFIC EDUCATIONAL SUPPORT NEEDS (SSESN)**
The teaching methodology and evaluation will be tailored to students with specific educational support needs (SSESN), in accordance with Article 11 of the Evaluation and Qualification Regulations for Students of the University of Granada, published in the Official Gazette of the University of Granada No. 112, of 9 November 2016.

**DESCRIPTION OF THE EXERCISES WHICH WILL CONSTITUTE SINGLE FINAL ASSESSMENT AS ESTABLISHED IN UGR REGULATIONS**

According to the Students Assessment and Qualification Policy of the University of Granada (adopted by the Governing Council on Oct 26, 2016), those students who cannot follow the continuous assessment system due to working, health or disability issues (or any other reason appropriately justified) can apply for a Single Final Assessment. For this purpose, the student will submit a formal request to the Director (Head) of the Department, arguing and proving (with documented evidence) the reason for not being able to follow the continuous system. The submission deadline will be 2 weeks after the beginning of the lectures. In extraordinary circumstances, the starting date for counting the 2-week period will be the enrolment date (policy NC78/9) and, in this case, the student will have to include the proof of enrolment date when making the request. After ten days without the student receiving a written reply from the Director of the Department, it will be understood that the request has been deemed. In case of denial, the student may file, within one month, an appeal to the Rector, who may delegate this task to the Dean or Director of the Centre, exhausting the administrative proceedings.

Students who have opted for this system and have been admitted to it, during the first two weeks of teaching, will have to take and pass a theoretical test and / or development questions, which would represent 40% of the final grade for evaluate the theoretical knowledge of the Physiology part, another test-type exam and / or development questions that would also represent 40% of the final grade to evaluate the theoretical knowledge of the Biochemistry part; and a theoretical-practical exam that would suppose 10% of the final grade to evaluate the practical knowledge of the Physiology part, and finally another theoretical-practical exam that would also suppose the remaining 10% to evaluate the practical knowledge of the Biochemistry part. The student may be required by the teaching staff in order to assess their grade.

Teachers will be able to take complementary oral exams whenever necessary to better weigh the grade or when in doubt about the authenticity of written exercises. When appropriate, a final evaluation will be carried out by means of an individual interview of the student with the professor of the subject or with a tribunal made up of 3 professors from the Department.

- **Extraordinary call**
  There will be a single exam similar to the second exam of the ordinary call that will include all the subject matter. The grade of any theory exam will not be saved, although the practical grade will be saved.
### SCENARIO A (ON-CAMPUS AND REMOTE TEACHING AND LEARNING COMBINED)

#### TUTORIALS

<table>
<thead>
<tr>
<th>TIMETABLE</th>
<th>TOOLS FOR TUTORIALS</th>
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<tbody>
<tr>
<td>(According to Official Academic Organization Plan)</td>
<td>(Indicate which digital tools will be used for tutorials)</td>
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<tr>
<td><strong><a href="https://www.ugr.es/~fisiougr/tutorias.php">https://www.ugr.es/~fisiougr/tutorias.php</a></strong></td>
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</table>

A similar timetable.

#### MEASURES TAKEN TO ADAPT TEACHING METHODOLOGY

- Royal Decree-Law 21/2020, of June 9, on urgent measures of prevention, containment and coordination to face the health crisis caused by COVID-19, establishes in its article 9 that in educational centers, including University students must guarantee the adoption of organizational measures, avoid crowds and ensure that a safety distance is maintained, maintaining on campus teaching.
- When it is not possible to maintain this safety distance, adequate hygiene measures will be observed to prevent the risks of contagion. If it is not possible to maintain social distance in the classrooms, the classes will be taught in person and / or virtual, using the tools for GOOGLE MEET videoconferencing, respecting the same schedule that appears in the Teaching Guide for this subject.
- The most relevant teaching material used in virtual classes will be available on the PRADO platform, as well as other resources that the teacher considers important to complement the student’s training.
- The tutorials, queries and clarifications may be done in person in the teachers’ offices and / or using the PRADO, SWAD, GOOGLE MEET platform and the Ugr email.
- For practical teaching, the explanation of the theoretical foundations may be taught online, while the practical part will subdivide the groups to do it in person in the laboratory, keeping the distance of safety and hygiene measures.

