1. **BASIC INFORMATION**. .................................................................................................................. 2
2. **CONTEXTUAL INFORMATION** ........................................................................................................ 2
3. **SPECIFIC COMPETENCES**. ............................................................................................................... 2
   A. **PROFESSIONAL VALUES, ATTITUDES AND ETHICAL BEHAVIOUR.** ................................................... 2
   B. **DENTISTRY SCIENTIFIC FUNDAMENTS. ACQUISITION AND INFORMATION CRITICAL ASSESSMENT.** 3
   C. **CLINICAL SKILLS: DIAGNOSIS, PROGNOSIS AND DENTAL TREATMENT PLAN.** ................................. 3
   D. **CLINICAL SKILLS: DENTAL THERAPEUTICS.** ................................................................................ 3
4. **GENERAL COMPETENCES (CROSS-COMPETENCES)** .................................................................... 4
   A. **BASIC COMPETENCES** .................................................................................................................. 4
   B. **CROSS COMPETENCES.** .................................................................................................................. 4
5. **CONTENT.** ........................................................................................................................................... 5
6. **CLASSROOM ACTIVITIES** .............................................................................................................. 6
   **ACTIVITY THAT ENCOURAGES THE USE OF THE SPANISH LANGUAGE:** ............................................. 6
7. **TEACHING METHODOLOGY** ........................................................................................................... 6
8. **EVALUATION PROCEDURE** ............................................................................................................. 6
   **SPECIFIC ASSESSMENT REGULATIONS** .............................................................................................. 6
   A. **THEORY BLOCK (55%).** ..................................................................................................................... 6
   
   A1. **Exam (80%).** ...................................................................................................................................... 7
   A2. **Lectures post-test (20%).** ................................................................................................................ 7
   B. **PRACTICALS BLOCK (35%).** .............................................................................................................. 7
   B1. **Practice activity (80%).** ................................................................................................................... 7
   B2. **Practice pre-test (20%).** ................................................................................................................ 8
   C. **ACTIVITY (10%).** ............................................................................................................................... 8
   C1. **Presentation and summary documents (50% of the block)** ........................................................... 8
   C2. **Exam about a reference book for the subject and/or scientific papers (flipped classroom) (50% of the block)** ........................................................................................................................................... 8
   D. **CRITERIA FOR THE SUBJECT AS A WHOLE (100%).** ..................................................................... 9
9. **MATERIALS** .......................................................................................................................................... 9
10. **CHRONOGRAM** .................................................................................................................................. 10
11. **RECOMMENDED BIBLIOGRAPHY** ................................................................................................. 11
1. Basic information.

<table>
<thead>
<tr>
<th>Name of the subject: Normal and Pathological Occlusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code: 9999001211</td>
</tr>
<tr>
<td>Degree: Grade in Dentistry</td>
</tr>
<tr>
<td>Year: 2nd</td>
</tr>
<tr>
<td>N. of ECTS credits: 3</td>
</tr>
<tr>
<td>N. of hours: 22 lecture hours and 12 practice hours</td>
</tr>
<tr>
<td>Regulation requirements: none</td>
</tr>
<tr>
<td>Recommended requirements: none</td>
</tr>
<tr>
<td>Name of the professor: Pablo González de Villaumbrosia Santa Cruz, Francisco De Sena Espósito y Fernando Sanclemente Reina.</td>
</tr>
<tr>
<td>Office hours:</td>
</tr>
<tr>
<td>Wednesdays: 12:30-13:30</td>
</tr>
</tbody>
</table>

2. Contextual information.

This subject concerns the field of Dental Occlusion: the anatomical and functional components of the Masticatory System, the basics of the positions and movements of the mandible and the functional anatomy of the occlusal surfaces. It initiates students in the use of articulators and facebows, as well as their classification and purposes.

The practices are intended to let the students implement their theoretical knowledge to the actual practice with patients, regarding impressions, the use or articulators and facebows and occlusal analysis.

3. Specific competences.

**Specific:** CE1, CE2, CE3, CE9, CE10, CE12, CE13, CE14, CE15, CE16, CE17, C19, CE21, CE25, CE26 y CE27.

**A. Professional values, attitudes and ethical behaviour.**

CE1. Recognise the basic elements of the dental profession, including the ethical principles and legal responsibilities.

CE2. Understand the importance of those principles for the benefit of the patient, society and profession, taking special attention to the professional secret.
CE3. Identify the patient’s concerns and expectancies, as well as having the ability to have an efficient and clear oral and written communication with the patients, their family, the social media and other professionals.

CE9. Understand the importance of maintaining and using records information of patient for later analysis, preserving the confidentiality of data.

CE10. Recognize and identify the psychological and physical problems resulting from gender violence, in order to train students in the prevention, early detection, care, and rehabilitation of victims of such violence.

B. Dentistry scientific fundamentals. Acquisition and information critical assessment.

CE12. Understand and recognize the structure and normal function of the oral cavity at molecular, cellular, tissue and organ level in the different stages of life.

CE13. Understand and recognize the essential biomaterials sciences for the dental practice and immediate management of possible allergies related to them.

CE14. Recognise the general process of diseases, which include infections, inflammations, immune system alteration, degeneration, cancer, metabolic alterations and genetic disorders.

CE15. Be familiar with the general pathological features of diseases and disorders affecting organ systems, specifically those with oral impact.

CE16. Understand the action mechanisms, indications, drug efficiency and other therapeutic procedures, knowing the contraindications, interactions, systemic effects and interactions on other organs, based on the scientific evidence available.

CE17. Understand and recognise the ergonomic and occupational safety principles (including cross-infection control, radiation protection, occupational and biological diseases).

CE19. Knowledge of the scientific method and critical capacity to assess the established knowledge and new information. Be able to formulate hypotheses, collect and critically evaluate information for problem solving, using the scientific method.

C. Clinical skills: Diagnosis, prognosis and dental treatment plan.

CE21. Know how to fulfil a complete oral examination, including the radiological and complementary explorations, and to obtain the clinical references correctly.

D. Clinical skills: Dental Therapeutics.
CE25. To know and apply the basic treatment of the most common oral and dental diseases in patients of all ages. Therapeutic procedures must be based on the concept of minimally invasive dentistry and in a comprehensive and integrated approach to the dental treatment.

CE26. To know how to plan and carry out multidisciplinary, sequential and integrated limited complexity in patients of all ages and conditions and patients who require special care dental treatments.

CE27. Ask and propose appropriate preventive measurements in every clinical situation.

4. General competences (cross-competences)

Basic competences: CB1, CB2, CB4, CB5

Cross competences: CT1, CT2, CT4, CT5, CT7, CT8, CT9, CT10

A. Basic competences

CB1. Students must prove they have knowledge on a specific field, based on the secondary general education. This knowledge is at a level that, apart from being supported by advanced textbooks, includes aspects that imply knowledge coming from the forefront of its field of study.

CB2. Students are able to apply their knowledge to their professional work or vocation and prove to have these competences by proposing and defending arguments and by having the ability to solve problems on their study area.

CB4. Students are able to transmit information, ideas, problems and solutions to a specialised and non-specialised public.

CB5. Students have developed the learning skills needed to carry out works with a high level of personal autonomy.

B. Cross competences

CT1. Autonomous learning: Process that enables a person to be in charge of its own development, choosing his path, strategies, tools and the best moment to learn and apply what has been learnt. An autonomous student, at the end, chooses the best strategies to fulfil his learning goals.

CT2. Self-confidence: Ability to value our own results, performances and the conviction to fulfil the challenges that have been laid out.

CT4. Analysis and synthesis ability: Analysis is the reasoning methods that allow us to split up complicated situations into their components; also assesses other alternatives and
perspectives to find out optimal solutions. Synthesis aims to reduce the complexity in order to have a better understanding and problem-solving capacity.

CT5. Ability to apply knowledge into practice: Ability to use the acquired knowledge in the academic field in situations which are similar to the reality of the profession for which they are formed. For example, by relating theoretical foundations with their application to real problems of everyday life, addressing problems and situations close to the professional activity or resolve issues and / or actual problems.