#### MEASURES TAKEN TO ADAPT ASSESSMENT (Instruments, criteria and percentage of final overall mark)

**Ordinary assessment session**

The exam will be face-to-face in principle. If this were not possible, the PRADO and SWAD platform tools would be used to carry out the exam.

**Physiology Department**

Practices: 5%; Presentation of topics by students, completion of work and participation in seminars: 5%, Attendance with use of class: 5% Written exam: 35%

**Biochemistry and Molecular Biology II Department:**

Practices: 5%; Different activities: 5%; Written exam: 40%

Teachers will be able to take complementary oral exams whenever necessary to better weigh the grade or when in doubt about the authenticity of written exercises.

Extraordinary assessment session

The exam will be face-to-face in principle. If this were not possible, the PRADO and SWAD platform tools would be used to carry out the exam.

Physiology Department
Practices: 5%; Presentation of topics by students, completion of work and participation in seminars: 5%, Attendance with use of class: 5% Written exam: 35%

Biochemistry and Molecular Biology II Department:
Practices: 5%; Different activities: 5%; Written exam: 40%

Teachers will be able to take complementary oral exams whenever necessary to better weigh the grade or when in doubt about the authenticity of written exercises.

Single final assessment

Physiology Department
Theoretical exam (90% of the qualification) and a practical exam (10% of the qualification). Both the theory and internship examinations will include the two parts of the subject, Physiology and Biochemistry. The student may be required by the teacher in order to access their qualification.

Biochemistry and Molecular Biology II Department
Practices: 10%; Written exam: 40%
• The extraordinary exam will include tests, short questions and development that will be carried out through the PRADO or SWAD platform.

SCENARIO B (ONCAMPUS ACTIVITY SUSPENDED)

TUTORIALS

<table>
<thead>
<tr>
<th>TIMETABLE (According to Official Academic Organization Plan)</th>
<th>TOOLS FOR TUTORIALS (Indicate which digital tools will be used for tutorials)</th>
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<tbody>
<tr>
<td>The tutorials are given at the same times that it was done in person. Exceptionally, when this is not possible, the students will have meetings in a new schedule from 2:30 p.m. or 7:00 p.m. In addition, emails are attended to students at any time, for</td>
<td>• Videoconference (Google Meet)</td>
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<td>• E-mail</td>
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<td>• Study guides</td>
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<td>• PRADO and SWAD forums</td>
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<td>• Teaching communications</td>
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specific questions.

**MEASURES TAKEN TO ADAPT TEACHING METHODOLOGY**

1. **Theoretical Teaching:** classes are held on-line synchronous videoconference through the Google Meet platform at the same times that they had been taught in person.  
   2. **Practical Teaching:** students are called through PRADO and SWAD, or teaching communication and a Google Meet link is created to teach these practices.  
   3. Use of the PRADO and SWAD platforms with support material for theory and practices and activities for monitoring continuous assessment.

**MEASURES TAKEN TO ADAPT ASSESSMENT** (Instruments, criteria and percentage of final overall mark)

**Ordinary assessment session**

### PHYSIOLOGY

**Theoretical Teaching:**

- Online questionnaires through the PRADO-EXAMEN platform.
- Online questions according to the PRADO-EXAMEN exam modality. The questions are ordered sequentially without being able to go back. The questions are elaborated and carried out through PRADO-EXAMEN.
- The allocation of points in the evaluation system will be made according to the percentages: 70% of the final grade will be the theoretical exam, 10% the practices and 20% continuous evaluation activities + seminars.