CT7. Ethical value awareness: Ability to think and act according to the universal principles based on the personal values aimed at his full development related to the commitment of determined social values.

CT8. Information management: Ability to search, choose, analyse and integrate information from different sources.

CT9. Personal relationship values: Positive relationship with others verbally and non-verbally by assertive communication, understanding by this, the ability to express or transmit what is wanted, thought or felt without causing discomfort, attacking or hurting someone’s feelings.

CT10. Initiative and entrepreneurial spirit: Preference to assume and carry out different tasks. Ability to overcome correctly difficult tasks. Problem anticipation ability, to suggest improvements and carry on with the achievement of a task.

5. Content.

- **Lesson 01**: Occlusion in Dentistry.
- **Lesson 02**: Comprehensive review of Anatomy.
- **Lesson 03**: Functional neuroanatomy and physiology.
- **Lesson 04**: Alignment and occlusion of the dentition.
- **Lesson 05**: Mandibular positions and movements.
- **Lesson 06**: Facebows.
- **Lesson 07**: Articulators.
- **Lesson 08**: Mandibular dynamics.
- **Lesson 09**: Optimal functional occlusion.
- **Lesson 10**: Occlusal schemes
- **Lesson 11**: Seminar about the handling of articulators and facebows. Discussion about Occlusion books and/or scientific papers.
6. Classroom activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>N. of hours</th>
<th>Mandatory attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>0,72 ECTS - 18h</td>
<td>50%</td>
</tr>
<tr>
<td>Laboratory practices</td>
<td>0,56 ECTS - 14h</td>
<td>100%</td>
</tr>
<tr>
<td>Portfolio</td>
<td>0,16 ECTS - 4h</td>
<td>100%</td>
</tr>
<tr>
<td>Tutorials</td>
<td>1,08 ECTS - 25,2h</td>
<td>50%</td>
</tr>
<tr>
<td>Knowledge tests</td>
<td>0,18 ECTS - 4,5h</td>
<td>100%</td>
</tr>
<tr>
<td>Autonomous work and study</td>
<td>0,28 ECTS - 7 h</td>
<td>0%</td>
</tr>
</tbody>
</table>

**Activity that encourages the use of the Spanish Language:**

It’s a mandatory activity that promotes the use of Spanish. It consists of an activity in which the students will prepare a presentation about several topics of the subject. The day of the activity (see calendar), the students will do a very short Power Point presentation (3-4 minutes maximum) about one of the topics that will be listed on the Virtual Campus, in groups of 2 people. The presentation will be made in English, but every group will have to prepare a summary of the topic in both Spanish and English, therefore learning the basic terminology in Spanish.

7. Teaching methodology

- Master lectures.
- Simulation environments.
- Problem-based learning.

8. Assessment procedure

<table>
<thead>
<tr>
<th>Evaluation procedure</th>
<th>Minimum and maximum grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge tests</td>
<td>45-55%</td>
</tr>
<tr>
<td>Laboratory practices</td>
<td>35-40%</td>
</tr>
<tr>
<td>Portfolio</td>
<td>10-15%</td>
</tr>
</tbody>
</table>

**Specific assessment regulations**

A. Theory block (55%)

This block will consist of an exam and a series of lectures post-tests.
A1. Exam (80%)

There will be a multiple choice exam. It will consist of 40 questions, and the students will have to answer at least 80% of them (32). Every right question adds 1 points, every wrong one -1/3 points and every not-answer question 0 points.

The exam will last 1 hour. Anybody writing anything or having a pen in its hand after the time is over will fail the exam.

The exam will have 3 extra questions, apart from the first 40, to act as reserve questions, just in case one of the first 40 has to be discarded.

During the exam no questions are allowed. If you think one or several of the questions are not clear or are not properly worded, you will have to write your criticism and reasons to contest this question/s at the back of the answers sheet.

The contents you will be asked about in the exam will mainly be the lectures, as well as books and the pdf documents on Moodle in a lesser degree.

A2. Lectures post-test (20%)

After every lecture, a question will be made about what has been explained that day. Every day’s grade will range from 0 to 2 points, depending on how correct the answer is. It will be 0 if the answer is wrong, 1 if it is partially correct and 2 if it is fully right.

B. Practicals block (35%)

B1. Practice activity (80%):

You will have a grade for the first 5 practices. The final grade will be the average of them.

Every practice must be finished before the time provided ends. Not finishing a practice on time will entail failing that practice. It is not allowed to work in the lab outside of the time given for the practices.

During every practice the student will have explanations and feedback from the professors.

Not attending a practice will entail failing it too. If the student provides a written prove to his/her professor, he/she will be allowed to retake it at the appropriate time at the end of the semester. Not giving proper written justification for the absence will make the student lose the right to retake the practice during the ordinary period and will have to retake it during the “Follow-up Period”.

Up to 2 practices can be failed, but will have to be retaken at the corresponding time at the end of the semester (see chronogram). There will only be one day for that. If the student fails more than 2 practices, they will all have to be retaken during the “Follow-up Period”.
Practices 1 to 5 will be regular practices during which the student will take impressions of a typodont, will pour those impressions and will mount the casts on the articulator.

During the 6th practice the students will have to mount the upper and the lower casts on the articulator without help from the professors, so they can check whether the students can perform that procedure on their own.

During the 7th practice the students will have to complete a sheet of paper with information from the case they have mounted on the articulator. After that, a few questions will be asked to every student about practical aspects of Occlusion by the professor.

After the retake time at the end of the semester, the final grade will be the average of the grade of every practice. If any practice has a grade lower than 5 after the retake time, all of them will be considered failed.

It’s very important and absolutely mandatory having all the necessary materials for each practice. Not having them will entail failing the practice.

Only the materials for the practice are allowed to be present over the working table. Any personal belongings should be kept into the lockers of the laboratory.

B2. Practice pre-test (20%)

At the beginning of every practice the students will be asked to answer two questions about the practice they are about to do. The student must have studied thoroughly in advance the description of the practice that is on Moodle. The grade for every question will range from 0 to 5 points, for a total of 10 points.

Students MUST arrive on time for the pretest of the practice. Arriving late will entail getting a grade of 0 for the pre-test and not being allowed to do the practice, and therefore failing it too.

C. Activity (10%)

C1. Presentation and summary documents (50% of the block)

The activity will consist of a presentation that the students will do about several topics of the subject. The day of the activity (see chronogram), the students will do a very short Power Point presentation (3-4 minutes maximum) about one of the topics that will be listed on the Virtual Campus, in groups of 2 people. The presentation will be made in English, but every group will have to prepare a summary of the topic (max 2 pages) in both Spanish and English, therefore learning the basic terminology in Spanish. All three files will be given to the professor the day of the presentations.

C2. Exam about a reference book for the subject and/or scientific papers (flipped classroom) (50% of the block)
One day (see chronogram) there will be a discussion about an Occlusion book and/or scientific papers that the students will have to read in advance. In a different day after that (see chronogram) there will be a multiple choice exam with 10-20 questions about that book/scientific papers. Every right question will add 1 point, every wrong one +0 points and every not-answered question +0 points too.

**D. Criteria for the subject as a whole (100%)**

Every block (Theory, Practice and Activity) of the subject must be passed with at least a grade of 5 out of 10 in order to pass the whole subject. The individual parts that every block consists of don’t have to be passed to pass the whole block, but remember that every part has a weight in the grade of the block. So, for example, if the grade an exam is 5 but the grade of the post-tests is 4, the whole block will be failed.

Any block that is failed will be retaken during June/July, keeping the grade for the parts passed. If any part remains failed after July, the whole subject will have to be repeated next year.

During June/July’s exams, any failed part will have to be passed with a grade of 5 out of 10. Regarding practicals, there will be a time to retake them (the Follow-up Period – “Periodo de Seguimiento”) that will consist of specific days during which every practice failed will have to be retaken, not existing more days outside of the scheduled ones.