**Practical Teaching:**

- Online questionnaires through the PRADO-EXAMEN platform.
- It will consist of a test (60% of the grade with a structure similar to the theory exam) and the questions from the practical notebook adapted to the new teaching methodology (40% of the grade) that is sent to students in a single file, through PRADO or teaching communication.
- Students who have not completed or have not passed the practices will be called for a practice exam on the day of the theory exam.
- Both to evaluate the theoretical teaching as well as the practical teaching in the event of a connection failure, another time will be agreed on the same day. In the event that it fails again, another day will be agreed in the form of individualized online oral test.

### BIOCHEMISTRY

**Theoretical Teaching:**

- The evaluation will be carried out by means of various tests, more activities proposed in the teacher’s opinion (10%), plus 10% of practices (similar to that foreseen in option A), or different activities delivered in due time and form or a standard exam d test of each or several topics and at the teacher’s choice, which will compute together 30% and a final test type exam that will compute 10%, leaving the student’s final grade resulting from applying the following percentages: practices 10%; activities and exams test by subject 30%; final exam type test 10%.

- Online questionnaires through the PRADO-EXAMEN platform. Each test will consist of a proposed Activity or the realization of an exam with test questions (the number is pending, ranging from 10 to 20) that will be raised randomly one by one. Each student will see the questions in a different order and within each question the answers will also be seen randomly. Once a question has been answered, the next one will be passed, without the possibility of going back. There will be a time of 1.5 minutes per question and at the end of the time the results will be automatically sent to the teachers. Every four incorrect answers will subtract the value of a correct one.

- At the end of the course, the grade of all the tests will be calculated, which must be 4.5 or higher to pass the
subject corresponding to the Biochemistry part. If a student has passed some of the parts, they will be saved and must take the final exam with the part that they have not passed.

**Practical Teaching:**
Online questionnaires through the PRADO-EXAMEN platform.

**Extraordinary assessment session**

**PHYSIOLOGY**
- Online questionnaires through the PRADO-EXAMEN platform
  - Online questions according to the PRADO-EXAMEN exam modality. The questions are ordered sequentially without being able to go back. The questions are elaborated and carried out through PRADO-EXAMEN.
  - To evaluate both theoretical and practical teaching in the event of a connection failure, another time will be agreed on the same day. In case it fails again, another day will be agreed in the form of individualized online oral test.
  - Students who have not completed or have not passed the practices will be called for a practice exam on the day of the theory exam.
  - Students will always take a theory test that will be evaluated over 70%. In the rest of the sections, the students will be able to keep their mark or waive the mark of all the sections (practices, seminar and continuous evaluation questions) and be re-evaluated of all of them if they so request. The qualification will be obtained by applying the same criteria specified in the ordinary call.

**BIOCHEMISTRY**
- Similar to the scenario A
  - Online questionnaires through the PRADO-EXAMEN platform

**Single final assessment**

**PHYSIOLOGY**
- Online questionnaires through the PRADO-EXAMEN platform
  - Online questions according to the PRADO-EXAMEN exam modality (70% of the final grade). The questions are ordered sequentially without being able to go back. The questions are elaborated and carried out through PRADO-EXAMEN.
  - Students will be called for a practical exam on the day of the theoretical exam (10% of the final grade).
  - The allocation of points in the evaluation system will be made according to the percentages: 90% of the final grade will be the theoretical exam (those who pass the test must also pass an oral exam the same day through Google Meet to complete the grade up to 90%) and 10% corresponds to the practices.
  - Both to evaluate the theoretical teaching as well as the practical teaching in the event of a connection failure, another time will be agreed on the same day. In case it fails again, another day will be agreed in the form of individualized online oral test.

**BIOCHEMISTRY**
- Similar to the scenario A
  - Online questionnaires through the PRADO-EXAMEN platform
**ADDITIONAL INFORMATION (if necessary)**

In the event of suspension of on campus teaching, the students of the single final evaluation may request to join virtual teaching, since the difficulties they claimed to not follow the continuous evaluation will have disappeared.