**9. Materials**

- Scrubs (sanitary pajama).
- Gloves (provided by the University).
- Face masks (provided by the University).
- Wax heater with thermostat (provided by the University).
- Photograph.
- Mouth mirror.
- Eye glasses.
- Kavo Protar 5 or 5B, or Artex CP or CR (semi-adjustable articulator and corresponding face-bow).
- Articulator mounting plates.
- Totally dentate typodont (Kavo® or Frasaco®).
- Mechanical pencil.
- Articulating paper (40 and 200 microns).
- Articulating forceps.
- 20 cm transparent standard ruler.
- Cutter/blades/X-acto blade.
- Scissors (blade length of 5 cm).
- Alginate (Ca37 or similar) with water and powder dispensers (very important).
- Satin white alginate mixing bowl.
- Alginate spatula: rigid (metallic) with curved tip.
- Complete set of upper and lower impression trays. Rim-Lock type.
- Two point pair of compasses.
- Type IV plaster (pink) (Vel-Mix Stone). 6kg.
- Fast-set plaster (Kerr® Snow-White n.2). 2kg.
- Type IV plaster (white) (Kerr ® Snow White n.1).
- 1kg capacity weighing scales.
- 200 cc syringe.
- Black rubber plaster mixing bowl.
- Plaster spatula: rigid and straight.
- Plaster knife.
- 25x25x10 cm Tupperware.
- Spontex wipe.
- Brush.
- Base formers (two upper and two lower) with slots.
- 15 mm wideinsulating tape.
- Moyco® wax (extra-hard wax). 1 box per 2 students.
- Thermometer. 1 per 2 students.
- Two wax knives (one large and one small).

10. **Chronogram**

<table>
<thead>
<tr>
<th>Day</th>
<th>Lecture</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 25th</td>
<td>Presentation of the subject and <strong>Lesson 1</strong>: Occlusion in Dentistry</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>February 1st</td>
<td><strong>Lesson 02</strong>: Review of Anatomy related to Occlusion</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td><strong>Lesson 03</strong>: Functional neuroanatomy and physiology</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>February 8th</td>
<td><strong>Lesson 04</strong>: Alignment and occlusion of the dentition</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>February 15th</td>
<td><strong>Lesson 05</strong>: Mandibular positions and movements</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>February 22nd</td>
<td><strong>Lesson 06</strong>: Facebows.</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td><strong>Lesson 07</strong>: Articulators.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>March 1st</td>
<td><strong>Lesson 08</strong>: Mandibular dynamics</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>March 8th</td>
<td><strong>Lesson 09</strong>: Optimal functional occlusion</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td><strong>Lesson 10</strong>: Occlusal schemes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>March 15th</td>
<td>Presentations of the topics by the students.</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>March 22nd</td>
<td>Presentations of the topics by the students. <strong>Discussion and</strong></td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td><strong>clarification of a book/scientific papers.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>March 29th</td>
<td><strong>Lesson 11</strong>: Seminar about handling of articulators and facebows and</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>exam of the book (flipped classroom).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April 5th</td>
<td><strong>Practices 1, 2 &amp; 3</strong>: Upper and lower impressions + pouring + base</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>April 19th</td>
<td><strong>Practices 1, 2 &amp; 3</strong>: Upper and lower impressions + pouring + base</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>April 26th</td>
<td><strong>Practices 1, 2 &amp; 3</strong>: Upper and lower impressions + pouring + base</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>May 3rd</td>
<td><strong>Practices 4 &amp; 5</strong>: Facebow record, upper cast mounting and lower cast</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>mounting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May 10th</td>
<td><strong>Practices 4 &amp; 5</strong>: Facebow record, upper cast mounting and lower cast</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>mounting</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
May 17th  | Practice 6: Upper and lower cast mounting without feedback (practical exam). | No  | No
May 24th  | Practice 7: Assessment about handling of the articulator and mandibular positions and movements. | No  | No
May 31st  | Practice retake | No  | No
June 7th  | Questions and answers session | No  | No
June 14th | Exam | No  | No
June 16th | Exam revision | No  | No

11. Recommended bibliography

